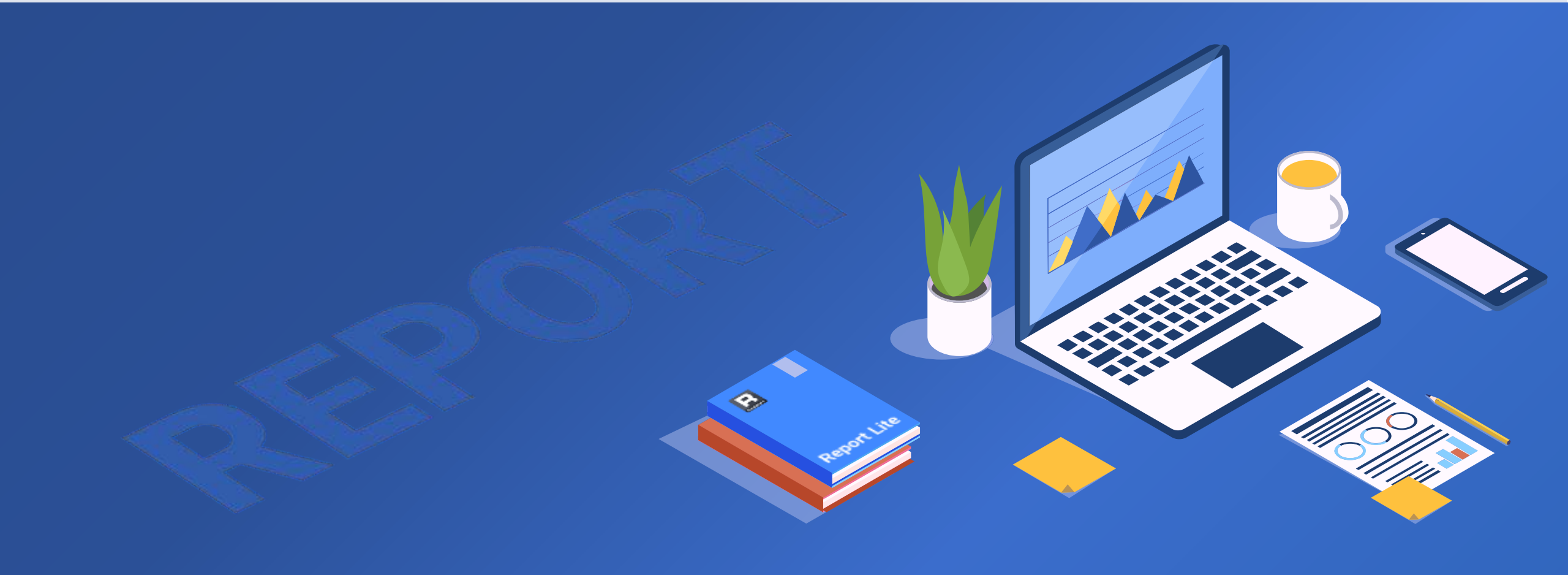
Learning ReportLite



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Chapter 1

Installation & Trial

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Chapter 1 Installation & Trial

1.1 Download & install

1.2 Create row-wise reports through wizard

1.3 Expansion & expression

1.4 Report zone

1.1

Download & install

Download ReportLite

Download software

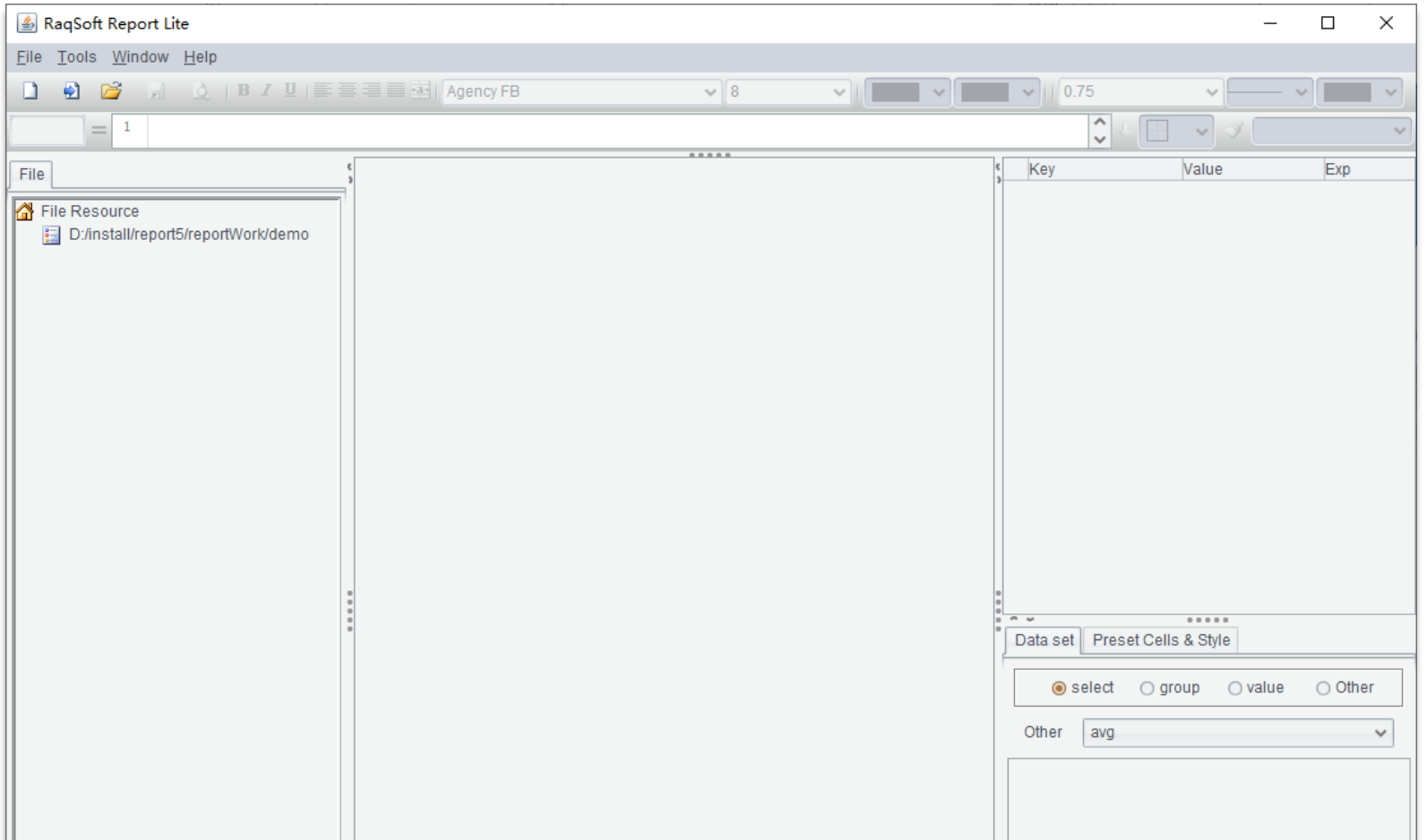
Course material

Installation

- After ReportLite is downloaded, select an installation directory (or use the default) and click “Next” to finish installation.
- Then start ReportLite directly.

ReportLite interface

Below is the initial application interface after ReportLite is started:



1.2

Create row-wise reports through wizard

1.2 Create row-wise reports through wizard

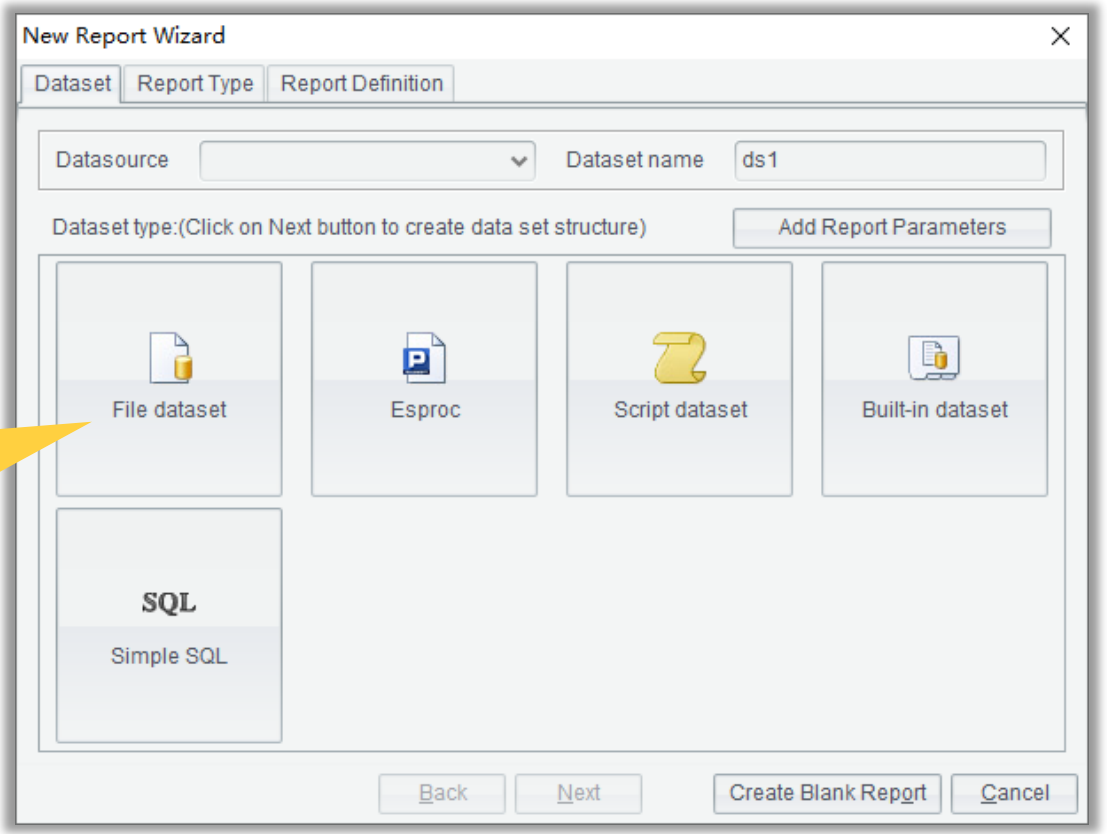
Below is the student score table in the Excel format (data1.2.xlsx). Let's look at how to generate a simple row-wise report using ReportLite.

	A	B	C	D
1	Name	Subject	Midterm	Final
2	Rose	Math	59	80
3	Rose	Physics	48	65
4	Mike	Math	87	77
5	Mike	Physics	70	86
6	Ronald	Math	36	50
7	Ronald	Physics	54	75
8	Smith	Math	25	55
9	Smith	Physics	56	75
10	Frank	Math	66	80
11	Frank	Physics	75	65
12	Aimay	Math	32	50
13	Aimay	Physics	42	65
14	James	Math	37	67
15	James	Physics	97	88
16	Jay	Math	56	56
17	Jay	Physics	88	79

1.2 Create row-wise reports through wizard

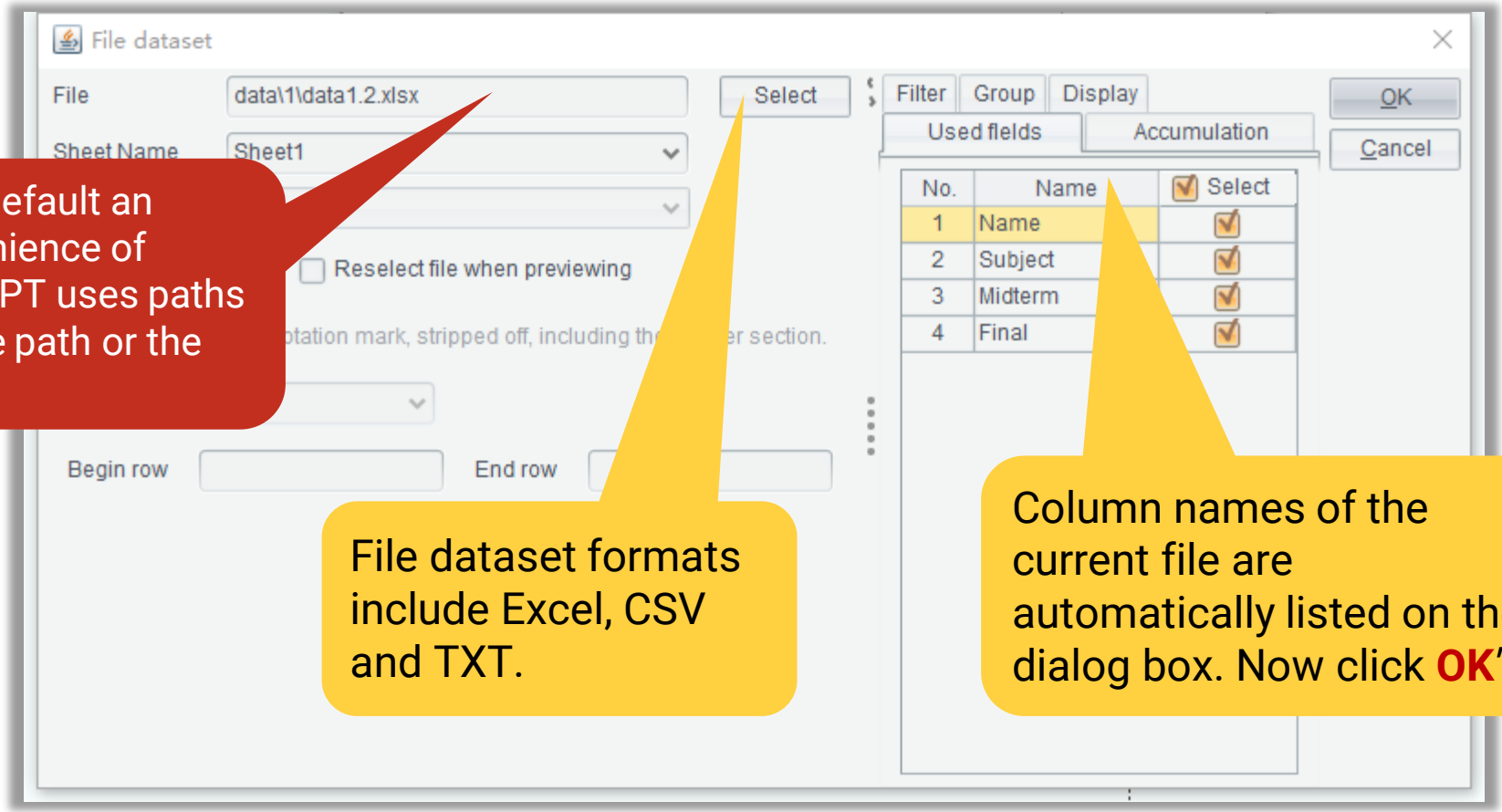
When ReportLite starts running, click “File” and then “New Report” on the menu, or press shortcut key Ctrl+N, to pop up New Report Wizard:

First, find the data source for generating the report. Let’s begin from simple file data. Click **File dataset** :



1.2 Create row-wise reports through wizard

On the pop-up “File dataset” dialog box, click “Select” to select an xlsx data file:



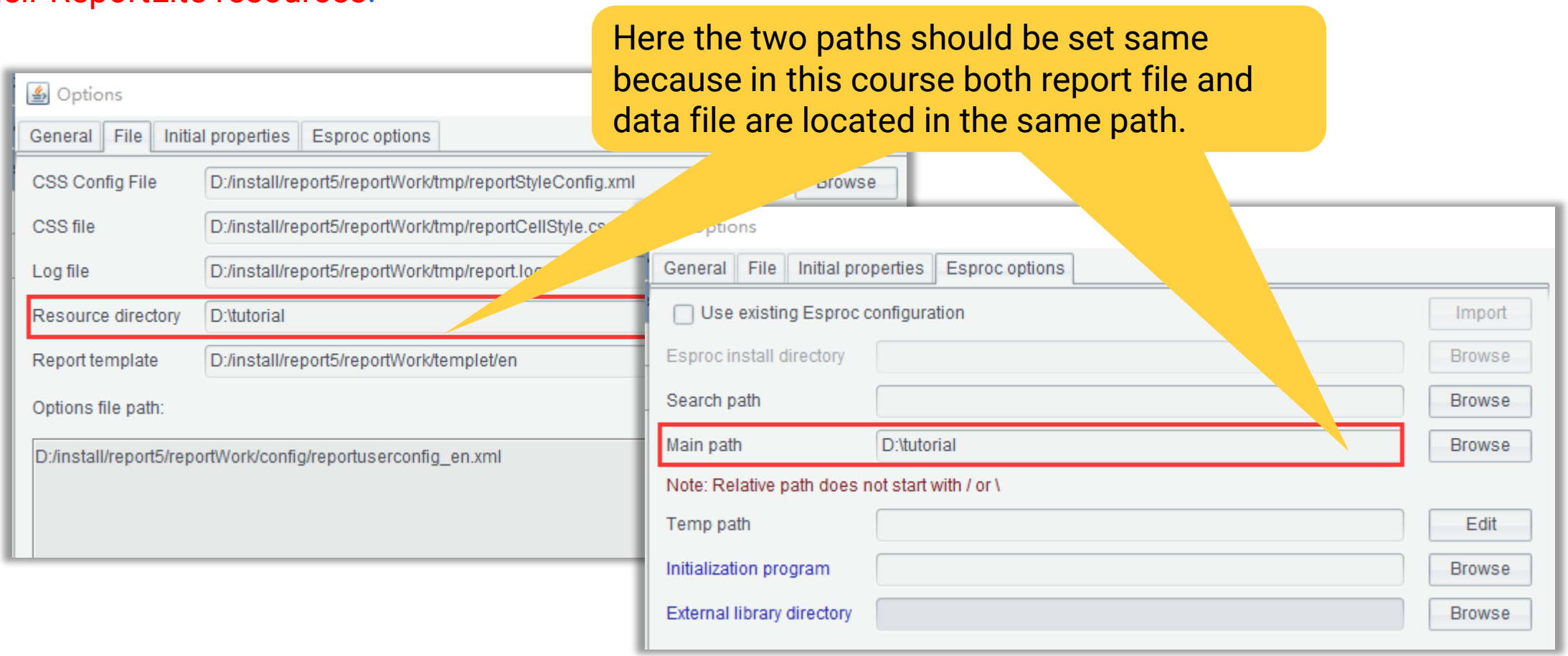
Note: The selected file is by default an absolute path. For the convenience of migration and learning, this PPT uses paths relative to the report resource path or the main path.

File dataset formats include Excel, CSV and TXT.

Column names of the current file are automatically listed on the dialog box. Now click **OK**” .

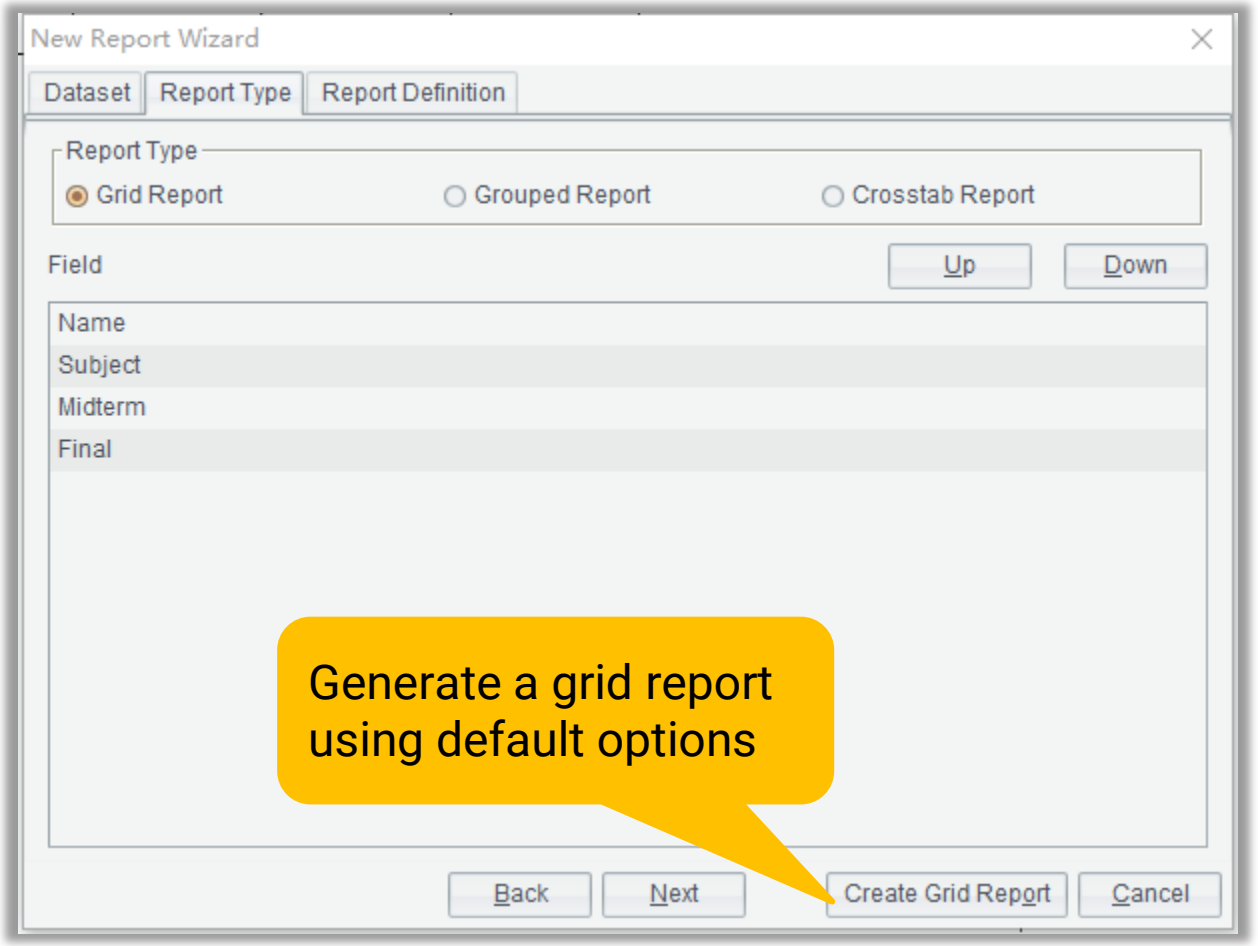
1.2 Create row-wise reports through wizard

On “Options” dialog, users need to modify “Resource directory” and “Main path” to the root directory holding their ReportLite resources:



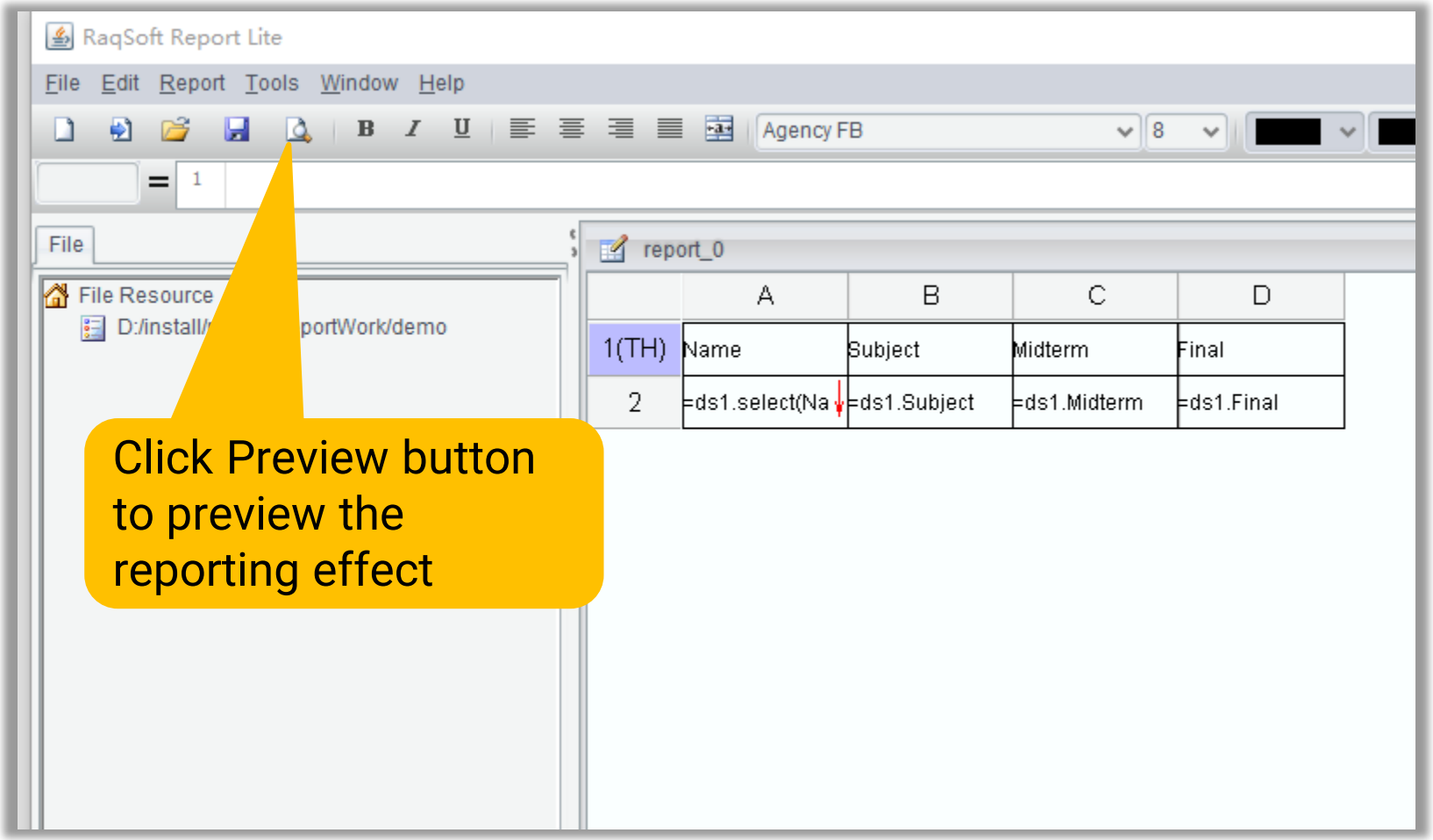
1.2 Create row-wise reports through wizard

Let’s start from the simplest grid report. Click “Create Grid Report” button.



1.2 Create row-wise reports through wizard

Such a simple grid report is a row-wise report:



1.2 Create row-wise reports through wizard

Report preview effect:

Preview report:report_0

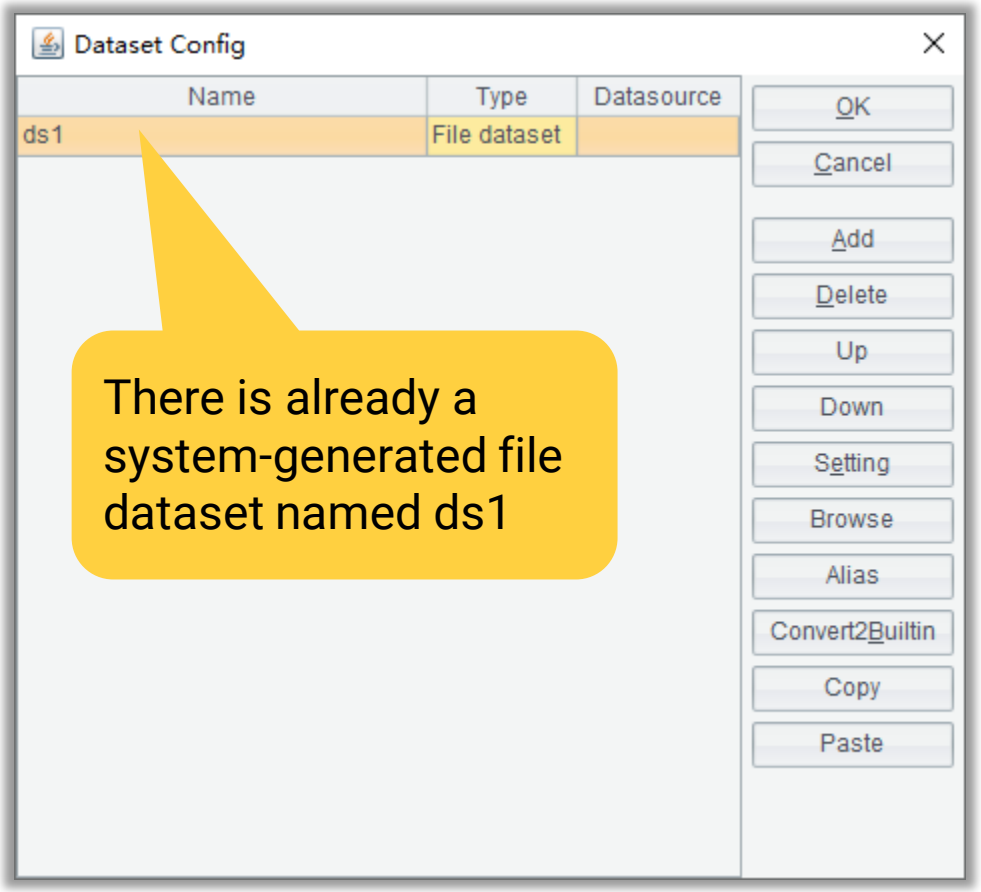
Name	Subject	Midterm	Final
Rose	Math	59	80
Rose	Physics	48	65
Mike	Math	87	77
Mike	Physics	70	86
Ronald	Math	36	50
Ronald	Physics	54	75
Smith	Math	25	55
Smith	Physics	56	75
Frank	Math	66	80
Frank	Physics	75	65
Aimay	Math	32	50
Aimay	Physics	42	65
James	Math	37	67

1.3

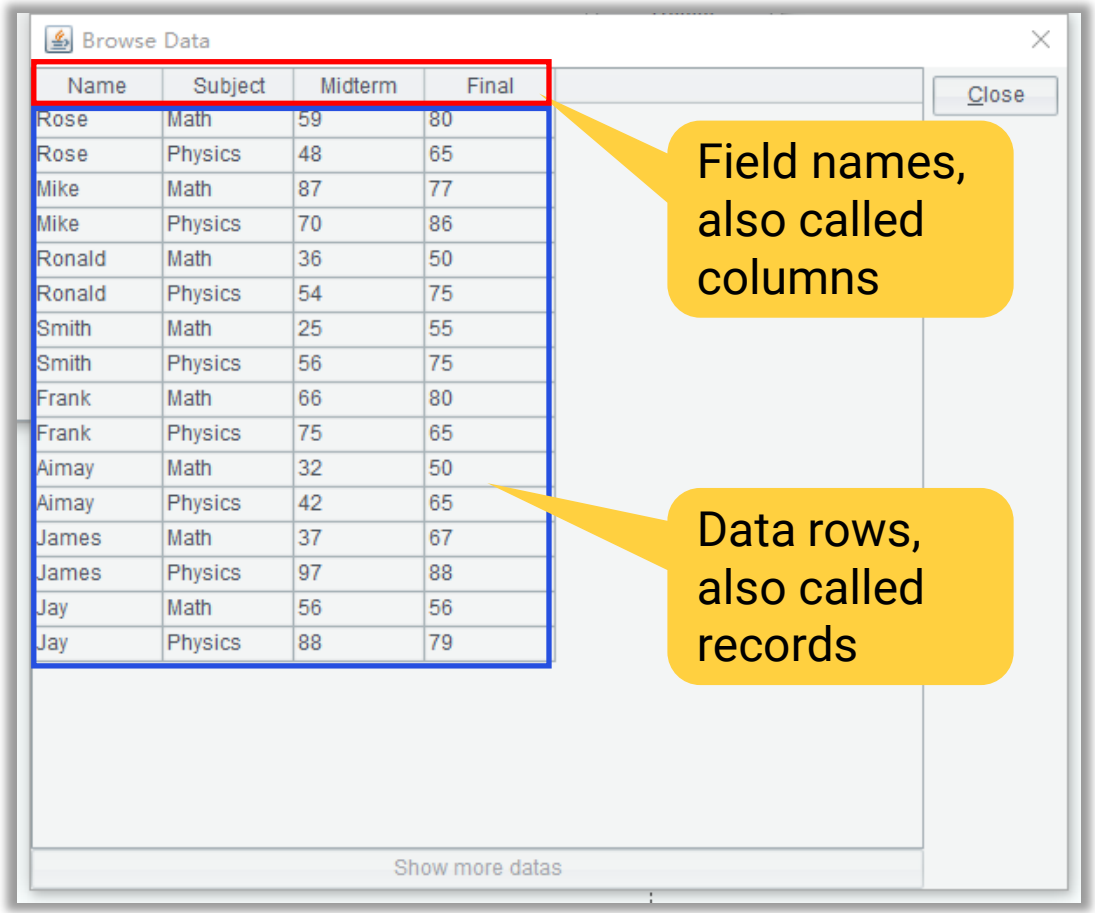
Expansion & expression

1.3 Expansion and expression

Click “Report” and then “Dataset” (or press shortcut key F11) to open “Dataset Config” interface:



Click “Browse” to look through data



1.3 Expansion and expression

D:\tutorial\data\1\1.2.rptx

	A	B	C	D
1(TH)	Name	Subject	Midterm	Final
2	=ds1.select(N	=ds1.Subject	=ds1.Midterm	=ds1.Final

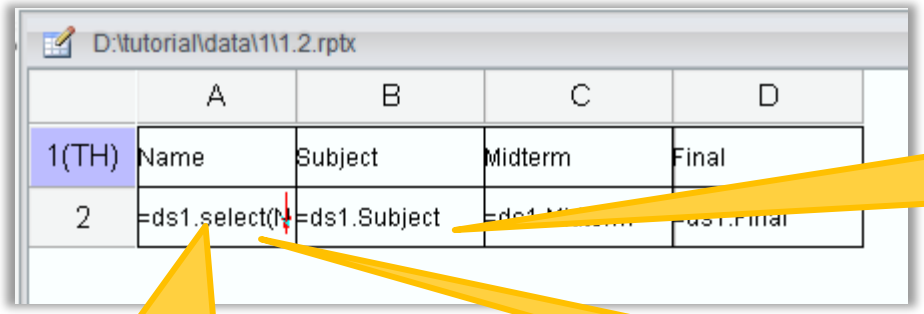
The wizard automatically sets the row holding field names as report title (TH). The title gets locked when we scroll data, which is similar to Excel Freeze Panes.

Vertical expansion refers to the ability of data zone in the report template being vertically extended to a certain number of rows according to the dataset row count.

Preview report:D:\tutorial\data\1\1.2.rptx

Name	Subject	Midterm	Final
Rose	Math	59	80
Rose	Physics	48	65
Mike	Math	87	77
Mike	Physics	70	86
Ronald	Math	36	50
Ronald	Physics	54	75
Smith	Math	25	55
Smith	Physics	56	75
Frank	Math	66	80
Frank	Physics	75	65
Aimay	Math	32	50
Aimay	Physics	42	65
James	Math	37	67
James	Physics	97	88
Jay	Math	56	56
Jay	Physics	88	79

1.3 Expansion and expression



B2 and the function after it do not use select() function. This means that subject and score correspond to the (Name) selected in A2.

There is a vertical, red arrow in the right of the cell A2, meaning the current cell will have multiple values after it is computed and will expand vertically.

In A2, “=” indicates that an expression follows and needs to be computed. ”**ds1.select(Name)**”selects all names (Name) from the dataset.

1.3 Expansion and expression

Calculate the weighted grade according to the midterm percentage and final percentage.

D:\tutorial\data\1\1.2.rptx

	A	B	C	D	E
1(TH)	Name	Subject	Midterm	Final	WA
2	=ds1.select(N	=ds1.Subject	=ds1.Midterm	=ds1.Final	=C2*0.4+D2*0.6

1. Add a column E through “Add column” under Edit on the menu.

2. E2 calculates the weighted grade using the completely same expression as in Excel.

1.3 Expansion and expression

Modify A2's expression and select Math scores. Then add a row to calculate the total math score using expression.

D:\tutorial\data\1\1.2.rptx

	A	B	C	D	E
1(TH)	Name	Subject	Midterm	Final	WA
2	=ds1.select(N	=ds1.Subject	=ds1.Midterm	=ds1.Final	=C2*0.4+D2*0.6
3		Total	=sum(C2{})	=sum(D2{})	=sum(E2{})

1. Add a third row through "Add row" under "Edit" on the menu.

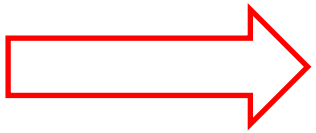
2. C3 uses sum() function to calculate total score. In syntax C2{}, the braces represent all cells expanded from C2.

A2's expression " =ds1.select(Name,Subject=="Math")" means selecting the Math subject only. Find more about select() function.

1.3 Expansion and expression

After report preview, we export it as an Excel With Formula. The comparison tells that after the source file is modified, re-previewing report and exporting it can conveniently generate a corresponding Excel report.

	A	B	C	D
1	Name	Subject	Midterm	Final
2	Rose	Math	59	80
3	Rose	Physics	48	65
4	Mike	Math	87	77
5	Mike	Physics	70	86
6	Ronald	Math	36	50
7	Ronald	Physics	54	75
8	Smith	Math	25	55
9	Smith	Physics	56	75
10	Frank	Math	66	80
11	Frank	Physics	75	65
12	Aimay	Math	32	50
13	Aimay	Physics	42	65
14	James	Math	37	67
15	James	Physics	97	88
16	Jay	Math	56	56
17	Jay	Physics	88	79

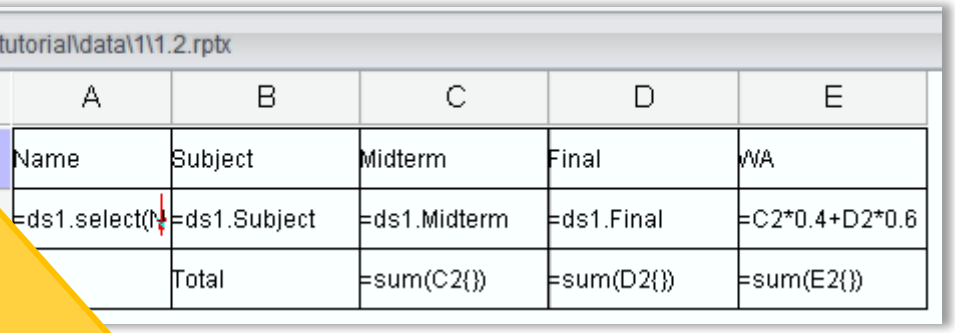


	A	B	C	D	E
1	Name	Subject	Midterm	Final	WA
2	Rose	Math	59	80	71.6
3	Mike	Math	87	77	81.0
4	Ronald	Math	36	50	44.4
5	Smith	Math	25	55	43.0
6	Frank	Math	66	80	74.4
7	Aimay	Math	32	50	42.8
8	James	Math	37	67	55.0
9	Jay	Math	56	56	56.0
10		Total			468.2

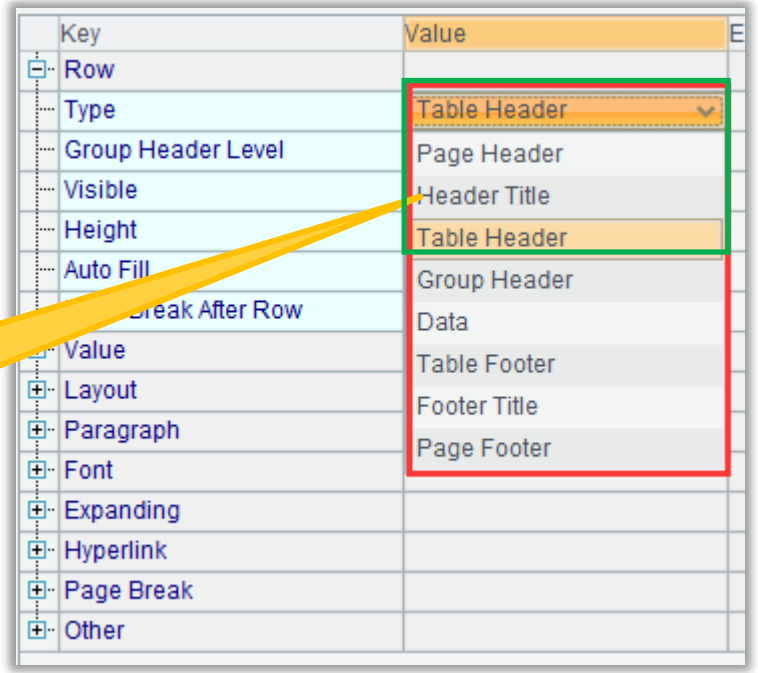
1.4

Report zone

1.4 Report zone



1. The report zone can only be configured at the master cell of rows.



2. Select the master cell and then we can change zone of the row through the row type on the right property pane.

Generally, a row type applies within the currently row zone only from top down in order. And row types before those for data zone (Data), which are highlighted in green, will enable frozen panes when generating an Excel report. If we do not want to freeze panes, just set the row type as data zone by default.

Chapter 2

Appearance & format

CONTENTS

Chapter 2 Appearance & format

2.1 Border, font and color

2.2 Display format and display value

2.3 Conditional format

2.4 Card-style report

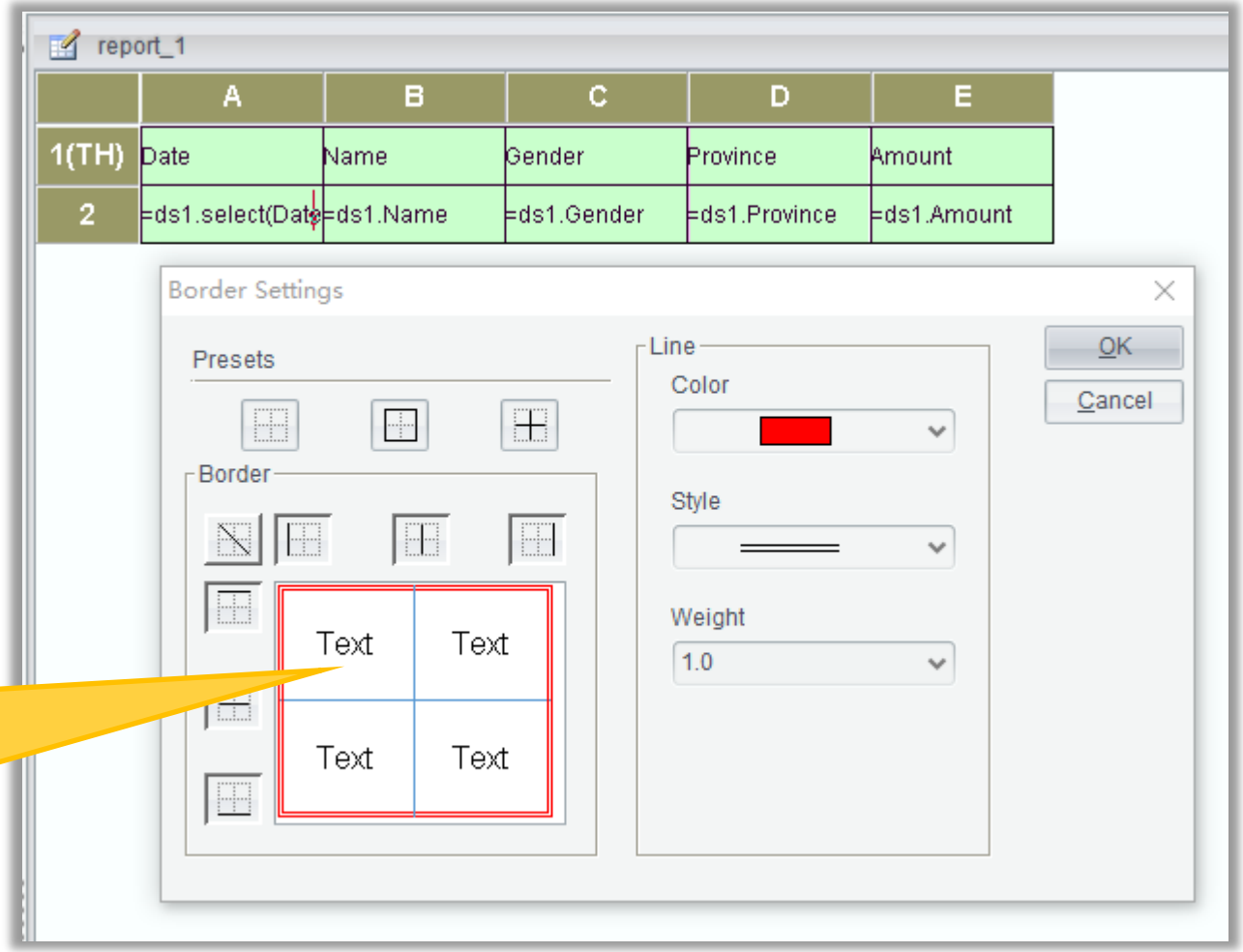
2.5 Picture

2.6 Exercises

2.1

Border, font and color

2.1 Border, font and color



Click the top-left corner to select all cells, then click "Border Settings" on the right-click menu to set border color, style and thickness.

2.1 Border, font and color

Preview report:report_1

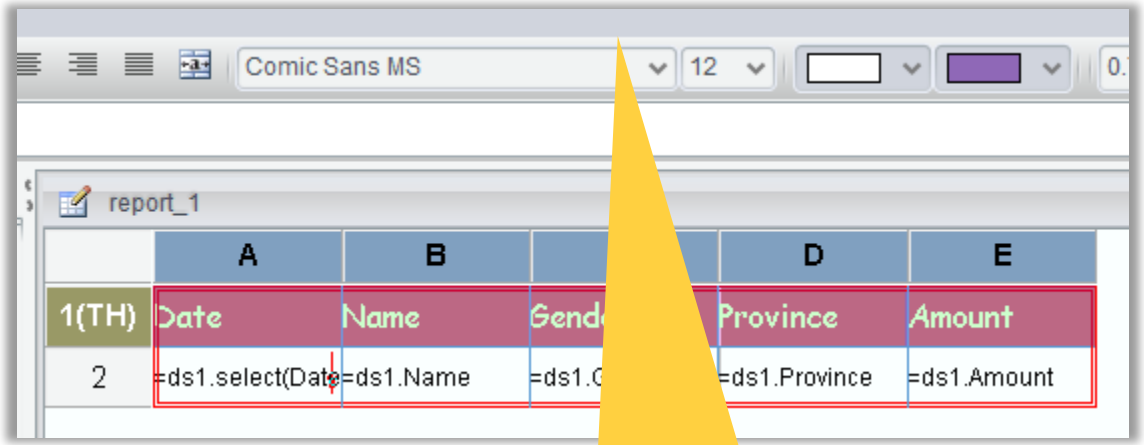
Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

Border settings
Contrast effect

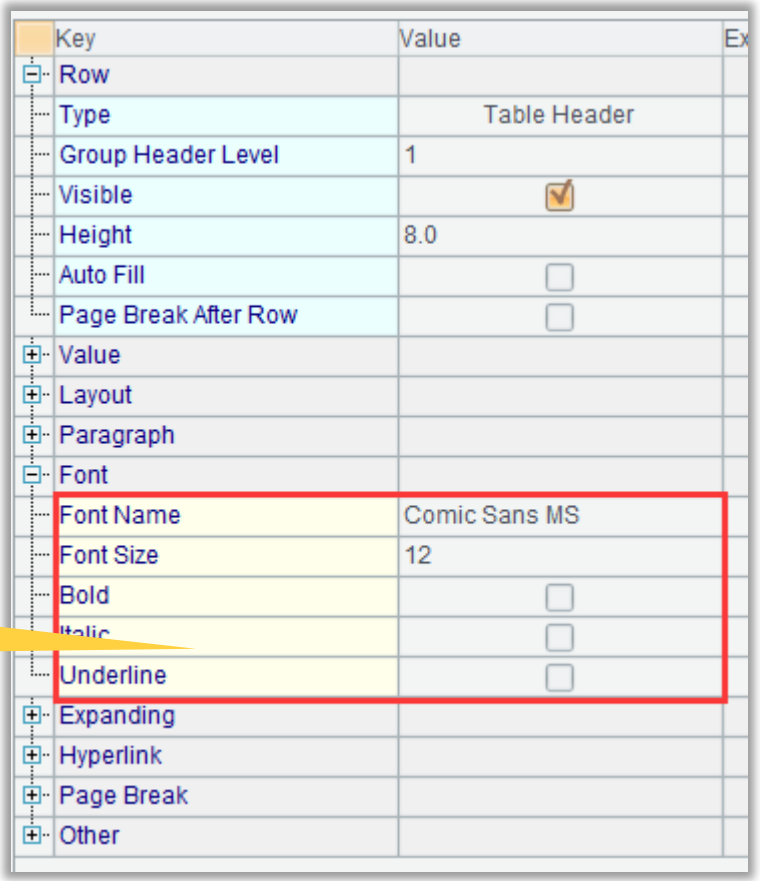
Preview report:report_1

Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

2.1 Border, font and color



Select the grid area, and set font, foreground and background colors for the report through toolbar or under “Font” on the right property pane.



2.1 Border, font and color

Preview report:report_1

Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

Set font and color for report header Contrast effect

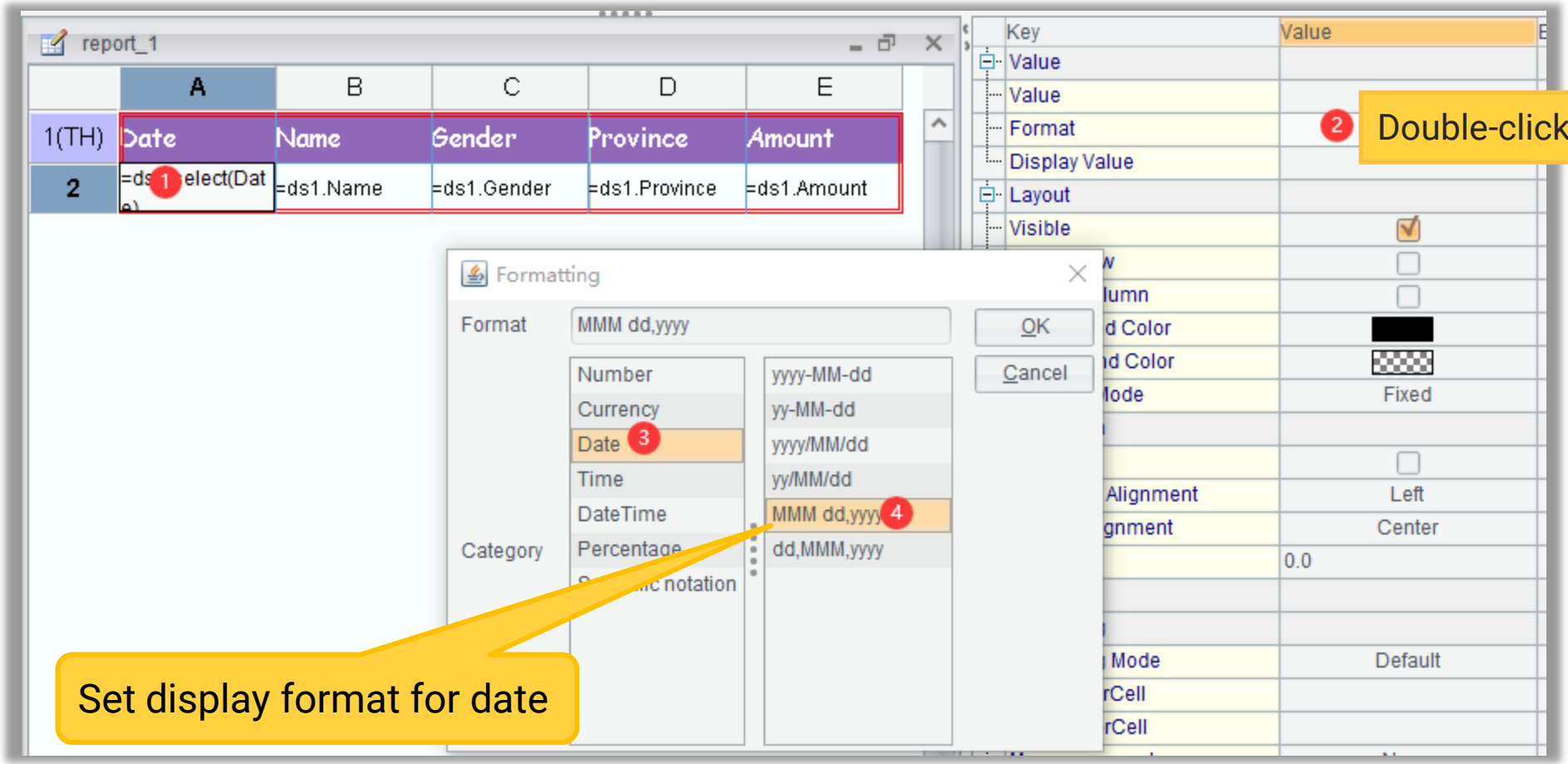
Preview report:report_1

Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

2.2

Display format and display value

2.1 Display format & display value



2.2 Display format & display value

Preview report:report_1

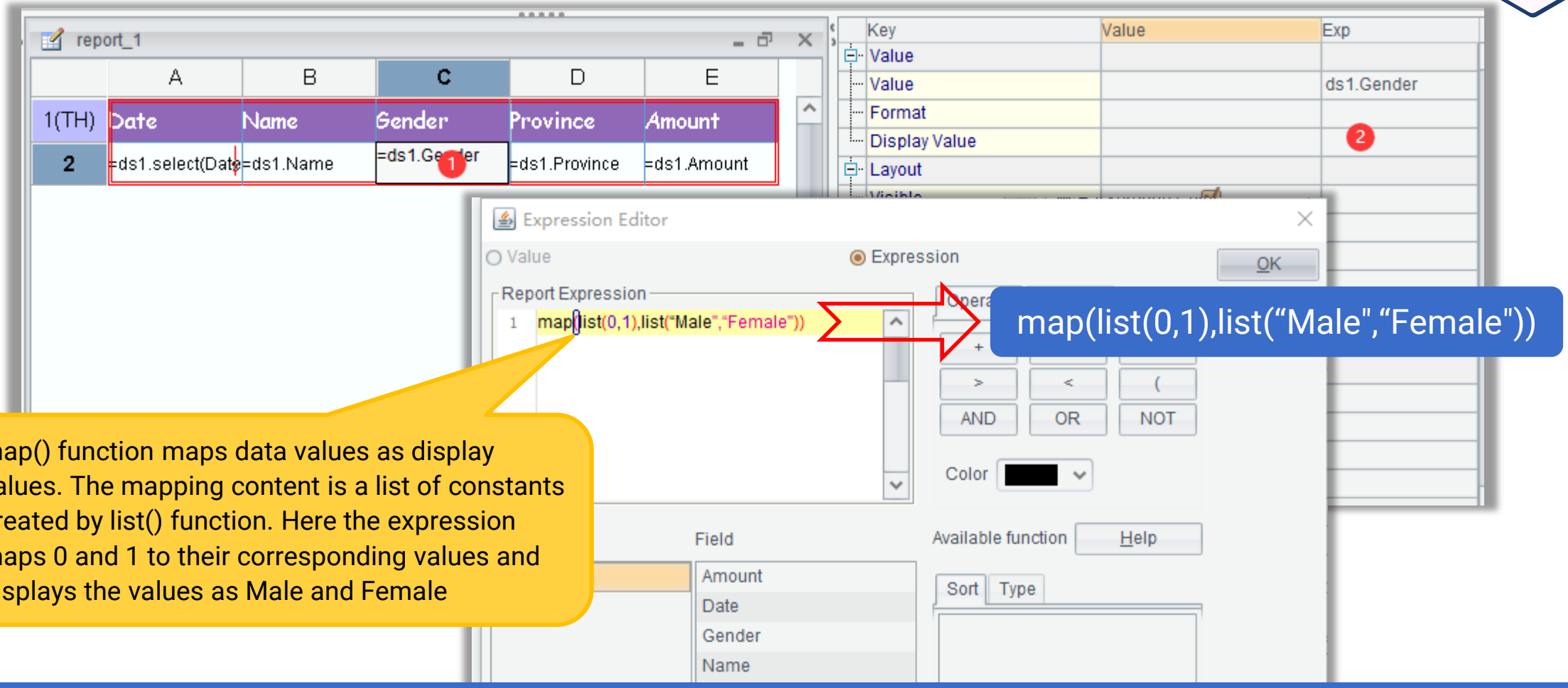
Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

Set display format for date
Contrast effect

Preview report:report_1

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	1	1	100
Feb 08,2019	Ice Chan	1	2	200
Feb 14,2019	Tossman	0	3	50
Feb 15,2019	Lisa	1	1	200
Apr 16,2019	Amay	1	4	100
Apr 27,2019	Tossman	0	3	100
Apr 28,2019	Lisa	1	1	50
May 09,2019	Smith	0	5	200
May 11,2019	Tossman	0	3	100
May 21,2019	Amay	1	4	200
Jun 22,2019	Ice Chan	1	2	100
Jun 23,2019	Tossman	0	3	100
Jun 24,2019	Lisa	1	1	50
Jun 25,2019	Ice Chan	1	2	150
Jun 26,2019	Tossman	0	3	50
Jun 27,2019	Smith	0	5	100
Jun 28,2019	Ice Chan	1	2	50
Jun 29,2019	Tossman	0	3	50
Jun 30,2019	Lisa	1	1	50
Jul 01,2019	Amay	1	4	200
Jul 02,2019	Tossman	0	3	50

2.2 Display format & display value



map() function maps data values as display values. The mapping content is a list of constants created by list() function. Here the expression maps 0 and 1 to their corresponding values and displays the values as Male and Female

Learn more about map() function: http://d.raqsoft.com.cn:6999/report/preference/mapvle.html

2.2 Display format & display value

Preview report:report_1

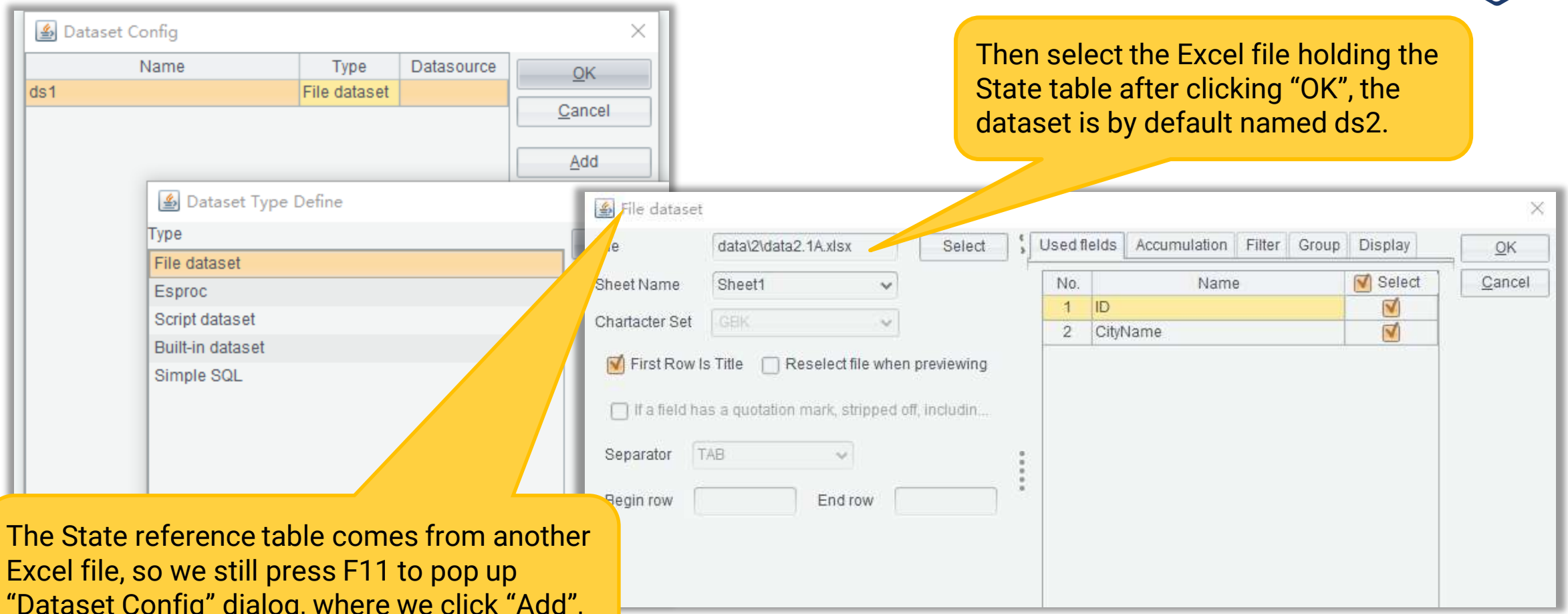
Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	1	1	100
Feb 08,2019	Ice Chan	1	2	200
Feb 14,2019	Tossman	0	3	50
Feb 15,2019	Lisa	1	1	200
Apr 16,2019	Amay	1	4	100
Apr 27,2019	Tossman	0	3	100
Apr 28,2019	Lisa	1	1	50
May 09,2019	Smith	0	5	200
May 11,2019	Tossman	0	3	100
May 21,2019	Amay	1	4	200
Jun 22,2019	Ice Chan	1	2	100
Jun 23,2019	Tossman	0	3	100
Jun 24,2019	Lisa	1	1	50
Jun 25,2019	Ice Chan	1	2	150
Jun 26,2019	Tossman	0	3	50
Jun 27,2019	Smith	0	5	100
Jun 28,2019	Ice Chan	1	2	50
Jun 29,2019	Tossman	0	3	50
Jun 30,2019	Lisa	1	1	50
Jul 01,2019	Amay	1	4	200
Jul 02,2019	Tossman	0	3	50

Set display constants for gender
Contrast effect

Preview report:report_1

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female		100
Feb 08,2019	Ice Chan	Female	2	200
Feb 14,2019	Tossman	Male	3	50
Feb 15,2019	Lisa	Female		200
Apr 16,2019	Amay	Female	4	100
Apr 27,2019	Tossman	Male	3	100
Apr 28,2019	Lisa	Female		50
May 09,2019	Smith	Male	5	200
May 11,2019	Tossman	Male	3	100
May 21,2019	Amay	Female	4	200
Jun 22,2019	Ice Chan	Female	2	100
Jun 23,2019	Tossman	Male	3	100
Jun 24,2019	Lisa	Female		50
Jun 25,2019	Ice Chan	Female	2	150
Jun 26,2019	Tossman	Male	3	50
Jun 27,2019	Smith	Male	5	100
Jun 28,2019	Ice Chan	Female	2	50
Jun 29,2019	Tossman	Male	3	50
Jun 30,2019	Lisa	Female		50
Jul 01,2019	Amay	Female	4	200
Jul 02,2019	Tossman	Male	3	50

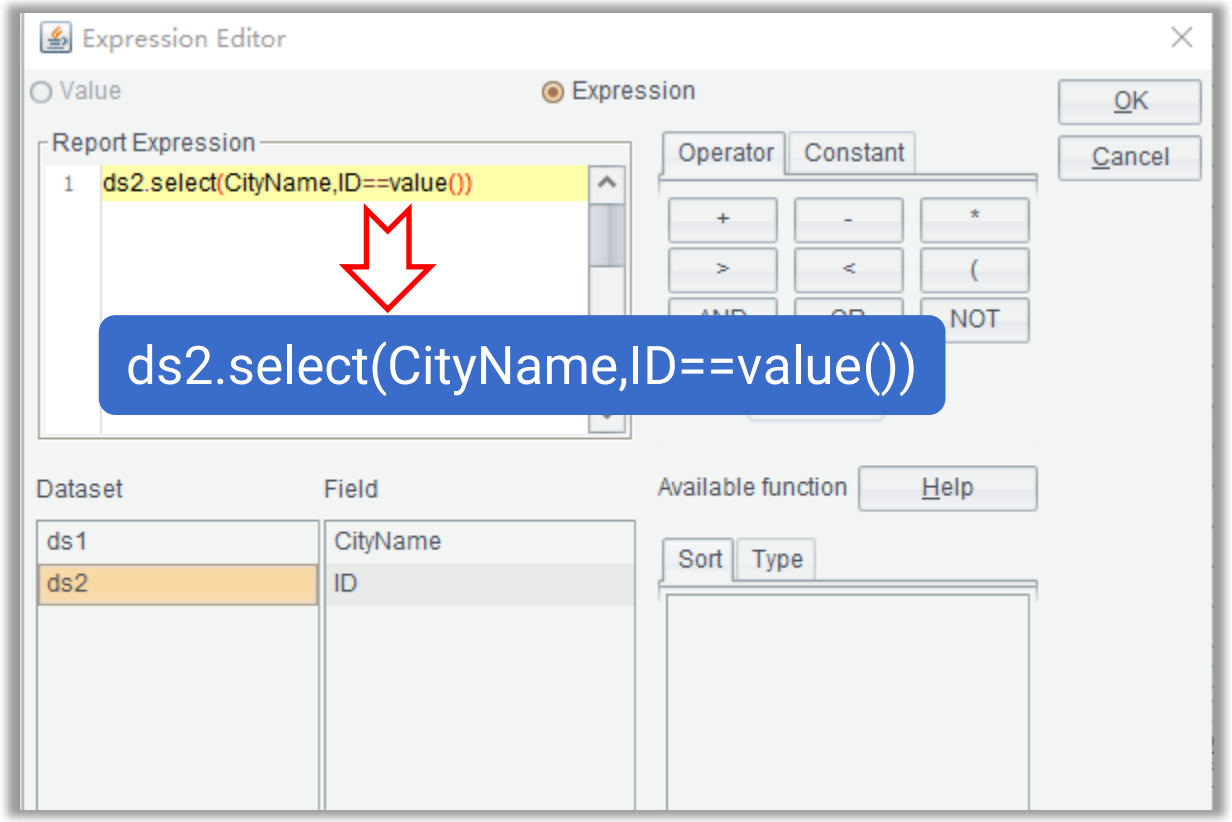
2.2 Display format & display value



Then select the Excel file holding the State table after clicking “OK”, the dataset is by default named ds2.

The State reference table comes from another Excel file, so we still press F11 to pop up “Dataset Config” dialog, where we click “Add”, select “File dataset”, and click “OK”.

2.2 Display format & display value



Set display value expression for State column.

The expression selects state names from ds2, the reference table, according to the condition that ds2's ID field is equivalent to **value()**. Since State field comes into being from expansion, we use value() function to get each expansion value.

2.2 Display format & display value

Preview report:report_1

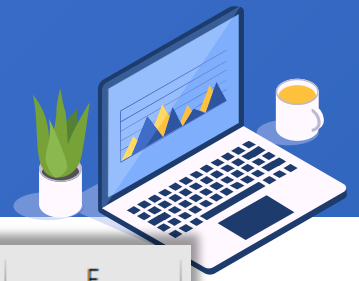
Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	1	1	100
Feb 08,2019	Ice Chan	1	2	200
Feb 14,2019	Tossman	0	3	50
Feb 15,2019	Lisa	1	1	200
Apr 16,2019	Amay	1	4	100
Apr 27,2019	Tossman	0	3	100
Apr 28,2019	Lisa	1	1	50
May 09,2019	Smith	0	5	200
May 11,2019	Tossman	0	3	100
May 21,2019	Amay	1	4	200
Jun 22,2019	Ice Chan	1	2	100
Jun 23,2019	Tossman	0	3	100
Jun 24,2019	Lisa	1	1	50
Jun 25,2019	Ice Chan	1	2	150
Jun 26,2019	Tossman	0	3	50
Jun 27,2019	Smith	0	5	100
Jun 28,2019	Ice Chan	1	2	50
Jun 29,2019	Tossman	0	3	50
Jun 30,2019	Lisa	1	1	50
Jul 01,2019	Amay	1	4	200
Jul 02,2019	Tossman	0	3	50

Set display format of State field and Amount field Contrast effect

Preview report:report_1

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.0
Feb 08,2019	Ice Chan	Female	New York	$200.0
Feb 14,2019	Tossman	Male	Seattle	$50.0
Feb 15,2019	Lisa	Female	Washington	$200.0
Apr 16,2019	Amay	Female	Los Angeles	$100.0
Apr 27,2019	Tossman	Male	Seattle	$100.0
Apr 28,2019	Lisa	Female	Washington	$50.0
May 09,2019	Smith	Male	Detroit	$200.0
May 11,2019	Tossman	Male	Seattle	$100.0
May 21,2019	Amay	Female	Los Angeles	$200.0
Jun 22,2019	Ice Chan	Female	New York	$100.0
Jun 23,2019	Tossman	Male	Seattle	$100.0
Jun 24,2019	Lisa	Female	Washington	$50.0
Jun 25,2019	Ice Chan	Female	New York	$150.0
Jun 26,2019	Tossman	Male	Seattle	$50.0
Jun 27,2019	Smith	Male	Detroit	$100.0
Jun 28,2019	Ice Chan	Female	New York	$50.0
Jun 29,2019	Tossman	Male	Seattle	$50.0
Jun 30,2019	Lisa	Female	Washington	$50.0
Jul 01,2019	Amay	Female	Los Angeles	$200.0
Jul 02,2019	Tossman	Male	Seattle	$50.0

2.2 Display format & display value



	A	B	C	D	E
1	Date	Name	Gender	Province	Amount
2	2019/1/12	Lisa	1	1	100
3	2019/2/8	Ice Chan	1	2	200
4	2019/2/14	Tossman	0	3	50
5	2019/2/15	Lisa	1	1	200
6	2019/4/16	Amay	1	4	100
7	2019/4/27	Tossman	0	3	100
8	2019/4/28	Lisa	1	1	50
9	2019/5/9	Smith	0	5	200
10	2019/5/11	Tossman	0	3	100
11	2019/5/21	Amay	1	4	200
12	2019/6/22	Ice Chan	1	2	100
13	2019/6/23	Tossman	0	3	100
14	2019/6/24	Lisa	1	1	50
15	2019/6/25	Ice Chan	1	2	150
16	2019/6/26	Tossman	0	3	50
17	2019/6/27	Smith	0	5	100
18	2019/6/28	Ice Chan	1	2	50
19	2019/6/29	Tossman	0	3	50
20	2019/6/30	Lisa	1	1	50
21	2019/7/1	Amay	1	4	200
22	2019/7/2	Tossman	0	3	50

Export as Excel after source data and desired display format settings become valid Contrast effect

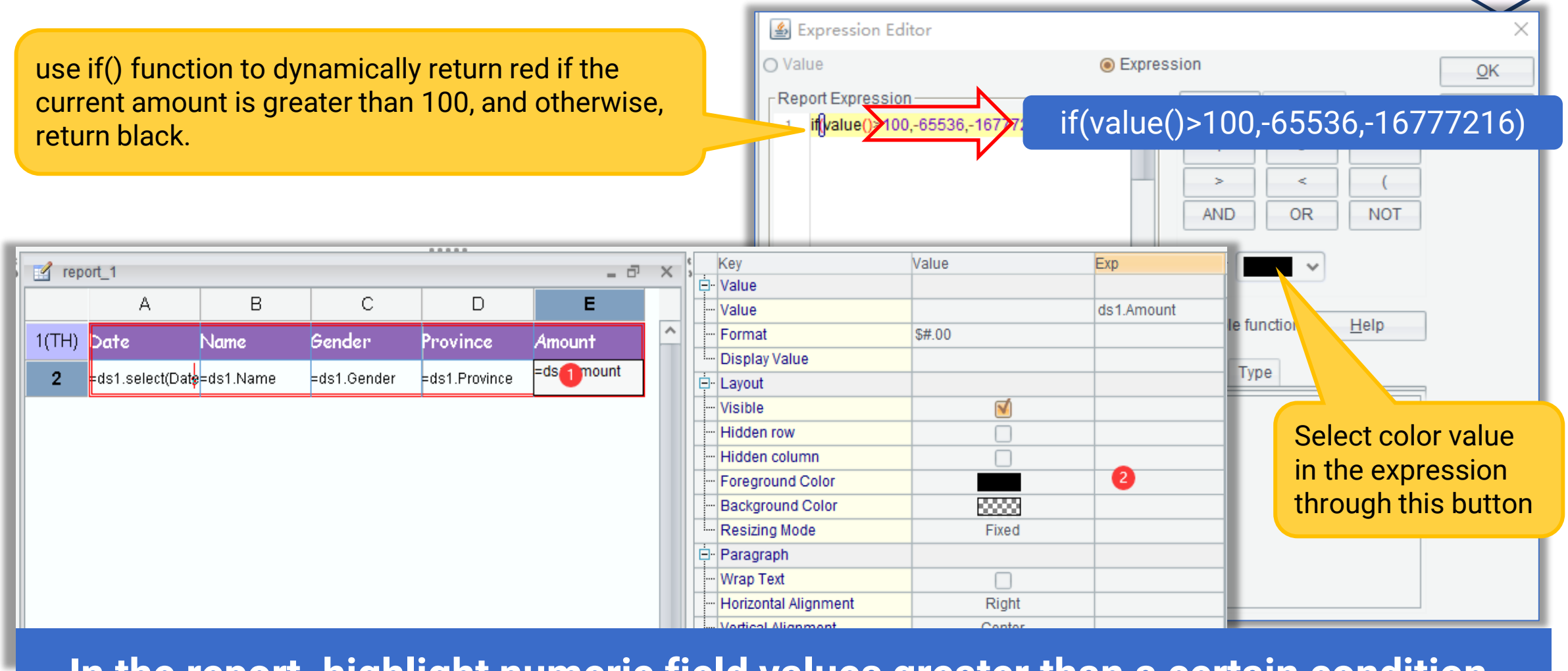
	A	B	C	D	E
1	Date	Name	Gender	Province	Amount
2	Jan 12,2019	Lisa	Female	Washington	$100.00
3	Feb 08,2019	Ice Chan	Female	New York	$200.00
4	Feb 14,2019	Tossman	Male	Seattle	$50.00
5	Feb 15,2019	Lisa	Female	Washington	$200.00
6	Apr 16,2019	Amay	Female	Los Angeles	$100.00
7	Apr 27,2019	Tossman	Male	Seattle	$100.00
8	Apr 28,2019	Lisa	Female	Washington	$50.00
9	May 09,2019	Smith	Male	Detroit	$200.00
10	May 11,2019	Tossman	Male	Seattle	$100.00
11	May 21,2019	Amay	Female	Los Angeles	$200.00
12	Jun 22,2019	Ice Chan	Female	New York	$100.00
13	Jun 23,2019	Tossman	Male	Seattle	$100.00
14	Jun 24,2019	Lisa	Female	Washington	$50.00
15	Jun 25,2019	Ice Chan	Female	New York	$150.00
16	Jun 26,2019	Tossman	Male	Seattle	$50.00
17	Jun 27,2019	Smith	Male	Detroit	$100.00
18	Jun 28,2019	Ice Chan	Female	New York	$50.00
19	Jun 29,2019	Tossman	Male	Seattle	$50.00
20	Jun 30,2019	Lisa	Female	Washington	$50.00

2.3

Conditional format

2.3 Conditional format

use if() function to dynamically return red if the current amount is greater than 100, and otherwise, return black.



In the report, highlight numeric field values greater than a certain condition

2.3 Conditional format

Preview report:report_1

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 14,2019	Tossman	Male	Seattle	$50.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
Apr 28,2019	Lisa	Female	Washington	$50.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 24,2019	Lisa	Female	Washington	$50.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 26,2019	Tossman	Male	Seattle	$50.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jun 28,2019	Ice Chan	Female	New York	$50.00
Jun 29,2019	Tossman	Male	Seattle	$50.00
Jun 30,2019	Lisa	Female	Washington	$50.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00
Jul 02,2019	Tossman	Male	Seattle	$50.00

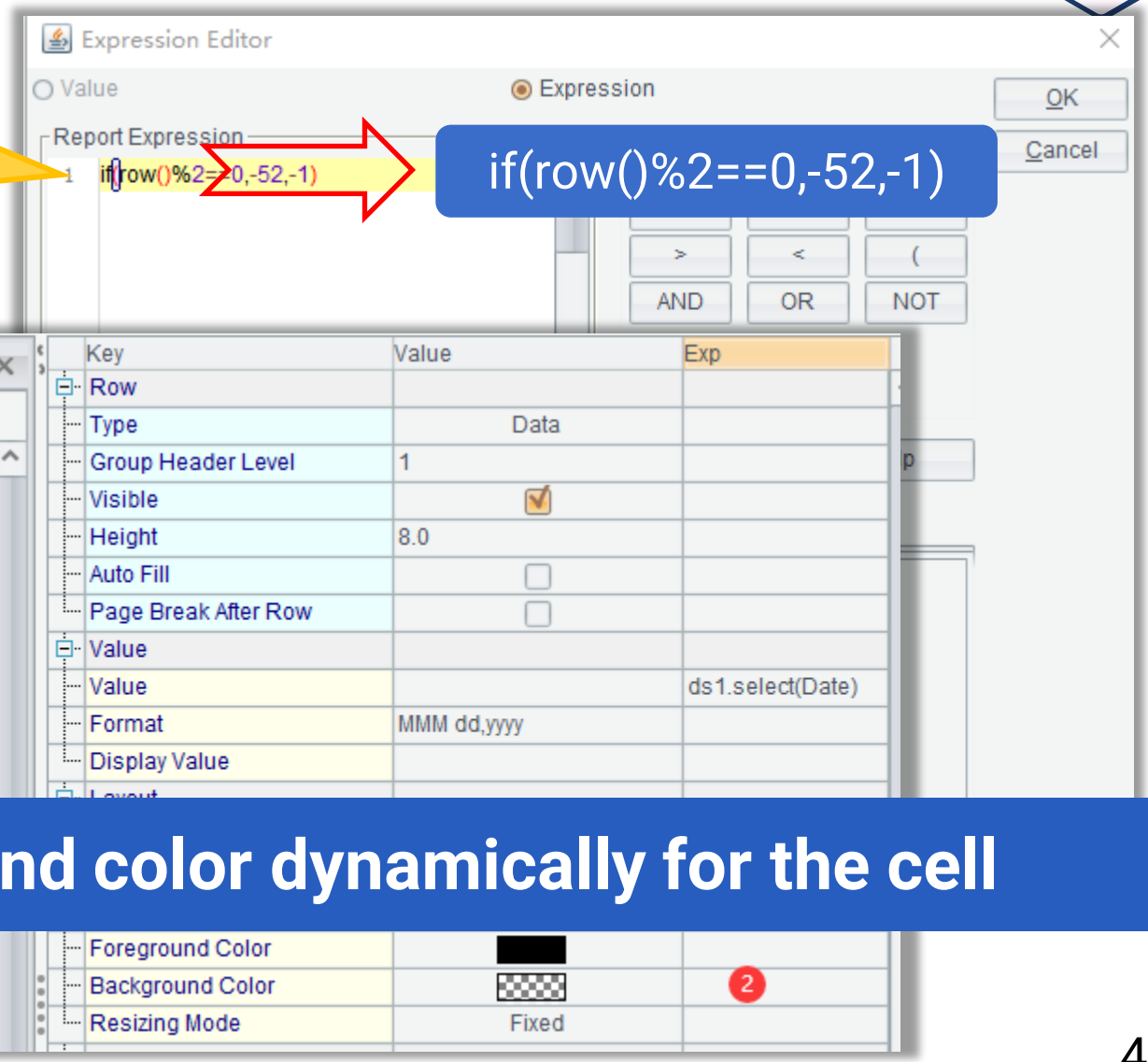
Contrast effect after warning color is set using dynamic foreground color

Preview report:report_1

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 14,2019	Tossman	Male	Seattle	$50.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
Apr 28,2019	Lisa	Female	Washington	$50.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 24,2019	Lisa	Female	Washington	$50.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 26,2019	Tossman	Male	Seattle	$50.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jun 28,2019	Ice Chan	Female	New York	$50.00
Jun 29,2019	Tossman	Male	Seattle	$50.00
Jun 30,2019	Lisa	Female	Washington	$50.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00
Jul 02,2019	Tossman	Male	Seattle	$50.00

2.3 Conditional format

The if conditional exp sets light yellow for the cells every one row, where row() function gets ordinal number of each of expanding rows



In the report, set background color dynamically for the cell

2.3 Conditional format

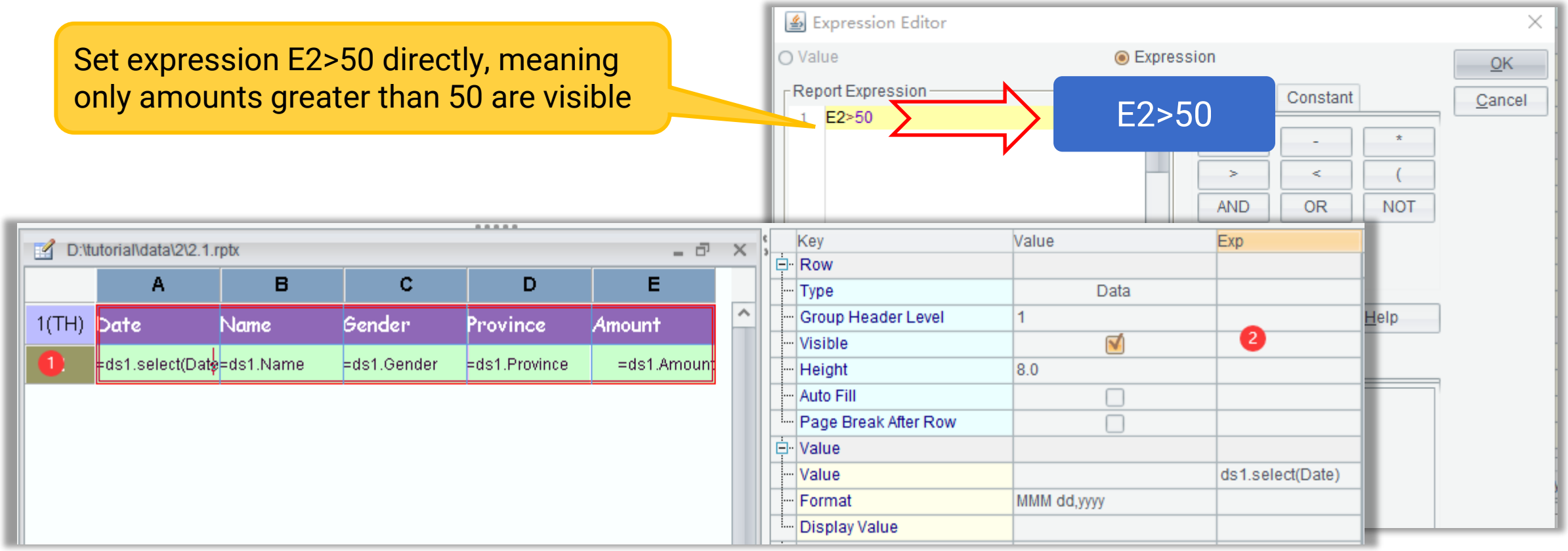
Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 14,2019	Tossman	Male	Seattle	$50.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
Apr 28,2019	Lisa	Female	Washington	$50.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 24,2019	Lisa	Female	Washington	$50.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 26,2019	Tossman	Male	Seattle	$50.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jun 28,2019	Ice Chan	Female	New York	$50.00
Jun 29,2019	Tossman	Male	Seattle	$50.00
Jun 30,2019	Lisa	Female	Washington	$50.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00
Jul 02,2019	Tossman	Male	Seattle	$50.00

Contrast effect after evenly spaced colors are set using dynamic background color

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 14,2019	Tossman	Male	Seattle	$50.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
Apr 28,2019	Lisa	Female	Washington	$50.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 24,2019	Lisa	Female	Washington	$50.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 26,2019	Tossman	Male	Seattle	$50.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jun 28,2019	Ice Chan	Female	New York	$50.00
Jun 29,2019	Tossman	Male	Seattle	$50.00
Jun 30,2019	Lisa	Female	Washington	$50.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00
Jul 02,2019	Tossman	Male	Seattle	$50.00

2.3 Conditional format

Set expression E2>50 directly, meaning only amounts greater than 50 are visible



In the report, set master cell as visible for each row dynamically

2.3 Conditional format

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 14,2019	Tossman	Male	Seattle	$50.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
Apr 28,2019	Lisa	Female	Washington	$50.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 24,2019	Lisa	Female	Washington	$50.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 26,2019	Tossman	Male	Seattle	$50.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jun 28,2019	Ice Chan	Female	New York	$50.00
Jun 29,2019	Tossman	Male	Seattle	$50.00
Jun 30,2019	Lisa	Female	Washington	$50.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00
Jul 02,2019	Tossman	Male	Seattle	$50.00

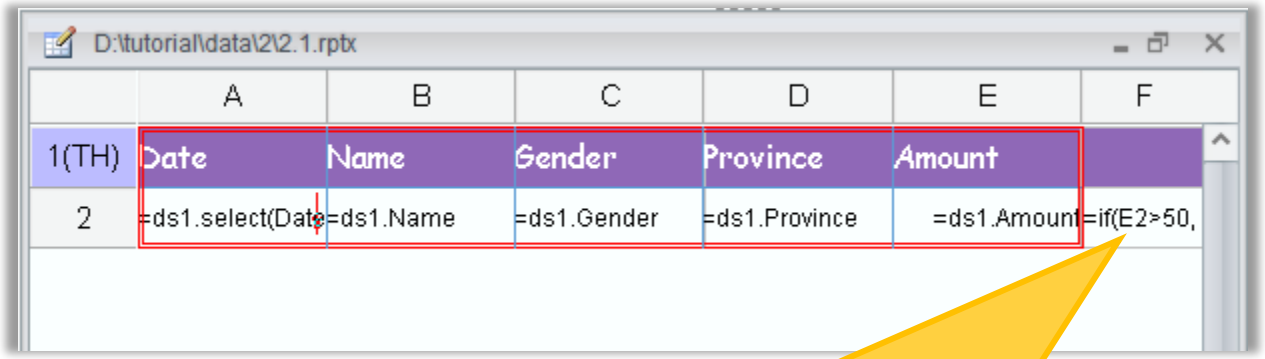
Contrast effect after small amounts are hidden

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00

2.3 Conditional format

In the previous page, the evenly spaced colors are disrupted after certain rows are hidden.

Get row numbers after small amounts are hidden through a computed column.

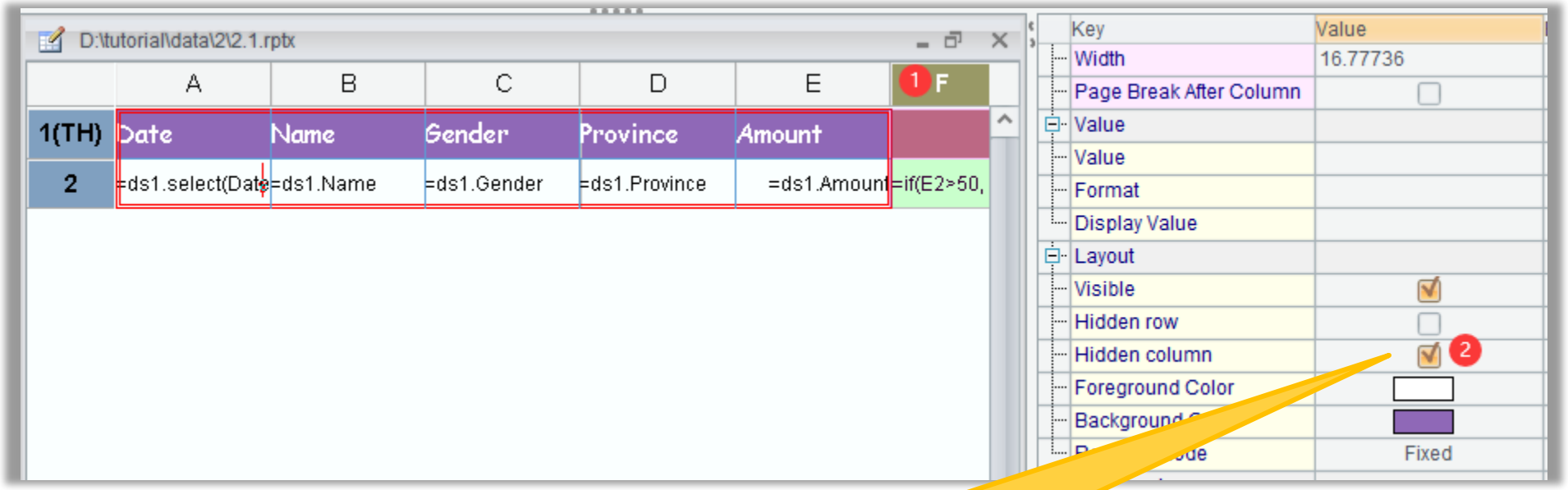


Add a computed column, and enter expression "=if(E2>50, F2[-1]+1, F2[-1])" in F2 to get new row numbers according to the filter condition. The expression uses displacement coordinate, whose uses are explained in chapter 6 (Inter-cell computation).

Re-computed row numbers through computed column expression:

Date	Name	Gender	Province	Amount	
Jan 12,2019	Lisa	Female	Washington	$100.00	1
Feb 08,2019	Ice Chan	Female	New York	$200.00	2
Feb 15,2019	Lisa	Female	Washington	$200.00	3
Apr 16,2019	Amay	Female	Los Angeles	$100.00	4
Apr 27,2019	Tossman	Male	Seattle	$100.00	5
May 09,2019	Smith	Male	Detroit	$200.00	6
May 11,2019	Tossman	Male	Seattle	$100.00	7
May 21,2019	Amay	Female	Los Angeles	$200.00	8
Jun 22,2019	Ice Chan	Female	New York	$100.00	9
Jun 23,2019	Tossman	Male	Seattle	$100.00	10
Jun 25,2019	Ice Chan	Female	New York	$150.00	11
Jun 27,2019	Smith	Male	Detroit	$100.00	12
Jul 01,2019	Amay	Female	Los Angeles	$200.00	13

2.3 Conditional format



Hide the unnecessary column F in the order the figure shows

2.3 Conditional format

Finally, change the background expression for all cells in row 2 into if(F2%2==0,-52,-1)

Preview the report:

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00

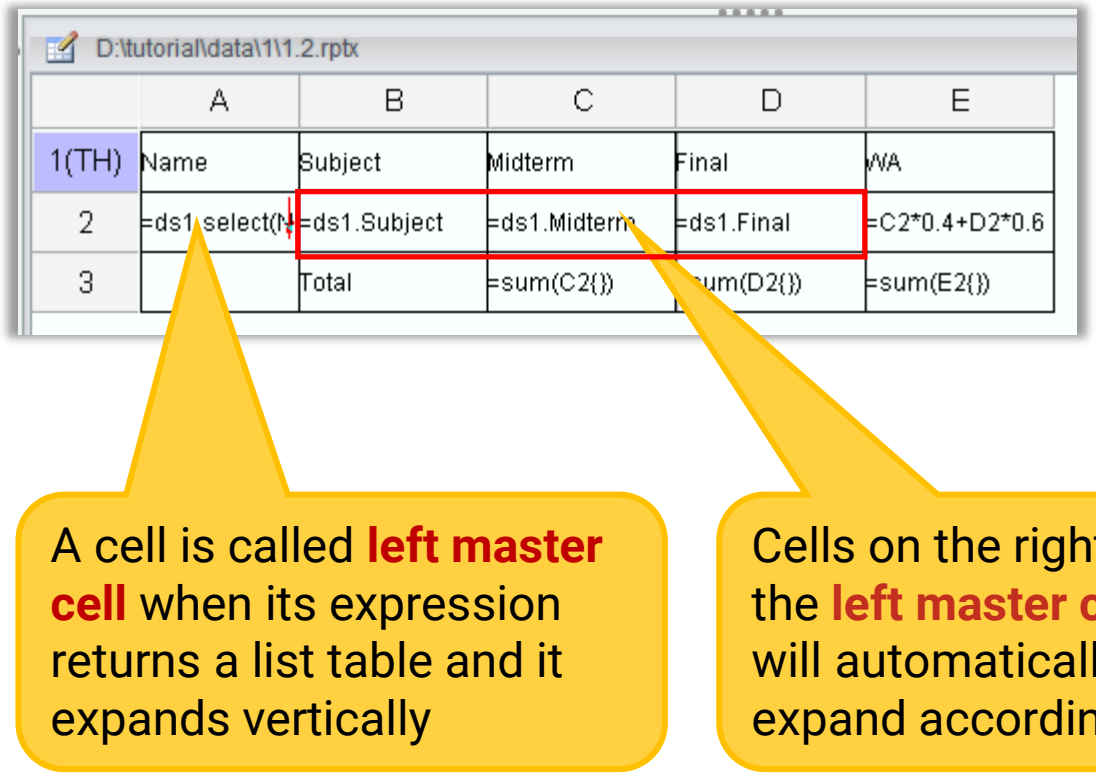
Export report as Excel:

	A	B	C	D	E
1	Date	Name	Gender	Province	Amount
2	Jan 12,2019	Lisa	Female	Washington	$100.00
3	Feb 08,2019	Ice Chan	Female	New York	$200.00
5	Feb 15,2019	Lisa	Female	Washington	$200.00
6	Apr 16,2019	Amay	Female	Los Angeles	$100.00
7	Apr 27,2019	Tossman	Male	Seattle	$100.00
9	May 09,2019	Smith	Male	Detroit	$200.00
10	May 11,2019	Tossman	Male	Seattle	$100.00
11	May 21,2019	Amay	Female	Los Angeles	$200.00
12	Jun 22,2019	Ice Chan	Female	New York	$100.00
13	Jun 23,2019	Tossman	Male	Seattle	$100.00
15	Jun 25,2019	Ice Chan	Female	New York	$150.00
17	Jun 27,2019	Smith	Male	Detroit	$100.00
21	Jul 01,2019	Amay	Female	Los Angeles	$200.00

2.4

Card-style report

2.4 Card-style report



A cell is called **left master cell** when its expression returns a list table and it expands vertically

Cells on the right of the **left master cell** will automatically expand accordingly

Review the previous example. A2 gets a list names, which will expand into multiple rows during report presentation. The subject and scores automatically follow suit to expand into corresponding values.

Concept of left master cell

2.4 Card-style report

D:\tutorial\data\2\2.4.rptx

	A	B	C	D
1	Student Information			
2	ID	=ds1.select	photo	
3	Name	=ds1.Name		
4	Gender	=ds1.Gende		
5	Age	=ds1.Age		
6	Address			=ds1.Address
7				

Edit the card-style report according to the template

Preview report

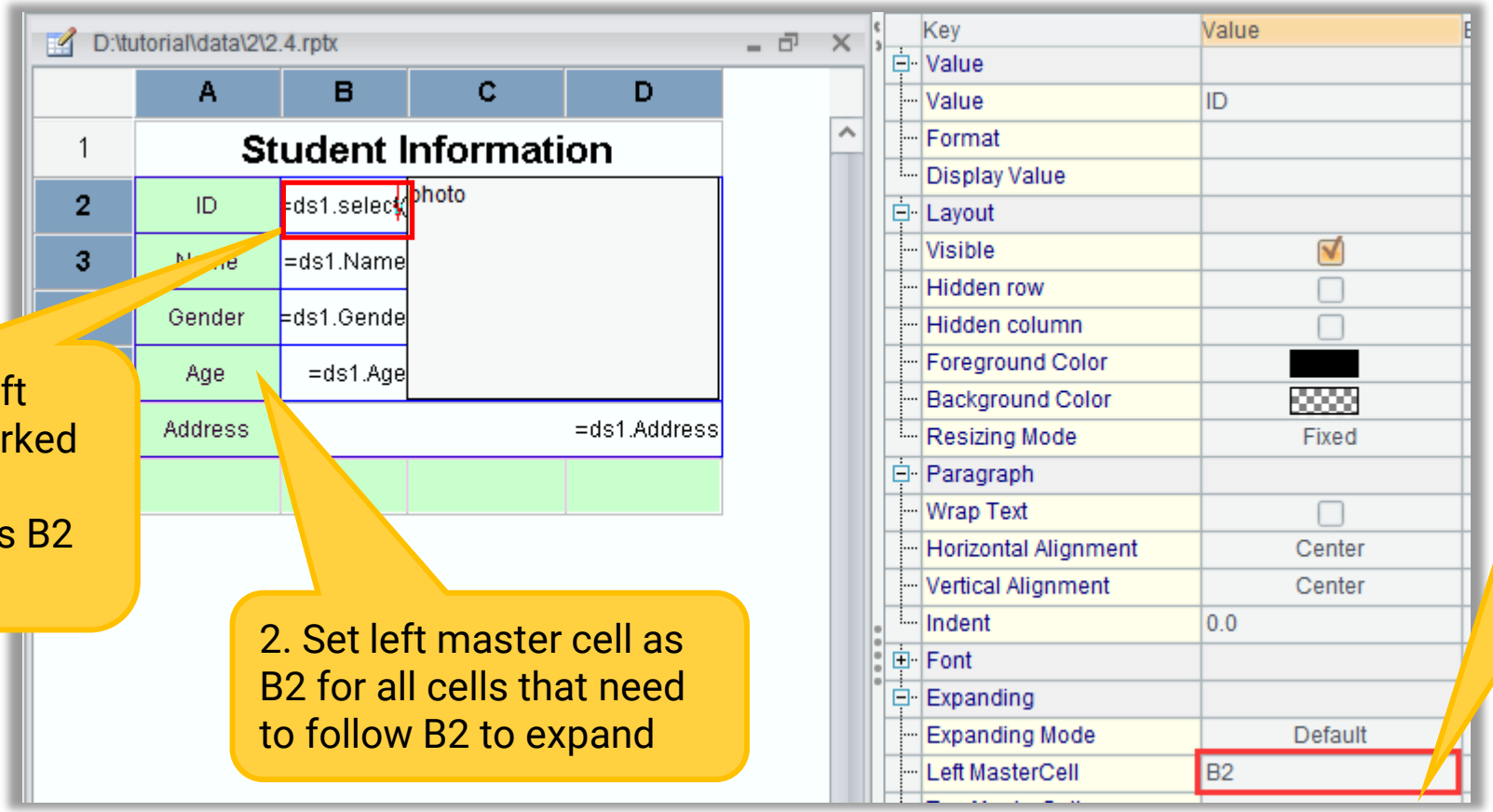
Preview report:D:\tutorial\data\2\2.4.rptx

Student Information

ID	1	photo
ID	2	
ID	3	
ID	4	
ID	5	
Name	Roddy	
Gender	0	
Age	17	
Ad	30830 Orchard Lake Road	

Preview report and find that there isn't one card for each student as expected but that only ID expands while the other rows do not follow suit

2.4 Card-style report



1. Locate the left master cell, marked by a red arrow usually, which is B2 in this example

2. Set left master cell as B2 for all cells that need to follow B2 to expand

3. The cells will automatically expand according to left cells for which left master cell is set. Here we just need to set B2 as the left master cell for A2~A7 and C2

Set left master cell for cells in the card-style report

2.4 Card-style report

Preview report:D:\tutorial\data\2\2.4.rptx

Student Information

ID	1	photo
ID	2	
ID	3	
ID	4	
ID	5	
Name	Roddy	
Gender	0	
Age	17	
Address	30830 Orchard Lake Road	

The contrast preview effect after left master cell is set

Preview report:D:\tutorial\data\2\2.4.rptx

Student Information

ID	1	photo
Name	Roddy	
Gender	0	
Age	17	
Address	30830 Orchard Lake Road	

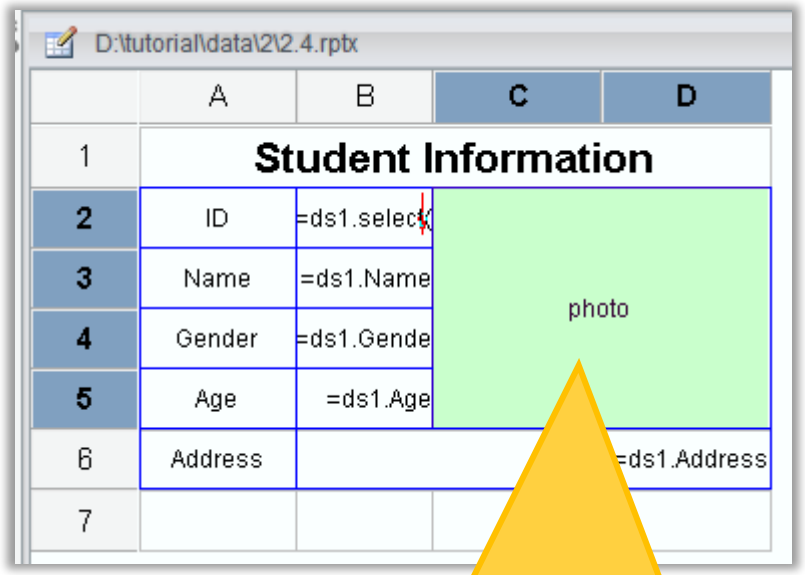
ID	2	photo
Name	Lisa	
Gender	1	
Age	16	
Address	120 Wall St. 22nd Floor New York, NY	

2.5

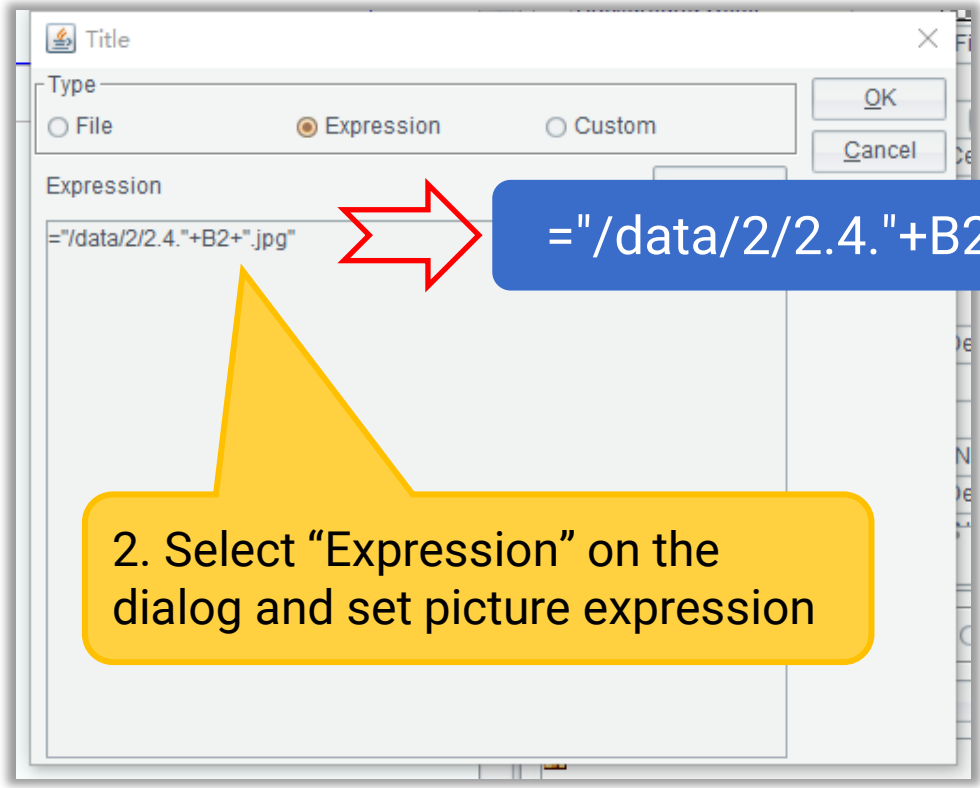
Picture

2.5 Picture

In the card-style report in example 2.4, the student photo needs to be displayed using picture type.



1. Select C2, right-click to pop up menu, and click “Picture”



2. Select “Expression” on the dialog and set picture expression

Set dynamic pictures in a report cell

2.5 Picture

Preview report:D:\tutorial\data\2\2.4.rptx

Student Information

ID	1
Name	Roddy
Gender	0
Age	17
Address	30830 Orchard Lake Road

ID	2
Name	Lisa
Gender	1
Age	16
Address	120 Wall St. 22nd Floor New York, NY

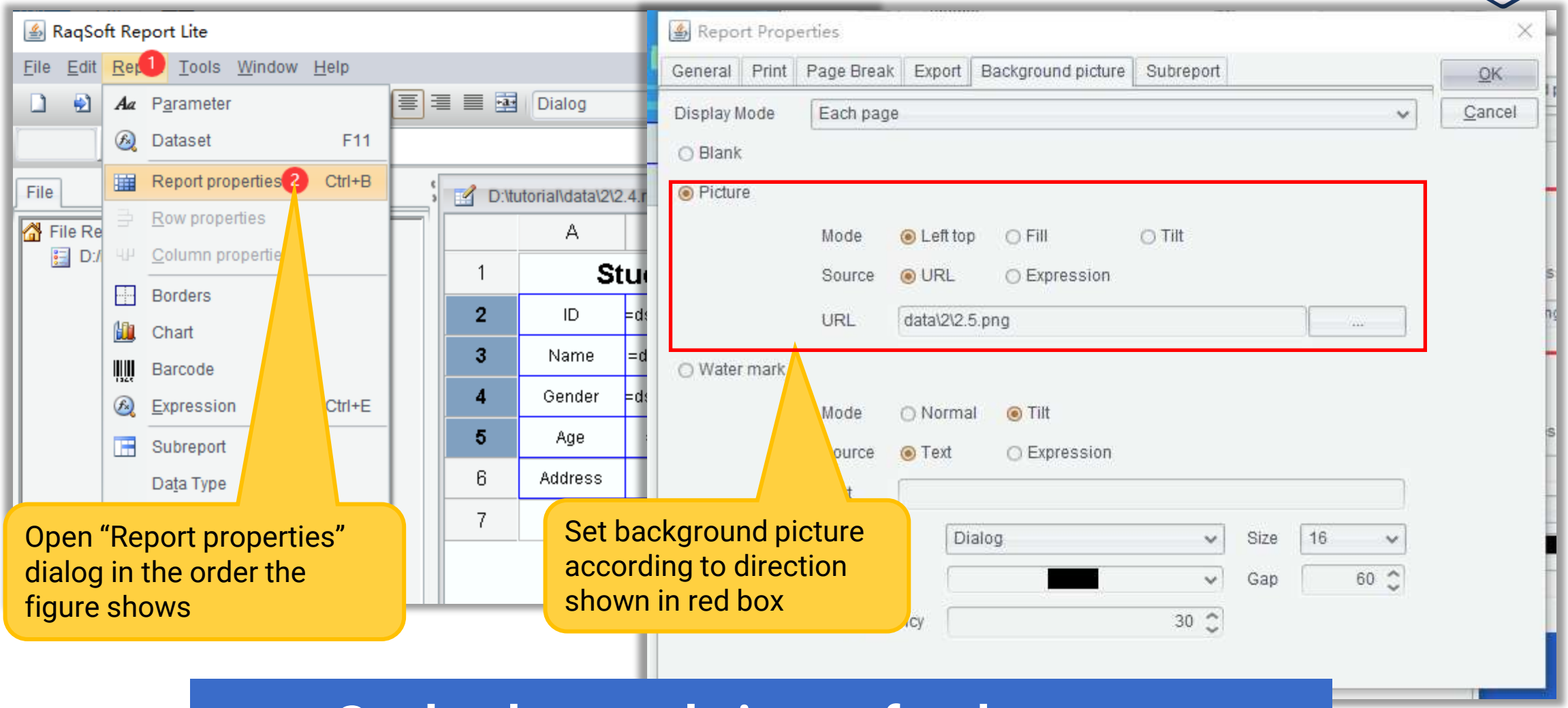
ID	3
Name	Shaw
Gender	0
Age	15
Address	4114 Sepulveda Blvd Culver City，CA

Preview effect with dynamic picture configured

Effect of exporting report as Excel

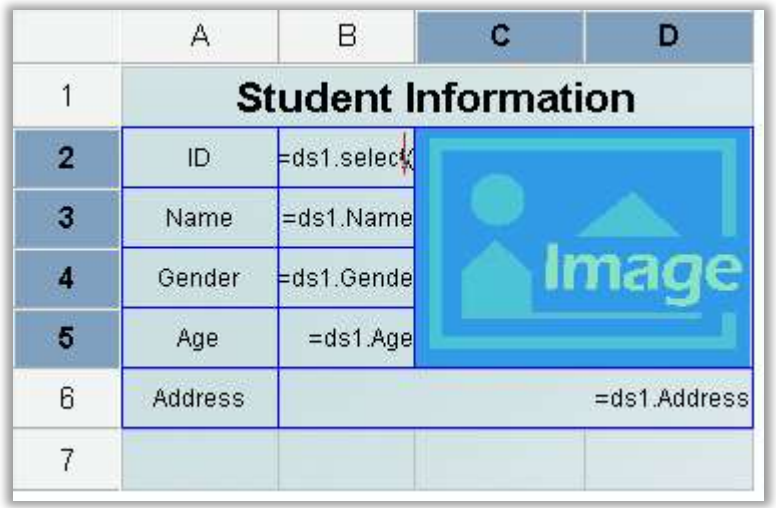
	A	B	C	D
1	**Student Information**			
2	ID	1		
3	Name	Roddy		
4	Gender	0		
5	Age	17		
6	Address	30830 Orchard Lake Road		
7				
8	ID	2		
9	Name	Lisa		
10	Gender	1		
11	Age	16		
12	Address	120 Wall St. 22nd Floor New York, NY		
13				
14	ID	3		
15	Name	Shaw		
16	Gender	0		
17	Age	15		
18	Address	4114 Sepulveda Blvd Culver City，CA		
19				

2.5 Picture



Set background picture for the report

2.5 Picture



Report after background is configured

Note:
After background picture is set, the grid background color will automatically become transparent.

2.6

Exercises

2.6 Exercise 1

According to example data data1.2.xlsx, use red and green background to differentiate students who pass the math exam and those who fail it. Below is the report template:

	A	B	C
1	Math Score		
2	Name	Final	Status
3	Rose	80	Pass
4	Mike	77	Pass
5	Ronald	50	Make-up
6	Smith	55	Make-up
7	Frank	80	Pass
8	Aimay	50	Make-up
9	James	67	Pass
10	Jay	56	Make-up
11	Average	64.375	

Chapter 3

Grouped report

Chapter 3 Grouped report

3.1 Create grouped reports through wizard

3.2 Common grouped reports

3.3 Structure of a grouped report and master cell

3.4 Computations on a grouped report

3.5 Exercise

Chapter 3 Grouped report

3.1

Create grouped reports through wizard

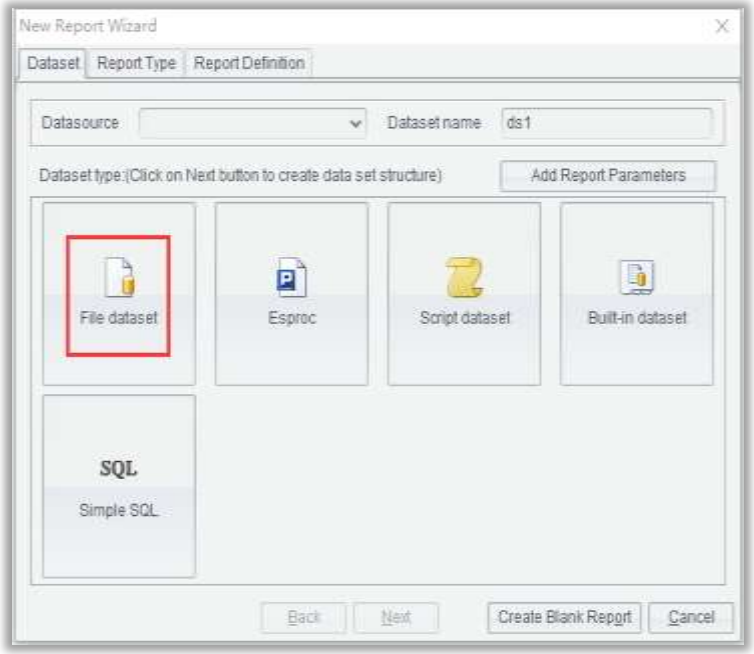
3.1 Create grouped reports through wizard – data source

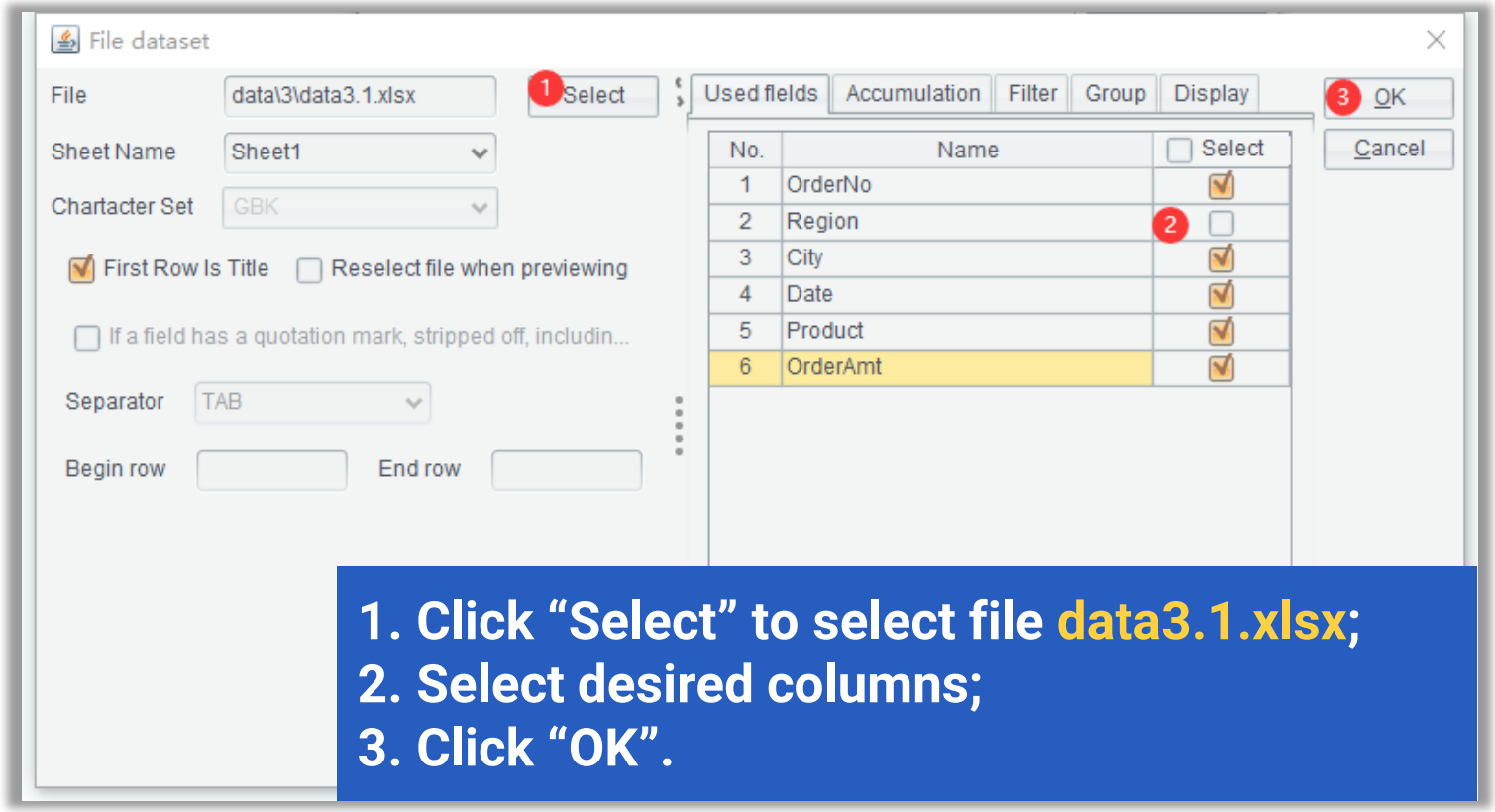
Below is a company's orders table (data3.1.xlsx):

	A	B	C	D	E	F
1	OrderNo	Region	City	Date	Product	OrderAmt
2	1001	NE	Dalian	2018-01-02	Apple	189.73
3	1002	N	Beijing	2018-01-02	Peach	203.96
4	1003	NW	Lanzhou	2018-01-02	Banana	208.09
5	1004	NW	Xining	2018-01-02	Banana	179.19
6	1005	NW	Lanzhou	2018-01-03	Apple	342.06
7	1006	N	Beijing	2018-01-03	Apple	69.19
8	1007	NE	Shenyang	2018-01-03	Apple	231.44
9	1008	N	Tianjin	2018-01-03	Apple	256.15
10	1009	NW	Xining	2018-01-04	Peach	52.28
11	1010	NS	Guiyang	2018-01-04	Apple	290.31
12	1011	N	Shijiazhuang	2018-01-04	Banana	201.71
13	1012	NE	Changchun	2018-01-04	Peach	267.02
14	1013	NE	Shenyang	2018-01-05	Banana	83.34
15	1014	NE	Dalian	2018-01-05	Banana	204.73
16	1015	NE	Dalian	2018-01-05	Peach	229.84
17	1016	NW	Lanzhou	2018-01-05	Banana	57.38
18	1017	NW	Lanzhou	2018-01-06	Banana	232.57
19	1018	NS	Kunming	2018-01-06	Banana	262.99
20	1019	NW	Xining	2018-01-06	Apple	256.56

3.1 Create grouped reports through wizard – simple grouping

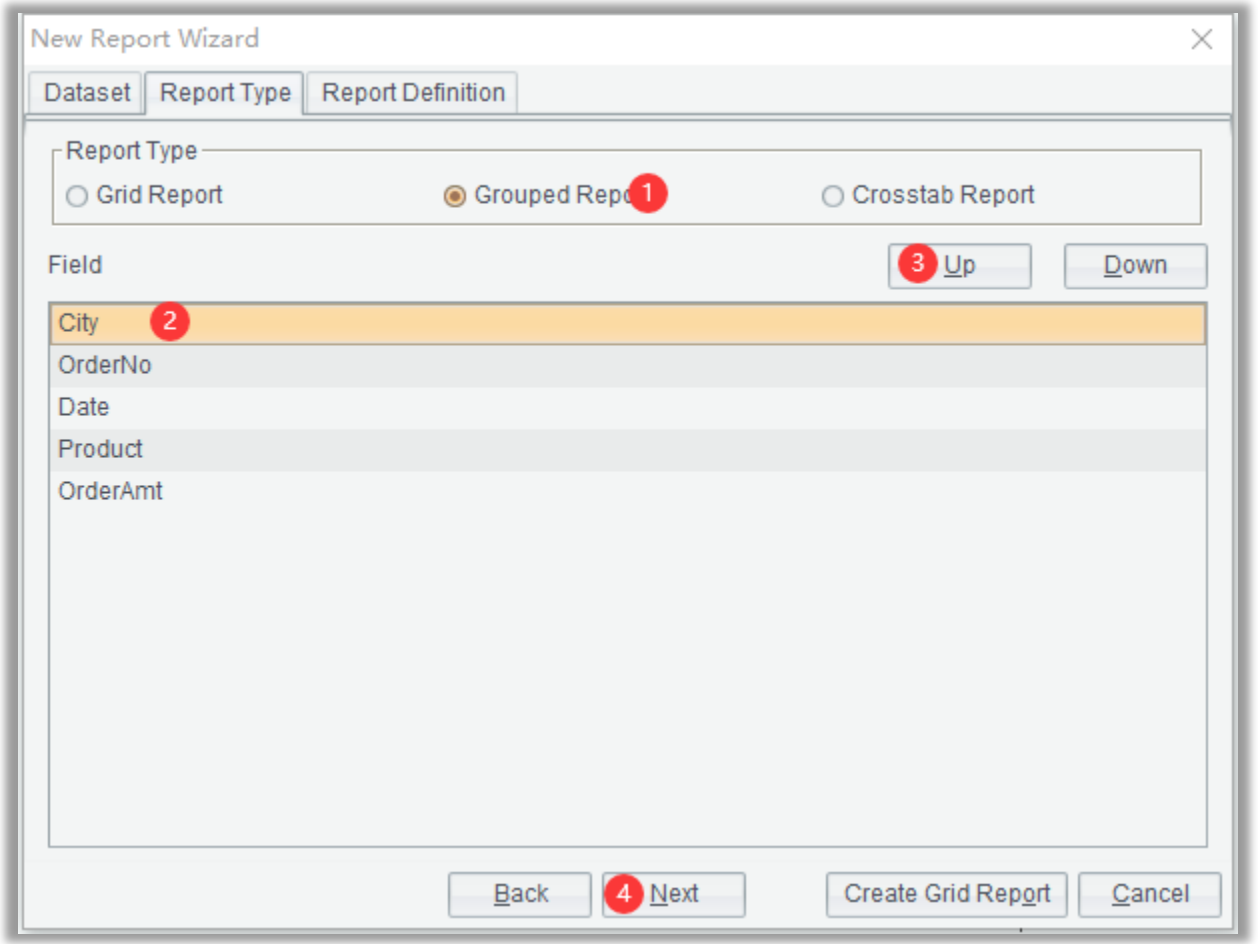
Run report designer, select “New Report” under “File” to get the dialog below on the left. Then click “File dataset” in red box to pop up the window on the right.



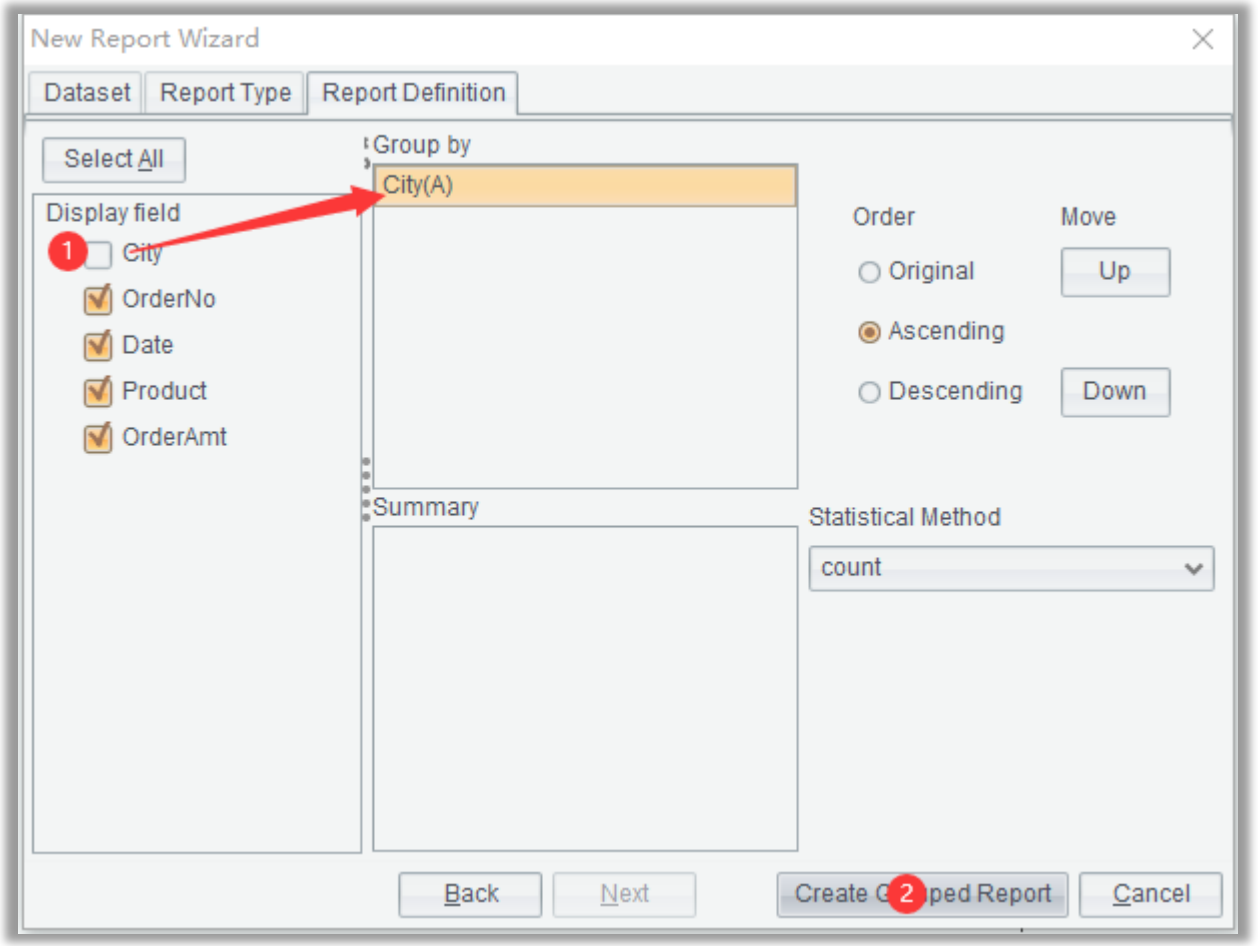


3.1 Create grouped reports through wizard – simple grouping

Select “Grouped Report” and City field, and click “Up” button to move up the grouping field to the first. Click “Next” to continue:



3.1 Create grouped reports through wizard – simple grouping



1. **Drag City to Group by, and select “Ascending” under Order**
2. **Click “Create Grouped Report”**

3.1 Create grouped reports through wizard – simple grouping

Now a grouped report (as shown below) is created through the wizard. Set center align for all cells and save the report as 3.1.rptx.

D:\tutorial\data\3\3.1.rptx

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(City	=ds1.select(Orc	=ds1.Date	=ds1.Product	=ds1.OrderAmt

A2's expression： =ds1.group(City;City:1)

The group() function groups dataset ds1 by City field, putting records of city to one group. The second parameter"City:1" means sorting by city; 1 represents ascending and -1 descending.

Expressions in B2-E2, similar to those in a row-wise report explained in chapter 1, vertically expand records in the same group.

3.1 Create grouped reports through wizard – simple grouping

Click “Preview” under “Tool” to view the report:

Records are grouped by City, and cells of same city are merged

City	OrderNo	Date	Product	OrderAmt
Beijing	1002	2018-01-02	Peach	203.96
	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
	1040	2018-01-11	Banana	243.77
Changchun	1012	2018-01-04	Peach	267.02
	1038	2018-01-11	Peach	53.57
Chengdu	1027	2018-01-08	Banana	121.32
	1034	2018-01-10	Peach	311.34
Dalian	1001	2018-01-02	Apple	189.73
	1014	2018-01-05	Banana	204.73
	1015	2018-01-05	Peach	229.84

3.1 Create grouped reports through wizard – simple grouping

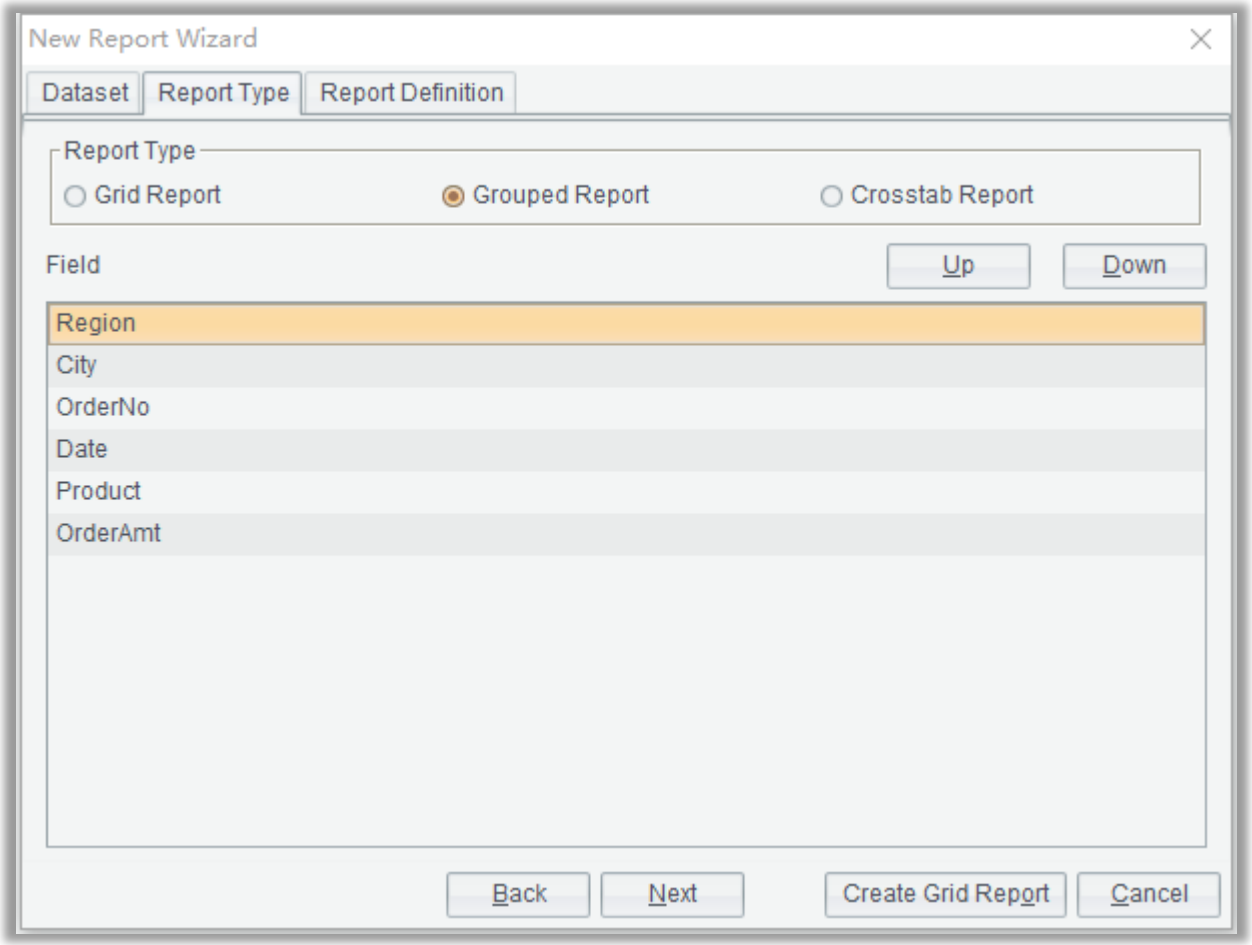
Export the report as Excel:

Records are grouped by City, and cells of same city are merged

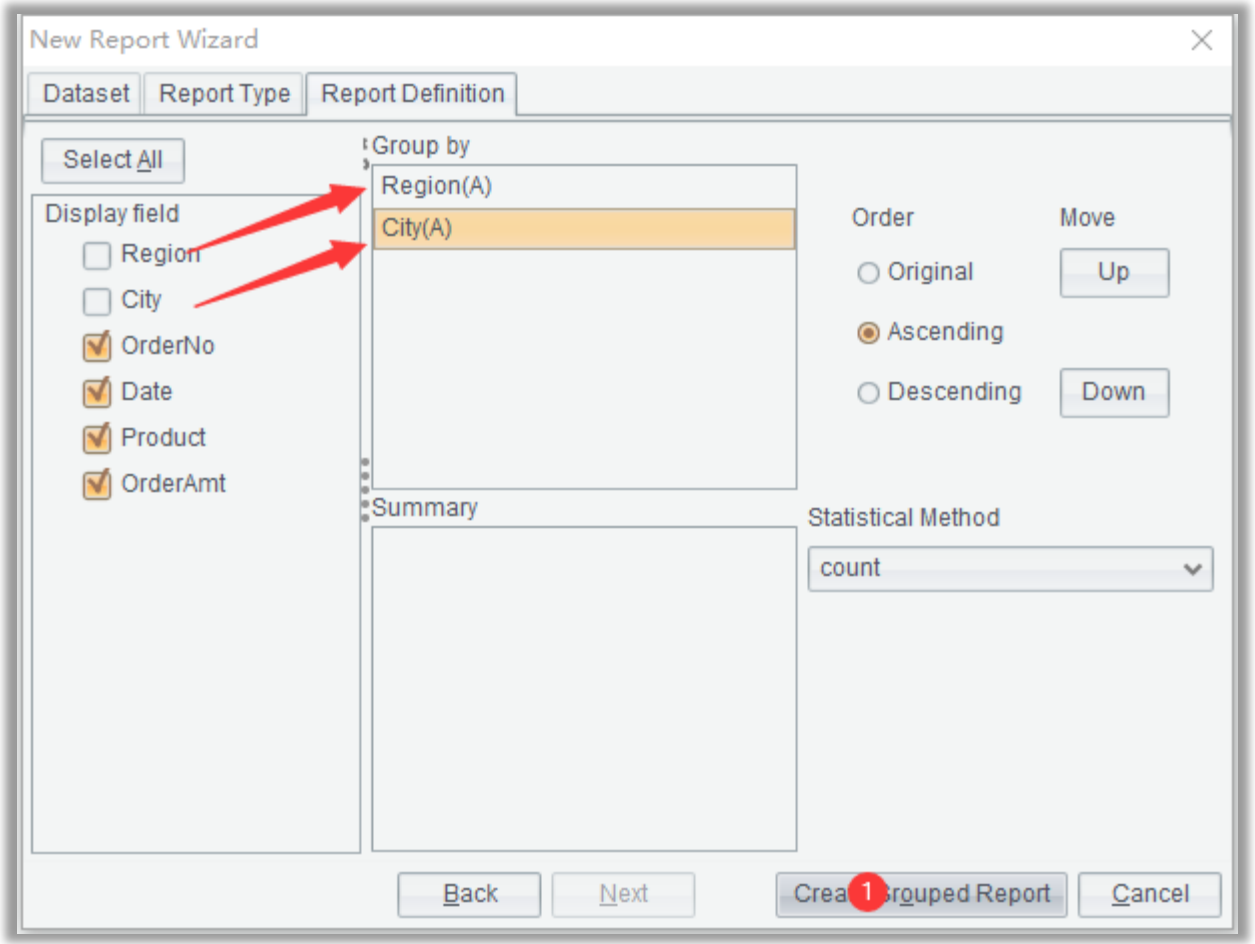
	A	B	C	D	E
1	City	OrderNo	Date	Product	OrderAmt
2	Beijing	1002	2018-01-02	Peach	203.96
3		1006	2018-01-03	Apple	69.19
4		1021	2018-01-07	Apple	96.53
5		1026	2018-01-08	Apple	325.56
6		1040	2018-01-11	Banana	243.77
7	Changchun	1012	2018-01-04	Peach	267.02
8		1038	2018-01-11	Peach	53.57
9	Chengdu	1027	2018-01-08	Banana	121.32
10		1034	2018-01-10	Peach	311.34
11	Dalian	1001	2018-01-02	Apple	189.73
12		1014	2018-01-05	Banana	204.73
13		1015	2018-01-05	Peach	229.84
14	Guiyang	1010	2018-01-04	Apple	290.31
15		1028	2018-01-08	Peach	228.96
16		1033	2018-01-10	Banana	173.26

3.1 Create grouped reports through wizard – multilevel grouping

In the previous grouped report, there is single level grouping where data is grouped by one field. But sometimes the report requires that data is grouped by multiple fields, which is called multilevel grouping. For example, to group the orders table by Region and City, we check Region under “Field” in the Wizard and click “Next”:



3.1 Create grouped reports through wizard – multilevel grouping



1. **Drag Region to Group by, and select Ascending**
2. **Drag City to Group by, and select Ascending**
3. **Click “Create Grouped Report”**

3.1 Create grouped reports through wizard – multilevel grouping

Now the multilevel grouped report (as shown below on the left) is created through the wizard. Set center align for all cells and save the report as 3.2.rptx.

D:\tutorial\data\3\3.2.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(R	=ds1.group(C	=ds1.select(C	=ds1.Date	=ds1.Product	=ds1.OrderAmt

A2's expression： =ds1.group(Region;Region:1)

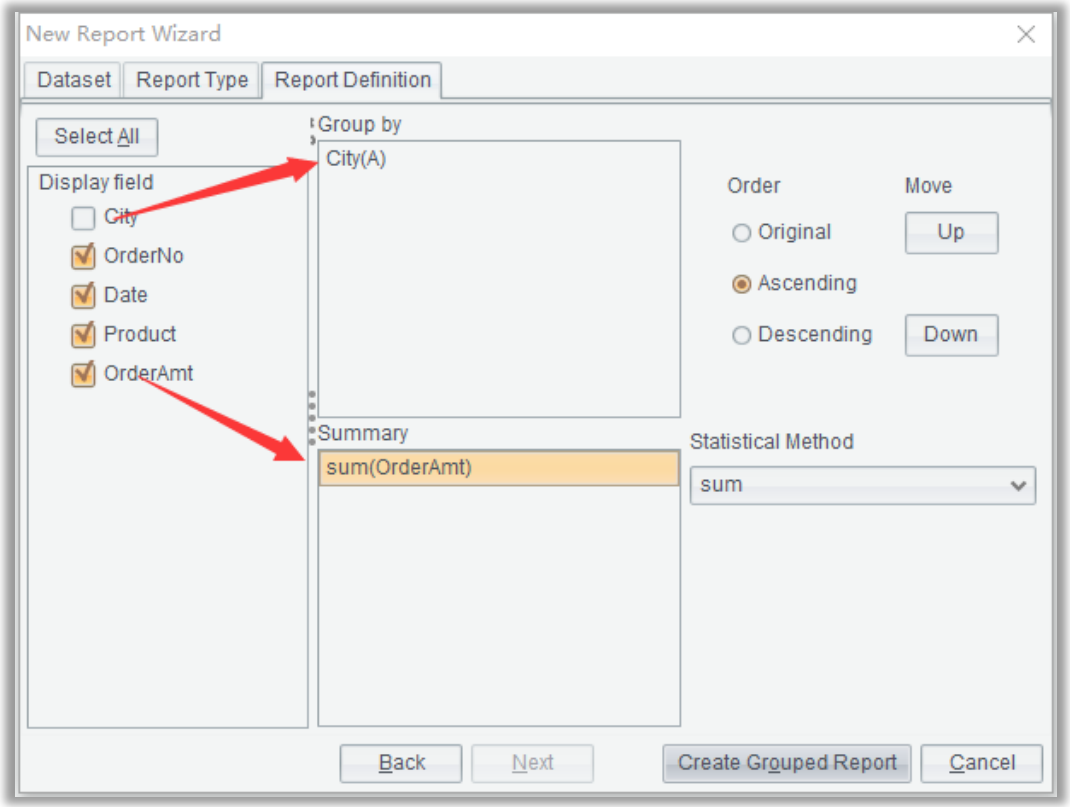
B2's expression： =ds1.group(City;City:1)

Preview the report (as shown on the right):

Region	City	OrderNo	Date	Product	OrderAmt
N	Beijing	1002	2018-01-02	Peach	203.96
		1006	2018-01-03	Apple	69.19
		1021	2018-01-07	Apple	96.53
		1026	2018-01-08	Apple	325.56
		1040	2018-01-11	Banana	243.77
	Shijiazhuang	1011	2018-01-04	Banana	201.71
		1022	2018-01-07	Apple	127.97
	Tianjin	1008	2018-01-03	Apple	256.15
		1023	2018-01-07	Banana	319.83
		1031	2018-01-09	Banana	61.1
NE	Changchun	1012	2018-01-04	Peach	267.02
		1038	2018-01-11	Peach	53.57
	Dalian	1001	2018-01-02	Apple	189.73
		1014	2018-01-05	Banana	204.73
		1015	2018-01-05	Peach	229.84

3.1 Create grouped reports through wizard – summarization

The purpose of data grouping is to summarize data in each group. Let's look at how to summarize data on a grouped report. Configure grouping definition as follows:



Drag OrderAmt to Summary, and select sum under Statistical Method

3.1 Create grouped reports through wizard – summarization

Now the multilevel grouped report (as shown below on the left) is created through the wizard. Click "Save" on the tool bar to save the report as 3.3.rptx.

D:\tutorial\data\3\3.3.rptx

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Ci	=ds1.select(O	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3	sum(City)				=ds1.sum(Ord
4	sum				=ds1.sum(Ord

Set center align for all cells, and set display format as #.00 for cells E2, E3 and E4.

Preview the report (as shown on the right):

City	OrderNo	Date	Product	OrderAmt
Beijing	1002	2018-01-02	Peach	203.96
	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
	1040	2018-01-11	Banana	243.77
sum(City)				939.01
Changchun	1012	2018-01-04	Peach	267.02
	1038	2018-01-11	Peach	53.57
sum(City)				320.59
Chengdu	1027	2018-01-08	Banana	121.32
	1034	2018-01-10	Peach	311.34
sum(City)				432.66
Dalian	1001	2018-01-02	Apple	189.73
	1014	2018-01-05	Banana	204.73
	1015	2018-01-05	Peach	229.84
sum(City)				624.30

3.1 Create grouped reports through wizard – summarization

We can add an aggregation operation during creating a multilevel grouped report through wizard, as shown in the following report 3.4.rptx:

D:\tutorial\data\3\3.4.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(R	=ds1.group(Ci	=ds1.select(O	=ds1.Date	=ds1.Product	=ds1.OrderA
3		sum(City)				=ds1.sum(Or
4	sum(Region)					=ds1.sum(Or
5	sum					=ds1.sum(Or

Set center align for all cells, and set display format as #.00 for cells F2, F3, F4 and F5.

Preview the report (as shown on the right):

Region	City	OrderNo	Date	Product	OrderAmt
N	Beijing	1002	2018-01-02	Peach	203.96
		1006	2018-01-03	Apple	69.19
		1021	2018-01-07	Apple	96.53
		1026	2018-01-08	Apple	325.56
		1040	2018-01-11	Banana	243.77
	sum(City)				939.01
	Shijiazhuang	1011	2018-01-04	Banana	201.71
		1022	2018-01-07	Apple	127.97
	sum(City)				329.68
	Tianjin	1008	2018-01-03	Apple	256.15
		1023	2018-01-07	Banana	319.83
		1031	2018-01-09	Banana	61.10
	sum(City)				637.08
sum(Region)					1905.77

3.2

Common grouped reports

3.2 Common grouped reports

1. In the grouped report 3.3.rptx created through the wizard, the summary zone is below the grouping cell. It seems that the report becomes more intuitive if the summary zone is on the right of the grouping cell. Let's make the changes manually and save the report as 3.5.rptx.

D:\tutorial\data\3\3.3.rptx

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Ci	=ds1.select(O	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3	sum(City)				=ds1.sum(Ord
4	sum				=ds1.sum(Ord

Delete contents of A3 and A4

D:\tutorial\data\3\3.5.rptx

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(City;	=ds1.select(Orc	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3				=A2+" subtotal"	=ds1.sum(Order
4				Total	=ds1.sum(Order

Merge A2 and A3
Merge B3 - D3
Merge A4 - D4

1. **Enter =A2+ "subtotal" in B3**
2. **Enter Total in A4**
3. **Set B3 and A4 as right aligned, while retaining center aligned for the other cells**

3.2 Common grouped reports

Click “Preview” on the toolbar and get a report as follows:

Preview report:D:\tutorial\data\3\3.5.rptx

City	OrderNo	Date	Product	OrderAmt
Tianjin	1008	2018-01-03	Apple	256.15
	1023	2018-01-07	Banana	319.83
	1031	2018-01-09	Banana	61.10
			Tianjin subtotal	637.08
Xiamen	1039	2018-01-11	Banana	231.30
			Xiamen subtotal	231.30
Xining	1004	2018-01-02	Banana	179.19
	1009	2018-01-04	Peach	52.28
	1019	2018-01-06	Apple	256.56
	1032	2018-01-09	Peach	197.31
	1035	2018-01-10	Banana	271.55
			Xining subtotal	956.89
Yinchuan	1037	2018-01-11	Peach	208.94
			Yinchuan subtotal	208.94
			Total	7872.10

Grouping

Subtotal in each group

Total on all groups

3.2 Common grouped reports

In a same way, we move summary cells in multilevel grouped report 3.4.rptx to the right of grouping cells and save the report as 3.6.rptx.

D:\tutorial\data\3\3.4.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(R	=ds1.group(Ci	=ds1.select(O	=ds1.Date	=ds1.Product	=ds1.OrderA
3		sum(City)				=ds1.sum(Or
4	sum(Region)					=ds1.sum(Or
5	sum					=ds1.sum(Or

Save as 3.6.rptx and make the change

D:\tutorial\data\3\3.6.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(	=ds1.group(C	=ds1.select(	=ds1.Date	=ds1.Product	=ds1.OrderA
3			=B2+" Subtotal"			=sum(F2{})
4			=A2+" Subtotal"			=sum(F2{})
5			Total			=ds1.sum(Or

Preview

Region	City	OrderNo	Date	Product	OrderAmt
NW	Lanzhou	1003	2018-01-02	Banana	208.09
		1005	2018-01-03	Apple	342.06
		1016	2018-01-05	Banana	57.38
		1017	2018-01-06	Banana	232.57
		1036	2018-01-10	Apple	169.24
		Lanzhou Subtotal			1009.34
	Xining	1004	2018-01-02	Banana	179.19
		1009	2018-01-04	Peach	52.28
		1019	2018-01-06	Apple	256.56
		1032	2018-01-09	Peach	197.31
		1035	2018-01-10	Banana	271.55
		Xining Subtotal			956.89
	Yinchuan	1037	2018-01-11	Peach	208.94
		Yinchuan Subtotal			208.94
	NW Subtotal				2175.17
S	Shenzhen	1029	2018-01-09	Apple	278.33
		Shenzhen Subtotal			278.33
	Xiamen	1039	2018-01-11	Banana	231.30
		Xiamen Subtotal			231.30
	S Subtotal				509.63
Total					7872.10

3.2 Common grouped reports

2. Each grouping cell occupies a single row. So does each summary, as shown in the right figure:

Region	City	OrderNo	Date	Product	OrderAmt
N					
	Beijing				
		1002	2018-01-02	Peach	203.96
		1006	2018-01-03	Apple	69.19
		1021	2018-01-07	Apple	96.53
		1026	2018-01-08	Apple	325.56
		1040	2018-01-11	Banana	243.77
				Beijing Subtotal	939.01
	Shijiazhuang				
		1011	2018-01-04	Banana	201.71
		1022	2018-01-07	Apple	127.97
				Shijiazhuang Subtotal	329.68
	Tianjin				
		1008	2018-01-03	Apple	256.15
		1023	2018-01-07	Banana	319.83
		1031	2018-01-09	Banana	61.10
				Tianjin Subtotal	637.08
				N Total	1905.77

3.2 Common grouped reports

Let's look at how to make a grouped report on the previous page.

1. Create an empty report of 7 rows x 6 columns, where the first row is the header row, and enter expressions in the other cells as follows:

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2						
3						
4						
5						
6						
7						

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Reg					
3		=ds1.group(City				
4			=ds1.select(Ord	=ds1.date	=ds1.Product	=ds1.OrderAmt
5		=B3+" Subtotal"				=ds1.sum(Order
6	=A2+" Total"					=ds1.sum(Order
7	Total					=ds1.sum(Order

2. Create a new file dataset ds1 using data3.1.xlsx in chapter 3;

3. Enter expression =ds1.group(Region;Region:1) in A2;

4. Enter expression =ds1.group(City;City:1) in B3;

5. Set A2 and B3 as vertically expanding;

6. Merge A3, A4 and A5;

7. Merge A6 – E6 and then A7 – E7;

8. Set A2 as the left master cell of A3, B3 and A6;

9. Enter expression =ds1.select(OrderNo) in C4;

10. Set C4 as vertically expanding;

11. Enter expression =ds1.Date in D4;

12. Enter expression =ds1.Product in E4;

(Go to the next page)

3.2 Common grouped reports

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Reg					
3		=ds1.group(City				
4			=ds1.select(Ord	=ds1.date	=ds1.Product	=ds1.OrderAmt
5		=B3+" Subtotal"				=ds1.sum(Order
6	=A2+" Total"					=ds1.sum(Order
7	Total					=ds1.sum(Order

13. Enter expression： =ds1.OrderAmt in F4;
14. Merge B5 – E5;
15. Set B3 as the left master cell of B4 and B5;
16. Enter expression =B3+“ Subtotal“ in B5;
17. Enter =ds1.sum(OrderAmt) in F5, F6 and F7;
18. Enter expression =A2+“ Total“ in A6;
19. Enter text: Total in A7;
20. Set all cells as center aligned;
21. Set B5, A6 and A7 as right aligned;
22. Set display format as #.00 for F4, F5, F6 and F7;
23. Save the report as 3.7.rptx.

3.2 Common grouped reports

3. Aggregate values are placed on the right and displayed in merged cells, as shown in the figure:

Region	City	OrderNo	Date	Product	OrderAmt	CitySubtotal	RegionTotal
N	Beijing	1002	2018-01-02	Peach	203.96	939.01	1905.77
		1006	2018-01-03	Apple	69.19		
		1021	2018-01-07	Apple	96.53		
		1026	2018-01-08	Apple	325.56		
		1040	2018-01-11	Banana	243.77		
	Shijiazhuang	1011	2018-01-04	Banana	201.71	329.68	
		1022	2018-01-07	Apple	127.97		
	Tianjin	1008	2018-01-03	Apple	256.15	637.08	
		1023	2018-01-07	Banana	319.83		
		1031	2018-01-09	Banana	61.10		
NE	Changchun	1012	2018-01-04	Peach	267.02	320.59	1589.60
		1038	2018-01-11	Peach	53.57		
	Dalian	1001	2018-01-02	Apple	189.73	624.30	
		1014	2018-01-05	Banana	204.73		
		1015	2018-01-05	Peach	229.84		
	Shenyang	1007	2018-01-03	Apple	231.44	644.71	
		1013	2018-01-05	Banana	83.34		
		1025	2018-01-08	Banana	243.93		
		1030	2018-01-09	Banana	86.00		

3.2 Common grouped reports

Let's look at how to make a grouped report in the previous page. Open report 3.2.rptx, and save it as 3.8.rptx.

D:\tutorial\data\3\3.2.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Re	=ds1.group(Ci	=ds1.select(Or	=ds1.Date	=ds1.Product	=ds1.OrderAmt

Right-click column F and select "Add column" twice

D:\tutorial\data\3\3.8.rptx

	A	B	C	D	E	F	G	H
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt	CitySubtotal	RegionTotal
2	=ds1.group(Reg	=ds1.group(City	=ds1.select(Ord	=ds1.Date	=ds1.Product	=ds1.OrderAmt	=ds1.sum(Order	=ds1.sum(Order

Enter CitySubtotal

Enter ReigonTotal

Enter =ds1.sum(OrderAmt) and set B2 as left master cell

Enter =ds1.sum(OrderAmt) and set A2 as left master cell

3.3

Structure of a grouped report and master cell

3.3 Structure of a grouped report and master cell

Master cell: Copied cells will be automatically expanded during report computations. The master cell has an expansion direction. A vertically expanding master cell is called left master cell (marked by a red downward arrow), and a horizontally expanding one is top master cell (marked by a red rightward arrow).

Expanding area: An expanding area consists of a set of cells that have one and only one master cell. The expansion direction of a master cell determines the direction in which the current area will be expanded. The other cells in this area will follow the master cell to copy.

D:\tutorial\data\3\3.1.rptx

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(City	=ds1.select(Or	=ds1.Date	=ds1.Product	=ds1.OrderAmt

The red area is the expanding area of a city group, whose master cell is A2

The green area is the expanding area of grouped city details, whose master cell is B2

Default rules for the left master cell:

The default left master cell of the current cell is the first vertically expanding cell to its left when searched from right to left. If the left master cell has been specified for a cell to its left, this specified cell is by default the current cell's left master cell. If no eligible cell is found during the backward search, the report master cell (the cell at top-left corner) becomes the current cell's default left master cell.

In the left figure, the default left master cell of C2, D2 and E2 is 2, and the default one for B2 is A2.

3.3 Structure of a grouped report and master cell

Compute the report on previous page and we get the following report:

City	OrderNo	Date	Product	OrderAmt
Beijing	1002	2018-01-02	Peach	203.96
	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
	1040	2018-01-11	Banana	243.77
Changchun	1012	2018-01-04	Peach	267.02
	1038	2018-01-11	Peach	53.57
Chengdu	1027	2018-01-08	Banana	121.32
	1034	2018-01-10	Peach	311.34
Dalian	1001	2018-01-02	Apple	189.73
	1014	2018-01-05	Banana	204.73
	1015	2018-01-05	Peach	229.84

The city master cell copies itself and generates a red area for each of the other cities. The green details area follows suit to copy.

The master cell B2 in the details area expands and has 5 copies of green areas according to the number of orders in the current area.

3.3 Structure of a grouped report and master cell

Below is structure of report 3.6.rptx:

The rose red area is grouped cities area, whose master cell is B2; the default left master cell of this area's C2, C3 and F3 is also B2

D:\tutorial\data\3\3.6.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Re	=ds1.group(Cit	=ds1.select(Or	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3			=B2+" Subtotal"			=sum(F2{})
4		=A2+" Subtotal"				=sum(F2{})
5	Total					=ds1.sum(Ord

Blue details area (same as that in the previous report)

Will not expand because its left master cell is report master cell

The yellow area is grouped regions area, whose master cell is A2; the default left master cell of this area's B2, B4 and F4 is also A2

Tips: No need to specify the left master cell when a cell's default left master cell happens to be the expanding area's master cell

3.3 Structure of a grouped report and master cell

Compute the report on previous page:

NW	Lanzhou	1003	2018-01-02	Banana	208.09
		1005	2018-01-03	Apple	342.06
		1016	2018-01-05	Banana	57.38
		1017	2018-01-06	Banana	232.57
		1036	2018-01-10	Apple	169.24
		Lanzhou Subtotal			1009.34
	Xining	1004	2018-01-02	Banana	179.19
		1009	2018-01-04	Peach	52.28
		1019	2018-01-08	Apple	256.56
		1032	2018-01-09	Peach	197.31
		1035	2018-01-10	Banana	271.55
		Xining Subtotal			956.89
	Yinchuan	1037	2018-01-11	Peach	208.94
		Yinchuan Subtotal			208.94
	NW Subtotal				2175.17
S	Shenzhen	1029	2018-01-09	Apple	278.33
		Shenzhen Subtotal			278.33
	Xiamen	1039	2018-01-11	Banana	231.30
		Xiamen Subtotal			231.30
	S Subtotal				509.63
Total					7872.10

The region master cell copies itself and generates a yellow area for each of the other regions, where the rose red city area follows suit to copy.

The city master cell copies itself and generates a rose red area for each of the other cities, where the blue details area follows suit to copy.

The master cell C2 in the details area expands to generate a blue area according to the number of orders in the current group.

3.3 Structure of a grouped report and master cell

Below is structure of report 3.7.rptx:

The red area is grouped cities area whose master cell is B3. In this area the default left master cell of B4, C4 and B5 isn't B3, so we need to specify B3 as their left master cell so that they can follow B3 to copy.

Green details area (same as that in the previous report)

D:\tutorial\data\3\3.7.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	Or...
2	=ds1.group(Reg					
3		=ds1.group(C...y)				
4			=ds1.select(Ord	=ds1.date	=ds1.Product	=ds1.OrderAmt
5					=B3+" Subtotal"	=ds1.sum(Order
6					=A2+" Total"	=ds1.sum(Order
7					T	ds1.sum(Order

No left master cell is specified for F5; its default is the left master cell B3 specified in B5

The cell's left master cell is report master cell, so it will not expand

The orange area is grouped regions area whose master cell is A2. In this area the default left master cell of A3, B3 and A6 isn't A2, so we need to specify A2 as their left master cell so that they can follow A2 to copy.

No left master cell is specified for F6; its default is the left master cell A2 specified in A6

Tips: When a cell's default left master cell isn't master cell of the current expanding area, we need to specify the master cell of the current expanding area as its left master cell

3.3 Structure of a grouped report and master cell

Compute the report on previous page:

Region	City	OrderNo	Date	Product	OrderAmt
N					
	Beijing				
		1002	2018-01-02	Peach	203.96
		1006	2018-01-03	Apple	69.19
		1021	2018-01-07	Apple	96.53
		1026	2018-01-08	Apple	325.56
		1040	2018-01-11	Banana	243.77
	Beijing Subtotal				939.01
	Shijiazhuang				
		1011	2018-01-04	Banana	201.71
		1022	2018-01-07	Apple	127.97
	Shijiazhuang Subtotal				329.68
	Tianjin				
		1008	2018-01-03	Apple	256.15
		1023	2018-01-07	Banana	319.33
		1031	2018-01-09	Banana	61.10
	Tianjin Subtotal				637.08
N Total					1905.77

The city master cell copies itself and generates a red area for each of the other cities, where the green details area follows suit to copy.

The master cell C4 in the details area expands to generate a green area of corresponding number of rows according to the number of orders in the current group.

The region master cell copies itself and generates an orange area for each of the other regions, where the red city area follows suit to copy.

3.3 Structure of a grouped report and master cell

Below is structure of report 3.8.rptx:

D:\tutorial\data\3\3.8.rptx

	A	B	C	D	E	F	G	H
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt	CitySubtotal	RegionTotal
2	=ds1.group(Reg	=ds1.group(City	=ds1.select(Or	=ds1.Date	=ds1.Product	=ds1.OrderAmt	=ds1.sum(Order	=ds1.sum(Order

H2 belongs to the blue region area, but its default left master cell is C2. In this case we need to specify A2, master cell of the area it belongs to, as its left master cell.

Region	City	OrderNo	Date	Product	OrderAmt	CitySubtotal	RegionTotal
N	Beijing	1002	2018-01-02	Peach	203.96	939.01	1905.77
		1006	2018-01-03	Apple	69.19		
		1021	2018-01-07	Apple	96.53		
		1026	2018-01-08	Apple	325.56		
		1040	2018-01-11	Banana	243.77		
	Shijiazhuang	1011	2018-01-04	Banana	201.71	329.68	
		1022	2018-01-07	Apple	127.97		
	Tianjin	1008	2018-01-03	Apple	256.15	637.08	
		1023	2018-01-07	Banana	319.83		
		1031	2018-01-09	Banana	61.10		

G2 belongs to the red city area, but its default left master cell is C2; in this case we need to specify B2, master cell of the area it belongs to, as its left master cell.

3.3 Structure of a grouped report and master cell

Now try to make a report as the left figure below shows according to what we have learned. Open report 3.1.rptx and save it as 3.9.rptx.

ID	City	OrderNo	Date	Product	OrderAmt
1	Beijing	1002	2018-01-02	Peach	203.96
2		1006	2018-01-03	Apple	69.19
3		1021	2018-01-07	Apple	96.53
4		1026	2018-01-08	Apple	325.56
5		1040	2018-01-11	Banana	243.77
6	Changchun	1012	2018-01-04	Peach	267.02
7		1038	2018-01-11	Peach	53.57
8	Chengdu	1027	2018-01-08	Banana	121.32
9		1034	2018-01-10	Peach	311.34
10	Dalian	1001	2018-01-02	Apple	189.73
11		1014	2018-01-05	Banana	204.73
12		1015	2018-01-05	Peach	229.84
13	Guiyang	1010	2018-01-04	Apple	290.31
14		1028	2018-01-08	Peach	228.96
15		1033	2018-01-10	Banana	173.26

Right-click column A and select “Insert column”

	A	B	C	D	E
1(TH)	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(City	=ds1.select(Orc	=ds1.Date	=ds1.Product	=ds1.OrderAmt

Enter ID in A1

	A	B	C	D	E	F
1(TH)	ID	City	OrderNo	Date	Product	OrderAmt
2	=row()-1	=ds1.group(City	=ds1.select(Orc	=ds1.Date	=ds1.Product	=ds1.OrderAmt

Enter expression =row()-1 in A2; According to the report template, IDs correspond to detailed orders data, so we set C2 as the left master cell of details cells

Set B2 as C2’s left master cell

3.4

Computations on a grouped report

3.4 Computations on a grouped report – summary range

In a grouped report, the range of aggregated data values varies when the aggregate expression is written on different levels of grouping. Take SUM as an example (avg, max, min, count and the other aggregate operations are similar):

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2			=ds1.select(Or	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3	=ds1.group(Re	=ds1.group(Cit			=B2+" Subtotal"	=ds1.sum(Ord
4					=A2+" Subtotal"	=ds1.sum(Ord
	N	Beijing	1021	2018-01-07	Apple	96.53
			1026	2018-01-08	Apple	325.56
			1040	2018-01-11	Banana	243.77
					Beijing Subtotal	939.01
		Shijiazhuang	1011	2018-01-04	Banana	201.71
			1022	2018-01-07	Apple	127.97
					Shijiazhuang Subtotal	329.68
		Tianjin	1008	2018-01-03	Apple	256.15
			1023	2018-01-07	Banana	319.83
			1031	2018-01-09	Banana	61.10
					Tianjin Subtotal	637.08
					N Subtotal	1905.77

ds1.sum(OrderAmt)
Group and summarize the second level data whose master cell is B2; calculate sum of all order amounts under B2

ds1.sum(OrderAmt)
Group and summarize the first level data whose master cell is A2; calculate sum of all order amounts under A2

Calculate sum of all order amounts under master cell Beijing

Calculate sum of all order amounts under master cell N (North China)

3.4 Computations on a grouped report – summary range

Besides the dataset aggregate functions, we can also summarize data using cell values; the summary range is defined in the same way.

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Re	=ds1.group(Cit	=ds1.select(O	=ds1.Date	=ds1.Product	=ds1.OrderAmt
3			=B2+" Subtotal"			=sum(F2{})
4		=A2+" Subtotal"				=sum(F2{})
	N	Beijing	1002	2018-01-02	Peach	203.96
			1006	2018-01-03	Apple	69.19
			1021	2018-01-07	Apple	96.53
			1026	2018-01-08	Apple	325.56
			1040	2018-01-11	Banana	243.77
			Beijing Subtotal			939.01
		Shijiazhuang	1011	2018-01-04	Banana	201.71
			1022	2018-01-07	Apple	127.97
			Shijiazhuang Subtotal			329.68
		Tianjin	1008	2018-01-03	Apple	256.15
			1023	2018-01-07	Banana	319.83
			1031	2018-01-09	Banana	61.10
			Tianjin Subtotal			637.08
		N Subtotal				1905.77

sum(F2{})
Group and summarize the second level data whose master cell is B2; calculate sum of all expanded F2 values under B2

sum(F2{})
Group and summarize the first level data whose master cell is A2; calculate sum of all expanded F2 values under A2

Calculate sum of all F2 values (highlighted in red box) under master cell Shijiazhuang

Calculate sum of all F2 values under master cell N (North China)

3.4 Computations on a grouped report – summary range

When performing computations through cell values, the exported Excel with Formula contain formulas in aggregate cells; computations through dataset do not attach formulas in the cells.

	A	B	C	D	E	F
1	Region	City	OrderNo	Date	Product	OrderAmt
2	N	Beijing	1002	2018-01-02	Peach	203.96
3			1006	2018-01-03	Apple	69.19
4			1021	2018-01-07	Apple	96.53
5			1026	2018-01-08	Apple	325.56
6			1040	2018-01-11	Banana	243.77
7					Beijing Subtotal	939.01
8		Shijiazhuang	1011	2018-01-04	Banana	201.71
9			1022	2018-01-07	Apple	127.97
10					Shijiazhuang Subtotal	329.68
11		Tianjin	1008	2018-01-03	Apple	256.15
12			1023	2018-01-07	Banana	319.83
13			1031	2018-01-09	Banana	61.1
14					Tianjin Subtotal	637.08
15					N Subtotal	1905.77

=SUM(F2:F6)

=SUM(F8:F9)

=SUM(F11:F13)

=SUM(F2:F6,F8:F9,F11:F13)

3.4 Computations on a grouped report – group() function

In a grouped report, we always use the dataset's group() function in a grouping master cell to perform grouping operations.

Learn more about group() function in http://d.raqsoft.com.cn:6999/report/preference/%20dngroupsof.html .

3.4 Computations on a grouped report – group() function

Grouping effects of group() function working with different parameters – sorting before grouping

	A	B	C
1	OrderNo	Region	City
2	1001	NE	Dalian
3	1002	N	Beijing
4	1003	NW	Lanzhou
5	1004	NW	Xining
6	1005	NW	Lanzhou
7	1006	N	Beijing
8	1007	NE	Shenyang
9	1008	N	Tianjin
10	1009	NW	Xining
11	1010	NS	Guiyang
12	1011	N	Shijiazhuang
13	1012	NE	Changchun
14	1013	NE	Shenyang
15	1014	NE	Dalian
16	1015	NE	Dalian
17	1016	NW	Lanzhou
18	1017	NW	Lanzhou
19	1018	NS	Kunming
20	1019	NW	Xining

Original data

City	OrderNo
Dalian	1001
Beijing	1002
Lanzhou	1003
Xining	1004
Lanzhou	1005
Beijing	1006
Shenyang	1007
Tianjin	1008
Xining	1009
Guiyang	1010
Shijiazhuang	1011
Changchun	1012
Shenyang	1013
Dalian	1014
	1015
Lanzhou	1016
	1017
Kunming	1018
Xining	1019

ds1.group(City)
Not sort before grouping – put neighboring same-city records in one group in the original order

ds1.group(City;City:1)
Sort in ascending order before grouping – put all records of city in one group

ds1.group(City;City:-1)
Sort in descending order before grouping – put all records of city in one group

City	OrderNo
Beijing	1002
	1006
	1021
	1026
	1040
Changchun	1012
	1038
Chengdu	1027
	1034
Dalian	1001
	1014
Guiyang	1010
	1028
	1033
Kunming	1018
	1020
	1024

City	OrderNo
Yinchuan	1037
Xining	1004
	1009
	1019
	1032
	1035
Xiamen	1039
Tianjin	1008
	1023
	1031
Shijiazhuang	1011
	1022
Shenzhen	1029
Shenyang	1007
	1013
	1025
	1030

3.4 Computations on a grouped report – group() function

Grouping effects of group() function working with different parameters – filtering before grouping

City	OrderNo	Date	Product	OrderAmt
Beijing	1002	2018-01-02	Peach	203.96
	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
	1040	2018-01-11	Banana	243.77
Changchun	1012	2018-01-04	Peach	267.02
	1038	2018-01-11	Peach	53.57
Chengdu	1027	2018-01-[illegible]	Banana	121.32
	1034	[illegible]	[illegible]	[illegible]
Dalian	1001			
	1014			
	1015	2018-01-05	Peach	229.84

ds1.group(City;City:1)
No filtering happens

City	OrderNo	Date	Product	OrderAmt
Beijing	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
Dalian	1001	2018-01-02	Apple	189.73
Guiyang	1010	2018-01-04	Apple	290.31
Kunming	1024	2018-01-07	Apple	238.61
Lanzhou	1005	2018-01-[illegible]	Apple	342.06
	1036	20[illegible]	Apple	169.24
[illegible]	[illegible]	[illegible]	[illegible]	231.44
[illegible]	[illegible]	[illegible]	[illegible]	278.33
[illegible]	[illegible]	[illegible]	[illegible]	127.97
Tianjin	1008	2018-01-03	Apple	256.15
Xining	1019	2018-01-06	Apple	256.56

ds1.group(City,Product=="Apple";City:1)Group up records where Product is Apple only

3.4 Computations on a grouped report – group() function

Grouping effects of group() function working with different parameters – sorting after grouping

Preview report:D:\tutorial\data\3\3.10.rptx

City	OrderNo	Date	Product	OrderAmt
Beijing	1002	2018-01-02	Peach	203.96
	1006	2018-01-03	Apple	69.19
	1021	2018-01-07	Apple	96.53
	1026	2018-01-08	Apple	325.56
	1040	2018-01-11	Banana	243.77
			Beijing subtotal	939.01
Changchun	1012	2018-01-04	Peach	267.02
		2018-01-11	Peach	53.57
			Changchun subtotal	320.59
Chengd	1	01-08	Banana	121.32

ds1.group(City;City:1)
Display records in ascending order by city as no sorting after grouping is specified

Preview report:D:\tutorial\data\3\3.10.rptx

City	OrderNo	Date	Product	OrderAmt
Lanzhou	1003	2018-01-02	Banana	208.09
	1005	2018-01-03	Apple	342.06
	1016	2018-01-05	Banana	57.38
	1017	2018-01-06	Banana	232.57
	1036	2018-01-10	Apple	169.24
			Lanzhou subtota	1009.34
Xining	1004	2018-01-02	Banana	179.19
	1009	2018-01-04	Pr	52.28
	1019	2018-01-06		256.56
	1032	2018-01-09		197.31
	1035	2018-01		271.55
			btotal	956.89
	1002		h	203.96
			Beijing subtotal	939.01

ds1.group(City;City:1 ; ds1.sum(OrderAmt):-1)
Display records in descending order by city order amount as sorting after grouping is specified

3.5

Exercise

3.5 Exercise

1. Make a grouped report grouped by product that lists order details and calculates the largest order amount for each product based on file practice3.1.xlsx manually and through the wizard respectively.

2. Add a filer condition for the report in Exercise 1 – perform aggregations for the three cities of Beijing, Tianjin and Shenzhen only, and display records in descending order by order amount.

3. Make a three-level grouped report grouped by region, city and product in order based on file practice3.2.xlsx, and list orders details for each group and sum order amounts in each region, in each city of every region and for each product in every city.

3.5 Exercise

4. The grouping requirements are same as those in exercise 3, but the format is same as that in report 3.7.rptx – each grouping master cell occupies one row.

3.7.rptx

	A	B	C	D	E	F
1(TH)	Region	City	OrderNo	Date	Product	OrderAmt
2	=ds1.group(Reg					
3		=ds1.group(City				
4			=ds1.select(Ord	=ds1.date	=ds1.Product	=ds1.OrderAmt
5					=B3+" Subtotal"	=ds1.sum(Order
6					=A2+" Total"	=ds1.sum(Order
7					Total	=ds1.sum(Order

5. Make a report grouped by region, where the first column contains IDs and grouping cell Region is put in the rightmost, and which only lists orders details without summarization, based on file practice3.1.xlsx.

Chapter 4

Crosstab report

Chapter 4 Crosstab report

4.1 Create crosstab reports through wizard

4.2 Common crosstab reports

4.3 Structure of a crosstab report & master cell

4.4 Computations on a crosstab report

4.5 Exercise

Chapter 4 Crosstab report

4.1

Create crosstab reports through wizard

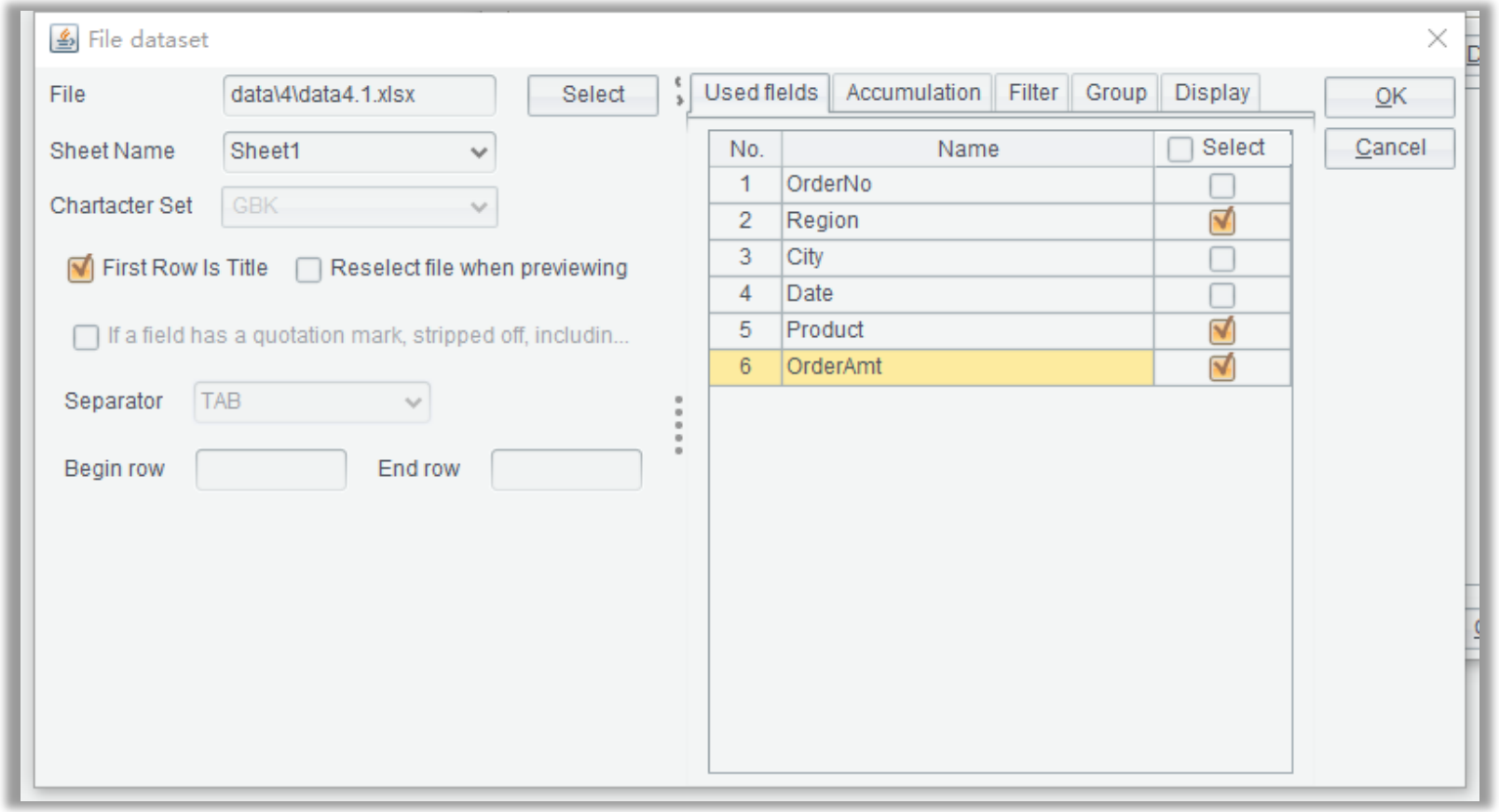
4.1 Create crosstab reports through wizard – data source

Below is a company's orders data that contains orders of 2016, 2017 and 2018. The example data data4.1.xlsx in chapter 4 has same structure as example data in chapter 3.

	A	B	C	D	E	F
1	OrderNo	Region	City	Date	Product	OrderAmt
2	1001	SW	Guiyang	2016-01-02	Apple	118.11
3	1002	N	Beijing	2016-01-02	Apple	64.44
4	1003	NE	Shenyang	2016-01-02	Banana	183.19
5	1004	SW	Guiyang	2016-01-02	Pear	133.56
6	1005	NW	Lanzhou	2016-01-03	Banana	115.5
7	1006	NE	Changchun	2016-01-03	Pear	82.78
8	1007	N	Beijing	2016-01-03	Pear	176.87
9	1008	SW	Guiyang	2016-01-03	Banana	73.57
10	1009	S	Xiamen	2016-01-04	Apple	344.26
11	1010	S	Guangzhou	2016-01-04	Apple	236.14
12	1011	SW	Kunming	2016-01-04	Apple	338.59
13	1012	SW	Guiyang	2016-01-04	Banana	156.35
14	1013	N	ıijiazhuaı	2016-01-05	Banana	74.46
15	1014	N	Beijing	2016-01-05	Apple	321.07
16	1015	S	Shenzhen	2016-01-05	Banana	82.26
17	1016	NE	Dalian	2016-01-05	Apple	145.64
18	1017	SW	Kunming	2016-01-06	Pear	291.04
19	1018	SW	Kunming	2016-01-06	Apple	333.48
20	1019	SW	Chengdu	2016-01-06	Apple	76.03

4.1 Create crosstab reports through wizard – simple crosstab reports

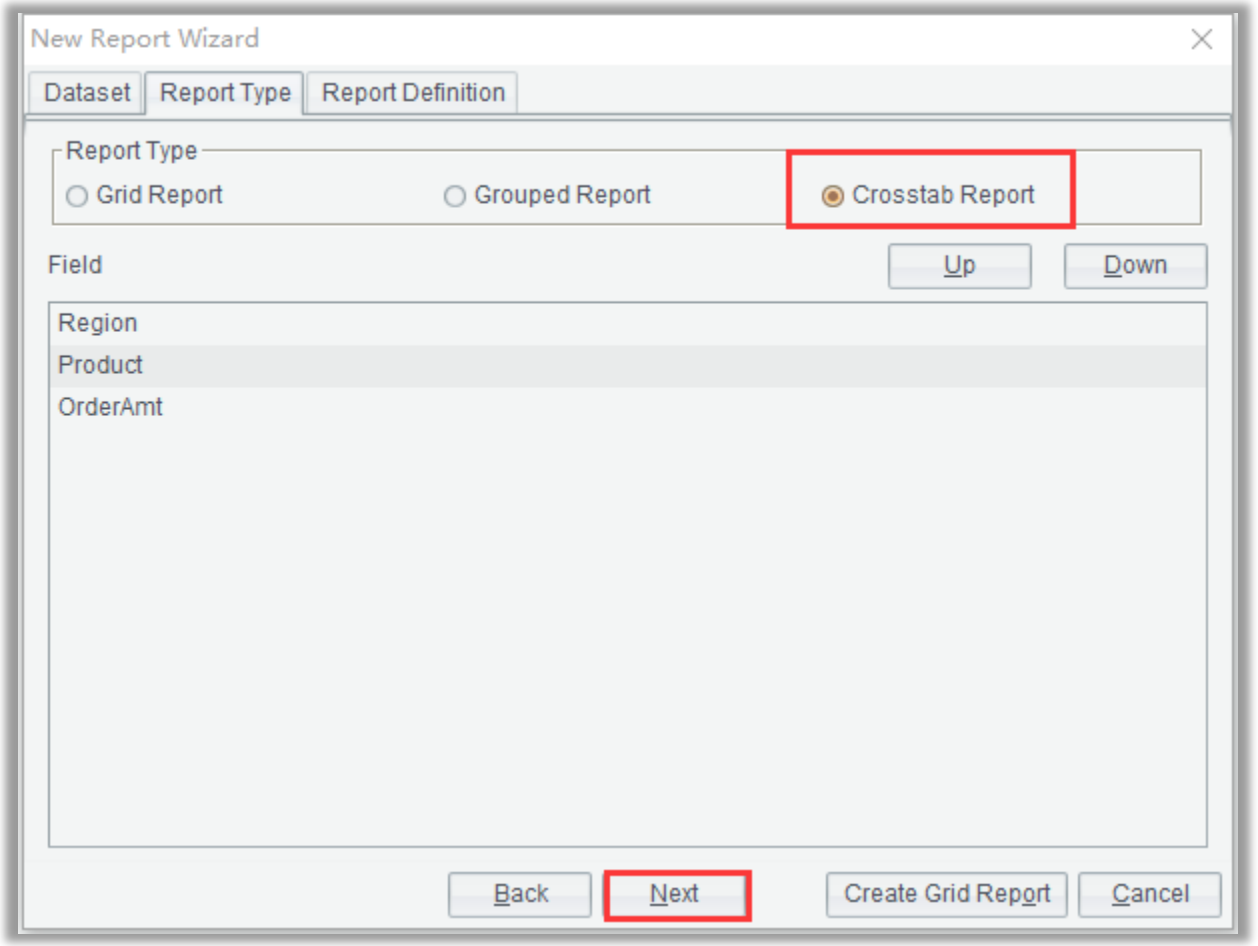
Run report designer, select “New Report” under “File”, use ds1 as default dataset name, and click “File dataset” to pop up the window below:



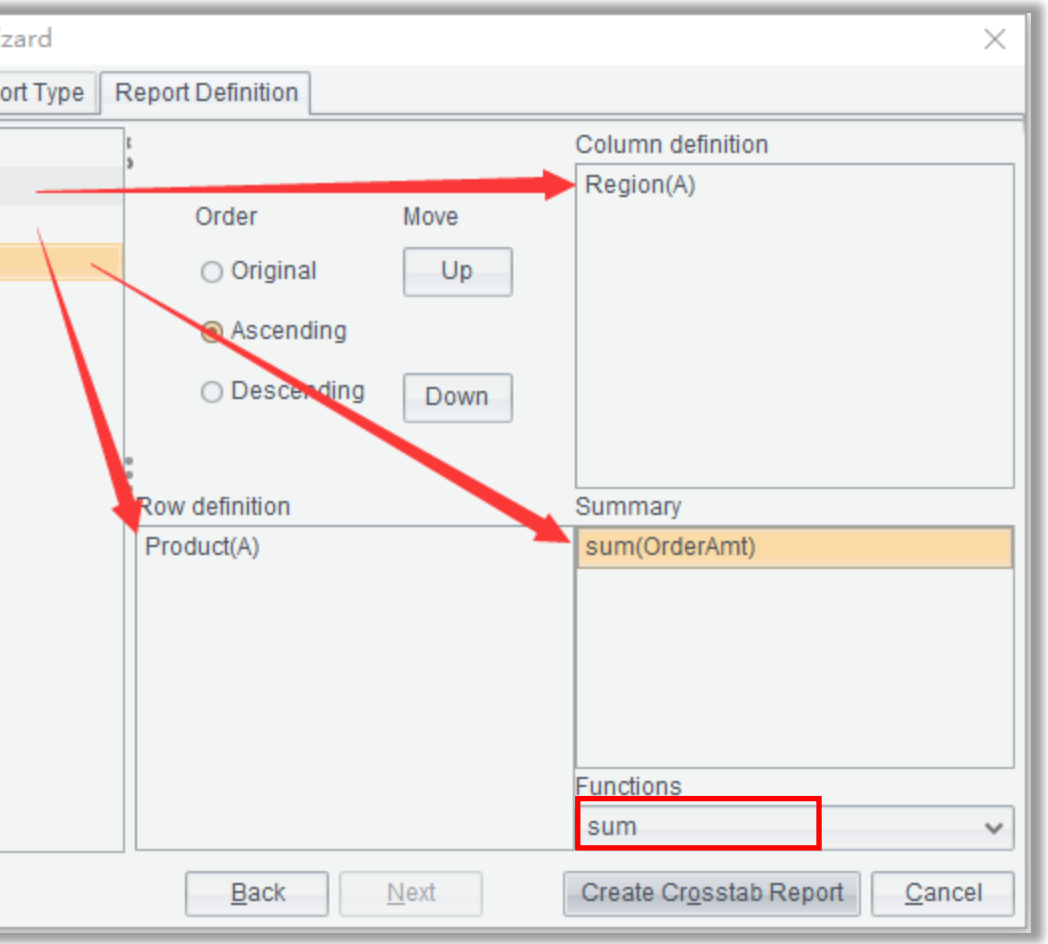
1. Click“Select” to select file **data4.1.xlsx**
2. **Select desired columns**
3. **Click “OK”**

4.1 Create crosstab reports through wizard – simple crosstab reports

Select “Crosstab Report” and click “Next” to continue:



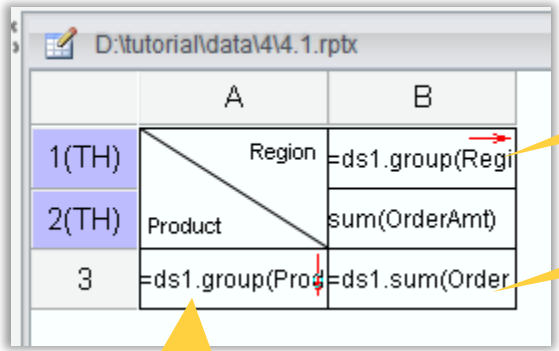
4.1 Create crosstab reports through wizard – simple crosstab reports



1. Drag Region to “Column definition”
2. Drag Product to “Row definition”
3. Drag OrderAmt to “Summary”
4. Select sum function
5. Click “Create Crosstab Report”

4.1 Create crosstab reports through wizard – simple crosstab reports

Now a crosstab report (as shown below) is created through the wizard. Set center align for all cells, set display format of B3 as #.00, and save the report as 4.1.rptx.



=ds1.group(Region; Region :1)

=ds1.sum(OrderAmt)

=ds1.group(Product;Product:1)

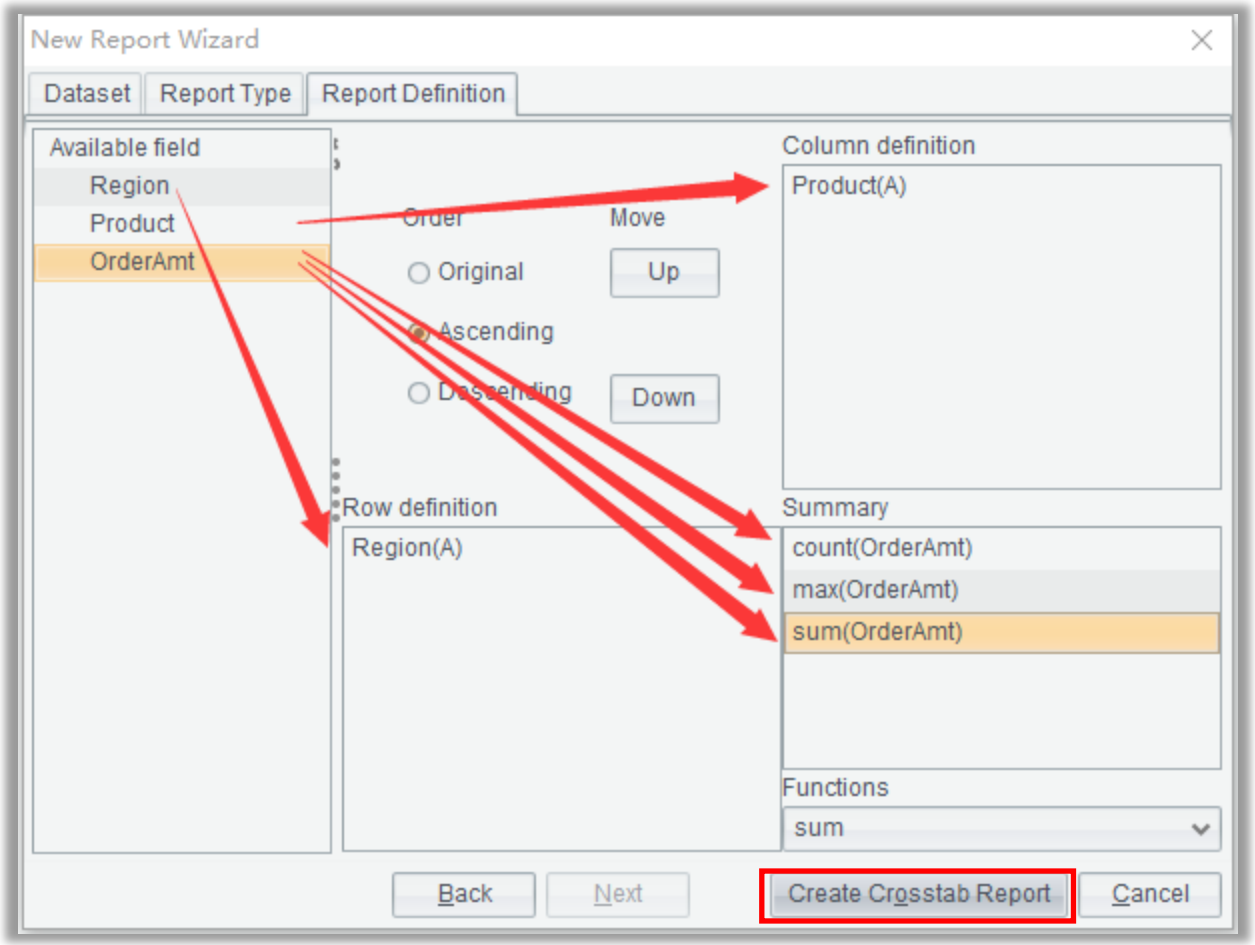
Preview

Sum of apple sales in NW region

Region / Product	N	NE		S	SW
	sum(OrderAmt)	sum(OrderAmt)	sum(erAmt)	sum(OrderAmt)	sum(OrderAmt)
Apple	5354.74	6296.86	6214.17	4063.84	7056.92
Banana	4732.21	3648.91	5657.35	4255.41	5668.79
Pear	4313.48	5619.03	5770.16	5380.94	4535.99

4.1 Create crosstab reports through wizard – multiple aggregations

In the step below during creating 4.1.rptx, add more aggregate operations:



1. **Drag Region to "Row definition"**
2. **Drag Product to "Column definition"**
3. **Drag OrderAmt to "Summary" and change aggregate function to COUNT; drag the field to it again and change the function to MAX; drag the field to it the third time and retain the default SUM function**
4. **Click "Create Crosstab Report"**

4.1 Create crosstab reports through wizard – multiple aggregations

Now a crosstab report (as shown below) is created through the wizard. Set center align for all cells, set display format of C3 and D3 as #.00, and save the report as 4.2.rptx.

D:\tutorial\data\4\4.2.rptx

	A	B	C	D
1(TH)	Product	=ds1.group(Product;Product:1)		
2(TH)	Region	count(OrderAmt)	max(OrderAmt)	sum(OrderAmt)
3	=ds1.group(Regi	=ds1.count()	=ds1.max(Order	=ds1.sum(Order

=ds1.sum(OrderAmt)

=ds1.max(OrderAmt)

=ds1.count()

=ds1.group(Region;Region:1)

Preview

Sum of apple sales in North China

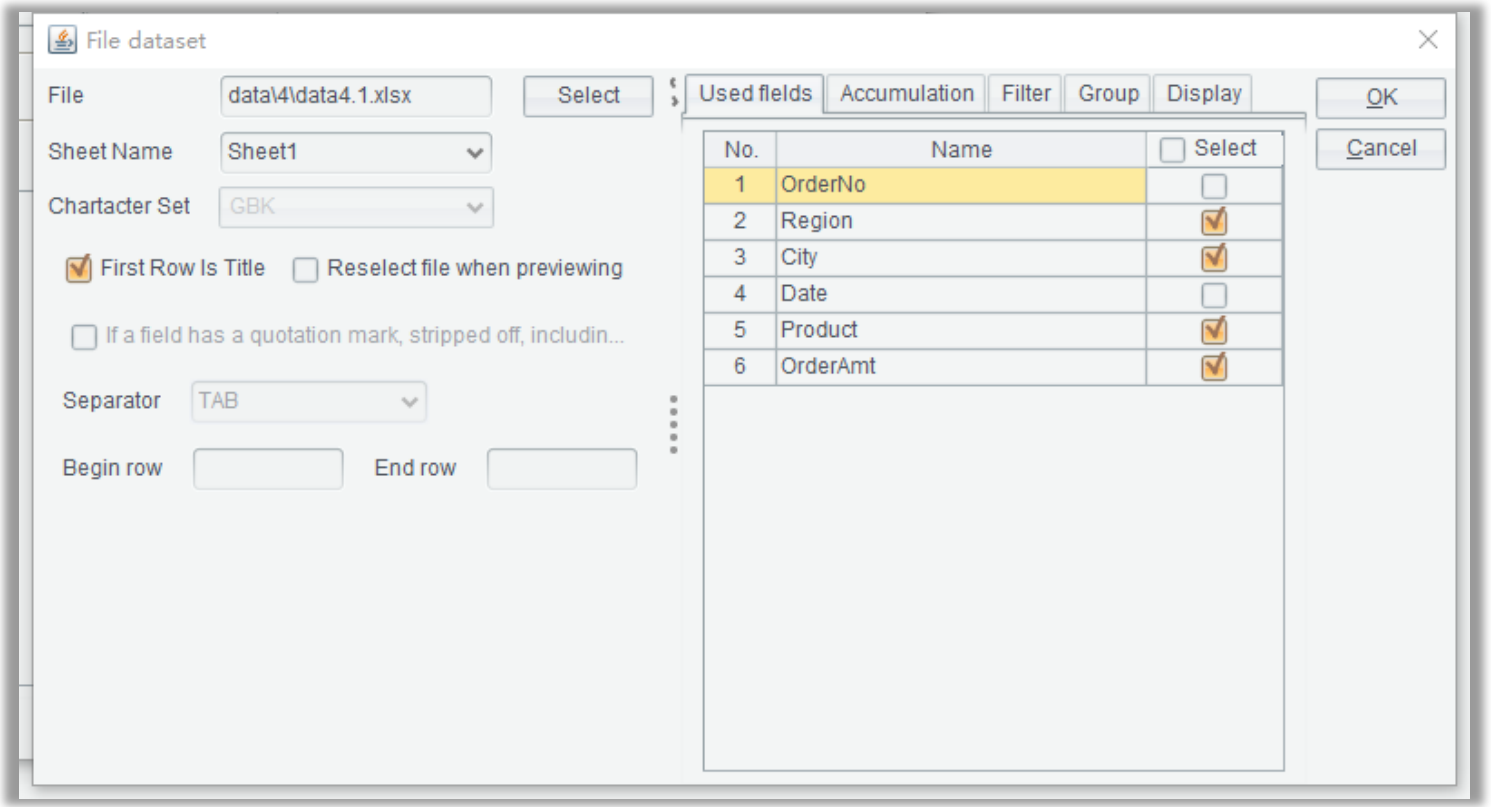
Max banana order amount in NE region

Pear orders count in NE region

Product / Region	Apple				...nana			Pear	
	count(Order	max(OrderA	...(OrderA	count(Order	...(OrderA	sum(OrderA	count(Ord	...ax(OrderA	sum(OrderA
N	28	329.56	5354.74	23	347.55	4732.21	22	339.80	4313.48
NE	32	334.63	6296.86	21	313.64	3648.91	27	341.37	5619.03
NW	29	336.48	6214.17	28	349.87	5657.35	26	344.84	5770.16
S	20	346.74	4063.84	23	335.23	4255.41	30	346.06	5380.94
SW	34	338.59	7056.92	33	344.34	5668.79	24	320.83	4535.99

4.1 Create crosstab reports through wizard – multilevel crosstab

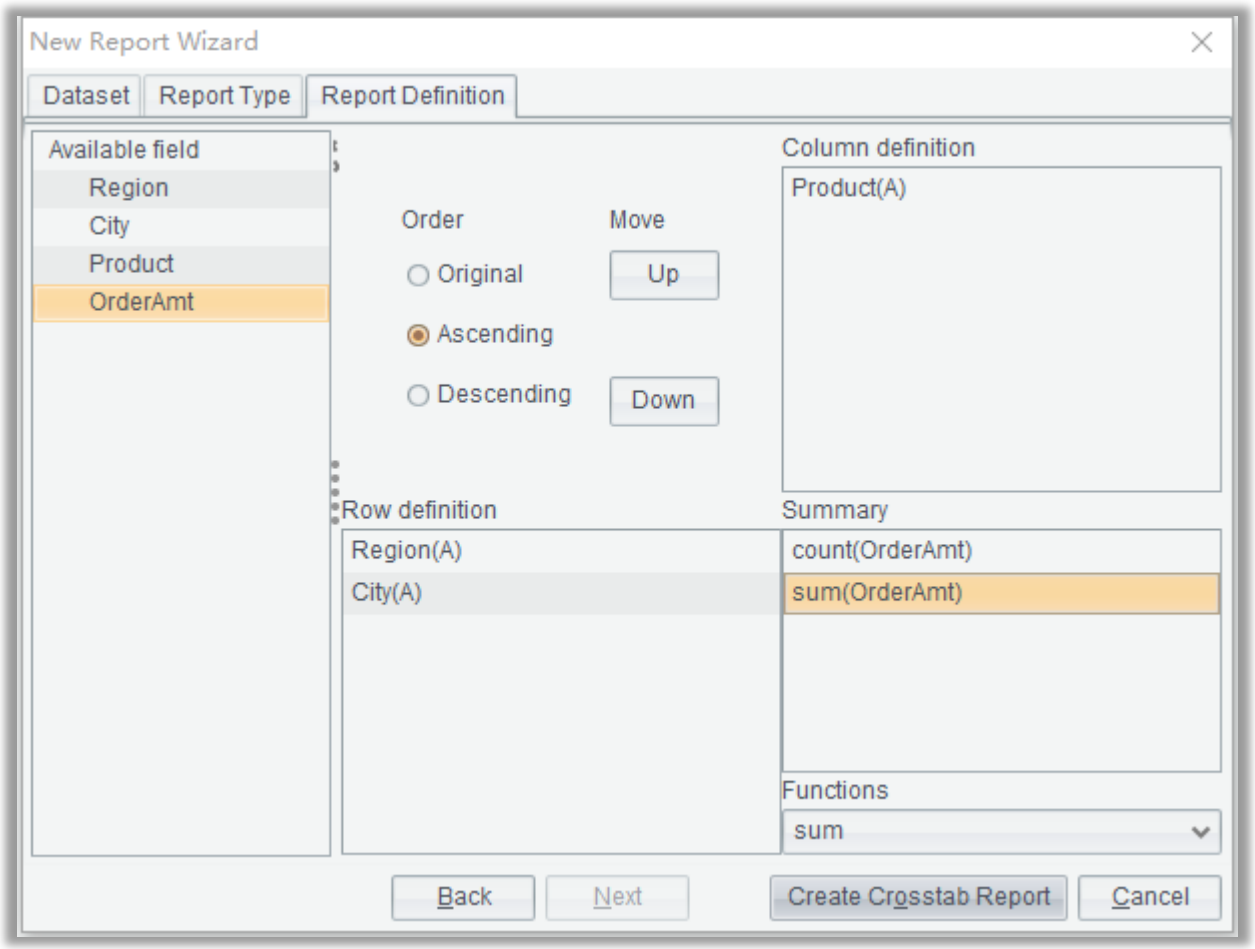
A multilevel crosstab report has multiple levels of grouping under “Row definition” or “Column definition”. Run report designer, select “New Report” under “File”, and click “File dataset” to select desired fields:



1. **Click “Select” to select file data4.1.xlsx**
2. **Select desired columns**
3. **Click “OK”**

4.1 Create crosstab reports through wizard – multilevel crosstab

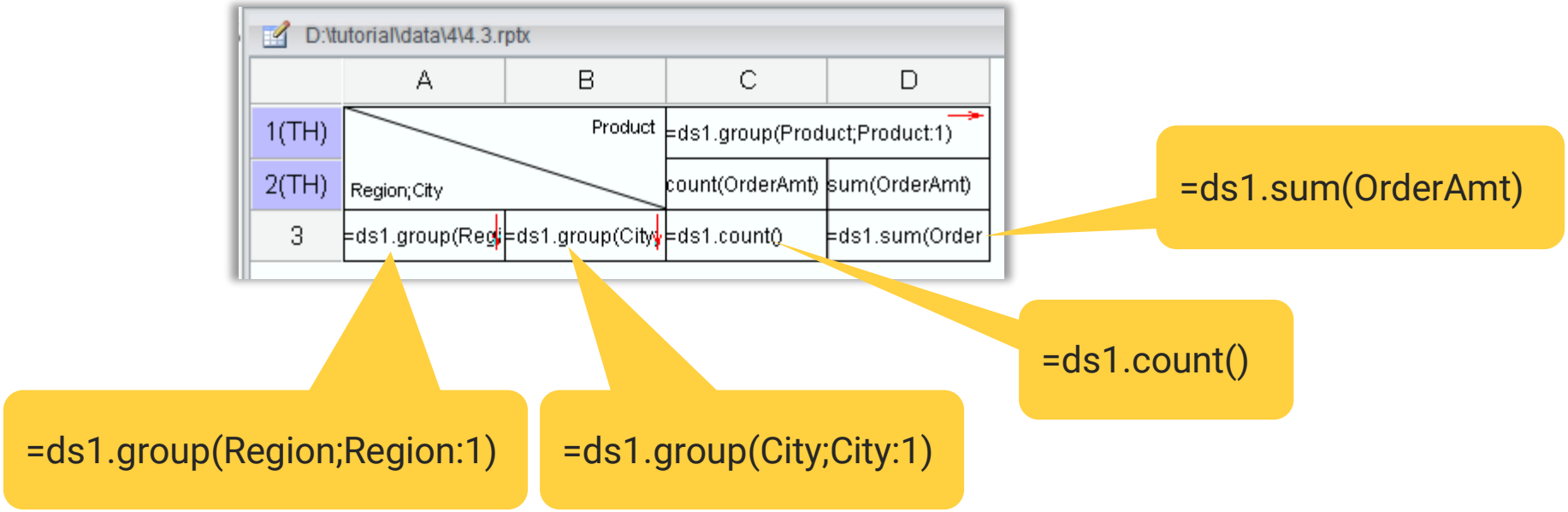
Select “Crosstab Report”, click “Next”, and configure the new report according to the directions on the right:



1. **Drag Region to “Row definition”**
2. **Drag City to “Row definition”**
3. **Drag Product to “Column definition”**
4. **Drag OrderAmt to “Summary”**
5. **Change aggregate function to COUNT**
6. **Drag OrderAmt to “Summary” again and use the default SUM**
7. **Click “Create Crosstab Report”**

4.1 Create crosstab reports through wizard – multilevel crosstab

Now a crosstab report (as shown below) is created through the wizard. Set center align for all cells, set display format of C3 as #.00, and save the report as 4.3.rptx.



4.1 Create crosstab reports through wizard – multilevel crosstab

Click “Preview” and we get this:

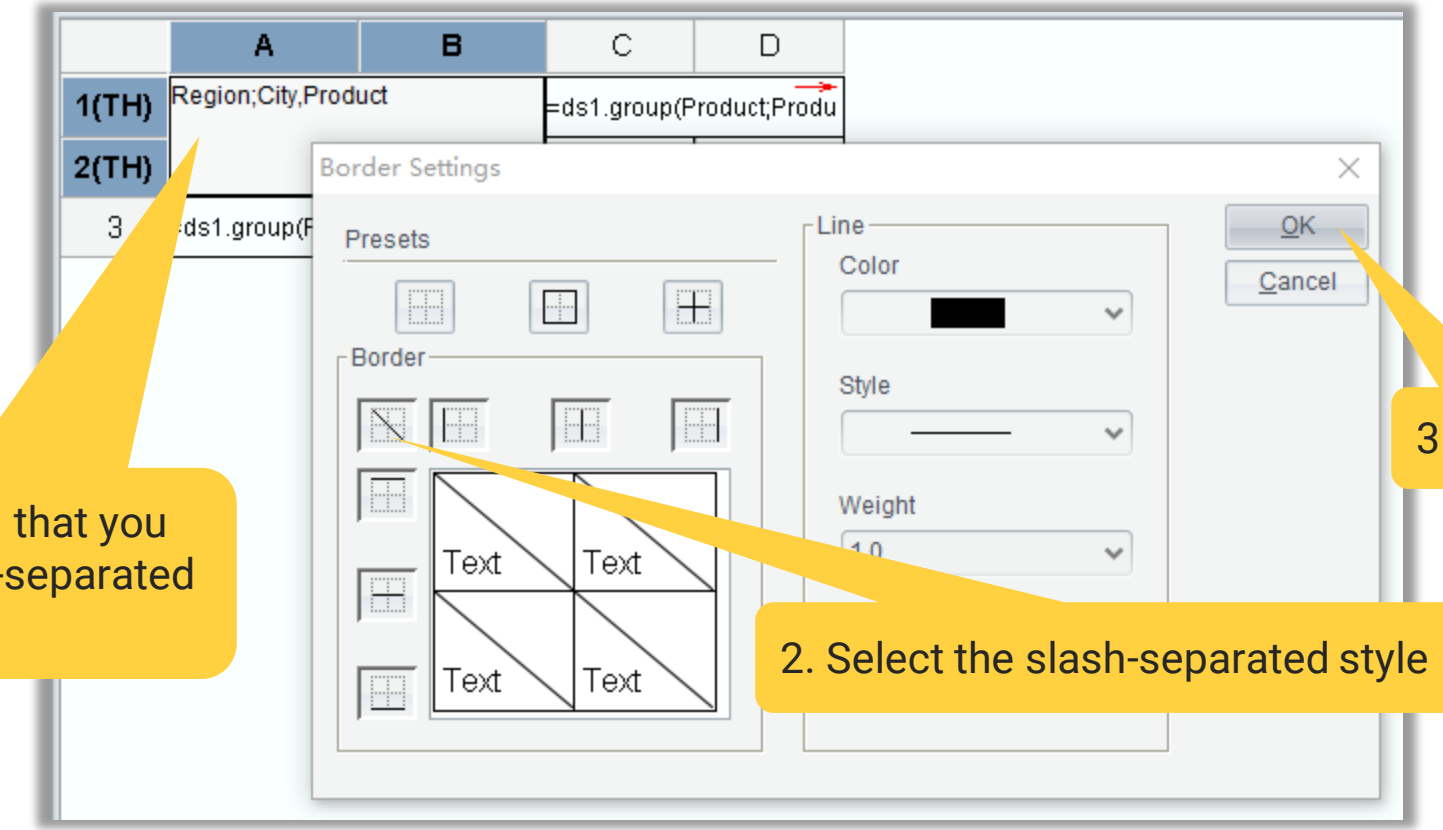
Region;City		Apple		Banana		Pear	
Product		count(OrderA	sum(OrderA	count(OrderA	sum(OrderA	count(OrderA	sum(OrderA
N	Beijing	10	2227.93	8	2049.68	8	1432.25
	Shijiazhuang	9	1595.69	7	1246.39	5	1246.26
	Tianjin	9	1531.12	8	1436.14	9	1634.97
NE	Changchun	13	2771.91	4	663.41	10	1992.59
	Dalian	13	2376.10	10	1721.67	10	2147.70
	Shenyang	6	1148.85	7	1263.83	7	1478.74
NW	Lanzhou	9	2026.33	11	2229.90	5	789.28
	Xining	3	621.34	11	2425.09	11	2242.21
	Yinchuan	17	3566.50	6	1002.36	10	2738.67
S	Guangzhou	10	1969.51	4	857.02	10	1572.92
	Shenzhen	5	964.31	9	1544.93	10	1814.28
	Xiamen	5	1130.02	10	1853.46	10	1993.74
SW	Chengdu	10	1944.38	13	1987.25	11	2089.25
	Guiyang	14	3081.82	9	1605.42	8	1385.13
	Kunming	10	2030.72	11	2076.12	5	1061.61

4.2

Common crosstab reports

4.2 Common crosstab reports – slash-separated cell

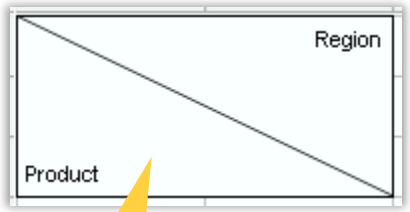
In some crosstab reports, we need to enter both row definition and column definition in one cell (usually at the upper-left corner) where the two definitions intersect, and separate them with a slash. Let’s look at how to create a slash-separated cell.



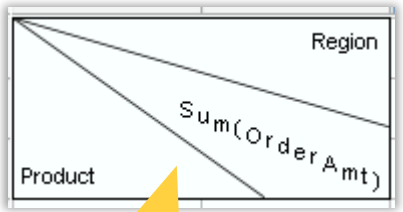
4.2 Common crosstab reports – slash-separated cell

The value of a slash-separated cell includes row description, column description and/or summary description

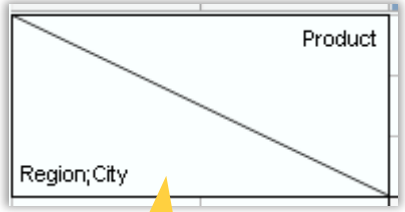
The comma is used to separate them, where summary description can be absent



Cell value:
Product,Region



Cell value:
Product,Region,Sum(OrderAmt)



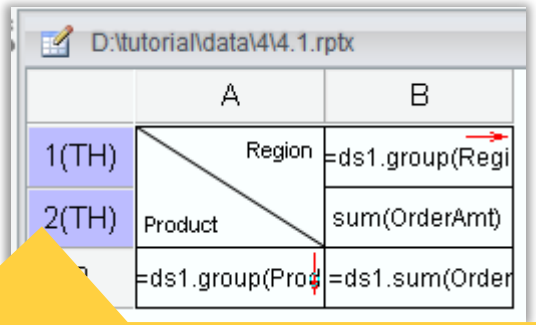
Cell value:
Region;City,Product

4.2 Common crosstab reports – slash-separated cell

When there is only one aggregate value, usually we put the summary description in the slash-separated cell on the upper-left corner, as the following figure shows. Now open 4.1.rptx and save it as 4.4.rptx.

Region / Sum(OrderAmt) / Product	N	NE	NW	S	SW
Apple	5354.74	6296.86	6214.17	4063.84	7056.92
Banana	4732.21	3648.91	5657.35	4255.41	5668.79
Pear	4313.48	5619.03	5770.16	5380.94	4535.99

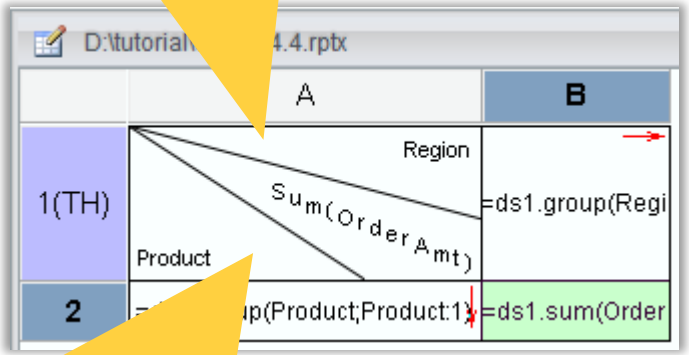
4.1.rptx



Right-click the header cell and select “Delete row” to delete the row

Save as 4.4.rptx

Modify cell value as: Product,Region,Sum(OrderAmt)



Adjust height of the first row and width of the first column to suitable size

4.2 Common crosstab reports –Multilevel crosstab reports with summarization

The right figure is a multilevel crosstab report where there is subtotal on upper levels

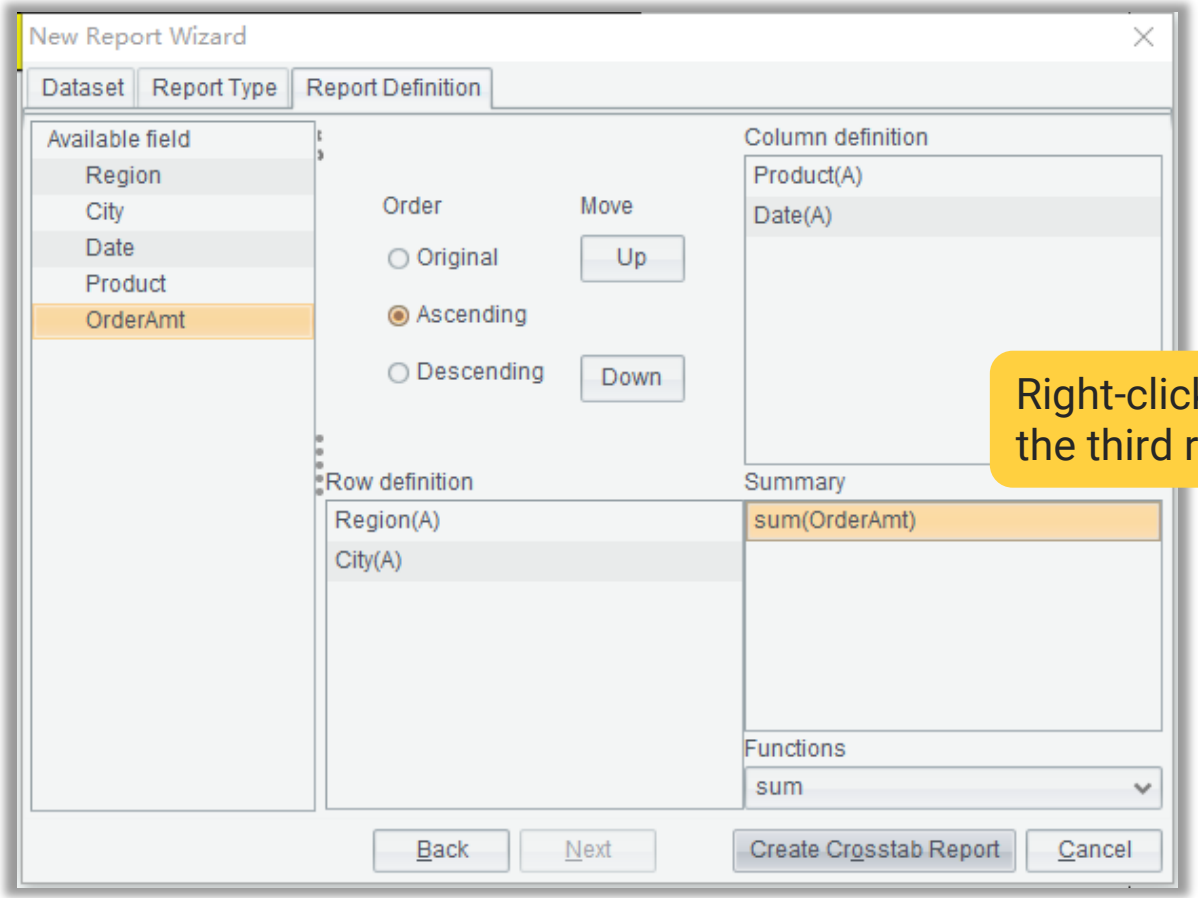
Region;City \ Product;Year — Sum(OrderAmt)		Apple				Banana				Pear				Total
		2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	
N	Beijing	385.51	1783.87	58.55	2227.93	0.00	2049.68	0.00	2049.68	176.87	678.25	577.13	1432.25	5709.86
	Shijiazhuang	581.09	943.54	71.06	1595.69	519.39	621.09	105.91	1246.39	0.00	1019.19	227.07	1246.26	4088.34
	Tianjin	417.82	914.77	198.53	1531.12	183.51	1252.63	0.00	1436.14	0.00	992.93	642.04	1634.97	4602.23
	Subtotal	1384.42	3642.18	328.14	5354.74	702.90	3923.40	105.91	4732.21	176.87	2690.37	1446.24	4313.48	14400.43
NE	Changchun	1079.08	1366.23	326.60	2771.91	174.60	488.81	0.00	663.41	596.57	1130.20	265.82	1992.59	5427.91
	Dalian	457.98	1358.01	560.11	2376.10	642.03	791.12	288.52	1721.67	174.07	1973.63	0.00	2147.70	6245.47
	Shenyang	469.36	504.87	174.62	1148.85	486.44	568.64	208.75	1263.83	368.33	955.69	154.72	1478.74	3891.42
	Subtotal	2006.42	3229.11	1061.33	6296.86	1303.07	1848.57	497.27	3648.91	1138.97	4059.52	420.54	5619.03	15564.80
NW	Lanzhou	213.45	1592.62	220.26	2026.33	592.32	1637.58	0.00	2229.90	99.73	689.55	0.00	789.28	5045.51
	Xining	0.00	621.34	0.00	621.34	153.36	1882.07	389.66	2425.09	649.91	1592.30	0.00	2242.21	5288.64
	Yinchuan	547.02	2323.09	696.39	3566.50	0.00	777.38	224.98	1002.36	316.73	2421.94	0.00	2738.67	7307.53
	Subtotal	760.47	4537.05	916.65	6214.17	745.68	4297.03	614.64	5657.35	1066.37	4703.79	0.00	5770.16	17641.68
S	Guangzhou	489.58	1111.86	368.07	1969.51	0.00	98.08	758.94	857.02	263.25	929.80	379.87	1572.92	4399.45
	Shenzhen	0.00	906.74	57.57	964.31	336.87	872.83	335.23	1544.93	497.07	1046.75	270.46	1814.28	4323.52
	Xiamen	739.74	390.28	0.00	1130.02	71.27	1590.39	191.80	1853.46	336.61	966.50	690.63	1993.74	4977.22
	Subtotal	1229.32	2408.88	425.64	4063.84	408.14	2561.30	1285.97	4255.41	1096.93	2943.05	1340.96	5380.94	13700.19
SW	Chengdu	76.03	1319.73	548.62	1944.38	399.65	948.21	639.39	1987.25	282.70	1213.50	593.05	2089.25	6020.88
	Guiyang	735.60	1980.90	365.32	3081.82	688.42	804.14	112.86	1605.42	299.13	1086.00	0.00	1385.13	6072.37
	Kunming	923.92	1106.80	0.00	2030.72	387.20	1556.20	132.72	2076.12	579.94	320.83	160.84	1061.61	5168.45
	Subtotal	1735.55	4407.43	913.94	7056.92	1475.27	3308.55	884.97	5668.79	1161.77	2620.33	753.89	4535.99	17261.70
Total		7116.18	18224.65	3645.70	28986.53	4635.06	15938.85	3388.76	23962.67	4640.91	17017.06	3961.63	25619.60	78568.80

4.2 Common crosstab reports – Multilevel crosstab reports with summarization

Let's look at how to make the crosstab report on the previous page.

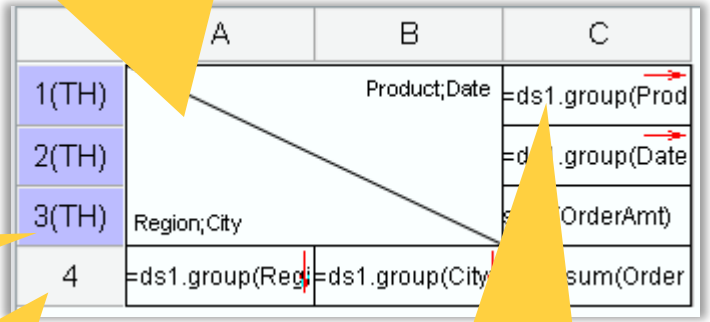
Similar to creating 4.3.rptx using wizard, select Date column and configure the report as the left figure shows.

Now we get a report as the right figure shows:



Modify cell value as:
Region;City,Product;Year,Sum(OrderAmt)

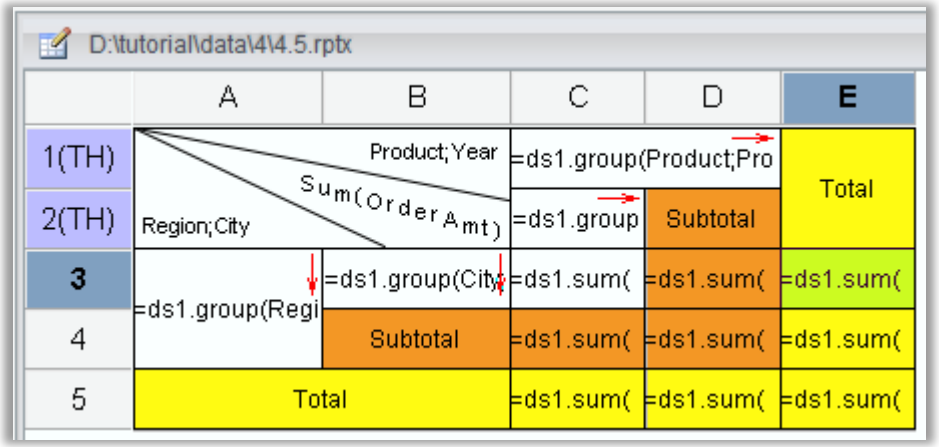
Right-click to delete the third row



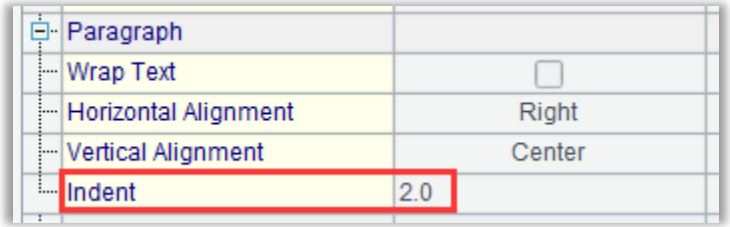
Right-click and select "Add row" twice

Right-click and select "Add column" twice

4.2 Common crosstab reports – Multilevel crosstab reports with summarization



Select C3-E5 and set indent for it



Then proceed according to directions below:

1. Set border style and center align for all cells;
2. Merge C1 and D1, and enter Subtotal in D2;
3. Merge E1 and E2, and enter Total in the merged cell;
4. Merge A3 and A4, and enter Subtotal in B4;
5. Merge A5 and B5, and enter Total in the merged cell;
6. Enter =ds1.sum(OrderAmt) in each cell of C3-C5;
7. Set display format as #0.00 and right align for cells in C3-E5;
8. Set indent as 2mm for cells in C3-E5;
9. Set background color as the figure shows;
10. Define grouping by year in C2 by entering expression=ds1.group(year(Date);Date:1);
11. Save the report as 4.5.rptx.

4.2 Common crosstab reports – Table header & footer

Based on report 4.5.rptx, add title in both table header and table footer, as shown in the right figure:

Product sales crosstab

Unit: 10,000$ Date: 2022-10-11

Region;City		Apple				Banana				Pear				Total
Product;Year / Sum(Amount)		2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	
N	Beijing	385.51	1783.87	58.55	2227.93	0.00	2049.68	0.00	2049.68	176.87	678.25	577.13	1432.25	5709.86
	Shijiazhuang	581.09	943.54	71.06	1595.69	519.39	621.09	105.91	1246.39	0.00	1019.19	227.07	1246.26	4088.34
	Tianjin	417.82	914.77	198.53	1531.12	183.51	1252.63	0.00	1436.14	0.00	992.93	642.04	1634.97	4602.23
	Subtotal	1384.42	3642.18	328.14	5354.74	702.90	3923.40	105.91	4732.21	176.87	2690.37	1446.24	4313.48	14400.43
NE	Changchun	1079.08	1366.23	326.60	2771.91	174.60	488.81	0.00	663.41	596.57	1130.20	265.82	1992.59	5427.91
	Dalian	457.98	1358.01	560.11	2376.10	642.03	791.12	288.52	1721.67	174.07	1973.63	0.00	2147.70	6245.47
	Shenyang	469.36	504.87	174.62	1148.85	486.44	568.64	208.75	1263.83	368.33	955.69	154.72	1478.74	3891.42
	Subtotal	2006.42	3229.11	1061.33	6296.86	1303.07	1848.57	497.27	3648.91	1138.97	4059.52	420.54	5619.03	15564.80
NW	Lanzhou	213.45	1592.62	220.26	2026.33	592.32	1637.58	0.00	2229.90	99.73	689.55	0.00	789.28	5045.51
	Xining	0.00	621.34	0.00	621.34	153.36	1882.07	389.66	2425.09	649.91	1592.30	0.00	2242.21	5288.64
	Yinchuan	547.02	2323.09	696.39	3566.50	0.00	777.38	224.98	1002.36	316.73	2421.94	0.00	2738.67	7307.53
	Subtotal	760.47	4537.05	916.65	6214.17	745.68	4297.03	614.64	5657.35	1066.37	4703.79	0.00	5770.16	17641.68
S	Guangzhou	489.58	1111.86	368.07	1969.51	0.00	98.08	758.94	857.02	263.25	929.80	379.87	1572.92	4399.45
	Shenzhen	0.00	906.74	57.57	964.31	336.87	872.83	335.23	1544.93	497.07	1046.75	270.46	1814.28	4323.52
	Xiamen	739.74	390.28	0.00	1130.02	71.27	1590.39	191.80	1853.46	336.61	966.50	690.63	1993.74	4977.22
	Subtotal	1229.32	2408.88	425.64	4063.84	408.14	2561.30	1285.97	4255.41	1096.93	2943.05	1340.96	5380.94	13700.19
SW	Chengdu	76.03	1319.73	548.62	1944.38	399.65	948.21	639.39	1987.25	282.70	1213.50	593.05	2089.25	6020.88
	Guiyang	735.60	1980.90	365.32	3081.82	688.42	804.14	112.86	1605.42	299.13	1086.00	0.00	1385.13	6072.37
	Kunming	923.92	1106.80	0.00	2030.72	387.20	1556.20	132.72	2076.12	579.94	320.83	160.84	1061.61	5168.45
	Subtotal	1735.55	4407.43	913.94	7056.92	1475.27	3308.55	884.97	5668.79	1161.77	2620.33	753.89	4535.99	17261.70
Total		7116.18	18224.65	3645.70	28986.53	4635.06	15938.85	3388.76	23962.67	4640.91	17017.06	3961.63	25619.60	78568.80

Prepared by: Joancy

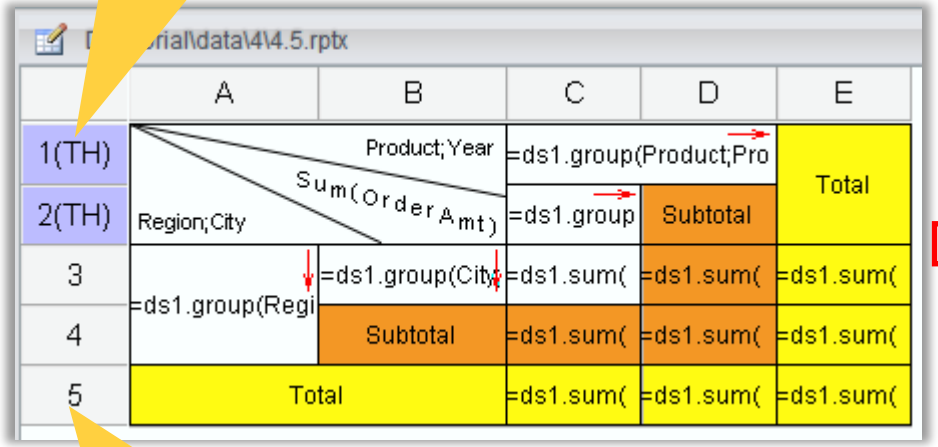
4.2 Common crosstab reports – Table header & footer

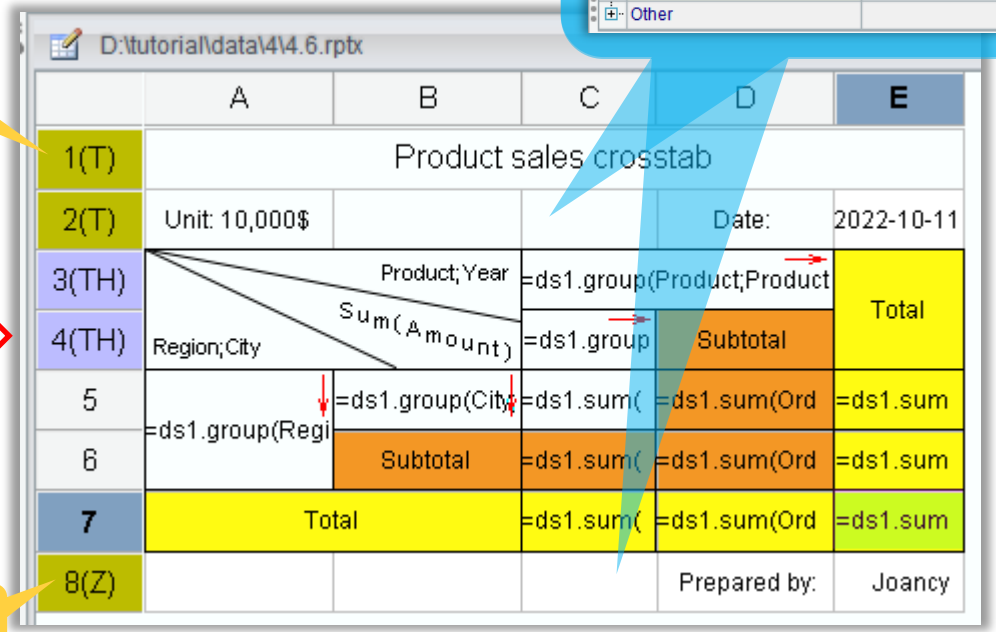
Let's look at how to make the crosstab report on the previous page. Open report 4.5.rptx, and save it as 4.6.rptx.

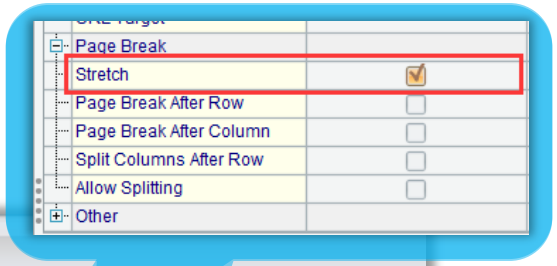
Right-click and select "Insert row" twice

Set the first two rows as header title

Set C2 and C8: Stretch at page break







Right-click and select "Add row"

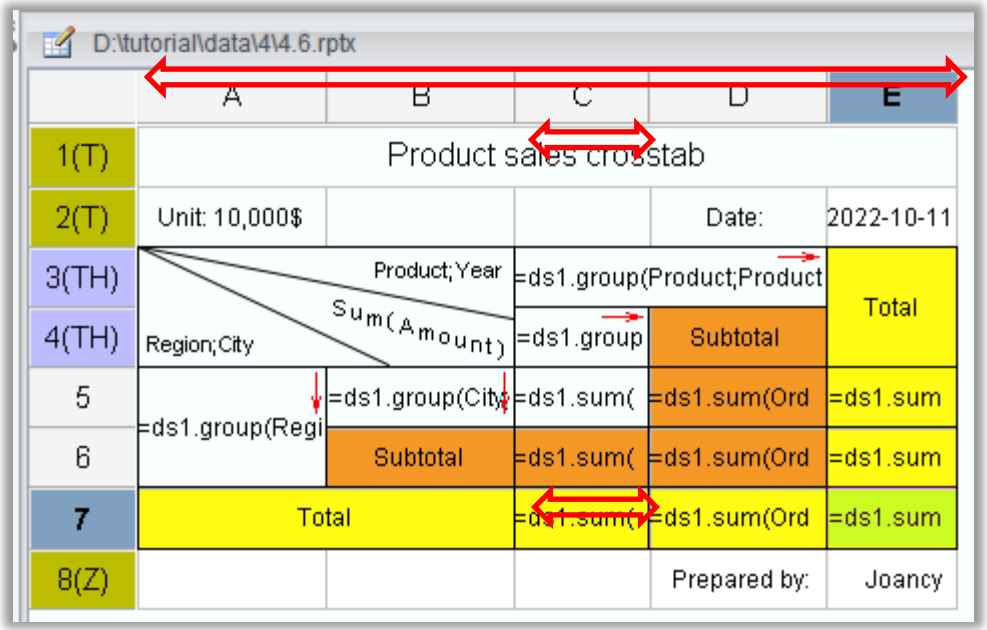
Set the last row as footer title

Configure cells of the other newly-added rows as the figure shows

4.2 Common crosstab reports – Table header & footer

Tips: The rule of specified cell stretch

A report grows wider as it expands horizontally. In order to obtain a neat effect, the header title, footer title, header and footer need to follow to stretch in the same direction, too. The rule is this: In each row only one cell will stretch wider while the other cells maintain the original sizes and positions; search a row from left to right and once a cell for which "Page break - Stretch" is checked is found, it is the current row's stretching cell. If such a cell isn't found, stretch the rightmost cell in this row.



In report 4.6.rptx:

In the 1st row, no cells are specified as "Stretch at page break", so A1 is the stretching cell.

In the 2nd row, "Stretch" under "Page break" is checked for C2, so C2 is the stretching cell.

Similarly, C8 in the 8th row is the stretching cell.

4.3

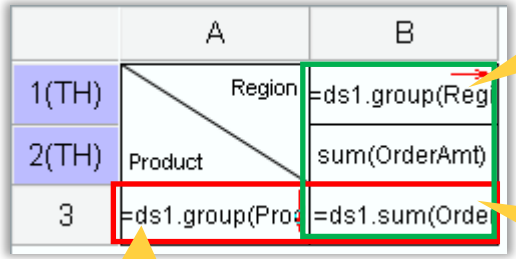
Structure of a crosstab report & master cell

4.3 Structure of a crosstab report & master cell

A crosstab report consists of at least one horizontally expanding area and at least one vertically expanding area. This means that it has at least one left master cell and one top master cell. A complex multilevel crosstab report probably has multiple horizontally expanding areas and multiple vertically expanding areas.

The default rule and configurations for a crosstab report's left master cell are same as those for a grouped report.

4.1.rptx



The green area, whose master cell is B1, is horizontally expanding

B3 is at the intersection of the two areas, and follows both to expand and copy

The red area, whose master cell is A3, is vertically expanding

Default rule for the top master cell:

Starting from the vertically previous cell and searching upwards, the first horizontally expanding cell is the current cell's default top master cell ; if a cell for which top master cell is already specified is found during the search, this specified top master cell is the default for the current cell; if no such a cell is found when the search reaches the uppermost, report master cell (at the top-left corner) becomes the current cell's default top master cell.

In the left figure, B3's default left master cell is A3, and B2 and B3's default top master cell is B1

4.3 Structure of a crosstab report & master cell

4.1.rptx

D:\tutorial\data\4\4.1.rptx

	A	B
1(TH)	Region	=ds1.group(Regi
2(TH)	Product	sum(OrderAmt)
3	=ds1.group(Pro	=ds1.sum(Order

Horizontally expand starting from B1

	A	B	C	D	E	F
1(TH)	Region	N	NE	NW	S	SW
2(TH)	Product	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)
3	=ds1.group(Pro	=ds1.sum(Order	=ds1.sum(Order	=ds1.sum(Order	=ds1.sum(Order	=ds1.sum(Orde

Copy and expand to 5 green areas according to the 5 regions

Vertically expand starting from A3

Region / Product	N	NE	NW	S	SW
	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)	sum(OrderAmt)
Apple	5354.74	6296.86	6214.17	4063.84	7056.92
Banana	4732.21	3648.91	5657.35	4255.41	5668.79
Pear	4313.48	5619.03	5770.16	5380.94	4535.99

Copy and expand to 3 red areas according to the 3 products

4.3 Structure of a crosstab report & master cell

Below is structure of report 4.2.rptx :

D:\tutorial\data\4\4.2.rptx

	A	B	C	D
1(TH)	Product	=ds1.group(Product;Product:1)		
2(TH)	Region	count(Order	max(OrderA	sum(OrderA
3	=ds1.group(Reg	=ds1.count()	=ds1.max(O	=ds1.sum(O

The green area, whose master cell is B1, is horizontally expanding; default top master cell of the other cells in this area is also B1

Tips: When a cell's default top master cell is master cell of the horizontally expanding area, there is no need to specify its top master cell

The red area, whose master cell is A3, is vertically expanding

Copy and expand to 3 green areas according to the 3 products

Copy and expand to 5 red areas according to the 5 regions

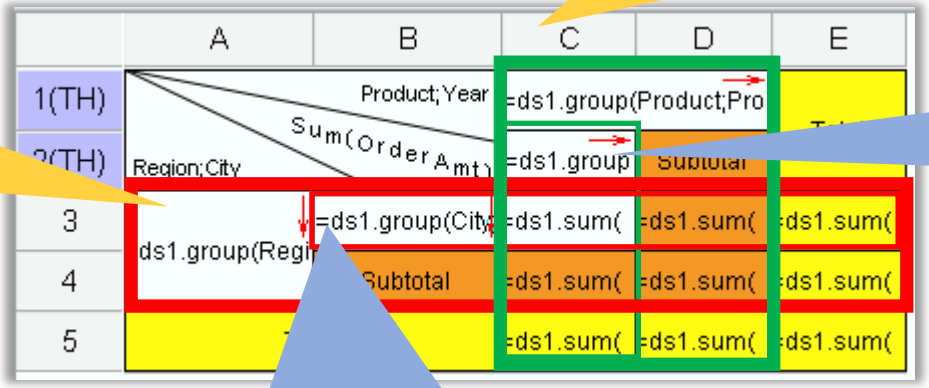
Product / Region	Apple			Banana			Pear		
	count(Order	max(OrderA	sum(OrderA	count(Order	max(OrderA	sum(OrderA	count(Order	max(OrderA	sum(OrderA
N	28	329.56	5354.74	23	347.55	4732.21	22	339.80	4313.48
NE	32	334.63	6296.86	21	313.64	3648.91	27	341.37	5619.03
NW	29	336.48	6214.17	28	349.87	5657.35	26	344.84	5770.16
S	20	346.74	4063.84	23	335.23	4255.41	30	346.06	5380.94
SW	34	338.59	7056.92	33	344.34	5668.79	24	320.83	4535.99

4.3 Structure of a crosstab report & master cell

Below is structure of report 4.5.rptx :

Cells in the green box with thick border contain horizontally expanding products on level 1; their master cell is C1

Cells in the red box with thick border contain vertically expanding regions on level 1; their master cell is A3



Cells in the green box with thin border contain horizontally expanding years on level 2, their master cell is C2

Cells in the red box with thin border contain vertically expanding cities on level 2, their master cell is B3

4.3 Structure of a crosstab report & master cell

Preview of report 4.5.rptx:

3 years of apple sales data copy and generate 3 thin-green-border areas

3 products copy and generate 3 thick-green-border areas

3 cities of North China copy and generate 3 thin-red-border areas

5 regions copy and generate 5 thick-red-border areas

Region;City \ Product;Year Sum(OrderAmt)		Apple				Banana				Pear				Total
		2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	2016	2017	2018	Subtotal	
N	Beijing	385.51	1783.87	58.55	2227.93	0.00	2049.68	0.00	2049.68	176.87	678.25	577.13	1432.25	5709.86
	Shijiazhuang	581.09	943.54	71.06	1595.69	519.39	621.09	105.91	1246.39	0.00	1019.19	227.07	1246.26	4088.34
	Tianjin	417.82	914.77	198.53	1531.12	183.51	1252.63	0.00	1436.14	0.00	992.93	642.04	1634.97	4602.23
	Subtotal	1384.42	3642.18	328.14	5354.74	702.90	3923.40	105.91	4732.21	176.87	2690.37	1446.24	4313.48	14400.43
NE	Changchun	1079.08	1366.23	326.60	2771.91	174.60	488.81	0.00	663.41	596.57	1130.20	265.82	1992.59	5427.91
	Dalian	457.98	1358.01	560.11	2376.10	642.03	791.12	288.52	1721.67	174.07	1973.63	0.00	2147.70	6245.47
	Shenyang	469.36	504.87	174.62	1148.85	486.44	568.64	208.75	1263.83	368.33	955.69	154.72	1478.74	3891.42
	Subtotal	2006.42	3229.11	1061.33	6296.86	1303.07	1848.57	497.27	3648.91	1138.97	4059.52	420.54	5619.03	15564.80
NW	Lanzhou	213.45	1592.62	220.26	2026.33	592.32	1637.58	0.00	2229.90	99.73	689.55	0.00	789.28	5045.51
	Xining	0.00	621.34	0.00	621.34	153.36	1882.07	389.66	2425.09	649.91	1592.30	0.00	2242.21	5288.64
	Yinchuan	547.02	2323.09	696.39	3566.50	0.00	777.38	224.98	1002.36	316.73	2421.94	0.00	2738.67	7307.53
	Subtotal	760.47	4537.05	916.65	6214.17	745.68	4297.03	614.64	5657.35	1066.37	4703.79	0.00	5770.16	17641.68
S	Guangzhou	489.58	1111.86	368.07	1969.51	0.00	98.08	758.94	857.02	263.25	929.80	379.87	1572.92	4399.45
	Shenzhen	0.00	906.74	57.57	964.31	336.87	872.83	335.23	1544.93	497.07	1046.75	270.46	1814.28	4323.52
	Xiamen	739.74	390.28	0.00	1130.02	71.27	1590.39	191.80	1853.46	336.61	966.50	690.63	1993.74	4977.22
	Subtotal	1229.32	2408.88	425.64	4063.84	408.14	2561.30	1285.97	4255.41	1096.93	2943.05	1340.96	5380.94	13700.19
SW	Chengdu	76.03	1319.73	548.62	1944.38	399.65	948.21	639.39	1987.25	282.70	1213.50	593.05	2089.25	6020.88
	Guiyang	735.60	1980.90	365.32	3081.82	688.42	804.14	112.86	1605.42	299.13	1086.00	0.00	1385.13	6072.37
	Kunming	923.92	1106.80	0.00	2030.72	387.20	1556.20	132.72	2076.12	579.94	320.83	160.84	1061.61	5168.45
	Subtotal	1735.55	4407.43	913.94	7056.92	1475.27	3308.55	884.97	5668.79	1161.77	2620.33	753.89	4535.99	17261.70
Total		7116.18	18224.65	3645.70	28986.53	4635.06	15938.85	3388.76	23962.67	4640.91	17017.06	3961.63	25619.60	78568.80

4.4

Computations on a crosstab report

4.4 Computations on crosstab report – Summary range

In a crosstab report, the range of aggregated data varies when the aggregate expression is written on different levels of grouping. The summary range is determined by both left master cell chain and top master cell chain of the cell holding the expression.

D:\tutorial\data\4\4.5.rptx

	A	B	C	D	E
1(TH)	Product;Year / Sum(OrderAmt) / Region;City		=ds1.group(Product;Pro		
2(TH)			=ds1.group	Subtotal	
3	=ds1.group(Regi	=ds1.group(City	=ds1.sum(	=ds1.sum(	=ds1.sum(
4		Subtotal	=ds1.sum(	=ds1.sum(	=ds1.sum(
5	Total		=ds1.sum(	=ds1.sum(	=ds1.sum(

=ds1.sum(OrderAmt)
C3's left master cell chain is A3 and B3, its top master cell chain is C1 and C2. The summary is to sum all order amounts for a certain product in a certain city of a certain region in a certain year.

=ds1.sum(OrderAmt)
D3's left master cell chain is A3 and B3, its top master cell chain is C1. The summary is to sum all order amounts for a certain product in a certain city of a certain region.

=ds1.sum(OrderAmt)
C4's left master cell chain is A3, its top master cell chain is C1 and C2. The summary is to sum all order amounts for a certain product in a certain region in a certain year.

=ds1.sum(OrderAmt)
D4's left master cell chain is A3, its top master cell chain is C1 and C2. The summary is to sum all order amounts for a certain product in a certain region.

Same rule for the other aggregate cells

4.4 Computations on crosstab report – Summary range

Sum apple order amounts in North China's Beijing city in the year 2016

Sum banana order amounts in North China's Tianjin city

Sum order amounts in North East China's Changchun city

Sum banana order amounts in North China

Sum order amounts in North East China

Sum apple order amounts in North East China in the year 2016

Sum apple order amounts in the year 2016

Sum banana order amounts

Sum all order amounts

Product;Year / Sum(Order Amt)		Apple								Pear				Total
		2016	2017	2018						2016	2017	2018	Subtotal	
		385.51	1783.87	58.55	2227.93	0.00	2049.68		2049.68	176.87	678.25			
	Shijiazhuang	581.09	943.54	71.06	1595.69	519.39	621.09	105.[illegible]	1246.39	0.00	1019.19			
	Tianjin	417.82	914.77	198.53	1531.12	183.51	1252.63	0.00	1436.14	0.00	992.93	642.04	[illegible]	802.23
	Subtotal	1384.42	3642.18	328.14	5354.74	702.90	3923.40	105.91	4732.21	176.87	2690.37	1446.24	4313.48	[illegible]0.43
NE	Changchun	1079.08	1366.23	326.60	2771.91	174.60	488.81	[illegible].00	663.41	596.57	1130.20	265.82	1992.59	5427.91
	Dalian	457.98	1358.01	560					1721.67	174.07	1973.63	0.00	2147.70	6245.47
	Shenyang	469.36	504.87	174					1263.83	368.33	955.69	154.72	1478.74	3891.42
	Subtotal	2006.42	3229.11	1061.33	6296.86	1303.07	1848.57	497.27	3648.91	1138.97	4059.52	420.54	5619.03	15564.80
	Lanzhou	213.45	1592.62	220.26	2026.33	592.32	1637.58	0.00	2229.90	99.73	689.55	0.00	789.28	5045.51
	Xining	0.00	621.34	0.00	621.34	153.36	1882.07	389.66	2425.09	649.91	1592.30	0.00	2242.21	5288.64
	Yinchuan	547.02	2323.09	696.39	3566.50	0.00	777.38	224.98	1002.36	316.73	2421.94	0.00	2738.67	7307.53
	Subtotal	760.47	4537.05	916.65	6214.17	745.68	4297.03	614.64	5657.35	1066.37	4703.79	0.00	5770.16	17641.68
S	Guangzhou	489.58	1111.86	368.07	1969.51	0.00	98.08	758.94	857.02	263.25	929.80	379.87	1572.92	4399.45
	Shenzhen	0.00	906.74	57.57	964.31	336.87	872.83	335.23	1544.93	497.07	1046.75	270.46	1814.28	4323.52
	Xiamen	739.74	390.28	0.00	1130.02	71.27	1590.39	191.80	1853.46	336.61	966.50	690.63	1993.74	4977.22
	Subtotal	1229.32	2408.88	425.64	4063.84	408.14	2561.30	1285.97	4255.41	1096.93	2943.05	1340.96	5380.94	13700.19
	Chengdu	76.03	1319.73	548.62	1944.38	399.65	948.21	639.39	1987.25	282.70	1213.50	593.05	2089.25	6020.88
	Guiyang	735.60	1980.[illegible]					[illegible]6	1605.42	299.13	1086.00	0.00	1385.13	6072.37
	Kunming	923.92	1106.[illegible]					[illegible]2	2076.12	579.94	320.83	160.84	1061.61	5168.45
	[illegible]total	1735.55	4407.43	913.94	7056.92	1475.27	3308.55	[illegible].97	5668.79	1161.77	2620.33	753.89	4535.99	17261.70
Total		7116.18	18224.65	3645.70	28986.53	4635.06	15938.85	3388.76	23962.67	4640.91	17017.06	3961.63	25619.60	78568.80

4.4 Computations on crosstab report – Summary range

To calculate a subtotal on an upper level or the total on the whole table, we can also use cell values to perform the aggregation. the summary range is defined in the same way. Now save report 4.5.rptx as 4.7.rptx and modify it as follows:

D:\tutorial\data\4\4.7.rptx

	A	B	C	D	E
1(TH)	Product;Year / Sum(OrderAmt) / Region;City		=ds1.group(Product;Pro		Total
2(TH)			=ds1.group	Subtotal	
3	=ds1.group(Regi	=ds1.group(City	=ds1.sum(	=sum(C3{}	=sum(C3{}
4		Subtotal	=sum(C3{}	=sum(C3{}	=sum(C3{}
5	Total		um(C3{}	=sum(	=sum(C3{}

=sum(C3{})
D3's left master cell chain is A3 and B3, its top master cell chain is C1; the summary is to sum all values under C3 for a certain product in a certain city in a certain region.

=sum(C3{})
E3's left master cell is A3 and B3, its top master cell is report master cell; the summary is to sum all values under C3 in a certain city of a certain region.

=sum(C3{})
E5's left master cell is report master cell, its top master cell is also report master cell; the summary is to sum all values under C3.

=sum(C3{})
C4's left master cell chain is A3, its top master cell chain is C1 and C2; the summary is to sum all values under C3 for a certain product in a certain region in a certain year.

=sum(C3{})
D4's left master cell chain is A3, its top master cell chain is C1; the summary is to sum all values under C3 for a certain product in a certain region.

4.4 Computations on crosstab report – Summary range

When performing computations through cell values, the exported Excel with Formula contains formulas in aggregate cells; computations through dataset do not attach formulas in cells

			Apple				Banana				Pear				Total
			2016	2017	2018	Sub total	2016	2017	2018	Sub total	2016	2017	2018	Sub total	
			385.51	1783.87	58.55	2227.93	0.00	2049.68	0.00	2049.68	176.87	678.25	577.13	1432.25	5709.86
			581.09	943.54	71.06	1595.69	519.39	621.09	105.91	1246.39	0.00	1019.19	227.07	1246.26	4088.34
			417.82	914.77	198.53	1531.12	183.51	1252.63	0.00	1436.14	0.00	992.93	642.04	1634.97	4603.23
6			1384.42	3642.18	328.14	5354.74	702.90	3923.40	105.91	4732.21	176.87	2690.37	1446.24	4313.48	14400.83
7	NE	Changchun	1079.08	1366.23	326.60	2771.91	174.60	488.81	0.00	663.41	596.57	1130.20	265.82	1992.59	5427.91
8		Dalian	457.98	1358.01	560.11	2376.10	642.03	791.12	288.[illegible]	1721.67	174.07	1973.63	0.00	2147.70	6245.47
9		Shenyang	469.36	504.87	174.62	1148.85	486.44	[illegible]	[illegible]3.83	[illegible]	368.33	955.69	154.72	1478.74	3891.42
10		Sub total	2006.42	3229.11	1061.33	6296.86	1303.07	1848.57	497.27	3648.91	1138.97	4059.52	420.54	5619.03	15564.80
11	NW	Lanzhou	1054.81	1317.26	220.26	2026.33	592.32	1637.58	0.00	2229.90	99.73	689.55	0.00	789.28	5045.51
12		Xining	0.00	0.00	0.00	621.34	153.36	1882.07	389.66	2425.09	649.91	1592.30	0.00	2242.21	5288.64
13		Yinchuan	547.02	2323.09	696.39	3566.50	0.00	777.38	224.98	1002.36	316.73	2421.94	0.00	[illegible]	[illegible]
14		Sub total	760.47	4537.05	916.65	6214.17	745.68	4297.03	614.64	5657.35	1066.37	4703.79	0.00	[illegible]	[illegible]
15	S	Guangzhou	489.58	1111.86	368.07	1969.51	0.00	98.08	758.94	857.02	263.25	929.80	379.87	[illegible]	[illegible]
16		Shenzhen	0.00	906.74	57.57	964.31	336.87	872.83	335.23	1544.93	497.07	1046.75	270.46	[illegible]	[illegible]
17		Xiamen	739.74	390.28	0.00	1130.02	71.27	1590.39	191.80	1853.46	336.61	966.50	690.63	1993.74	[illegible].22
18		Sub total	1229.32	2408.88	425.64	4063.84	408.14	2561.30	1285.97	4255.41	1096.93	2943.05	1340.96	5380.94	13700.19
19	WS	Chengdu	1054.81	1317.26	220.26	1944.38	399.65	948.21	639.39	1987.25	282.70	1213.50	593.05	2089.25	6020.88
20		Guiyang	735.60	1980.90	365.32	3081.82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]85.13	6072.37
21		Kunming	923.92	1106.80	0.00	2030.72	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]61.61	5168.45
22		Sub total	1735.55	4407.43	913.94	7056.92	1475.27	[illegible]	[illegible]884.97	5668.79	1161.77	2620.33	753.89	4535.99	17261.70
23	Total		7116.18	18224.65	3645.70	28986.53	4635.06	15938.85	3388.76	23962.67	4640.91	17017.06	3961.63	25619.60	78568.80

=SUM(C8:E8,G8:I8,K8:M8)

=SUM(G7:I7)

=SUM(E7:E9)

=SUM(C15:E15,G15:I15,K15:M15,C16:E16,G16:I16,K16:M16,C17:E17,G17:I17,K17:M17)

=SUM(C15:E17)

=SUM(G3:G5,G7:G9,G11:G13,G15:G17,G19:G21)

4.5

Exercise

4.5 Exercise

Below is part of data in data file practice4.1.xlsx for exercise:

	A	B	C	D	E	F
1	District	School	Grade	Class	Name	Math
2	Xicheng	Yumin primary school	4	1	Name1	82
3	Xicheng	Yumin primary school	4	1	Name2	84
4	Xicheng	Yumin primary school	4	1	Name3	97
5	Xicheng	Yumin primary school	4	1	Name4	68
6	Xicheng	Yumin primary school	4	1	Name5	81
7	Xicheng	Yumin primary school	4	1	Name6	78
8	Xicheng	Yumin primary school	4	1	Name7	73
9	Xicheng	Yumin primary school	4	1	Name8	94
10	Xicheng	Yumin primary school	4	1	Name9	90

Exercise 1. Make a crosstab report through wizard： Use District in row definition and Grade in column definition to calculate average math score for students in every grade.

Exercise 2. Make a crosstab report through wizard ： Use District as row definition and Grade as column definition to calculate average math score, the maximum and minimum score, and count students in each grade.

4.5 Exercise

Exercise 3. Make a crosstab report through wizard： Use District and School as row definition and Grade and Class as column definition to calculate average math score in each class.

Exercise 4. Modify report in Exercise 3 according to the format of 4.6.rptx： Move summary title to the slash-separated cell, add header title, summary date, and add report description and the person who makes the report on footer title.

Chapter 5

Multizone association

Chapter 5 Multizone association

5.1 From crosstab to zones

5.2 Coexistence of expanding and static areas

5.3 Equality of row and column

5.4 Make a master-sub table through multizone association

5.5 Exercise

Chapter 5 Multizone association

5.1

From crosstab to zones

5.1 From crosstab to zones

Below is a common crosstab report:

Dimension		Item	Sales Stats						TrialCount		WebTFC
			Esproc			Report			Esproc	Report	
			OrderCount	OrderAmt	ReceivedPmt	OrderCount	OrderAmt	ReceivedPmt			
Domestic	2019	**Total**	**3197**	**¥96,936,00**	**¥96,450,00**	**3131**	**¥87,064,00**	**¥74,820,00**	**21266**	**21711**	**116929**
		Q1	329	¥10,648,00	¥9,820,000	308	¥7,360,000	¥5,170,000	5446	5384	24383
		Q2	677	¥18,672,00	¥18,150,00	531	¥17,216,00	¥15,100,00	5407	5112	33186
		Q3	757	¥25,944,00	¥24,770,00	794	¥24,664,00	¥20,850,00	5330	5015	23193
		Q4	1434	¥41,672,00	¥43,710,00	1498	¥37,824,00	¥33,700,00	5083	6200	36167
	2020	**Total**	**4493**	**¥119,600,0**	**¥111,680,0**	**4130**	**¥116,150,0**	**¥106,630,0**	**23746**	**20881**	**141675**
		Q1	418	¥10,860,00	¥9,410,000	339	¥11,320,00	¥10,490,00	6189	5943	25139
		Q2	902	¥23,840,00	¥22,450,00	791	¥21,290,00	¥20,480,00	6576	4544	40336
		Q3	1191	¥33,700,00	¥30,880,00	1090	¥34,260,00	¥30,700,00	4769	4982	42268
		Q4	1982	¥51,200,00	¥48,940,00	1910	¥49,280,00	¥44,960,00	6212	5412	33933
	Total		**7690**	**¥216,536,0**	**¥208,130,0**	**7261**	**¥203,214,0**	**¥181,450,0**	**45012**	**42592**	**258604**
	Among Beijing		**1552**	**¥36,180,00**	**¥53,140,00**	**1314**	**¥34,980,00**	**¥40,300,00**	**8183**	**7101**	**47452**
	E		1183	¥30,514,00	¥24,530,00	783	¥28,578,00	¥22,840,00	7292	7647	58112
	N		3402	¥94,016,00	¥106,760,0	3515	¥88,196,00	¥83,710,00	14736	14437	86291
	S		1799	¥50,794,00	¥43,430,00	1836	¥49,598,00	¥42,510,00	16060	14458	74226
	SW		1306	¥41,212,00	¥33,410,00	1127	¥36,842,00	¥32,390,00	6924	6050	39975
Overseas	**Total**		**9434**	**$27,636,800**	**$24,092,000**	**9350**	**$26,470,400**	**$23,758,000**	**36076**	**35332**	**209832**
	Among USA		**962**	**$3,311,200**	**$3,001,000**	**1080**	**$3,614,400**	**$3,219,000**	**8635**	**7268**	**44682**
	Asia		3316	$9,247,800	$7,781,000	3164	$8,651,200	$7,891,000	10198	10852	61460
	Europe		3272	$9,087,400	$8,070,000	2989	$8,505,200	$7,489,000	10717	10469	63923
	North America		1833	$6,369,800	$5,652,000	2255	$6,539,400	$6,078,000	11738	10350	64913
	Oceania		1013	$2,931,800	$2,589,000	942	$2,774,600	$2,300,000	3423	3661	19536

More aggregate data

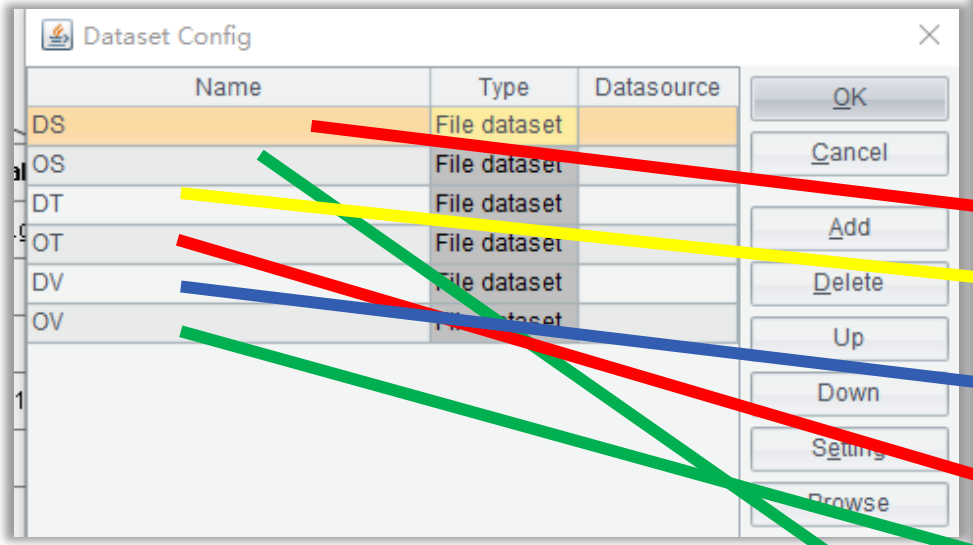
Data coming from different tables is associated according to same aggregation dimension

Want to view data summarized by region

And overseas sales data

5.1 Workflow – defining datasets

Define multiple datasets according to report summarization requirements



Dimension		Item	Sales Stats						TrialCount		WebTFC
			Esproc			Report			Esproc	Report	
			OrderCount	OrderAmt	ReceivedPmt	OrderCount	OrderAmt	ReceivedPmt			
	2019	**Total**	**3197**	**¥96,936,00**	**¥96,450,00**	**3131**	**¥87,064,00**	**¥74,820,00**	**21266**	**21711**	**116929**
		Q1	329	¥10,648,00	¥9,820,000	308	¥7,360,000	¥5,170,000	5446	5384	24383
		Q2	677	¥18,672,00	¥18,150,00	531	¥17,216,00	¥15,100,00	5407	5112	33186
		Q3	757	¥25,944,00	¥24,770,00	794	¥24,664,00	¥20,850,00	5330	5015	23193
		[illegible]	1434	¥41,672,00	¥43,710,00	1498	¥37,824,00	¥33,700,00	5083	6200	36167
	2020	**Total**	**4493**	**¥119,600,0**	**¥111,680,0**	**4130**	**¥116,150,0**	**¥106,630,0**	**23746**	**20881**	**141675**
		Q1	418	[illegible]	¥9,410,000	339	¥11,320,00	¥10,490,00	6189	5943	25138
		Q2	902	¥23,840,00	¥22,450,00	791	[illegible]	[illegible]	6576	4544	40336
		[illegible]	1191	¥33,700,00	¥30,880,00	1090	¥34,260,00	¥30,700,00	4769	4982	42268
		Q4	1982	¥51,200,00	[illegible]	1910	¥49,280,00	¥44,960,00	6212	5412	33933
	Total		**7690**	**¥216,536,0**	**¥208,130,0**	**7261**	**¥203,214,0**	[illegible]	**45012**	**42592**	**258604**
	Among Beijing		**1552**	**¥36,180,00**	**¥53,140,00**	**1314**	**¥34,960,00**	**¥40,300,00**	**8183**	**7101**	**47452**
	E		[illegible]	¥30,514,00	¥24,530,00	783	¥28,578,00	¥22,840,00	7292	7647	58112
	N		3402	[illegible]	¥106,760,0	3515	¥88,196,00	¥83,710,00	14736	14437	86291
	S		[illegible]	¥50,794,00	¥43,430,00	1836	¥49,598,00	¥42,510,00	16060	14458	74226
	SW		1306	¥41,212,00	[illegible]	1127	[illegible]	¥32,390,00	6924	6050	39975
Overseas	**Total**		**9434**	**$27,636,800**	**$24,092,000**	[illegible]	**$26,470,400**	[illegible]	**36076**	**35332**	**209832**
	Among USA		**962**	**$3,311,200**	**$3,001,000**	**1080**	[illegible]	**$3,219,000**	[illegible]	**7268**	**44682**
	Asia		3316	$9,247,800	$7,781,000	3164	$8,651,200	$7,891,000	10198	10852	61460
	Europe		3272	$9,087,400	$8,070,000	2989	$8,505,200	$7,489,000	10717	10469	63923
	North America		1833	$6,369,800	$5,652,000	2255	$6,539,400	$6,078,000	11738	10350	[illegible]
	Oceania		1013	$2,931,800	$2,589,000	942	$2,774,600	$2,300,000	3423	3661	19536

Each dataset corresponds to one data zone

5.1 Workflow —— Defining expression zone by zone

Step 1: define aggregation on domestic sales data

Horizontal expansion

Vertical expansion

	A(CH)	B(CH)	C(CH)	D	E	F
1(TH)	Dimension		Item	Sales Stats		
2(TH)				= DS.group(Product:1)		
3(TH)				OrderCount	OrderAmt	ReceivedPmt
4	Domestic	= DS.gro	Total	=sum(D5{})	=sum(E5{})	=sum(F5{})
5			= DS.gr	= DS.sum(Or	= DS.sum(O	= DS.sum(R
6		Total		=sum(D8{})	=sum(E8{})	=sum(F8{})
7		Among Beijing		= DS.sum(Or	= DS.sum(Or	= DS.sum(R
8		= DS.group(Regi		= DS.sum(Or	= DS.sum(Or	= DS.sum(R

Group and expand by aggregation dimension

These cells and their left/top master cell belong to same dataset, so no filter condition is needed and the default summary range is data under the current dimension

5.1 Workflow —— Defining expression zone by zone

Step 2： define aggregation on overseas sales data

	A(CH)	B(CH)	C(CH)	D	E	F
1(TH)	Item			Sales Stats		
2(TH)				= DS.group(Product:1)		
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt
4	Domestic	= DS.gro	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**
5			= DS.gro	= DS.sum(Or	= DS.sum(Or	= DS.sum(R
6		**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**
8		= DS.group(Regio		= DS.sum(Or	= DS.sum(Or	= DS.sum(R
9	Overseas	**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**
10		**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**
11		= OS.group(Contir		= OS.sum(Or	= OS.sum(Or	= OS.sum(R

These cells and their top master cell do not belong to same dataset, so a filter condition is needed to associate with domestic data zone

5.1 Workflow —— Defining expression zone by zone

Step 3： Add calculating sum of trial counts and total amount of web traffic

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)	Item			Sales Stats			TrialCount	WebTFC
2(TH)				= DS.group(Product:1)			= DT.group(Product:1)	
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt		
4	Domestic	= DS.gro	Total	=sum(D5{})	=sum(E5{})	=sum(F5{})	=sum(G5{})	=sum(H5{})
5			= DS.gro	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Year==B5 && Quarter==C5)	= DV.sum(WebTFC,Year==B5 && Quarter==C5)
6		Total		=sum(D8{})	=sum(E8{})	=sum(F8{})	=sum(G8{})	=sum(H8{})
7		Among Beijing		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,City=="Beijing")	= DV.sum(WebTFC,City=="Beijing")
8		= DS.group(Regio		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Region==B8)	= DV.sum(WebTFC,Region==B8)
9	Overseas	Total		=sum(D11{})	=sum(E11{})	=sum(F11{})	=sum(G11{})	=sum(H11{})
10		Among USA		= OS.sum(O	= OS.sum(O	= OS.sum(R	= OT.sum(TrialCount,Country=="USA" && Product==G2)	= OV.sum(WebTFC,Country=="USA")
11		= OS.group(Conti		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(TrialCount,Continent==B11 && Product==G2)	= OV.sum(WebTFC,Continent==B11)

These cells and their left master cell do not belong to same dataset, so a filter condition is needed to perform association

5.2

Coexistence of expanding and static areas

5.2 Coexistence of expanding and static areas

Vertical expansion

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)			Item	Sales Stats			TrialCount	
2(TH)				= DS.group(Product:1)			= DT.group(Prod	WebTFC
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt		
4		= DS.group(Year:1)	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**	**=sum(G5{})**	**=sum(H5{})**
5			= DS.group(Quarter:1)	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(Trial	= DV.sum(Web
6	Domestic	**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**	**=sum(G8{})**	**=sum(H8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**	**= DT.sum(Trial**	**= DV.sum(Web**
8		= DS.group(Region:1)		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(Trial	= DV.sum(Web
9		**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**	**=sum(G11{})**	**=sum(H11{})**
10	Overseas	**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**	**= OT.sum(Trial**	**= OV.sum(Web**
11		= OS.group(Continent:1)		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(Trial	= OV.sum(Web

5.2 Coexistence of expanding and static areas

Horizontal expansion

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)	Item			Sales Stats			TrialCount	
2(TH)				= DS.group(Product:1)			= DT.group(Product:1)	WebTFC
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt		
4	Domestic	= DS.gro	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**	**=sum(G5{})**	**=sum(H5{})**
5			= DS.gro	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Year=	= DV.sum(Web
6		**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**	**=sum(G8{})**	**=sum(H8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**	**= DT.sum(TrialCount,City==**	**= DV.sum(Web**
8		= DS.group(Regio		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Regio	= DV.sum(Web
9	Overseas	**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**	**=sum(G11{})**	**=sum(H11{})**
10		**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**	**= OT.sum(TrialCount,Count**	**= OV.sum(Web**
11		= OS.group(Conti		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(TrialCount,Contin	= OV.sum(Web

5.2 Coexistence of expanding and static areas

Static cells

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)	Dimension		Item	Sales Stats			TrialCount	WebTFC
2(TH)				= DS.group(Product:1)			= DT.group(Product:1)	
3(TH)				OrderCount	OrderAmt	ReceivedPmt		
4	Domestic	= DS.gro	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**	**=sum(G5{})**	**=sum(H5{})**
5			= DS.gro	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Year=	= DV.sum(Web
6		**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**	**=sum(G8{})**	**=sum(H8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**	**= DT.sum(TrialCount,City==**	**= DV.sum(Web**
8		= DS.group(Regio		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Regio	= DV.sum(Web
9	Overseas	**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**	**=sum(G11{})**	**=sum(H11{})**
10		**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**	**= OT.sum(TrialCount,Count**	**= OV.sum(Web**
11		= OS.group(Conti		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(TrialCount,Contin	= OV.sum(Web

5.2 Coexistence of expanding and static areas

Dimension		Item	Sales Stats						TrialCount		WebTFC
			Esproc			Report			Esproc	Report	
			OrderCount	OrderAmt	ReceivedPmt	OrderCount	OrderAmt	ReceivedPmt			
Domestic		**Total**	**3197**	**¥96,936,00**	**¥96,450,00**	**3131**	**¥87,064,00**	**¥74,820,00**	**21266**	**21711**	**116929**
	2019	Q1	329	¥10,648,00	¥9,820,000	308	¥7,360,000	¥5,170,000	5446	5384	24383
		Q2	677	¥18,672,00	¥18,150,00	531	¥17,216,00	¥15,100,00	5407	5112	33186
		Q3	757	¥25,944,00	¥24,770,00	794	¥24,664,00	¥20,850,00	5330	5015	23193
		Q4	1434	¥41,672,00	¥43,710,00	1498	¥37,824,00	¥33,700,00	5083	6200	36167
	2020	**Total**	**4493**	**¥119,600,0**	**¥111,680,0**	**4130**	**¥116,150,0**	**¥106,630,0**	**23746**	**20881**	**141675**
		Q1	418	¥10,860,00	¥9,410,000	339	¥11,320,00	¥10,490,00	6189	5943	25138
		Q2	902	¥23,840,00	¥22,450,00	791	¥21,290,00	¥20,480,00	6576	4544	40336
		Q3	1191	¥33,700,00	¥30,880,00	1090	¥34,260,00	¥30,700,00	4769	4982	42268
		Q4	1982	¥51,200,00	¥48,940,00	1910	¥49,280,00	¥44,960,00	6212	5412	33933
	Total		**7690**	**¥216,536,0**	**¥208,130,0**	**7261**	**¥203,214,0**	**¥181,450,0**	**45012**	**42592**	**258604**
	Among Beijing		**1552**	**¥36,180,00**	**¥53,140,00**	**1314**	**¥34,960,00**	**¥40,300,00**	**8183**	**7101**	**47452**
	E		1183	¥30,514,00	¥24,530,00	783	¥28,578,00	¥22,840,00	7292	7647	58112
	N		3402	¥94,016,00	¥106,760,0	3515	¥88,196,00	¥83,710,00	14736	14437	86291
	S		1799	¥50,794,00	¥43,430,00	1836	¥49,598,00	¥42,510,00	16060	14458	74226
	SW		1306	¥41,212,00	¥33,410,00	1127	¥36,842,00	¥32,390,00	6924	6050	39975
Overseas	**Total**		**9434**	**$27,636,800**	**$24,092,000**	**9350**	**$26,470,400**	**$23,758,000**	**36076**	**35332**	**209832**
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	Asia		3316	$9,247,800	$7,781,000	3164	$8,651,200	$7,891,000	10198	10852	61460
	Europe		3272	$9,087,400	$8,070,000	2989	$8,505,200	$7,489,000	10717	10469	63923
	North America		1833	$6,369,800	$5,652,000	2255	$6,539,400	$6,078,000	11738	10350	64913
	Oceania		1013	$2,931,800	$2,589,000	942	$2,774,600	$2,300,000	3423	3661	19536

Harmonious coexistence of expanding cells and static cells naturally forms a report of expanding and static areas

5.3

Equality of row and column

5.3 Equality of row and column

Vertical expansion

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)	Item			Sales Stats			TrialCount	
2(TH)				= DS.group(Product:1)			= DT.group(Prod	WebTFC
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt		
4		= DS.group(Year:1)	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**	**=sum(G5{})**	**=sum(H5{})**
5			= DS.group(Quarter:1)	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(Trial	= DV.sum(Web
6	Domestic	**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**	**=sum(G8{})**	**=sum(H8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**	**= DT.sum(Trial**	**= DV.sum(Web**
8		= DS.group(Region:1)		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(Trial	= DV.sum(Web
9		**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**	**=sum(G11{})**	**=sum(H11{})**
10	Overseas	**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**	**= OT.sum(Trial**	**= OV.sum(Web**
11		= OS.group(Continent:1)		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(Trial	= OV.sum(Web

5.3 Equality of row and column

Horizontal expansion

	A(CH)	B(CH)	C(CH)	D	E	F	G	H
1(TH)	Item			Sales Stats			TrialCount	
2(TH)				= DS.group(Product:1)			= DT.group(Product:1)	WebTFC
3(TH)	Dimension			OrderCount	OrderAmt	ReceivedPmt		
4	Domestic	= DS.gro	**Total**	**=sum(D5{})**	**=sum(E5{})**	**=sum(F5{})**	**=sum(G5{})**	**=sum(H5{})**
5			= DS.gro	= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Year==B	= DV.sum(Web
6		**Total**		**=sum(D8{})**	**=sum(E8{})**	**=sum(F8{})**	**=sum(G8{})**	**=sum(H8{})**
7		**Among Beijing**		**= DS.sum(Or**	**= DS.sum(Or**	**= DS.sum(R**	**= DT.sum(TrialCount,City==''**	**= DV.sum(Web**
8		= DS.group(Regio		= DS.sum(Or	= DS.sum(Or	= DS.sum(R	= DT.sum(TrialCount,Region=	= DV.sum(Web
9	Overseas	**Total**		**=sum(D11{})**	**=sum(E11{})**	**=sum(F11{})**	**=sum(G11{})**	**=sum(H11{})**
10		**Among USA**		**= OS.sum(O**	**= OS.sum(O**	**= OS.sum(R**	**= OT.sum(TrialCount,Country**	**= OV.sum(Web**
11		= OS.group(Conti		= OS.sum(Or	= OS.sum(Or	= OS.sum(R	= OT.sum(TrialCount,Contine	= OV.sum(Web

Equal ability in horizontal expansion and vertical expansion

5.3 Equality of row and column

Preview report:D:\tutorial\data\5\5.1.rptx

Dimension		Item	Sales Stats						TrialCount	
			Esproc			Report			Esproc	Report
			OrderCount	OrderAmt	ReceivedPmt	OrderCount	OrderAmt	ReceivedPmt		
Domestic		**Total**	**3197**	**¥96,936,00**	**¥96,450,00**	**3131**	**¥87,064,00**	**¥74,820,00**	**21**	**21711**
	2019	Q1	329	¥10,648,00	¥9,820,000	308	¥7,360,000	¥5,170,000		5384
		Q2	677	¥18,672,00	¥18,150,00	531	¥17,216,00	¥15,100,00		5112
		Q3						,00 ¥20,850,(		
		Q4						,00 ¥33,700,(		
	2020							**0,0 ¥106,630,**		
		Q1	418	¥10,860,00	¥9,410,000	339	¥11,320,00	¥10,490,00	6189	5943
		Q2	902	¥23,840,00	¥22,450,00	791	¥21,290,00	¥20,480,00	6576	4544
		Q3	1191	¥33,700,00	¥30,880,00	1090	¥34,260,00	¥30,700,00	4769	4982
		Q4	1982	¥51,200,00	¥48,940,00	1910	¥49,280,00	¥44,960,00	6212	5412
	Total		**7690**	**¥216,536,0**	**¥208,130,0**	**7261**	**¥203,214,0**	**¥181,450,0**	**45012**	**42592**
	Among Beijing		**1552**	**¥36,180,00**	**¥53,140,00**	**1314**	**¥34,960,00**	**¥40,300,00**	**8183**	**7101**
	SW		1306	¥41,212,00	¥33,410,00	1127	¥36,842,00	¥32,390,00	6924	6050
	Total		**9434**	**$27,636,800**	**$24,092,000**	**9350**	**$26,470,400**	**$23,758,000**	**36076**	**35332**
	Among USA		**962**	**$3,311,200**	**$3,001,000**	**1080**	**$3,614,400**	**$3,219,000**	**8635**	**7268**

Frozen row headers enable horizontal scrolling

Frozen column headers enable verticle scrolling

Equal scrolling ability in frozen column headers and frozen row headers

5.3 Features of row - column equality

- Equal expansion ability for rows and columns
- Both row headers and column headers can be frozen during table scrolling
- Both row headers and column headers can be duplicated at page break

5.4

Make a master-sub table through multizone association

5.4 Make a master-sub table through multizone association

Static zone

Vertically expanding zone

Customer Orders

Order ID	10248	Ship Date	Jul 16,2012	Delivery Date	Aug 01,2012
Customer ID	VINET			CneeName	Rose
Carrier	3	Freight:	￥32.38	CneeCity	Washington

ProductID	UnitPrice	Discount	Quantity	TotalAmt
17	￥14.00	0.0	12.0	￥168.00
42	￥9.00	0.0	10.0	￥90.00
72	￥34.00	0.0	5.0	￥170.00

The two data zones come from different tables and associate via OrderID in a one-to-many relationship

5.4 Make a master-sub table through multizone association

Preview report:D:\tutorial\data\5\5.2.rptx

Customer Orders

Order ID	10248	Ship Date	Jul 16,2012	Delivery Date	Aug 01,2012
Customer ID	VINET			CneeName	Rose
Carrier	3	Freight:	￥32.38	CneeCity	Washington

ProductID	UnitPrice	Discount	Quantity	TotalAmt
17	￥14.00	0.0	12.0	￥168.00
42	￥9.00	0.0	10.0	￥90.00
72	￥34.00	0.0	5.0	￥170.00

Customer Orders

Order ID	10249	Ship Date	Jul 10,2012	Delivery Date	Aug 16,2012
Customer ID	TOMSP			CneeName	Alic
Carrier	1	Freight:	￥11.61	CneeCity	Phoenix

ProductID	UnitPrice	Discount	Quantity	TotalAmt
14	￥18.00	0.0	9.0	￥162.00
51	￥42.00	0.0	40.0	￥1680.00

Customer Orders

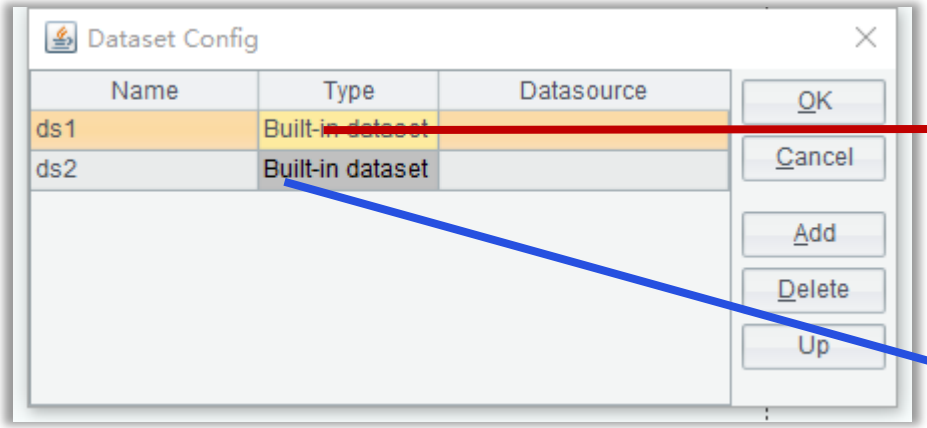
Order ID	10250	Ship Date	Jul 12,2012	Delivery Date	Aug 05,2012
Customer ID	HANAR			CneeName	Alice
Carrier	2	Freight:	￥65.83	CneeCity	SanJose

ProductID	UnitPrice	Discount	Quantity	TotalAmt
41	￥7.00	0.0	10.0	￥70.00
51	￥42.00	0.2	35.0	￥1470.00
65	￥16.00	0.2	15.0	￥240.00

Expand and generate multiple master – sub tables

5.4 Make a master-sub table through multizone association

Step 1： Define data sets



Customer Orders

Order ID	10248	Ship Date	Jul 16,2012	Delivery Date	Aug 01,2012
Customer ID	VINET			CneeName	Rose
Carrier	3	Freight:	￥32.38	CneeCity	Washington

ProductID	UnitPrice	Discount	Quantity	TotalAmt
17	￥14.00	0.0	12.0	￥168.00
42	￥9.00	0.0	10.0	￥90.00
72	￥34.00	0.0	5.0	￥170.00

The two data sets correspond to master table and sub table respectively

5.4 Make a master-sub table through multizone association

Step 2： Define the master table

B2 is master cell and expands vertically

	A	B	C	D	E	F
1		Customer Orders				
2	Order ID	= ds1.select(OrderID:1,,,OrderID)	Ship Date	=ds1.ShipDate	Delivery Date	=ds1.Delivery
4	Customer ID	=ds1.CustID			CneeName	=ds1.CneeName
5	Carrier	=ds1.Carrier	Freight:	=ds1.Freight	CneeCity	=ds1.CneeCity

Set B2 as the left master cell of all the other cells in the red box. Property names are as follows:

Key	Value
Value	
Layout	
Paragraph	
Font	
Expanding	
Expanding Mode	Default
Left MasterCell	B2
Top MasterCell	
Merge same value	None
The mode of merge same va...	Default
Merge null values	None

All the other cells in the red box follow the master cell to expand

5.4 Make a master-sub table through multizone association

Step 3： Define the sub table

	A	B	C	D	E	F
1		Customer Orders				
2	Order ID	= ds1.select(OrderID:1,,,OrderID)	Ship Date	=ds1.ShipDate	Delivery Date	=ds1.DeliveryDat
4	Customer ID	=ds1.CustID			CneeName	=ds1.Cn
5	Carrier	=ds1.Carrier	Freight:	=ds1.Freight	CneeCit	=ds1.CneeCity
7		ProductID	UnitPrice	Discount	Quantity	TotalAmt
8		= ds2.select(ProductID:1,OrderID==B2,,Prod	=ds2.UnitPrice	=ds2.Discount	=ds2.Quantity	=C8*E8
9						

The yellow zone is the sub table definition

Within the yellow sub table zone, set all cells outside the red box as B2's subordinate cells, which follow B2 to expand

The sub table's master cell, which is B2's subordinate cell and expands vertically

The rightmost cell is by default B8's subordinate cell that follows B8 to expand

5.4 The master cell identification rule

The default rule

For a horizontally expanding cell, the horizontally expanding cell directly above it is its default top master cell, and the one directly below it is its default subordinate cell; if there isn't a such a cell above it, its top master cell is by default cell `0.

For a vertically expanding cell, the neighboring, vertically expanding cell to the left is its default left master cell, and the neighboring cell to the right is its default subordinate cell; if there isn't a such a cell on the left, its left master cell is by default cell `0.

The specified master cell identification rule

To conform to the expansion rules, we are allowed to set master cells:

- A left master cell should be vertically expanding and a top master cell should be horizontally expanding, otherwise the setting is invalid.
- A circular setting is not permitted, such as setting A's master cell as B, B's master cell as C and C's master cell as A, and is regarded as an error that makes report computations unable to proceed. Such a setting cannot occur in the environment of default identification, but we must avoid the circular setting under the specified rule.
- A horizontally expanding cell cannot have a left master cell, and a vertically expanding cell cannot have a top master cell.

5.4 The concept and features of zone association

Multiple/diverse sources refer to the case that data in a report comes from multiple or different sources (file or database data). Rather than two or three, there are often seven or eight, even a dozen of, sources.

The multiple/diverse sources lead to multiple zones of data. The existence of data zones require that report making must be directly based on the multiple/diverse sources. Trying to transform the multiple sources into a single source for all zone reports is unfeasible because on many occasions this is impossible and on the other occasions the process is too complicated.

There are **zones** because a report is divided into multiple areas horizontally or vertically or in both directions. Each area expands separately or one expanding area can be the sub of another expanding area, or there is the coexistence of expanding areas and static areas.

Association means three is a correspondence relationship between data of expanding areas, or data of an expanding area and a static area. Computations could happen on data between them.

5.5 Exercise

5.5 Exercise 1

Make a report as shown on the right using practice5.1.xls in the appendix:

Resume

ID: 1 **Name:** Zhang Ying **Birthday:** 1988-12-08

Title: Sale **TitleofHonor:** Lady **Tel:** (010) 65559857

Country: China **Region:** North China **City:** Beijing

Note: Zhang Ying - Bachelor's degree in Psychology at Peking University while being a member of International Academy of Gastronomy with her "The Art of Cold Dishes".

ID	Education	School	From	To
1	Primary	Shangdi Primary school	1994-09-01	2000-09-01
1	Junior	Shangdi Junior school	2000-09-01	2006-07-01
1	Undergraduate	Beijing University	2006-09-01	2010-07-01

Resume

ID: 2 **Name:** Wang Wei **Birthday:** 1972-02-19

Title: CEO **TitleofHonor:** Doctor **Tel:** (010) 65559482

Country: China **Region:** North China **City:** Beijing

Note: Wang Wei - Bachelor of Business and PhD in International Marketing at Nanjing University; speak French and Italian fluently, and can read German; joined company as a sales rep. and promoted to sales manager and then VP of sales; now a member of Sales Manager Round Table, Beijing Chamber of Commerce and Pan-Pacific Trade Association.

ID	Education	School	From	To
2	Junior	Shangdi Junior school	1984-09-01	1987-07-01
2	Senior	Affiliated high school of Tsinghua university	1987-09-01	1990-07-01
2	Undergraduate	Nanjing University	1990-09-01	1995-07-01
2	Doctor	Nanjing University	1995-09-01	2000-07-01

5.5 Exercise 2

Make a report as shown below using practice5.2.xls in the appendix:

Item / Total		China							USA							Zhong tong
		NE	NW	S	SE	SW	W	T_OrderAmt	NE	NW	S	SE	SW	W	T_OrderAmt	
Zhang Ying		￥868.3	￥0	￥1323.3	￥6781.7	￥2048.5	￥8335.4	￥19357.34	$881.17	$0	$2470.26	$3549.47	$2239.56	$8988.72	$18129.17	￥2218.67
Wang Wei		￥257.6	￥0	￥2080.1	￥3535.8	￥588.99	￥5664.0	￥12126.67	$943.81	$0	$2634.68	$1844.18	$1883.07	$8395.79	$15701.53	￥2281.09
Li Fang		￥822.6	￥0	￥1663.2	￥5081.1	￥2098.6	￥8896.8	￥18562.5	$736.89	$721.11	$333.24	$7652.85	$1764.44	$5756.8	$16965.33	￥2491.74
Zheng Jianjie		￥2562.0	￥0	￥4397.6	￥4616.7	￥3891.6	￥10426.	￥25894.16	$2008.06	$117.47	$1059.06	$4042.6	$1854.28	$9268.81	$18350.27	￥3105.45
Zhao Jun		￥113.53	￥0	￥671.09	￥1911.2	￥0	￥959.54	￥3655.4	$776.39	$0	$782.85	$2377.87	$1565.73	$3269.84	$8772.68	￥1218.27
Sun Lin		￥1110.4	￥0	￥1944.3	￥1611.3	￥1192	￥4877.3	￥10735.48	$296.72	$0	$1382.49	$3295.6	$2565.73	$5800.65	$13341.19	￥1049.83
Jin Shipeng		￥1286.2	￥427.87	￥1077.5	￥3118.2	￥525	￥2923.1	￥9358.05	$769.46	$0	$2335.57	$837.24	$2084.39	$6561.62	$12588.28	￥1204.6
Liu YingMei		￥1463.8	￥0	￥1873.6	￥2785.5	￥1749.8	￥6527.4	￥14400.21	$1465.34	$249.67	$694.05	$2787.62	$2108.55	$4986.04	$12291.26	￥1889.27
Zhang XueMei		￥556.01	￥0	￥23.13	￥1638.3	￥1287.6	￥1767.0	￥5272.2	$0	$335.67	$1646.86	$3394.51	$98.33	$2778.91	$8254.28	￥726.41
Year 1996	Month 7	￥0	￥0	￥0	￥0	￥0	￥0	￥0	$0	$0	$0	$0	$444.55	$0	$444.55	￥0
	Month 8	￥33.41	￥0	￥215.04	￥672.75	￥0	￥1535.3	￥2456.56	$0	$0	$297.8	$2046.96	$0	$1351.63	$3696.39	￥656.45
	Month 9	￥0	￥0	￥0	￥1392.3	￥192.22	￥1321.5	￥2906.17	$0	$0	$1876.78	$0	$1434.92	$57.49	$3369.19	￥218.32
	Month 10	￥197.74	￥0	￥330.28	￥282.19	￥0	￥2542.0	￥3352.22	$199.73	$0	$0	$0	$3174.84	$2083.86	$5458.43	￥60.11
	Month 11	￥2.17	￥0	￥54.08	￥186.26	￥1765.3	￥2384.4	￥4392.24	$400.78	$0	$0	$0	$367.41	$2443.61	$3211.8	￥415.82
	Month 12	￥901.62	￥0	￥392.81	￥55.38	￥504.2	￥662.63	￥2516.64	$756.71	$0	$0	$610.01	$155.42	$1468.11	$2990.25	￥329.04
Year 1997	Month 1	￥270.37	￥0	￥491.4	￥2932.0	￥469.55	￥2044.0	￥6207.4	$981.8	$0	$0	$1256.46	$350.39	$1158.95	$3747.6	￥786.16
	Month 2	￥177.5	￥0	￥325.41	￥1830.0	￥1115.9	￥2611.8	￥6060.8	$356.42	$0	$0	$736.69	$1378.55	$1478.57	$3950.22	￥737.4
	Month 3	￥145.04	￥0	￥99.63	￥502.32	￥1193.6	￥516.67	￥2457.29	$696.19	$0	$464.76	$2399.22	$127.18	$462.69	$4150.04	￥331.4
	Month 4	￥98.49	￥0	￥116.92	￥1870.1	￥586.24	￥1100.2	￥3772.01	$989.31	$0	$0	$2322.42	$0	$1858.53	$5170.26	￥207.72
	Month 5	￥397.57	￥0	￥569.07	￥485.58	￥461.15	￥2168.8	￥4082.27	$159.38	$0	$0	$1466.48	$1160.82	$2075.45	$4862.13	￥537.83
	Month 6	￥332.12	￥0	￥0	￥670.54	￥777.23	￥1975.7	￥3755.67	$214.84	$0	$428.47	$1037.11	$503.94	$1927.37	$4111.72	￥707.37
	Month 7	￥323.15	￥0	￥372.15	￥922.22	￥1442.8	￥1653.7	￥4714.15	$346.88	$0	$502.21	$917.7	$389.18	$2256.21	$4412.18	￥580.62

Chapter 6

Inter-cell computations

Chapter 6 Inter-cell computations

6.1 Calculate proportion, running total & simple YOY growth

6.2 Calculate ratio & complex ratio

6.3 Calculate conditional aggregate, ranking & complex YOY growth

6.4 Get ordinal number in one group/across groups

6.5 Exercise

Chapter 6 Inter-cell computations

6.1

Calculate proportion, running total & simple YOY growth

6.1 Proportion

Country	Region	Amount	DomesticProp	TotalAmt	TotalProp
China	Central-West	50627.65	45.07%	112336.56	51.01%
	North-East	9759.53	8.69%		
	North-West	956.11	0.85%		
		12670.96	11.28%		
	South-East	29677.38	26.42%		
	South-West	8644.94	7.70%		
US	Central-West	49597.87	45.97%	107896.03	48.99%
	North-East	9519.73	8.82%		
	North-West	1399.69	1.30%		
	South	8626.35	8.00%		
	South-East	27488.23	25.48%		
	South-West	11264.15	10.44%		
Total					220232.60

Proportion of regional sales to total national sales

Proportion of domestic sales to total sales

Workflow – define data set

Define a data set according to the report's summarization requirements:

File dataset

File: data\6\data6.1.xlsx [Select]

Sheet Name: Order

Chartacter Set: GBK

☑ First Row Is Title ☐ Reselect file when previewing

☐ If a field has a quotation mark, stripped off, includin...

Separator: TAB

Begin row: [ ] End row: [ ]

Used fields | Accumulation | Filter | Group | Display

[OK] [Cancel]

No.	Name	Select
1	OrderID	☐
2	CustID	☐
3	EmpID	☐
4	OrderDate	☐
5	DeliveryDate	☐
6	ShipDate	☐
7	Carrier	☐
8	Freight	☐
9	OrderAmt	☑
10	Cnee	☐
11	CneeAddress	☐
12	CneeCity	☐
13	CneeRegion	☑
14	CneeZIP	☐
15	CneeCountry	☑

Check the three fields this report making task uses

6.1 Proportion

Workflow – define expressions

	A	B	C	D	E	F
1	Country	Region	Amount	DomesticProp	TotalAmt	TotalProp
2	= ds1.group(CneeCountry;CneeCountry:1	= ds1.group(CneeRegion;CneeRegion:1	=ds1.sum(OrderAmt)	=C2/E2	=sum(C2{})	=E2/C3
3	Total					=sum(C2{})

First, group by country and region

Then, sum order amounts for each region

Calculate total sales for each country

6.1 Proportion

Workflow – define expressions

D:\tutorial\data\6\6.1.rptx

	A	B	C	D	E	F
1	Country	Region	Amount	DomesticProp	TotalAmt	TotalProp
2	= ds1.group(CneeCountry;CneeCountry:1)	= ds1.group(CneeRegion;CneeRegion:1)	=ds1.sum(OrderAmt)	=C2/E2	=sum(C2{})	=E2/C3
3	Total					=sum(C2)

Key	Value
Paragraph	
Wrap Text	☐
Horizontal Alignment	Right
Vertical Alignment	Center
Indent	2.0
Font	
Expanding	
Expand... Mode	Default
Left MasterCell	A2
Top MasterCell	
Merge same value	None
The mode of merge sa...	Default
Merge null values	None
Hyperlink	
URL	
URL Target	
Page Break	
Stretch	☐
Page Break After Row	☐
Page Break After Column	☐
Split Columns After Row	☐

First, group by country and region

Set A2 as left master cell to sum amounts within its scope

6.1 Proportion

Workflow – define expressions

Enter proportion calculation expressions under corresponding fields respectively

D:\tutorial\data\6\6.1.rptx

	A	B	C	D	E	F
1	Country	Region	Amount	DomesticProp	TotalAmt	TotalProp
2	= ds1.group(CneeCountry;CneeCountry:1)	= ds1.group(CneeRegion;CneeRegion:1)	=ds1.sum(OrderAmt)	=C2/E2	=sum(C2{})	=E2/C3
3	Total					=sum(C2{})

The cell does not have a master cell and calculates the sum of all amounts by default

6.1 Proportion

Workflow – define expressions

D:\tutorial\data\6\6.1.rptx

	A	B	C	D	E	F
1	Country	Region	Amount	DomesticProp	TotalAmt	TotalProp
2	= ds1.group(Cne 1 ntry;CneeCountry:1)	= ds1.group(Cnee 2 ;CneeRegion:1)	=ds1.su 3 erAmt)	5 2/E2	= 4 2{})	7 E2/C3
3	Total					6 sum(C2{})

The report engine automatically judges dependency relationships between expressions, and calculates total sales before proportions

6.1 Running total

Year	Month	Amount	CumAmount
1996	7	6137.15	6137.15
	8	7046.94	13184.09
	9	4728.29	17912.37
	10	5716.42	23628.80
	11	6839.97	30468.76
	12	8272.08	38740.84
1997	1	8814.51	8814.51
	2	7439.41	16253.92
	3	8411.89	24665.81
	4	8549.87	33215.68
	5	7399.09	40614.77
	6	8604.61	49219.38
	9	10506.78	75112.69
	10	10748.40	85861.09
	11	8945.32	94806.41
	12	12224.65	107031.06

Re-calculate running total for the next year

A running total is the cumulative sum of values in a column from the first to the current row.

This is equivalent to "cumulative sum in the previous row + value to be added in the current row"

17912.37=6137.15+7046.94+4728.29

Amount	CumAmount
6137.15	6137.15
7046.94	13184.09
4728.29	sum 17912.37
5716.42	23628.80

Or 17912.37=13184.09+4728.29

Month	Amount	CumAmount
7	6137.15	6137.15
8		13184.09
9	+ 4728.29	= 17912.37
10	5716.42	23628.80

6.1 Running total

Workflow – define expressions

	A	B	C	D
1	Year	Month	Amount	CumAmount
2	= ds1.group(\y	= ds1.group(m	=ds1.sum(Orde	=D2[-1]+C2

D2[-1] represents D2 value in the previous row after expansion

6.1 Running total

Workflow – define expressions

Year	Month	Amount	CumAmount
1996	7	6137.15	6137.15
	8	7046.94	13184.09
	9	4728.29	17912.37
	10	5716.42	23628.80
	11	6839.97	30468.76
	12	8272.08	38740.84
1997	1	8814.51	47555.34
	2	7439.41	54994.76
	3	8411.89	63406.65
	4	8549.87	71956.52
	5	7399.09	79355.61
	6	8604.61	87960.22
	7	7667.49	95627.70
	8	7719.04	103346.75
	9	10506.78	113853.53
	10	10748.40	124601.93
	11	8945.32	133547.25
	12	12224.65	145771.90

The expression does not re-cumulate running total from 0 for the next year

6.1 Running total

Workflow – define expressions

	A	B	C	D
1	Year	Month	Amount	CumAmount
2	= ds1.group(y	= ds1.group(m	=ds1.sum(Orde	=D2[A2:0,B2:-1

D2[B2:-1] represents D2 value to which the previous B2 corresponds under same master cell A2, and enables re-cumulation outside A2's scope.

The complete expression is D2[A2:0,B2:-1]. As A2 is the highest-level master cell and the offset is 0, it can be omitted.

The master cell can be absent only when the downward offset is 0. Once there is a non-zero offset, the master cell shall not be omitted thereafter.

6.1 Running total

Workflow – define expressions

Year	Month	Amount	CumAmount
1996	7	6137.15	6137.15
	8	7046.94	13184.09
	9	4728.29	17912.37
	10	5716.42	23628.80
	11	6839.97	30468.76
	12	8272.08	38740.84
1997	1	8814.51	8814.51
	[illegible]	7439.41	16253.92
	3	8411.89	24665.81
	4	8549.87	33215.68
	5	7399.09	40614.77
	6	8604.61	49219.38
	7	7667.49	56886.86
	8	7719.04	64605.91
	9	10506.78	75112.69
	10	10748.40	85861.09
	11	8945.32	94806.41
	12	12224.65	107031.06

The expression enables re-cumulating running total for the next year

6.1 Simple YOY growth

Features of the report on the right:

1. Calculate ratio between sales of the current month and that of same month in the last year;
2. Do not perform the calculation when data of same month of the last year does not exist;
3. Both the Year data and the Month data are continuous; except for the first group for which no data of same month can be found, all the other groups by default have their corresponding month data.

Year	Month	Amount	YOY
2020	1	831300.00	
	2	352825.00	
	3	1037630.00	
	4	698713.00	
	5	268115.00	
	6	614630.00	
	7	515708.00	
	8	1130095.00	
	9	650920.00	
	10	513230.00	
	11	951065.00	
	12	637152.00	
2021	1	410845.00	49.42%
	2	831134.00	235.57%
	3	798206.00	76.93%
	4	868427.00	124.29%
	5	1024625.00	382.16%
	6	869321.00	141.44%
	7	487168.00	94.47%
	8	687312.00	60.82%
	9	671822.00	103.21%
	10	1164486.00	226.89%
	11	1058133.00	111.26%
	12	865862.00	135.90%
2022	1	340825.00	82.96%
	2	416007.00	50.05%
	3	440811.00	55.23%
	4	1178419.00	135.70%
	5	733871.00	71.62%
	6	209569.00	24.11%
	7	243520.00	49.99%
	8	942961.00	137.20%
	9	1070719.00	159.38%
	10	512876.00	44.04%
	11	506955.00	47.91%
	12	443768.00	51.25%

6.1 Simple YOY growth

Workflow – define expressions

D:\tutorial\data\6\6.3.rptx

	A	B	C	D
1	Year	Month	Amount	YOY
2	= ds1.group(Year	= ds1.select(Mont	=ds1.Amount	=C2/C2[A2:-1,B2:0]

C2[A2:-1,B2:0] represents the C2 value corresponding to same-ordinal-number B2 within the scope of the previous master cell A2

B2 cannot be omitted though its offset is 0 because its upper-level master cell A2 has offset

6.2

Calculate ratio & complex ratio

6.4 Ratio

Ratio report

Features of the report:

1. Calculate total sales for each salesperson and sort data by sales amount in descending order
2. Calculate the difference between each salesperson and the salesperson with the highest amount

Preview report:D:\tutorial\data\6\6.4.rptx

Rank	Name	Amount	Diff_#1
1	ZhengJianjie	40539.44	0.00
2	ZhangYing	34103.92	6435.52
3	LiFang	31728.79	8810.65
4	WangWei	29042.54	11496.90
5	LiuYingMei	24588.60	15950.84
6	JinShipeng	19430.65	21108.79
7	SunLin	18859.75	21679.68
8	ZhaoJun	12848.21	27691.22
9	ZhangXueMei	9090.68	31448.75

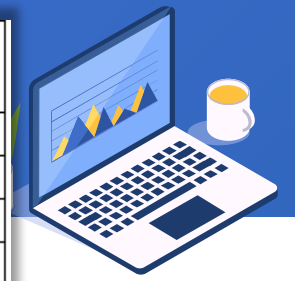
6.4 Ratio

Workflow

	A	B	C	D
1	Rank	Name	Amount	Diff_#1
2	=&B2	= ds1.group(EmplD;EmplD:1; ds1.sum(OrderAmt):-1)	=ds1.sum(OrderAmt)	=C2[1]-C2

- B2 groups records using group() function where a sorting by ds1.sum(OrderAmt) in descending order is defined so that the sales champion is placed in the first row
- C2[1] represents the first C2 after expanding

6.2 Complex ratio



Features of the report:

1. Group data by region and salesperson and sum sales amounts in each group, and sort data by amount in descending order
2. Calculate the difference between each salesperson and the one ranked 3rd in the region where the total sales ranked 2nd
3. Business background：There may be a big gap between the region having the highest sales and the other regions; the sales champion and runner-up are probably gifted or enjoy many resources and thus lack comparability. So, the most common and reasonable choice is comparing with the salesperson ranked 3rd in the region where the total sales ranked 2nd

Rank	Region	Name	TotalAmt	Diff_#3_RunnerUpRGN
1	Central-West	ZhengJianjie	17432.53	-8115.76
2		LiFang	16980.10	-7663.34
3		ZhangYing	14925.82	-5609.06
4		WangWei	13311.59	-3994.83
5		LiuYingMei	12360.69	-3043.92
6		JinShipeng	8606.31	710.45
7		SunLin	7825.35	1491.41
8		ZhaoJun	5904.30	3412.46
9		ZhangXueMei	2878.83	6437.93
		Region total:	100225.52	
1		ZhangYing	11544.87	-2228.11
2		LiFang	9776.16	-459.39
3		ZhengJianjie	9316.76	0.00
4	South-East	WangWei	7082.97	2233.79
5		SunLin	5303.31	4013.45
6		LiuYingMei	5213.94	4102.83
7		ZhangXueMei	3508.25	5808.51
8		ZhaoJun	3260.72	6056.05
9		JinShipeng	2158.63	7158.13
		Region total:	57165.61	
1	South	WangWei	4125.20	5191.56
2		ZhangYing	3637.53	5679.23
3		ZhengJianjie	3494.92	5821.84
4		JinShipeng	3360.64	5956.12
5		LiuYingMei	1789.22	7527.54
6		ZhaoJun	1616.56	7700.21
7		LiFang	1414.35	7902.41
8		SunLin	1215.02	8101.74
9		ZhangXueMei	643.86	8672.90

6.2 Complex ratio

Workflow

D:\tutorial\data\6\6.5.rptx

	A	B	C	D	E
1	Rank	Region	Name	TotalAmt	Diff_#3_RunnerUpRGN
2	=&C2	= ds1.group(CneeRegion;CneeRegion:1; ds1.sum(OrderAmt):	= ds1.group(EmpID;EmpID:1; ds1.sum(OrderAmt)	=ds1.sum(Orde	=D2[B2:2,C2:3]-D2
3			Region total:	=ds1.sum(Orde	

- First, B2 and C2 groups data using group() function where sorting by ds1.sum(OrderAmt) in descending order so that the runner-up region is the second group and the salesperson ranked 3rd is in row 3 of the corresponding group
- D2[B2:2,C2:3] represents D2's value corresponding to the second expanded master cell B2 and the third expanded master cell C2
- Here we should set A2's master cell as C2, A3's as B3, and B3's as `0 (the root cell, or called as root coordinates)

6.3

Calculate conditional aggregate, ranking & complex YOY growth

6.3 Conditional aggregate

Get the number of salespeople whose sales amounts are greater than 25,000 in the report.

Name	Amount
ZhangYing	34103.92
WangWei	29042.54
LiFang	31728.79
ZhengJianjie	40539.44
ZhaoJun	12848.21
SunLin	18859.75
JinShipeng	19430.65
LiuYingMei	24588.60
ZhangXueMei	9090.68
Number of sellers with amounts above 25,000	**4**

6.3 Conditional aggregate

Workflow

D:\tutorial\data\6\6.6.rptx

	A	B
1	Name	Amount
2	= ds1.group(EmplD;EmplD:1)	=ds1.sum(OrderAmt)
3	**Number of sellers with amounts above 25,000**	**=count(B2{B2>25000})**

B2{} represents a set of cells expanded from B2 inclusive

B2{B2>25000} represents a set of cells whose values are greater than 25,000 after expanding

Count(B2{B2>25000}) means performing COUNT on the set of cells B2{B2>25000}

6.3 Ranking

Features of the report:

1. Sort data by salesperson ID
2. Calculate total sales amount for each salesperson
3. Get rank of each sales amount

ID	Name	Amount	Rank
1	ZhangYing	34103.92	2
2	WangWei	29042.54	4
3	LiFang	31728.79	3
4	ZhengJianjie	40539.44	1
5	ZhaoJun	12848.21	8
6	SunLin	18859.75	7
7	JinShipeng	19430.65	6
8	LiuYingMei	24588.60	5
9	ZhangXueMei	9090.68	9

6.3 Ranking

Workflow

D:\tutorial\data\6\6.7.rptx

	A	B	C	D
1	ID	Name	Amount	Rank
2	= ds1.group(EmplD;EmplD:1)	= ds2.select@1(FirstName+LastName,ID	=ds1.sum(OrderAmt)	=count(C2[`0]{C2>$C2})+1

- [`0] represents the root coordinates
- C2[`0]{} represents all cells expanded from C2 inclusive under the root coordinates without any master cell limit
- $C2 in the conditional expression represents C2 in the current row
- C2[`0]{C2>$C2} represents a set of cells whose values are greater than C2's value in the current row among all cells expanded from C2 inclusive under the root coordinates

6.3 Complex YOY growth

Features of the report

1. Calculate ratio of amount in the current month to that in last year's same month
2. Do not do the calculation if data of the same month in the last year does not exist
3. There is discontinuous Year data and month data

Year	Month	Amount	YOY
1996	7	6137.15	
	8	7046.94	
	9	4728.29	
	10	5716.42	
	11	6839.97	
	12	8272.08	
1997	1	8814.51	
	2	7439.41	
	3	8411.89	
	4	8549.87	
	5	7399.09	
	6	8604.61	
	7	7667.49	124.94%
	8	7719.04	109.54%
	9	10506.78	222.21%
	10	10748.40	188.03%
	11	8945.32	130.78%
	12	12224.65	147.78%
1998	1	13227.46	150.06%
	2	16743.44	225.06%
	3	18971.77	225.54%
	4	21552.39	252.08%
	5	3965.63	53.60%

6.3 Complex YOY growth

Workflow

D:\tutorial\data\6\6.8.rptx

	A	B	C	D
1	Year	Month	Amount	YOY
2	= ds1.group(year(OrderDate);year(OrderDate):1	= ds1.group(month(OrderDate);month(OrderDate):1)	=ds1.sum(OrderAmt	=C2/C2[`0]{A2==$A2-1 && B

- C2[`0]{} represents all cells expanded from C2 inclusive under the root coordinates
- C2[`0]{A2==$A2-1 && B2==$B2} represents C2's value determined by that A2 is equivalent to A2-1 in the current row and that B2 is equivalent to the current row's B2 – that is, sales amount in the last year's same month

6.4

Get ordinal number in one group/across groups

6.4 An ordinal number in one group

Features of the report:

1. Group data by Country and Region
2. The first column contains IDs, which are numbered for each group separately

ID	Country	Region	Amount
1	China	Central-West	50627.65
2		North-East	9759.53
3		North-West	956.11
4		South	12670.96
5		South-East	29677.38
6		South-West	8644.94
1	US	Central-West	49597.87
2		North-East	9519.73
3		North-West	1399.69
4		South	8626.35
5		South-East	27488.23
6		South-West	11264.15

6.4 An ordinal number in one group

Workflow

D:\tutorial\data\6\6.9.rptx

	A	B	C	D
1	ID	Country	Region	Amount
2	=&C2	= ds1.group(CneeCountry;CneeCountry:1)	= ds1.group(CneeRegion;CneeRegion:1)	=ds1.sum(OrderAmt)

Its master cell is C2

Its master cell is `0

The & operator gets ordinal number of the specified master cell to which the current cell belongs among all the expanding cells.

We call this computation the inverse operation on multilevel coordinates.

6.4 An ordinal number across groups

Features of the report:

1. Group data by Country and Region
2. The first column contains IDs, which are numbered continuously across groups

ID	Country	Region	Amount
1	China	Central-West	50627.65
2		North-East	9759.53
3		North-West	956.11
4		South	12670.96
5		South-East	29677.38
6		South-West	8644.94
7	US	Central-West	49597.87
8		North-East	9519.73
9		North-West	1399.69
10		South	8626.35
11		South-East	27488.23
12		South-West	11264.15

6.4 An ordinal number across groups

Workflow

D:\tutorial\data\6\6.10.rptx

	A	B	C	D
1	ID	Country	Region	Amount
2	=seq(C2)	= ds1.group(CneeCountry;CneeCountry:1)	= ds1.group(CneeRegion;CneeRegion:1)	=ds1.sum(OrderAmt)

Its master cell is C2

Its master cell is `0

seq() function gets ordinal number of a specified expandable cell among cells expanded according to same master cell – that is, the ordinal number of the expandable cell when those cells are ordered by row/column number in ascending order after expansion.

6.5 Exercise

6.5 Exercise 1

Make a report as the right figure shows using OrderSummary of data6.1.xlsx in the appendix.

Features of the report:

1. Calculate ratio of sales amount in the current month to that in the last month
2. Do the same calculation for months involving two years, such as January and December of the last year
3. The Year data and Month data is by default continuous

Year	Month	Amount	LRR
2020	1	831300.00	
	2	352825.00	42.44%
	3	1037630.00	294.09%
	4	698713.00	67.34%
	5	268115.00	38.37%
	6	614630.00	229.24%
	7	515708.00	83.91%
	8	1130095.00	219.13%
	9	650920.00	57.60%
	10	513230.00	78.85%
	11	951065.00	185.31%
	12	637152.00	66.99%
2021	1	410845.00	64.48%
	2	831134.00	202.30%
	3	798206.00	96.04%
	4	868427.00	108.80%
	5	1024625.00	117.99%
	6	869321.00	84.84%
	7	487168.00	56.04%
	8	687312.00	141.08%
	9	671822.00	97.75%
	10	1164486.00	173.33%
	11	1058133.00	90.87%
	12	865862.00	81.83%

6.5 Exercise 2

Make a report as the right figure shows using OrderSummary of data6.1.xlsx in the appendix.

Features of the report:

1. Calculate ratio of sales amount in the current month to that in the last month
2. Do not perform the calculation for January that involves two years because December of the last month lacks comparability
3. The Year data and Month data is by default continuous

Year	Month	Amount	LRR
2020	1	831300.00	
	2	352825.00	42.44%
	3	1037630.00	294.09%
	4	698713.00	67.34%
	5	268115.00	38.37%
	6	614630.00	229.24%
	7	515708.00	83.91%
	8	1130095.00	219.13%
	9	650920.00	57.60%
	10	513230.00	78.85%
	11	951065.00	185.31%
	12	637152.00	66.99%
2021	1	410845.00	
	2	831134.00	202.30%
	3	798206.00	96.04%
	4	868427.00	108.80%
	5	1024625.00	117.99%
	6	869321.00	84.84%
	7	487168.00	56.04%
	8	687312.00	141.08%
	9	671822.00	97.75%
	10	1164486.00	173.33%
	11	1058133.00	90.87%
	12	865862.00	81.83%

6.5 Exercise 3

Make a report as the right figure shows using Score of data6.1.xlsx in the appendix.

Class	Stu_No	Name	Score	Rank_Class	Rank_Grade
Class 1	101	Canmore	565	5	6
	102	Kim	635	1	2
	103	Oscar	511	7	19
	104	Juliet	537	6	10
	105	Jack	587	4	5
	106	William	494	8	23
	107	Olive	634	2	3
	108	George	448	9	27
	109	Lily	603	3	4
Class 2	201	Sella	549	2	9
	202	James	476	9	25
	203	Robert	478	8	24
	204	Lucas	523	3	14
	205	Ella	658	1	1
	206	Hazel	522	4	15
	207	Ivy	519	5	17
	208	Henry	508	6	20
	209	Lucy	497	7	22
Class 3	301	Charlie	515	7	18
	302	Mae	553	2	8
	303	Miles	533	3	11
	304	Audrey	532	4	12
	305	Daisy	469	9	26
	306	Edith	503	8	21
	307	Sula	554	1	7
	308	Suki	524	5	13
	309	Max	520	6	16

6.5 Exercise 4

Make a report as the right figure shows using Score of data6.1.xlsx in the appendix.

Feature of the report:

Based on exercise 3, add the count of students who rank top 10 for each class.

Class	Stu_No	Name	Score	Rank_Class	Rank_Grade
Class 1	101	Canmore	565	5	6
	102	Kim	635	1	2
	103	Oscar	511	7	19
	104	Juliet	537	6	10
	105	Jack	587	4	5
	106	William	494	8	23
	107	Olive	634	2	3
	108	George	448	9	27
	109	Lily	603	3	4
Class 2	201	Sella	549	2	9
	202	James	476	9	25
	203	Robert	478	8	24
	204	Lucas	523	3	14
	205	Ella	658	1	1
	206	Hazel	522	4	15
	207	Ivy	519	5	17
	208	Henry	508	6	20
	209	Lucy	497	7	22
Class 3	301	Charlie	515	7	18
	302	Mae	553	2	8
	303	Miles	533	3	11
	304	Audrey	532	4	12
	305	Daisy	469	9	26
	306	Edith	503	8	21
	307	Sula	554	1	7
	308	Suki	524	5	13
	309	Max	520	6	16

	Grade Top10 Count
Class 1	6
Class 2	2
Class 3	2

Chapter 7

Irregular sorting & grouping

CONTENTS

Chapter 7 Irregular sorting & grouping

7.1 Incomplete grouping

7.2 Sorting & grouping by the specified order

7.3 Grouping by segment

7.4 Grouping by specified conditions

7.5 Exercise

7.1 Incomplete grouping

7.1 Incomplete grouping

Incomplete grouping: An incomplete grouping operation groups only some of the records in a data set and puts all the other records in one group named “Others”, as the following figure shows:

The grouping and sum of sales amounts is about records of North China and Northeast China, and records of the other regions are put to “Others” group

Region	City	Amount
North China	Beijing	939.01
	Shijiazhuang	329.68
	Tianjin	637.08
	North China total:	1905.77
Northeast China	Changchun	320.59
	Dalian	624.30
	Shenyang	644.71
	Northeast China total:	1589.60
Others	Chengdu	432.66
	Guiyang	692.53
	Kuming	65.14
	Kunming	501.60
	Lanzhou	1009.34
	Shenzhen	278.33
	Xiamen	231.30
	Xining	956.89
	Yinchuan	208.94
	Others total:	4376.73

7.1 Incomplete grouping

The following figure shows the workflow of making an incomplete grouping report as the previous page shows. Here we use file 7.1.xlsx and save the report as 7.1.rptx:

=ds1.group(City;City:1)

=ds1.group(Region,Region=='Northeast China' or Region=='North China';Region:1)

Select order records of Northeast China and North China to group them

D:\tutorial\data\7\7.1.rptx

	A	B	C
1(TH)	Region	City	Amount
2	=ds1.group(Regio	=ds1.group(City;Cit	=ds1.sum(Amount)
		=A2+" total:"	=ds1.sum(Amount)
4	Others	=ds1.group(City,	=ds1.sum(Amount)
5		Others total:	=ds1.sum(Amount,R

C5's expression can also be written as:

=sum(C4{})

Sum amounts on all cells expanded from C4

=ds1.group(City,Region!='Northeast China' and Region!='North China';City:1)

Select order records other than those of Northeast China and North China and group them by City

=ds1.sum(Amount,Region!='Northeast China' and Region!='North China')

Select order records other than those of Northeast China and North China and sum their amounts

7.2

Sorting & grouping by the specified order

7.2 Sorting & grouping by the specified order

Sorting by the specified order: Display data according to the fixed order of values of a certain field of records

The following left figure shows students scores in a certain exam. The task is to list scores of the five students of the current group in the specified order of Mason, Mia, Jack, Nora, Luke, as the right figure shows:

	A	B	C	D	E
1	Stu_No	Name	Chinese	Math	English
2	2001	David	68	87	91
3	2002	Emma	82	88	78
4	2003	Daniel	87	92	85
5	2004	Mason	77	84	83
6	2005	Mia	89	93	95
7	2006	Zoe	72	75	76
8	2007	Michael	79	94	86
9	2008	Nora	81	96	88
10	2009	Luke	78	83	82
11	2010	Sophia	79	81	68

Preview report:D:\tutorial\data\7\7.2.rptx

Name	Student_no	Chinese	Math	English
Mason	2004	77	84	83
Mia	2005	89	93	95
Jack				
Nora	2	81	96	88
Luke		78	83	82

Jack missed the exam due to illness

7.2 Sorting & grouping by the specified order

The following figure shows the workflow of making a report grouped by the specified order as the previous page shows. Here we use file 7.2.xlsx and save the report as 7.2.rptx:

D:\tutorial\data\7\7.2.rptx

	A	B	C	D	E
1(TH)	Name	Student_no	Chinese	Math	English
2	=list("Mason",...	=ds1.select(S...	=ds1.Chinese	=ds1.Math	=ds1.English

=list("Mason","Mia","Jack","Nora","Luke")

Use list() function to arrange data according to the order of names in the group

=ds1.select(Stu_No,Name==A2)

Select scores of students defined in master cell A2 according to the specified filter condition “Name==A2"

7.2 Sorting & grouping by the specified order

Sorting & grouping by the specified order: Sometimes we do not want to arrange groups in ascending/descending order. Instead, we want to display them in a specified order, as shown in the following figure, where groups are listed in the specified order of South China, Southwest China, North China, Northwest China, Northeast China.

Display groups from South to North

Region	Product	Amount
South China	dish soap	88912.39
	powder laundry det	87749.34
	soap	82660.64
Southwest China	dish soap	87514.58
	powder laundry det	90399.02
	soap	84147.52
North China	dish soap	86480.96
	powder laundry det	93098.99
	soap	87883.39
Northwest China	dish soap	82168.32
	powder laundry det	87320.34
	soap	89458.07
Northeast China	dish soap	85529.33
	powder laundry det	78992.82
	soap	89452.21

7.2 Sorting & grouping by the specified order

The following figure shows the workflow of making a report sorted and grouped by the specified order as the previous page shows. Here we use file 7.3.xlsx and save the report as 7.3.rptx:

D:\tutorial\data\7\7.3.rptx

	A	B	C
1(TH)	Region	Product	Amount
2	=list("South China	=ds1.group(Produc	=ds1.sum(Amount)

=list("South China","Southwest China","North China","Northwest China","Northeast China")

Use list() to list grouping field values in a specified order in the grouping master cell

=ds1.group(Product,Region==A2;Product:1)

Select order records of regions defined in master cell A2 according to filter condition “Region==A2"

7.3

Grouping by segment

7.3 Grouping by segment

Grouping by segment: Divide values of the grouping field into a number of intervals and group data by the segment to which a field value belongs. One common example is dividing scores into several categories – Excellent, Good, Satisfactory, Pass, Fail. And here is another example:

Divide order dates into multiple intervals according to festivals and perform grouping & aggregation

Date / Region / Total amt	Before May,2017	Between May,2017 to Oct,2017	Between Oct,2017 to Jan,2018	After Jan,2018
North China	124860.36	34293.42	20143.77	88165.79
Northeast China	111141.83	34587.00	20150.62	88094.91
Northwest China	115778.21	37185.40	21463.38	84519.74
South China	108753.29	36949.93	24809.01	88810.14
Southwest China	116549.48	41136.33	23678.30	80697.01

7.3 Grouping by segment

The following figure shows the workflow of making a report grouped by segment as the previous page shows. Here we use file 7.4.xlsx and save the report as 7.4.rptx:

D:\tutorial\data\7\7.4.rptx

	A	B
1(TH)	Date / Total amt / Region	=(dates=list(date("2017-05-01"),date("2017-10-01")),ds1.plot(Date,dates))
2	=ds1.group(Region;Region:1)	=ds1.sum(Amount)

=ds1.group(Region;Region:1)

=(dates=list(date("2017-05-01"),date("2017-10-01")),ds1.plot(Date,dates))

Since field names are case-insensitive, here confusion arises between Date field and date() function. Solution is to compute dates first and then pass dates variable to plot() function that will group data by interval that an order date belongs

Expression of displayed values in B1 :

map(list(0,1,2,3),list("Before May,2017","Between May,2017 to Oct,2017","Between Oct,2017 to Jan,2018","After Jan,2018"))

map() function returns ordinal numbers of groups. Three are altogether 4 groups – 0, 1, 2, and 3; list() function specifies values to be displayed for the 4 group numbers

7.4

Grouping by specified conditions

7.4 Grouping by specified conditions

Grouping by specified conditions: Such a grouping operation groups data by several specified conditions and puts data meeting same condition in one group. In the right report, orders data is grouped and summarized according to 3 specified conditions – “without discount, above 50,000, unpaid”.

Condition	OrderNo	Order date	Product	Amount	Discount	Actual amount	Paid
No discount	10009	2018-01-08	RaqReport	10000	0	10000	No
	10012	2018-01-09	RaqReport	10000	0	10000	Yes
	10013	2018-01-09	RaqReport	10000	0	10000	Yes
	10015	2018-01-10	esProc	60000	0	57000	No
	10016	2018-01-10	YModel	25000	0	25000	No
	10020	2018-01-13	RaqReport	10000	0	10000	Yes
					Total	122000	
Over 50K amount	10001	2018-01-02	esProc	60000	0.1	54000	Yes
	10003	2018-01-04	YModel	80000	0.08	73600	Yes
	10004	2018-01-05	esProc	60000	0.05	57000	Yes
	10006	2018-01-06	esProc	60000	0.05	57000	Yes
	10008	2018-01-07	YModel	80000	0.1	72000	Yes
	10015	2018-01-10	esProc	60000	0	57000	No
	10017	2018-01-11	YModel	80000	0.1	72000	Yes
	10021	2018-01-13	esProc	150000	0.1	135000	Yes
					Total	577600	
No paid	10002	2018-01-03	YModel	50000	0.05	47500	No
	10009	2018-01-08	RaqReport	10000	0	10000	No
	10015	2018-01-10	esProc	60000	0	57000	No
	10016	2018-01-10	YModel	25000	0	25000	No
					Total	139500	

7.4 Grouping by specified conditions

The following figure shows the workflow of making a report grouped by specified conditions as the previous page shows. Here we use file 7.5.xlsx and save the report as 7.5.rptx:

=ds1.select(OrderNo,Discount==0)

Select orders records without discount according to the filter condition

D:\tutorial\data\7\7.5.rptx

	A	B	C	D	E	F	G	H
1(TH)	Condition	OrderNo	Order date	Product	Amount	Discount	Actual amount	Paid
2	No discount	=ds1.select(	=ds1.OrderDat	=ds1.Produc	=ds1.Amoun	=ds1.Discou	=ds1.ActualAmt	=ds1.Paid
3						Total	=sum(G2{})	
4	Over 50K amount	=ds1.select(	=ds1.OrderDat	=ds1.Produc	=ds1.Amoun	=ds1.Discou	=ds1.ActualAmt	=ds1.Paid
5						Total	=sum(G4{})	
6	No paid	=ds1.select(	=ds1.OrderDat	=ds1.Produc	=ds1.Amoun	=ds1.Discou	=ds1.ActualAmt	=ds1.Paid
7						Total	=sum(G6{})	

=ds1.select(OrderNo,ActualAmt>50000)

Select orders records where the amount payable is above 50,000 according to the filter condition

=ds1.select(OrderNo,Paid=="No")

Select orders records that are unpaid according to the filter condition

7.4 Grouping by specified conditions

One record can be repeatedly put to multiple groups according to the specified conditions

Condition	OrderNo	Order date	Product	Amount	Discount	Actual amount	Paid
No discount	10009	2018-01-08	RaqReport	10000	0	10000	No
	10012	2018-01-09	RaqReport	10000	0	10000	Yes
	10013	2018-01-09	RaqReport	10000	0	10000	Yes
	10015	2018-01-10	esProc	60000	0	57000	No
	10016	2018-01-10	YModel	25000	0	25000	No
	10020	2018-01-13	RaqReport	10000	0	10000	Yes
					Total	122000	
Over 50K amount	10001	2018-01-02	esProc	60000	0.1	54000	Yes
	10003	2018-01-04	YModel	80000	0.08	73600	Yes
	10004	2018-01-05	esProc	60000	0.05	57000	Yes
	10006	2018-01-06	esProc	60000	0.05	57000	Yes
	10008	2018-01-07	YModel	80000	0.1	72000	Yes
	10015	2018-01-10	esProc	60000	0	57000	No
	10017	2018-01-11	YModel	80000	0.1	72000	Yes
	10021	2018-01-13	esProc	150000	0.1	135000	Yes
					Total	577600	
No paid	10002	2018-01-03	YModel	50000	0.05	47500	No
	10009	2018-01-08	RaqReport	10000	0	10000	No
	10015	2018-01-10	esProc	60000	0	57000	No
	10016	2018-01-10	YModel	25000	0	25000	No
					Total	139500	

The record appears in 2 groups

The record appears in 3 groups

7.5 Exercise

7.5 Exercise

Exercise 1 Make an incomplete grouping report the following figure shows using data7.1.xlsx. The report is grouped by City and grouping & aggregation is performed on Beijing, Chengdu and Dalian while records of the other cities are put in Others group.

City	Amount
Beijing	939.01
Chengdu	432.66
Dalian	624.30
Others	5876.13

Exercise 2 Make an incomplete grouping report the right figure shows using data7.1.xlsx. The report is grouped by City and Product and grouping & aggregation is performed on Beijing, Chengdu and Dalian while records of the other cities are put in Others group.

City	Product	Amount
Beijing	dish soap	203.96
	powder laundry det	243.77
	soap	491.28
	Beijing total:	939.01
Chengdu	dish soap	311.34
	powder laundry det	121.32
	Chengdu total:	432.66
Dalian	dish soap	229.84
	powder laundry det	204.73
	soap	189.73
	Dalian total:	624.30
Others	dish soap	1073.22
	powder laundry de	2612.24
	soap	2190.67
	Others total:	5876.13

7.5 Exercise

Exercise 3 Make a report grouped and summarized by Product and display data in the order of powder laundry detergent, soap and dish soap using data7.1.xlsx, as the following figure shows:

Product	Amount
powder laundry detergent	3182.06
soap	2871.68
dish soap	1818.36

Exercise 4 Make a report grouped by segment as the right figure shows using data7.4.xlsx. In the report, data is grouped by Region and Amount type and orders are counted for each group.

Amount below 60 is tiny, amount between 60 and 150 is small, amount between 150 and 300 is middle and amount above 300 is large.

Region	Amount type	Orders count
North China	Tiny	47
	Small	405
	Middle	679
	Large	216
Northeast China	Tiny	60
	Small	386
	Middle	626
	Large	218
Northwest China	Tiny	43
	Small	372
	Middle	650
	Large	219
South China	Tiny	48
	Small	404
	Middle	627
	Large	221
Southwest China	Tiny	36
	Small	416
	Middle	654
	Large	213

Chapter 8

Parameters & scripts

Chapter 8 Parameters & scripts

8.1 The concept & uses of parameters

8.2 Dynamic parameters

8.3 Reports with dynamic columns

8.4 Variables & scripts

8.5 Exercise

8.1

The concept & uses of parameters

8.1 The concept & uses of parameters

View example 1.2.rptx:

D:\tutorial\data\1\1.2.rptx

	A	B	C	D	E
1(TH)	Name	Subject	Midterm	Final	WA
2	=ds1.select(N	=ds1.Subj			
3		Total	=sum(C2())	=sum(D2())	=sum(E2())

=ds1.select(Name,Subject=="Math")

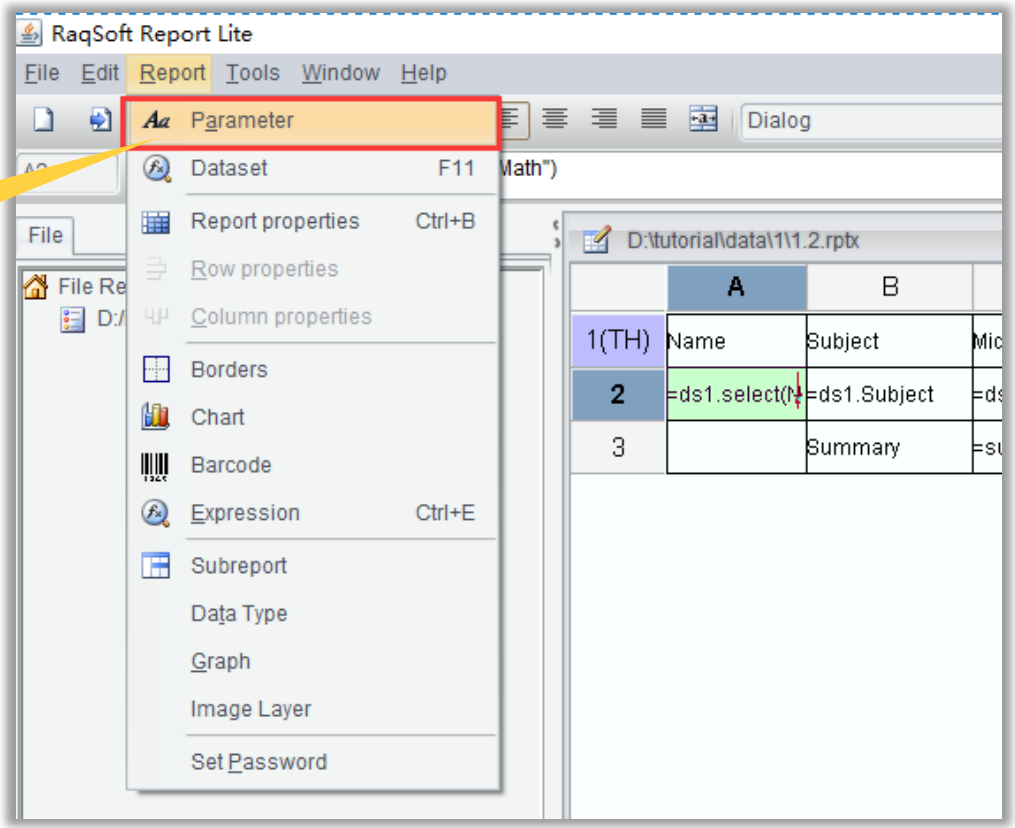
As the query condition is explicitly written in the expression, we have to modify the original report's expression if we need to calculate the total of physics scores. This is inconvenient.

Name	Subject	Midterm	Final	WA
Rose	Math	59	80	71.6
Mike	Math	87	77	81.0
Ronald	Math	36	50	44.4
Smith	Math	25	55	43.0
Frank	Math	66	80	74.4
Aimay	Math	32	50	42.8
James	Math	37	67	55.0
Jay	Math	56	56	56.0
	Total	398	515	468.2

8.1 The concept & uses of parameters

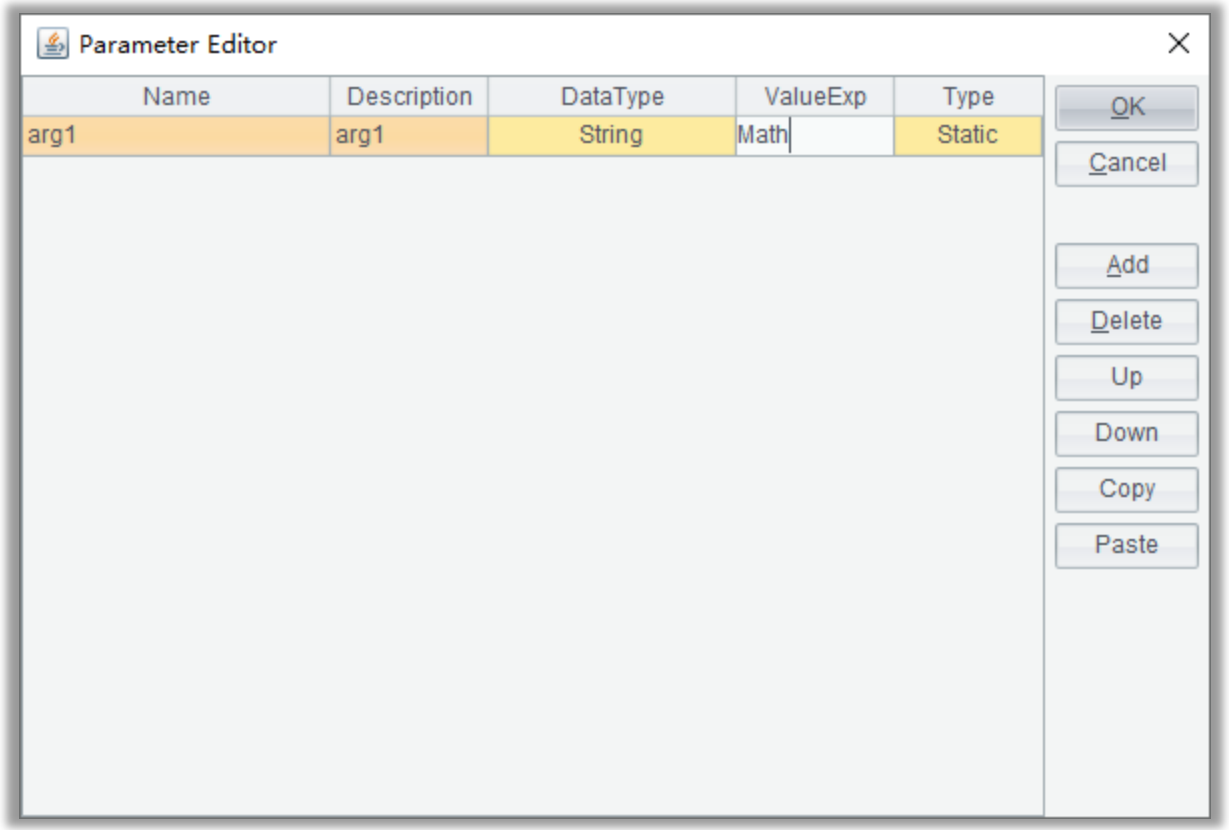
In order to write a dynamic report query condition, we can define a query variable for the report in advance and reference it during the report making to dynamically set up data. Such a query variable is called as parameter.

We can add parameters for the report through “Report -> Parameter”

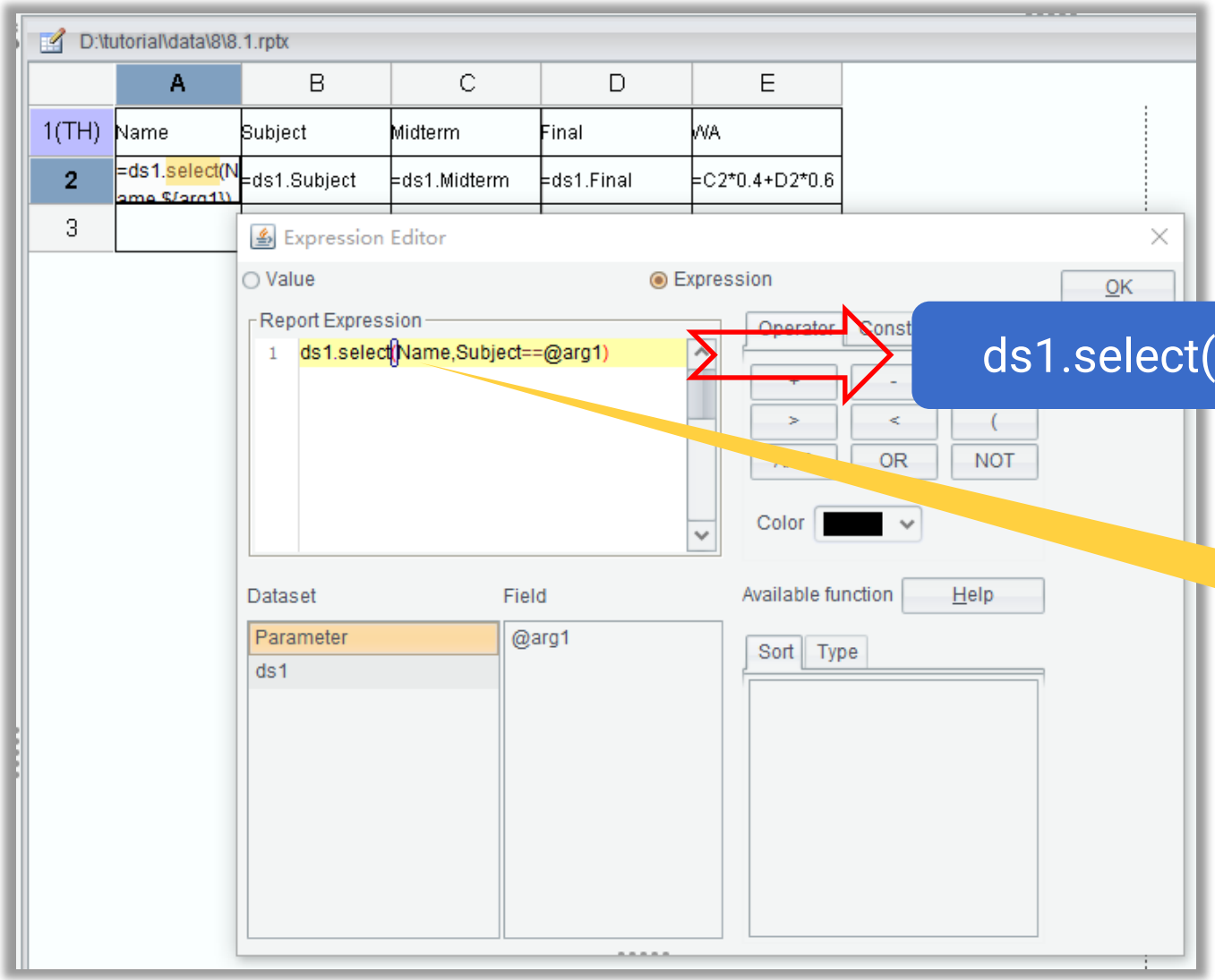


8.1 The concept & uses of parameters

Save 1.2.rptx as 8.1.rptx and click “Add” button in “Parameter Editor” dialog to add parameters for the report. In the following figure, we set default query value as Math for parameter arg1.



8.1 The concept & uses of parameters

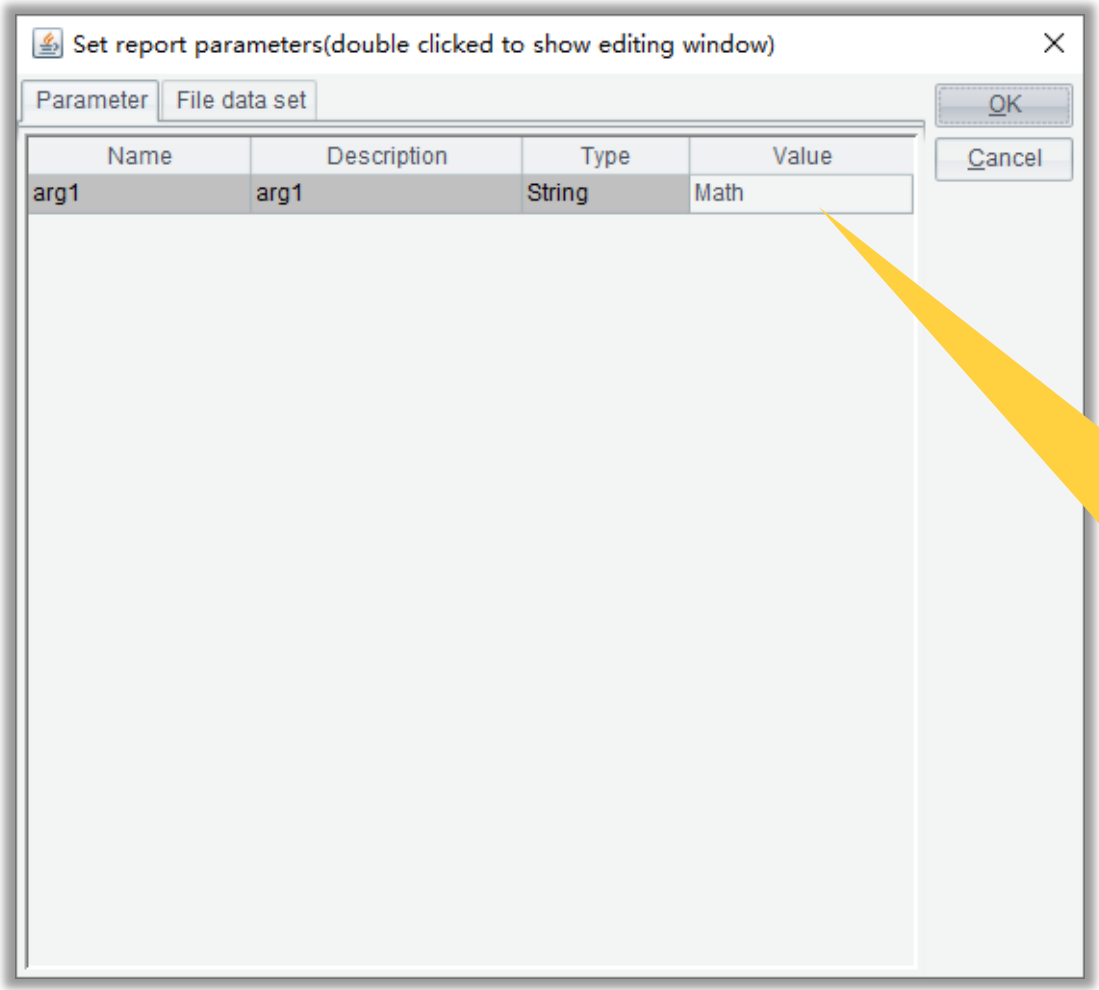


ds1.select(Name,Subject==@arg1)

As the figure shows, we modify A2's expression to reference the parameter

8.1 The concept & uses of parameters

Preview the report and “Set report parameters” dialog pops up：

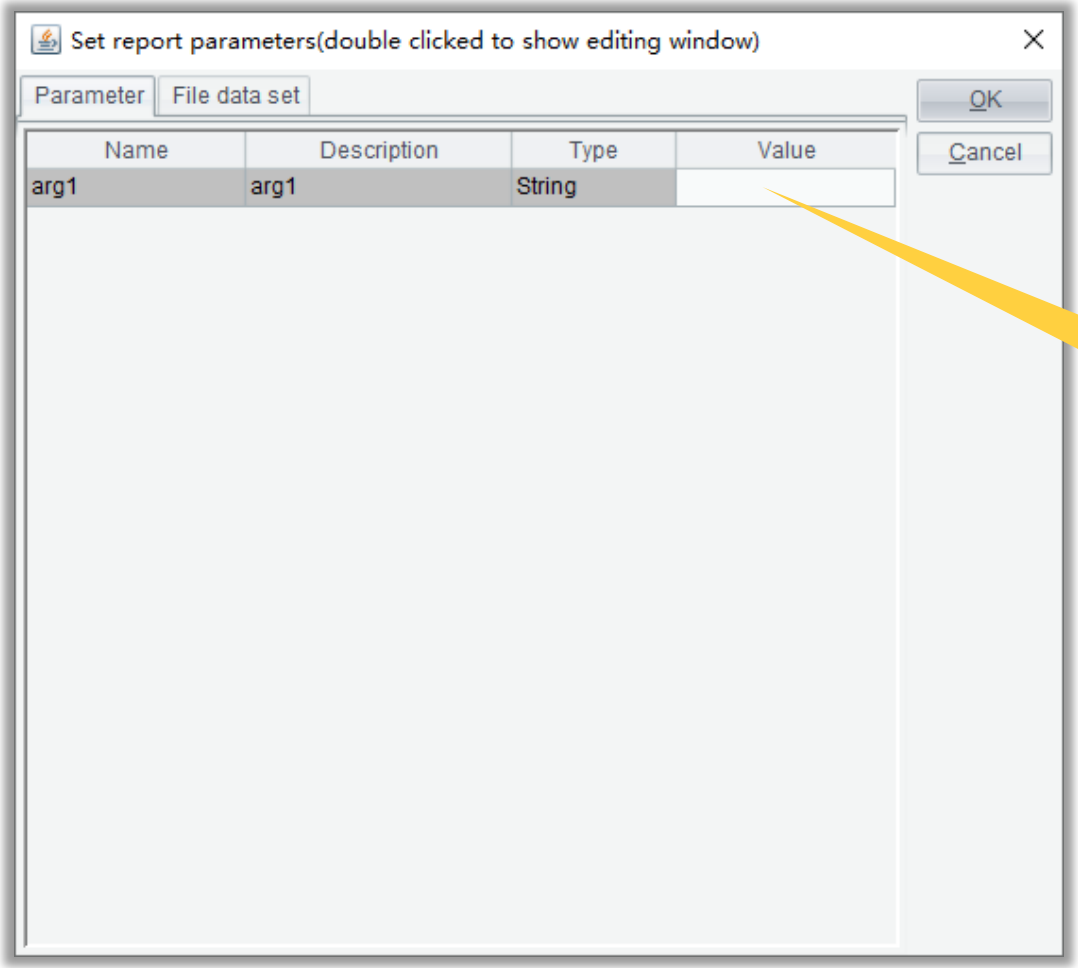


Name	Subject	Midterm	Final	WA
Rose	Math	59	80	71.6
Mike	Math	87	77	81.0
Ronald	Math	36	50	44.4
Smith	Math	25	55	43.0
Frank	Math	66	80	74.4
Aimay	Math	32	50	42.8
James	Math	7	67	55.0
Jay	Math		56	56.0
	Total		515	468.2

Set parameter value as Math, click “OK” and we get a report of Math scores

8.1 The concept & uses of parameters

Preview report again, remove parameter value and perform the query again：

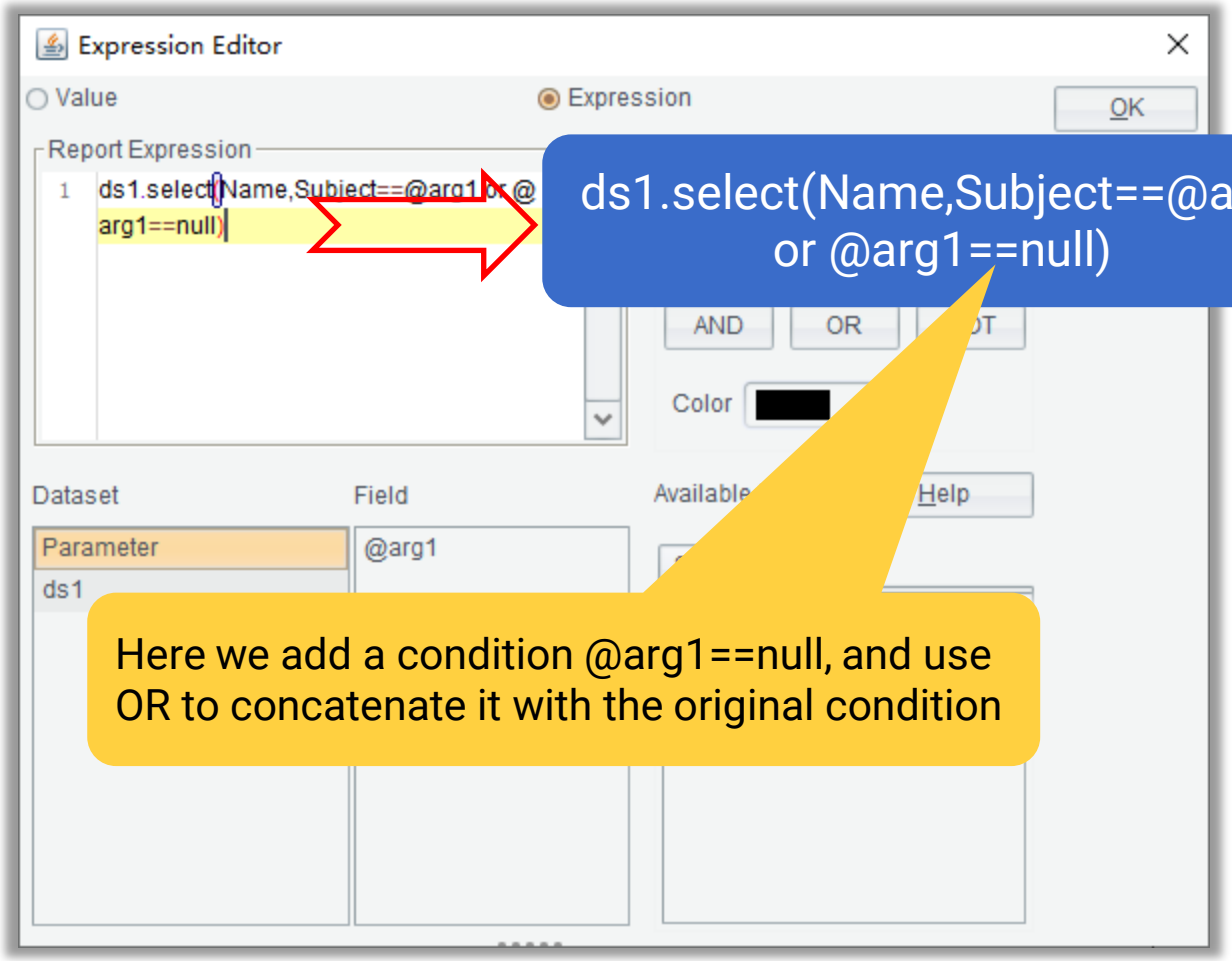


Name	Subject	Midterm	Final	WA
	Total	0.0	0.0	.00

Parameter value is empty and the query result is empty, too

8.1 The concept & uses of parameters

We have been accustomed to obtain all records without parameters :

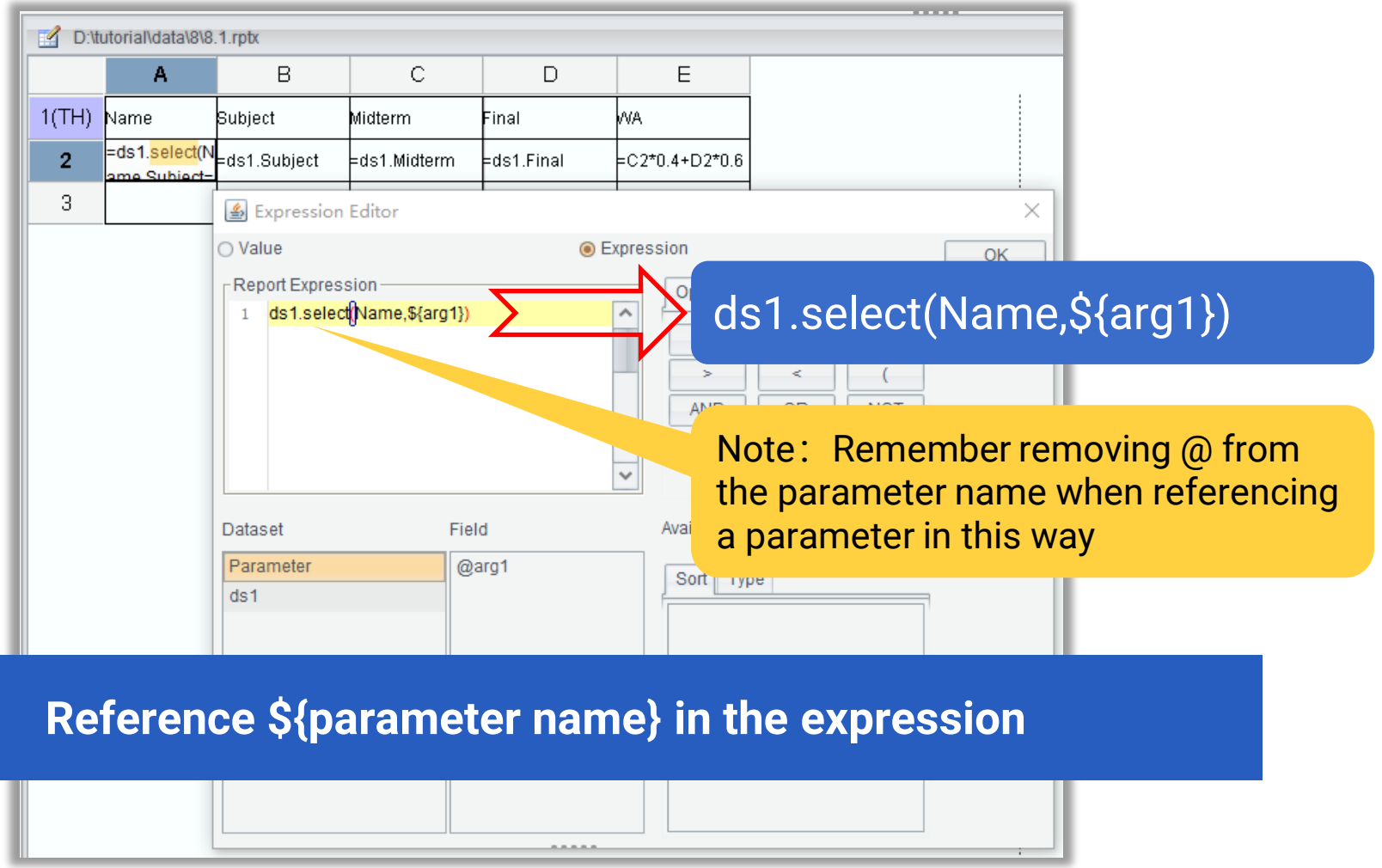


Name	Subject	Midterm	Final	WA
Rose	Math	59	80	71.6
Rose	Physics	48	65	58.2
Mike	Math	87	77	81.0
Mike	Physics	70	86	79.6
Ronald	Math	36	50	44.4
Ronald	Physics	54	75	66.6
Smith	Math	25	55	43.0
Smith	Physics	56	75	67.4
Frank	Math	66	80	74.4
Frank	Ph	75	65	69.0
			50	42.8
			65	55.8
			67	55.0
James	Physics	97	88	91.6
Jay	Math	56	56	56.0
Jay	Physics	88	79	82.6
	Total	928	1113	1039.00

Get all records while no parameter is set

8.1 The concept & uses of parameters

We can also use an expression as the parameter, and use it in a report expression in the form of ${parameter}:



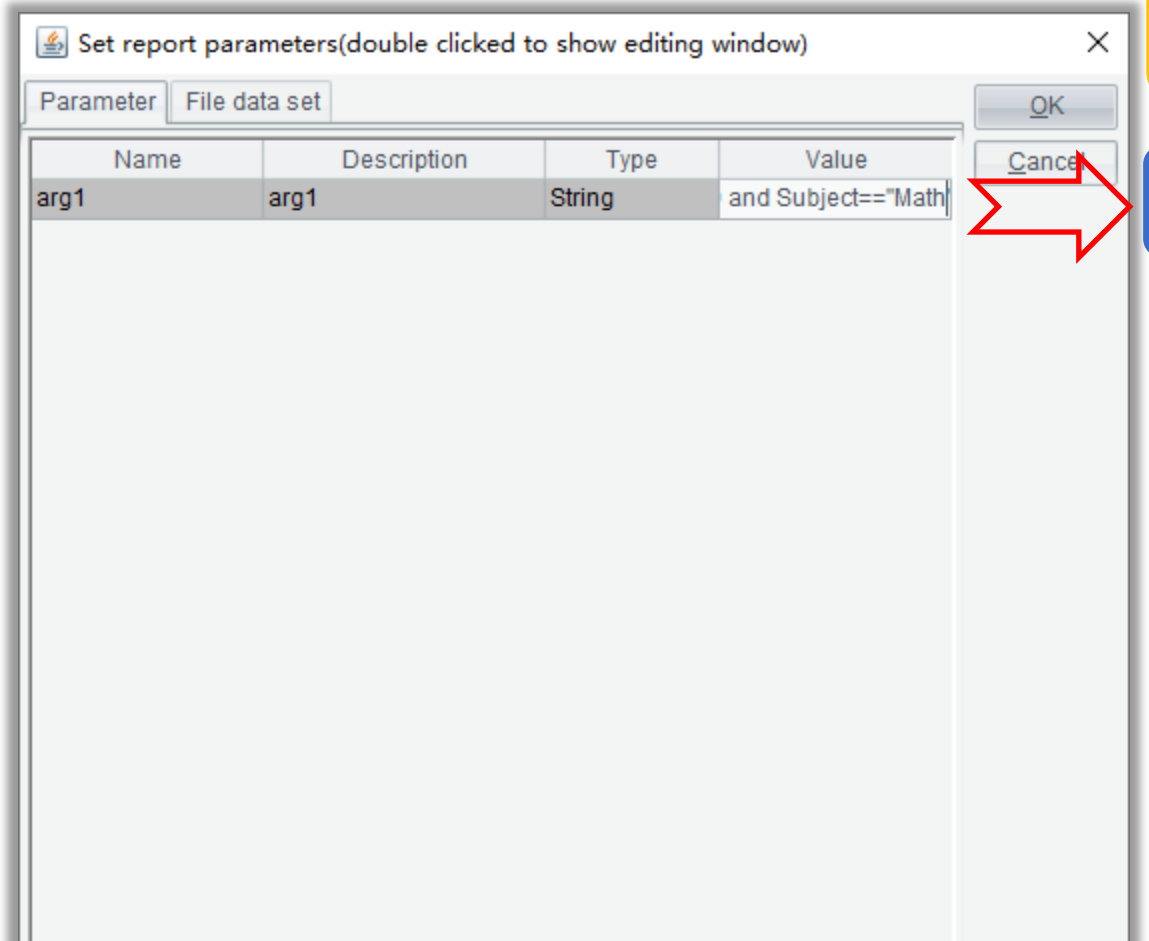
ds1.select(Name,${arg1})

Note： Remember removing @ from the parameter name when referencing a parameter in this way

Reference ${parameter name} in the expression

8.1 The concept & uses of parameters

Preview report, and the parameter value is an expression：



An expression parameter enables dynamic query conditions, such as querying student records where subject is Math and midterm score is equivalent to & greater than 60

Midterm>=60 and Subject=="Math"

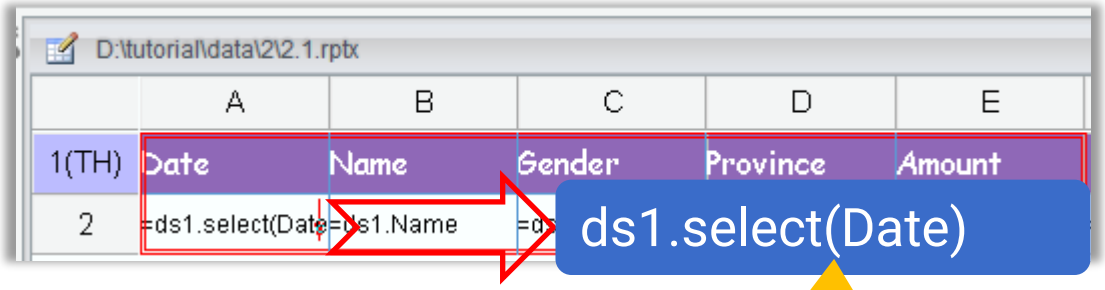
Name	Subject	Midterm	Final	WA
Mike	Math	87	77	81.0
Frank	Math	66	80	74.4
	Total	153	157	155.40

8.2

Dynamic parameters

8.2 Dynamic parameters

Let's view 2.1.rptx:

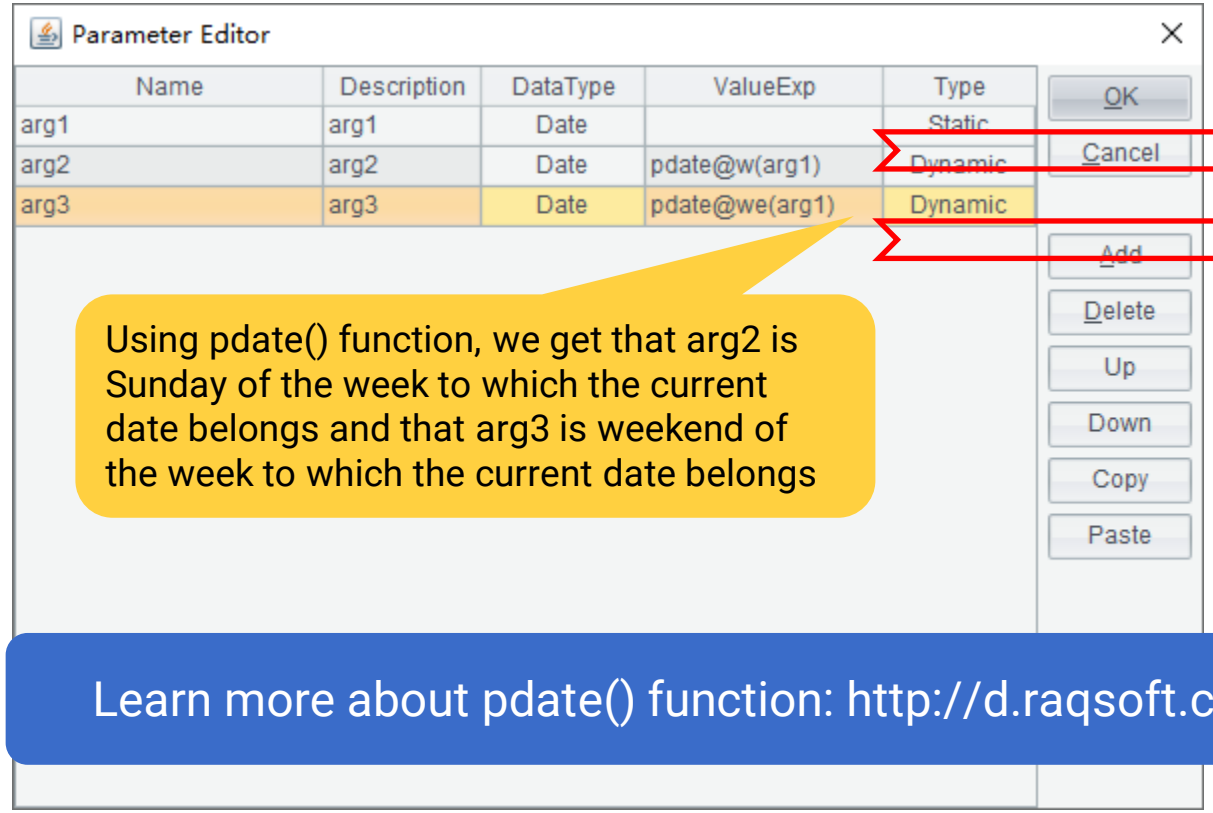


It's impossible that users can remember the starting date and ending date of each week if we want to query the crediting records of the week where a certain date belongs to

Date	Name	Gender	Province	Amount
Jan 12,2019	Lisa	Female	Washington	$100.00
Feb 08,2019	Ice Chan	Female	New York	$200.00
Feb 15,2019	Lisa	Female	Washington	$200.00
Apr 16,2019	Amay	Female	Los Angeles	$100.00
Apr 27,2019	Tossman	Male	Seattle	$100.00
May 09,2019	Smith	Male	Detroit	$200.00
May 11,2019	Tossman	Male	Seattle	$100.00
May 21,2019	Amay	Female	Los Angeles	$200.00
Jun 22,2019	Ice Chan	Female	New York	$100.00
Jun 23,2019	Tossman	Male	Seattle	$100.00
Jun 25,2019	Ice Chan	Female	New York	$150.00
Jun 27,2019	Smith	Male	Detroit	$100.00
Jul 01,2019	Amay	Female	Los Angeles	$200.00

8.2 Dynamic parameters

Save 2.1.rptx as 8.2.rptx and define parameters as the figure shows. Both arg2 and arg3 are dynamic parameters whose values can be computed from arg1 using an expression.



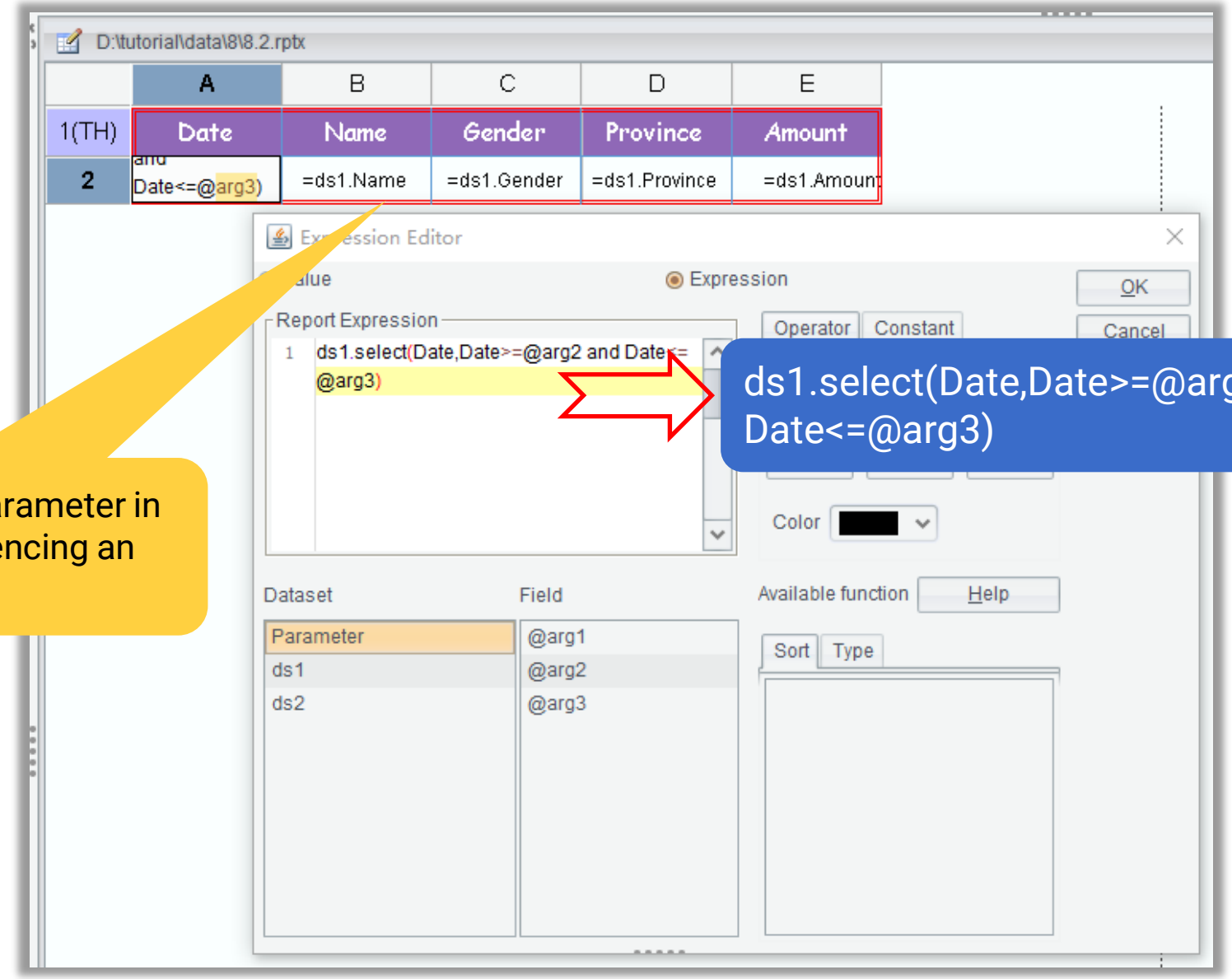
pdate@w(arg1)

pdate@we(arg1)

Learn more about pdate() function: http://d.raqsoft.com.cn:6999/report/preference/pdatede.html

8.2 Dynamic parameters

Modify A2's query expression:

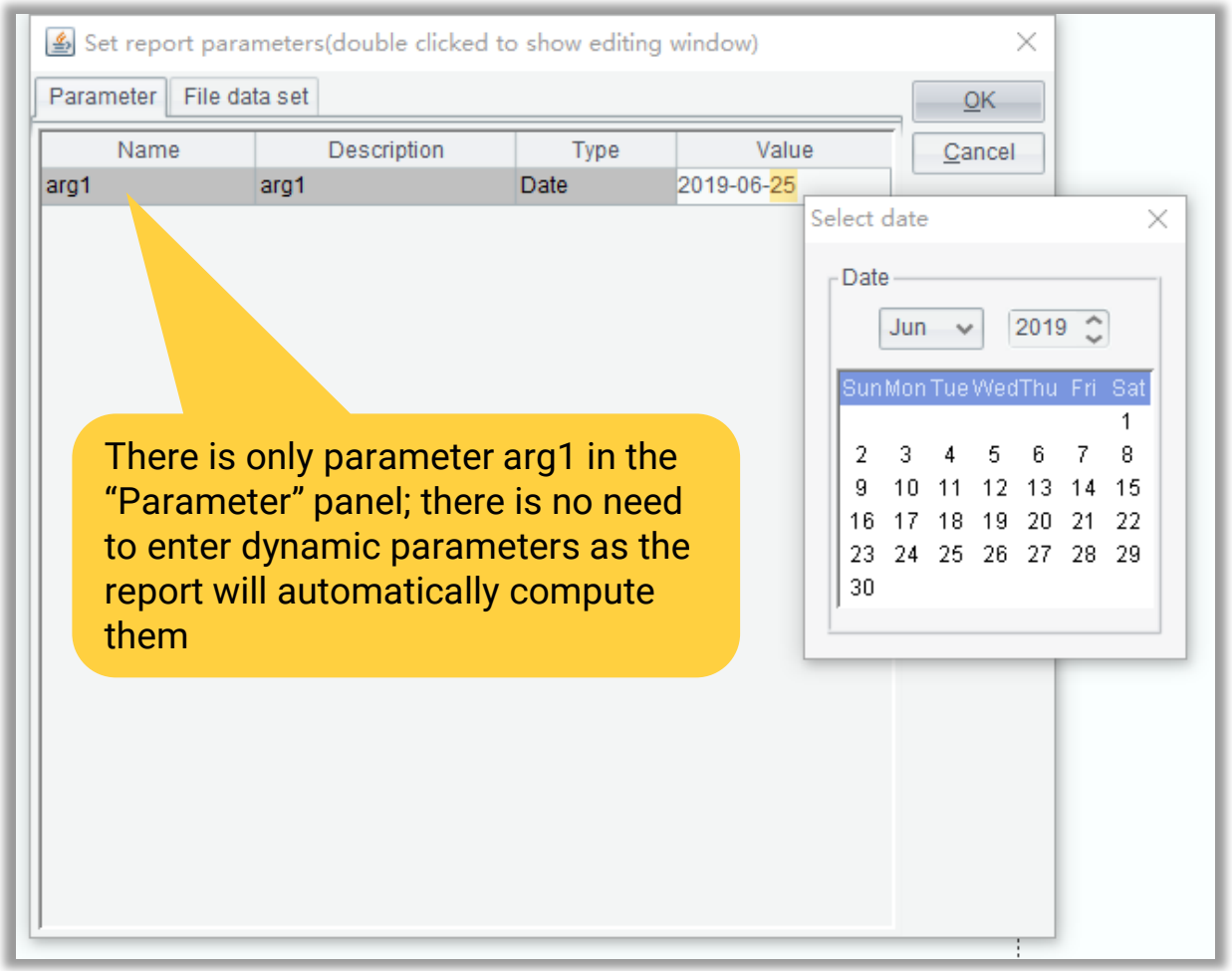


Reference a dynamic parameter in the expression as referencing an ordinary parameter

ds1.select(Date,Date>=@arg2 and Date<=@arg3)

8.2 Dynamic parameters

Preview report:



Date	Name	Gender	Province	Amount
Jun 23,2019	Tossman	Male	Seattle	$100.000
Jun 24,2019	Lisa	Female	Washington	$50.000
Jun 25,2019	Ice Chan	Female	New York	$150.000
Jun 26,2019	Tossman	Male	Seattle	$50.000
Jun 27,2019	Smith	Male	Detroit	$100.000
Jun 28,2019	I Chan	Female	New York	$50.000
Jun 29,2019	To	Male	Seattle	$50.000

Enter parameter 6/25/2019 to get all records of the corresponding week

8.2 Dynamic parameters

Features of uses of different types of parameters:

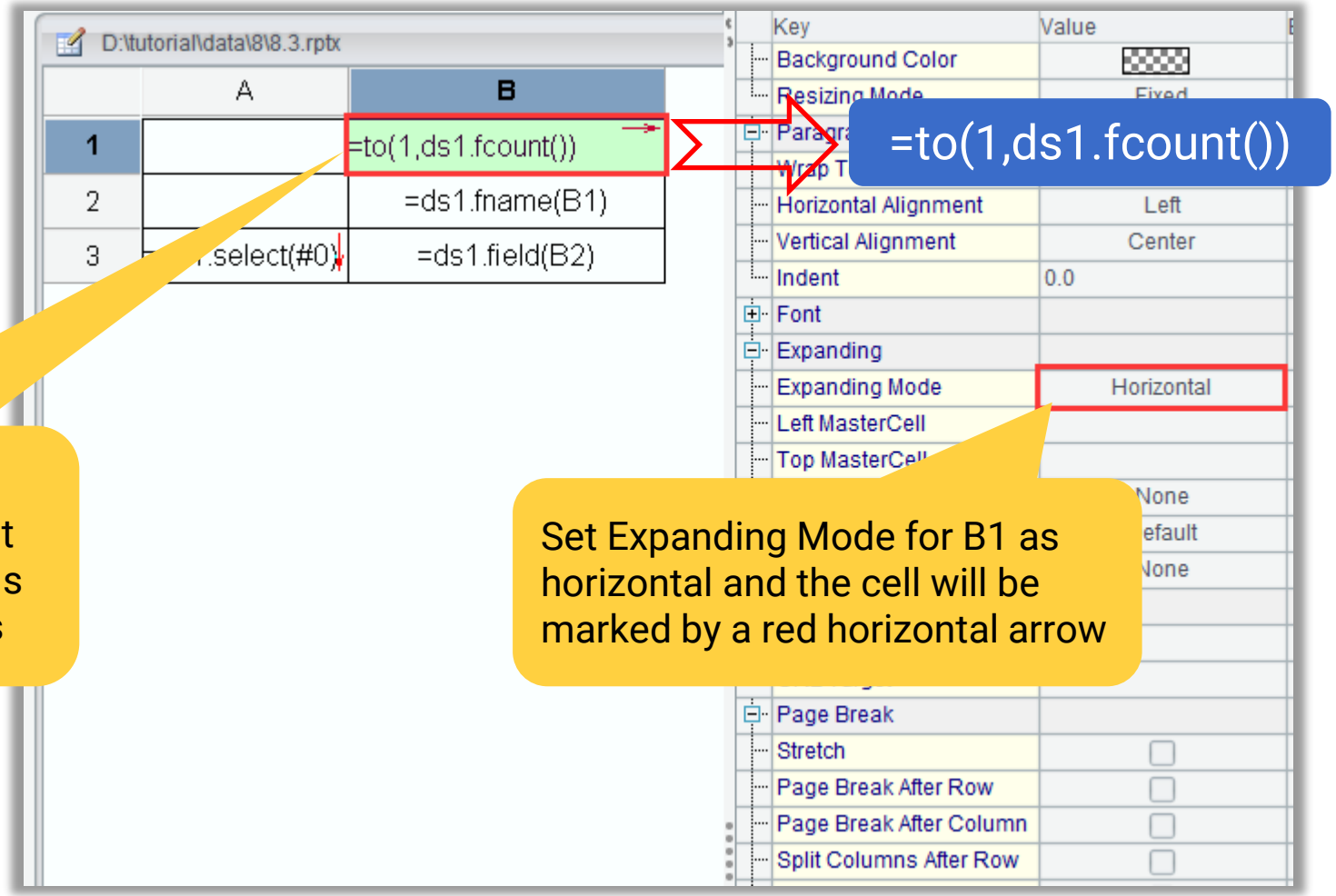
1. Ordinary parameters are the most widely used, and parameter values can only be constants.
2. In the format of ${parameter name} for an ordinary parameter, the parameter value can only be a string and it is an expression (or part of is an expression). Though the expression parameter is slightly hard to use, it is flexible.
3. Dynamic parameters are used when ordinary ones are inconvenient to use or cannot be entered to the cell directly. In such a case, we use an expression to compute on ordinary parameters for report query. A dynamic parameter is an expression that can be instantly computed.

8.3

Reports with dynamic columns

8.3 Reports with dynamic columns

Create an empty report, add a file dataset using data2.1.xlsx and save it as 8.3.rptx .



fcount() function returns the number of columns in dataset ds1, and to() function expands the same number of columns

Set Expanding Mode for B1 as horizontal and the cell will be marked by a red horizontal arrow

8.3 Reports with dynamic columns

Use fname() function to set dynamic field names for B2：

D:\tutorial\data\8\8.3.rptx

	A	B
1		=to(1,ds1.fcount())
2		=ds1.fname(B1)
3		

fname() function returns field names corresponding to specified ordinal numbers

=ds1.fname(B1)

The preview effect of dynamically expanded field names

	1	2	3	4	5
	Date	Name	Gender	Province	Amount

8.3 Reports with dynamic columns

Use field() function to get values of a dynamic column：

D:\tutorial\data\8\8.3.rptx

	A	B
1		=to(1,ds1.fcount
2		=ds1.fname(B1)
3	=ds1.select(	=ds1.field(B2)

The report where the first row and column A are hidden

Preview report:D:\tutorial\data\8\8.3.rptx

Date	Name	Gender	Province	Amount
2019-01-12	Lisa	1	1	100
2019-02-08	Ice Chan	1	2	200
2019-02-14	Tossman	0	3	50
2019-02-15	Lisa	1	1	200
2019-04-16	Amay	1	4	100
2019-04-27	Tossman	0	3	100
2019-04-28	Lisa	1	1	50
2019-05-09	Smith	0	5	200
2019-05-11	Tossman	0	3	100
2019-05-21	Amay	1	4	200
2019-06-22	Ice Chan	1	2	100
2019-06-23	Tossman	0	3	100
2019-06-24	Lisa	1	1	50
2019-06-25	Ice Chan	1	2	150
2019-06-26	Tossman	0	3	50
2019-06-27	Smith	0	5	100
2019-06-28	Ice Chan	1	2	50
2019-06-29	Tossman	0	3	50
2019-06-30	Lisa	1	1	50
2019-07-01	Amay	1	4	200
2019-07-02	Tossman	0	3	50

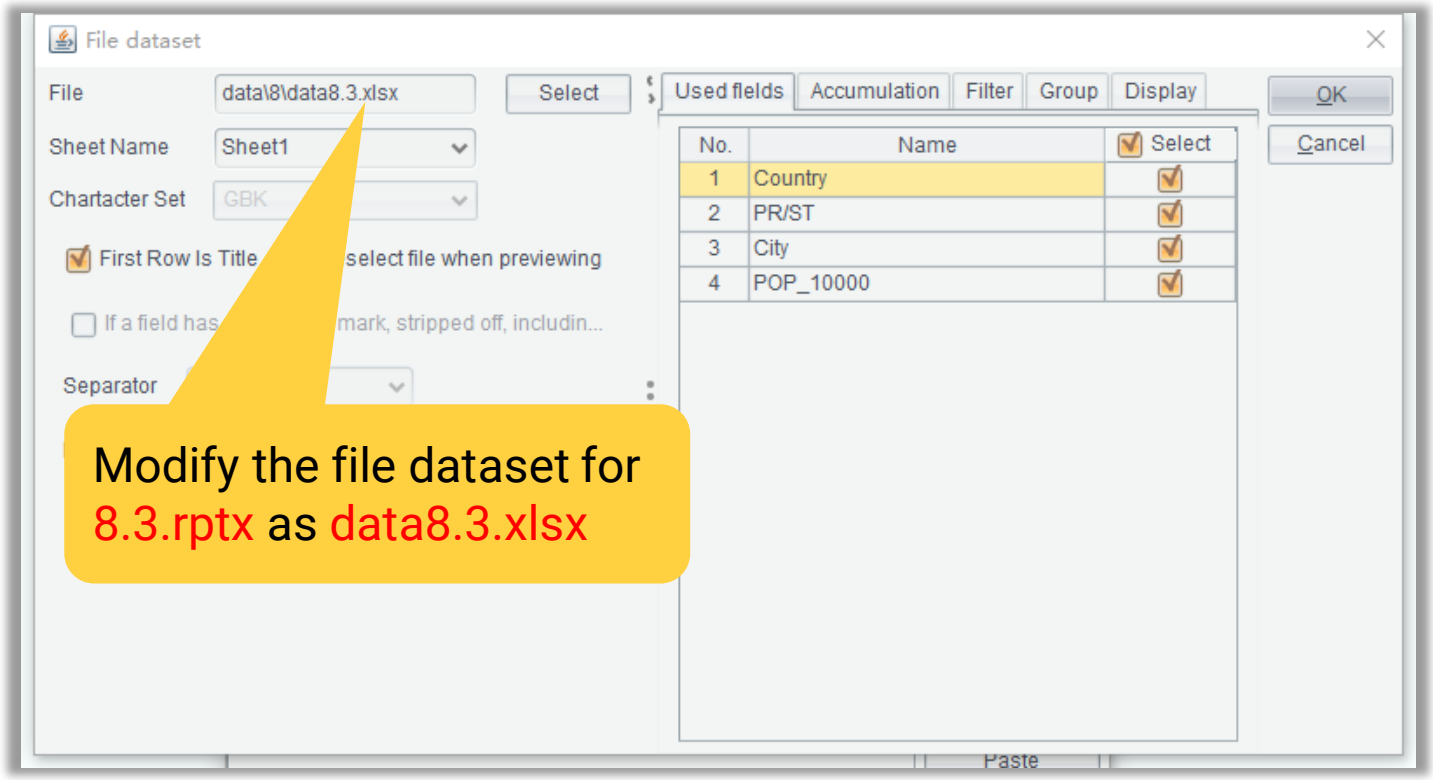
“#+number” means accessing columns according to their ordinal numbers; column 0 is the default ordinal number column

B3 automatically follows B1 to expand to a number of fields horizontally while following A3 to expand to multiple record rows vertically

8.3 Reports with dynamic columns

Let's view data file data8.3.xlsx:

	A	B	C	D
1	Country	PR/ST	City	POP_10000
2	China	Liaoning	Shenyang	831
3	China	Liaoning	Dalian	598
4	China	Liaoning	Yingkou	243
5	China	Liaoning	Benxi	151
6	China	Hebei	Shijiazhuang	1039
7	China	Hebei	Langfang	479
8	China	Hebei	Tangshan	793
9	China	Shandong	Jinan	655
10	China	Shandong	Qingdao	817
11	China	Shandong	Dongying	217
12	US	Alaska	Anchorage	29
13	US	Alaska	Fairbanks	5.4
14	US	California	Los Angeles	397
15	US	California	Hollywood	30



The data set for a report with dynamic columns can be changed as needed

8.3 Reports with dynamic columns

Preview report:

Preview report:D:\tutorial\data\8\8.3.rptx

Country	PR/ST	City	POP_10000
China	Liaoning	Shenyang	831
China	Liaoning	Dalian	598
China	Liaoning	Yingkou	243
China	Liaoning	Benxi	151
China	Hebei	Shijiazhuang	1039
China	Hebei	Langfang	479
China	Hebei	Tangshan	793
China	Shandong	Jinan	655
China	Shandong	Qingdao	817
China	Shandong	Dongying	217
US	Alaska	Anchorage	29
US	Alaska	Fairbanks	5.4
US	California	Los Angeles	397
US	California	Hollywood	30

8.4

Variables & scripts

8.4 Variables & scripts

In a report, we use expression “=variable name=value” to define a temporary variable:

D:\tutorial\data\8\8.4.1.rptx

	A	B	C	D	E	F
1(TH)	=a=0					
2(TH)	Date	Name	Gender	Province	Amount	CumAmount
3	=...ct(Date	=ds1.Name	=ds1.Gender	=ds1.Province	=ds1.Amount	=a=a+E3

=a=a+E3

A1 defines temporary variable *a* and assigns initial value 0 to it

The expanding cell F3 uses temporary variable *a* to calculate cumulative amount

Use a temporary variable to add CumAmount column to 2.1.rptx and save it as 8.4.1.rptx

8.4 Variables & scripts

Hide the first row and preview the report:

Date	Name	Gender	Province	Amount	CumAmount
Jan 12,2019	Lisa	Female	Washington	$100.000	100
Feb 08,2019	Ice Chan	Female	New York	$200.000	300
Feb 14,2019	Tossman	Male	Seattle	$50.000	350
Feb 15,2019	Lisa	Female	Washington	$200.000	550
Apr 16,2019	Amay	Female	Los Angeles	$100.000	650
Apr 27,2019	Tossman	Male	Seattle	$100.000	750
Apr 28,2019	Lisa	Female	Washington	$50.000	800
May 09,2019	Smith	Male	Detroit	$200.000	1000
May 11,2019	Tossman	Male	Seattle	$100.000	1100
May 21,2019	Amay		Los Angeles	$200.000	1300
		Female	New York	$100.000	1400
	Tossman	Male	Seattle	$100.000	1500
Jun 24,2019	Lisa	Female	Washington	$50.000	1550
Jun 25,2019	Ice Chan	Female	New York	$150.000	1700
Jun 26,2019	Tossman	Male	Seattle	$50.000	1750
Jun 27,2019	Smith	Male	Detroit	$100.000	1850
Jun 28,2019	Ice Chan	Female	New York	$50.000	1900
Jun 29,2019	Tossman	Male	Seattle	$50.000	1950
Jun 30,2019	Lisa	Female	Washington	$50.000	2000
Jul 01,2019	Amay	Female	Los Angeles	$200.000	2200
Jul 02,2019	Tossman	Male	Seattle	$50.000	2250

Automatically compute cumulative sum for each row through the temporary variable during row expansion

8.4 Variables & scripts

The example data file data8.4.xlsx contains crediting records of two quarters page by page:

	A	B	C
1	Date	Name	Credit
2	2019/1/12	Luna	100
3	2019/1/18	Jackie	200
4	2019/1/20	Ethan	50
5	2019/1/25	Luna	200
6	2019/2/2	Bella	100
7	2019/2/7	Ethan	100
8	2019/2/18	Luna	50
9	2019/2/19	Finley	200
10	2019/2/21	Ethan	100
11	2019/2/21	Bella	200
12	2019/2/22	Jackie	100
13	2019/2/23	Ethan	100
14	2019/2/24	Luna	50
15	2019/2/25	Jackie	150
16	2019/3/2	Ethan	50
17	2019/3/7	Finley	100
18	2019/3/8	Jackie	50
19	2019/3/12	Ethan	50
20	2019/3/13	Luna	50
21	2019/3/21	Bella	200
22	2019/3/22	Ethan	50
23			

Q1 Q2

	A	B	C
1	Date	Name	Credit
2	2019/4/12	Finley	100
3	2019/4/18	Ethan	200
4	2019/5/1	Bella	350
5	2019/5/2	Jackie	200
6	2019/5/4	Ethan	100
7	2019/5/4	Luna	200
8	2019/5/8	Luna	150
9	2019/5/9	Jackie	200
10	2019/5/21	Ethan	100
11	2019/6/11	Finley	300
12	2019/6/22	Jackie	100
13	2019/6/23	Ethan	100
14	2019/6/30	Luna	50
15			
16			
17			
18			
19			
20			
21			
22			
23			

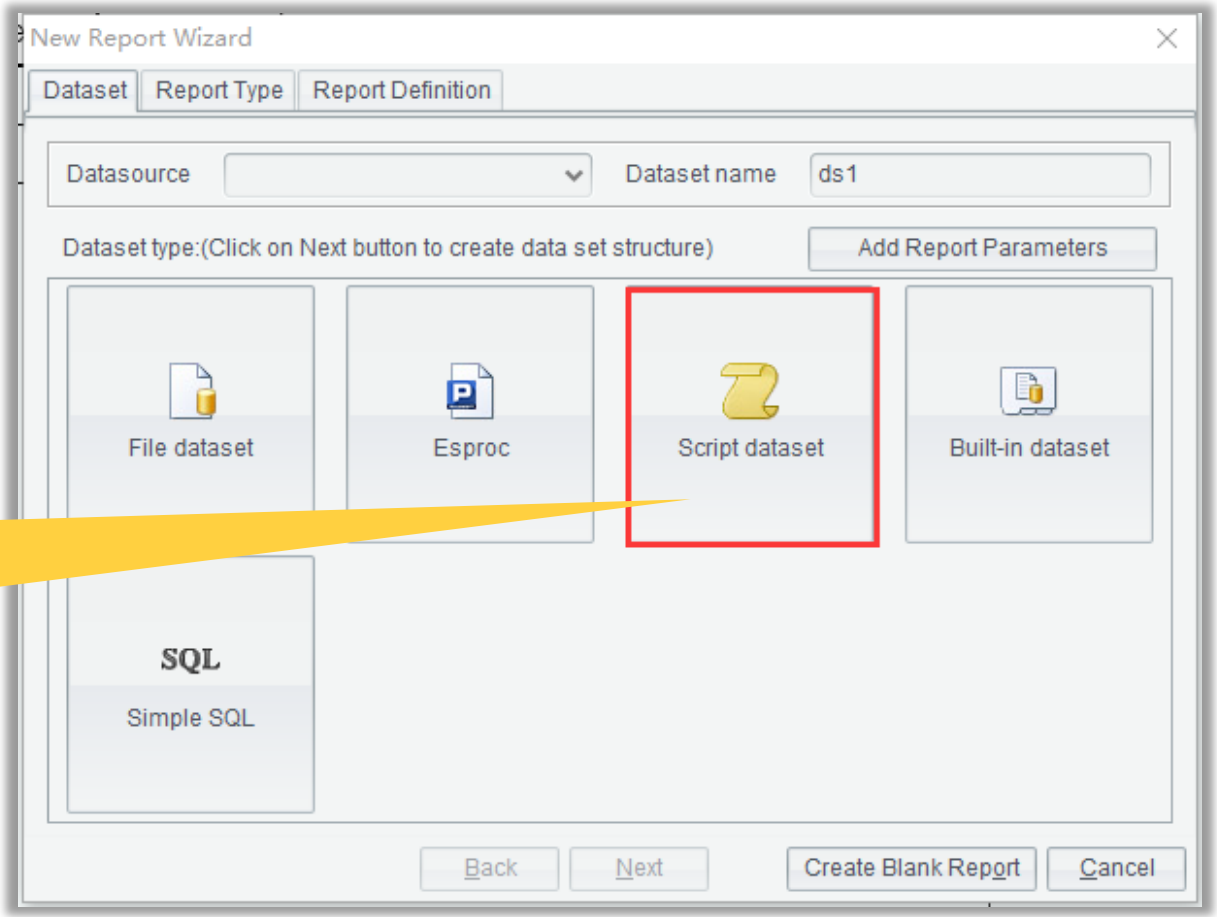
Q1 Q2

To calculate the total credit for each person during the two quarters

During report computations, one data set can only correspond to data of one quarter, but two separately data sets cannot be combined

8.4 Variables & scripts

To create a new report, select “Script dataset”:



We can use script dataset to conveniently handle computations involving multiple data sets that cannot dealt with in the report

Use script dataset to pre-process data

8.4 Variables & scripts

Edit the following sample script:

Script dataset

Cached file name

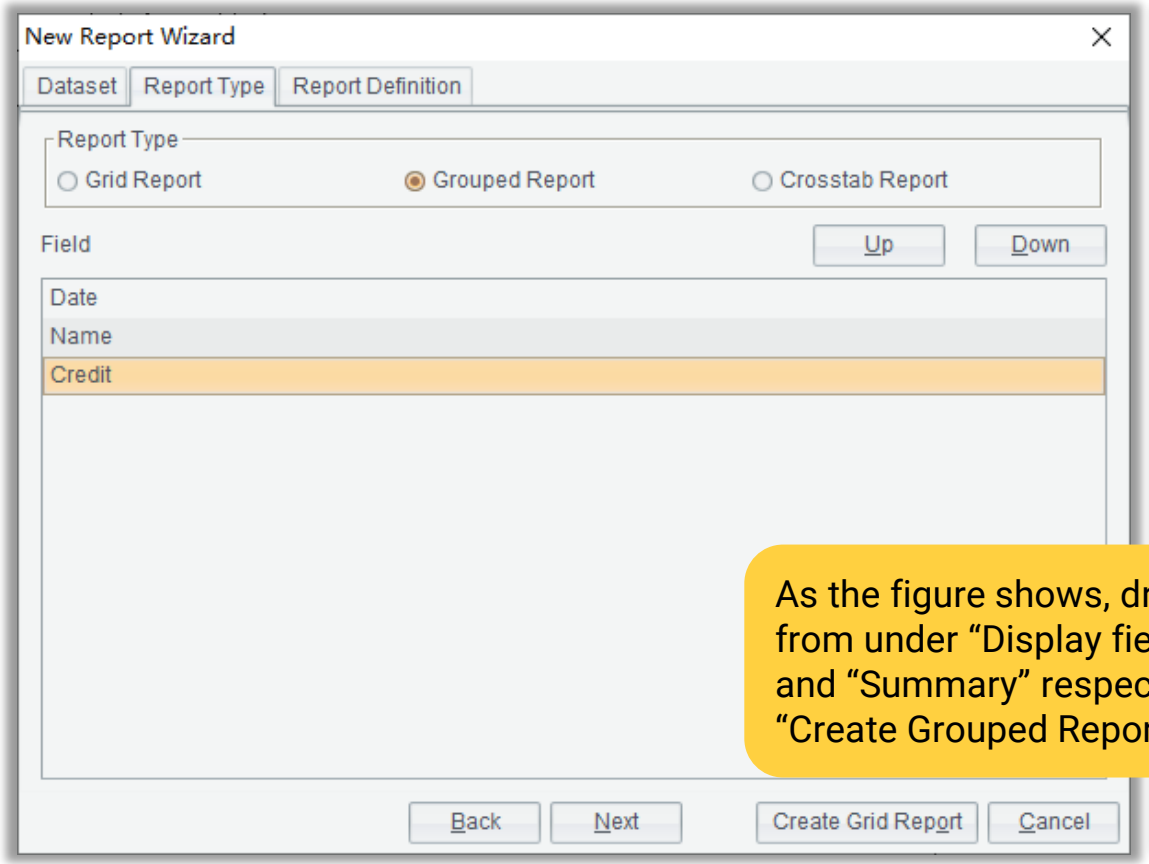
	A	B
1	=file("data\\8\\data8.4.xlsx")	
2	=A1.xlsimport@t(;"Q1",:)	
3	=A1.xlsimport@t(;"Q2",:)	
4	=A2|A3	
5		

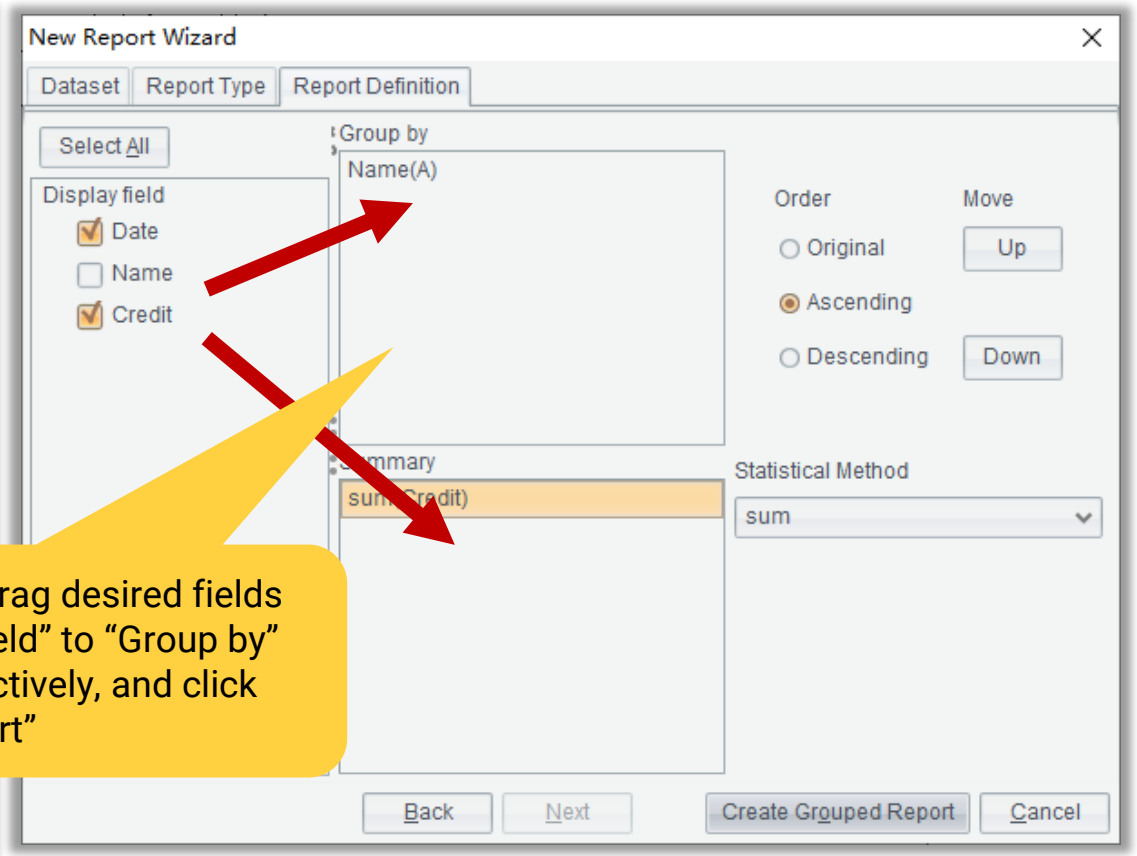
The script concatenates two quarters of data in sample file data8.4.xlsx into a large table sequence

The scripting language RaqReport uses is SPL. Learn how to program in SPL:
http://www.raqsoft.com/html/SPL-programming.html

8.4 Variables & scripts

Return from the “Script dataset” panel, select “Grouped report”, and click “Next” :





As the figure shows, drag desired fields from under “Display field” to “Group by” and “Summary” respectively, and click “Create Grouped Report”

8.4 Variables & scripts

Generate a grouped report as follows:

report_0

	A	B	C
1(TH)	Name	Date	Credit
2	=ds1.group(Nam	=ds1.select(Date	=ds1.Credit
3	sum(Name)		=ds1.sum(Credit
4	sum		=ds1.sum(Credit

Save and preview the report. The right figure shows part of the report:

Preview report:D:\tutorial\data\8\8.4.2.rptx

Name	Date	Credit
Bella	2019-02-02	100
	2019-02-21	200
	2019-03-21	200
	2019-05-01	350
sum(Name)		850
Ethan	2019-01-20	50
	2019-02-07	100
	2019-02-21	100
	2019-02-23	100
	2019-03-02	50
	2019-03-12	50
	2019-03-22	50
	2019-04-18	200
	2019-05-04	100
	2019-05-21	100
	2019-06-23	100
sum(Name)		1000

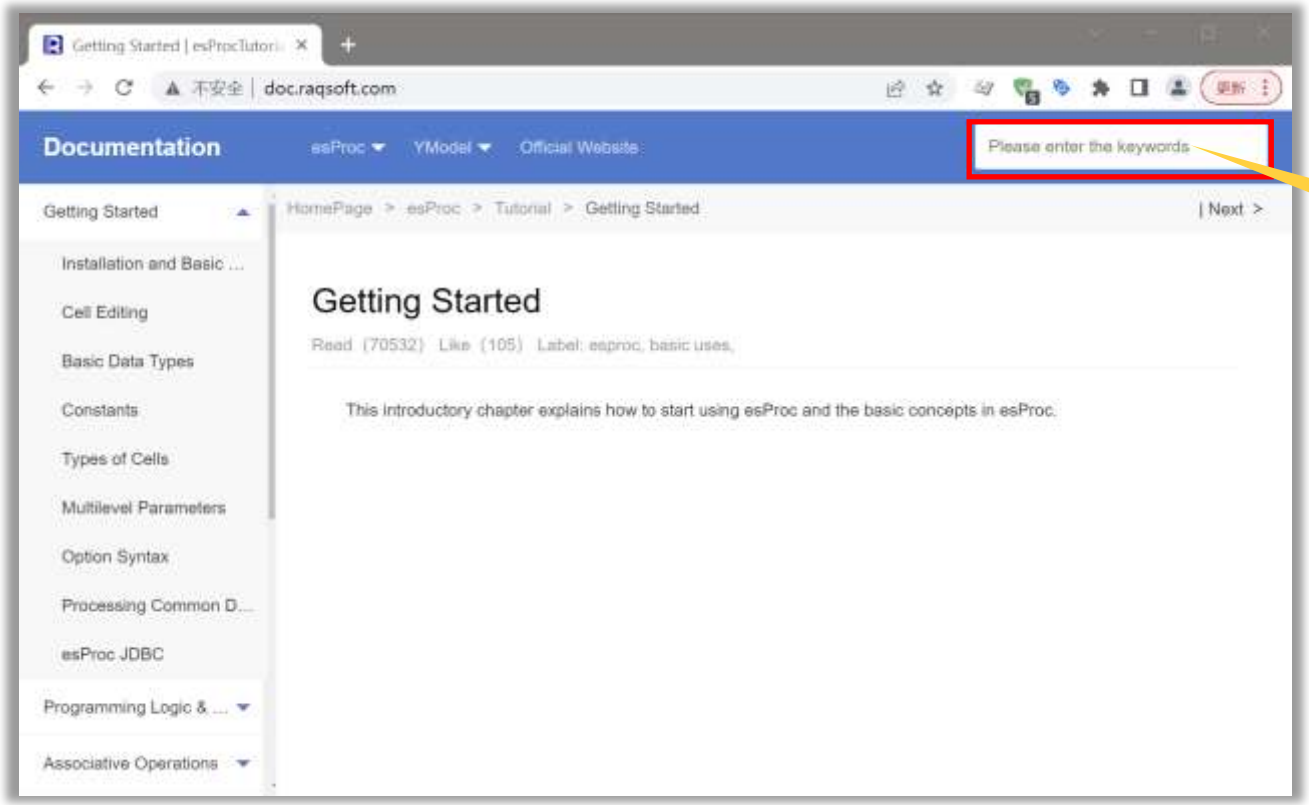
8.5 Exercise

8.5 Exercise 1

Add parameters of numbering and name querying for 2.4.rptx in order to get student cards conveniently (Require that part of the name be allowed for the name-based searching)

8.5 Exercise 2

Copy the script dataset code in 8.4.2.rptx to esProc IDE, run the code and view the cell content of executing each step. You can look up the functions used in the example in related documents.



Enter a function name in the Search Box to find related resources

Chapter 9

Report Group

Chapter 9 Report Group

9.1 Create report group

9.2 Report group parameters

9.3 Common datasets & parameters

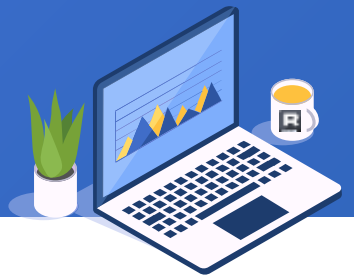
9.4 Continuous page numbers

Chapter 9 Report Group

9.1

Create report group

9.1 Create report group



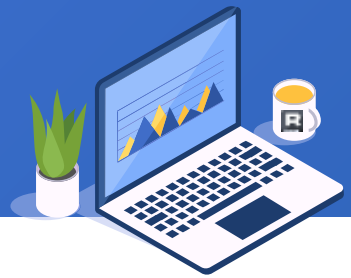
2.4.rptx is a card-style report, but sometimes the list style makes the viewing more convenient.

Now we create a list-style report 9.1.rptx :

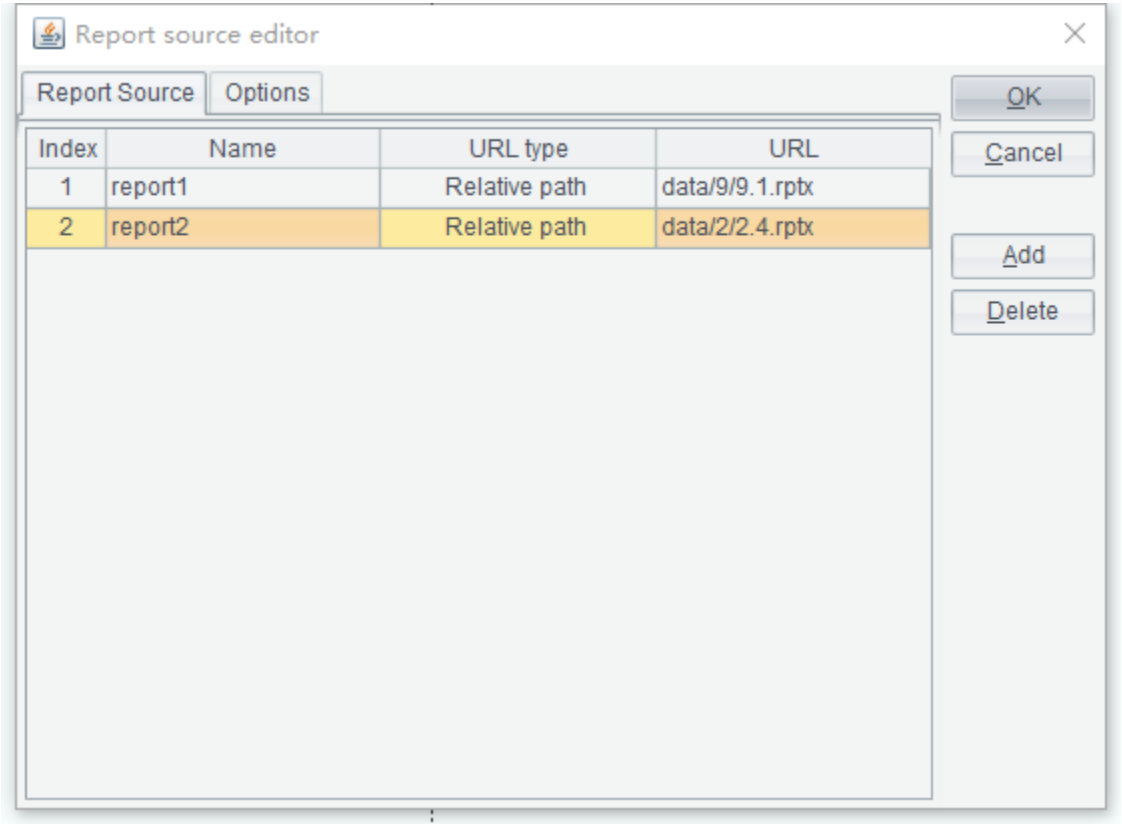
Preview report:D:/tutorial/data/9/9.1.rptx

ID	Name	Gender	Age	Address
1	Roddy	M	17	30830 Orchard Lake Road
2	Lisa	F	16	120 Wall St. 22nd Floor New York, NY
3	Shaw	M	15	4114 Sepulveda Blvd Culver City，CA
4	Dreamy	F	14	3330 S Figueroa St. Los Angeles CA
5	Alice	M	13	20 Main St.East Hampton NY

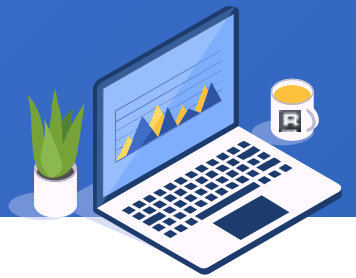
9.1 Create report group



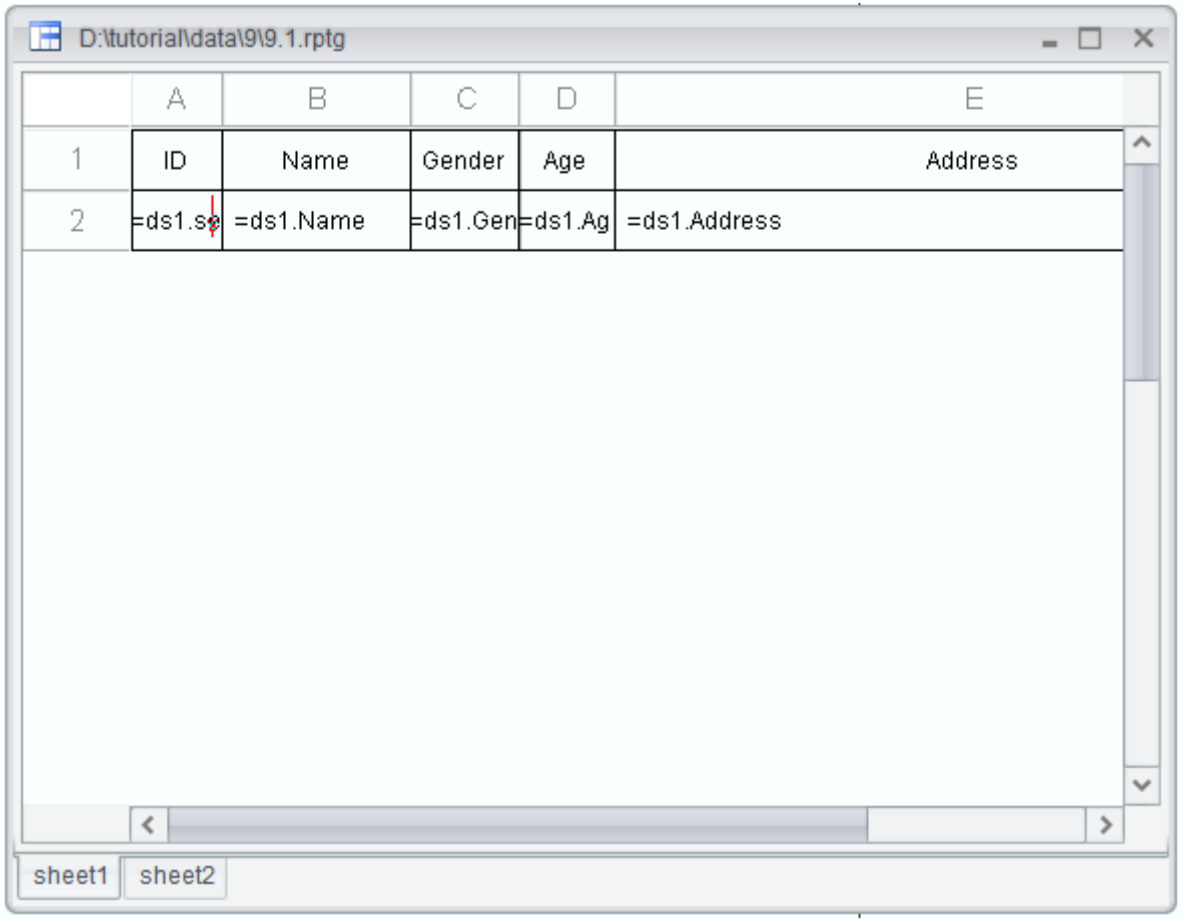
Click File -> New Report Group, or press the shortcut key Ctrl+G to pop up “Report source editor” window, where we add two new report sources:



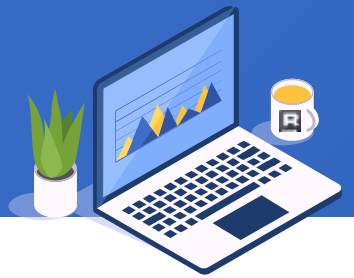
9.1 Create report group



Click “OK” button to get the following report group in an Excel-like sheet:



9.1 Create report group



Preview the report group and find the reports displayed on two sheets:

Preview report group:D:\tutorial\data\9\9.1.rptg

ID	Name	Gender	Age	Address
1	Roddy	M	17	30830 Orchard Lake Road
2	Lisa	F	16	120 Wall St. 22nd Floor New York, NY
3	Shaw	M	15	4114 Sepulveda Blvd Culver City，CA
4	Dreamy	F	14	3330 S Figueroa St. Los Angeles CA
5	Alice	M	13	20 Main St.East Hampton NY

sheet1 sheet2

Preview report group:D:\tutorial\data\9\9.1.rptg

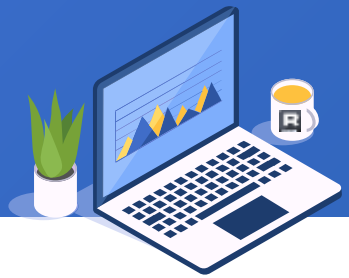
Student Information

ID	1
Name	Roddy
Gender	0
Age	17
Address	30830 Orchard Lake Road

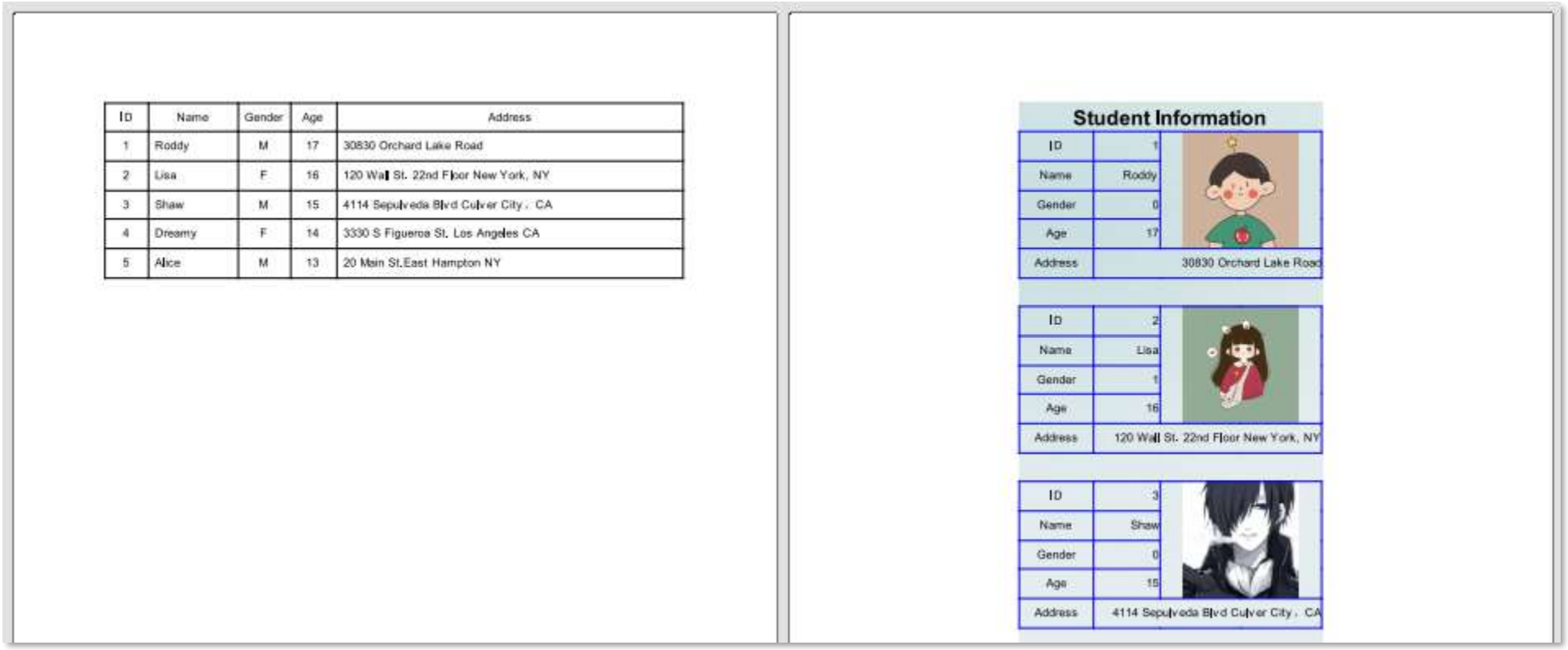
ID	2
Name	Lisa
Gender	1

sheet1 sheet2

9.1 Create report group



Output the report group as paginated PDF. We can see that both reports are output in the PDF format:



ID	Name	Gender	Age	Address
1	Roddy	M	17	30830 Orchard Lake Road
2	Lisa	F	16	120 Wall St. 22nd Floor New York, NY
3	Shaw	M	15	4114 Sepulveda Blvd Culver City , CA
4	Dreamy	F	14	3330 S Figueroa St. Los Angeles CA
5	Alice	M	13	20 Main St.East Hampton NY

Student Information

ID	1
Name	Roddy
Gender	0
Age	17
Address	30830 Orchard Lake Road

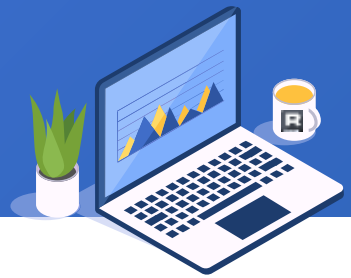
ID	2
Name	Lisa
Gender	1
Age	16
Address	120 Wall St. 22nd Floor New York, NY

ID	3
Name	Shaw
Gender	0
Age	15
Address	4114 Sepulveda Blvd Culver City , CA

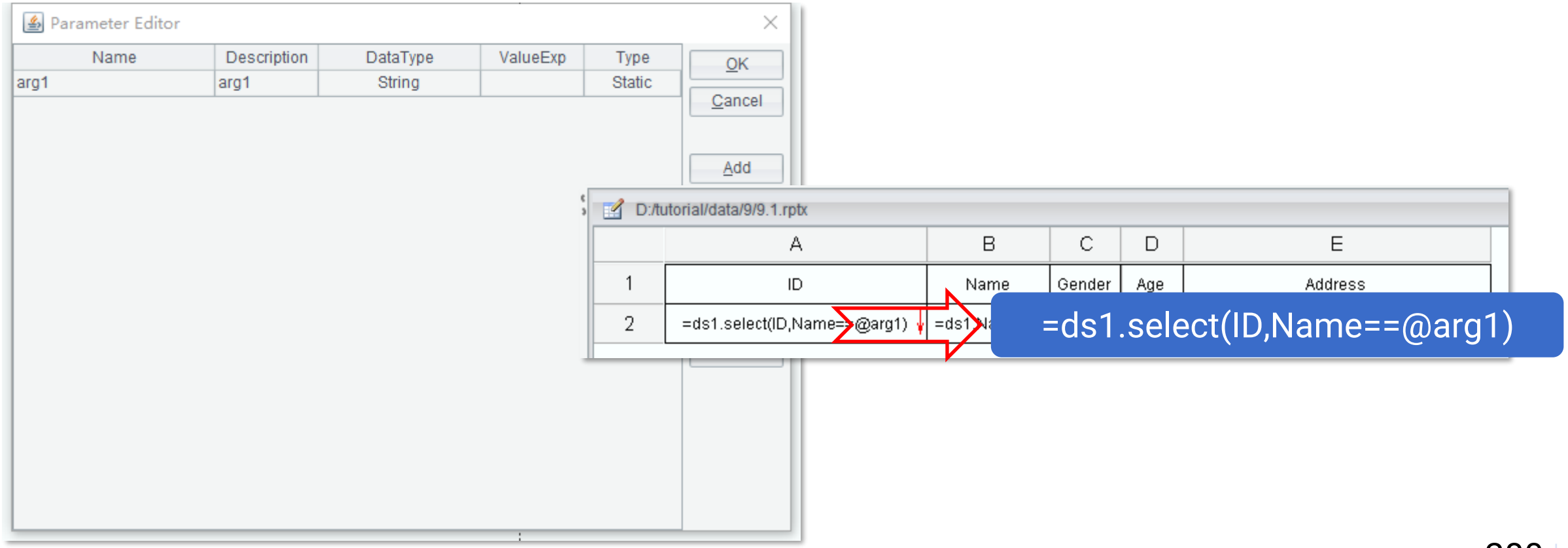
9.2

Report group parameters

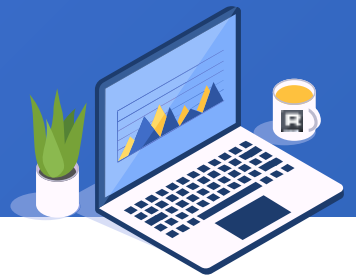
9.2 Report group parameters



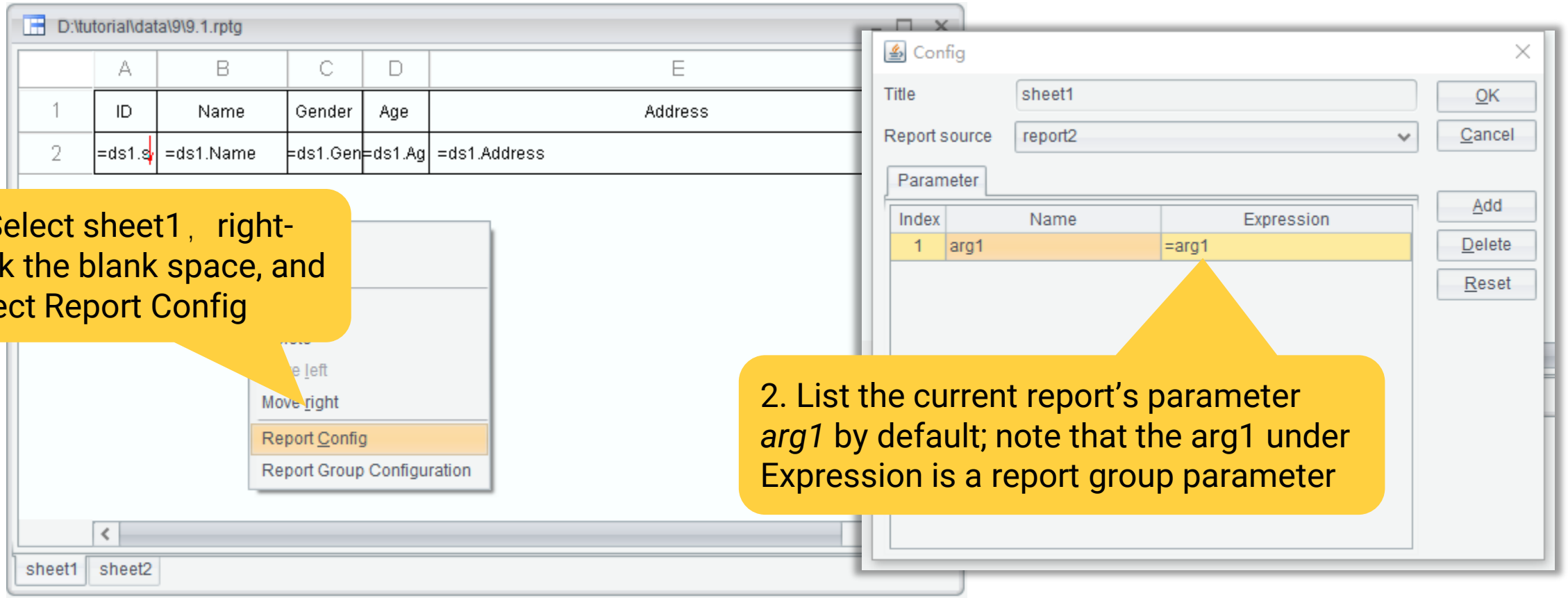
We can set parameters for a report group and query multiple reports at the same time according to the parameters. But first, we need to configure parameters for 2.4.rptx and 9.1.rptx :



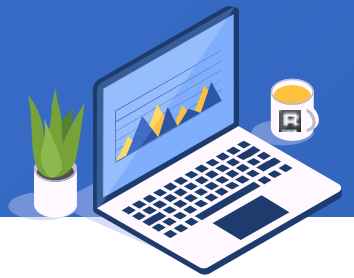
9.2 Report group parameters



Add a parameter *arg1* for the report group, too. Note that we should configure the report parameter value expression for every sheet.



9.2 Report group parameters



Preview the report group, enter parameter value Lisa, and get a report about Lisa only:

Preview report group:D:\tutorial\data\9\9.1.rptg

ID	Name	Gender	Age	Address
2	Lisa	F	16	120 Wall St. 22nd Floor New York, NY

sheet1 sheet2

Preview report group:D:\tutorial\data\9\9.1.rptg

Student Information

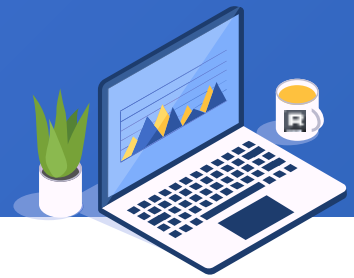
ID	2	
Name	Lisa	
Gender	1	
Age	16	
Address	120 Wall St. 22nd Floor New York, NY	

sheet1 sheet2

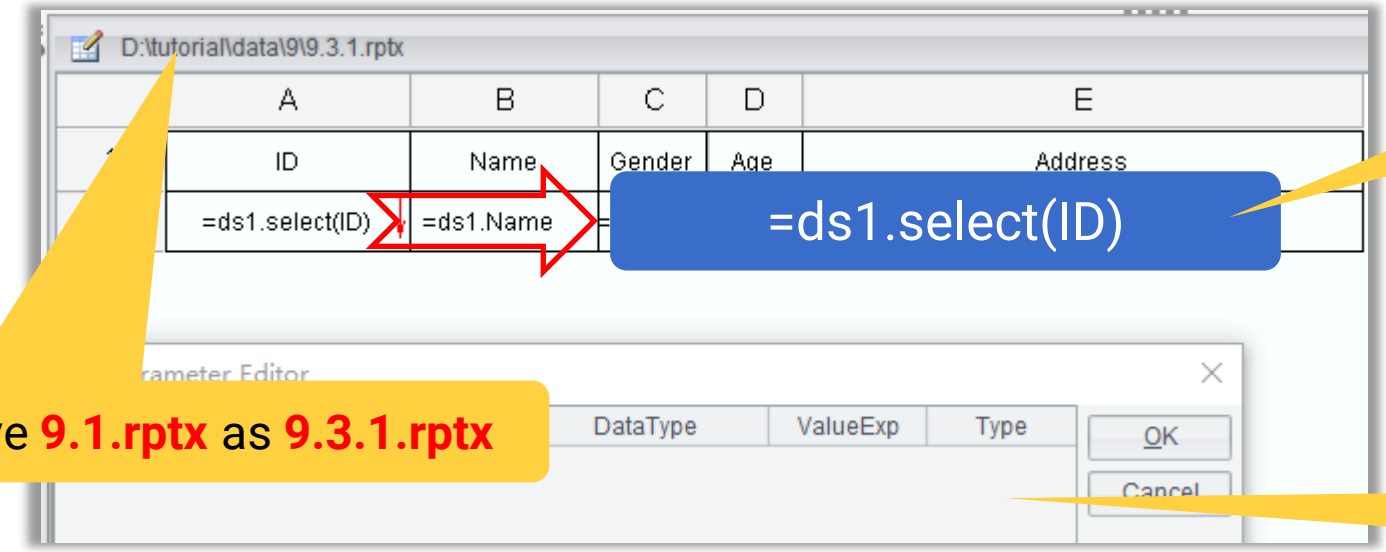
9.3

Common datasets & parameters

9.3 Common datasets & parameters



In section 9.2, we define a dataset for each report. In fact the two datasets are completely the same. Computing datasets repeatedly during report group computations lowers the performance.



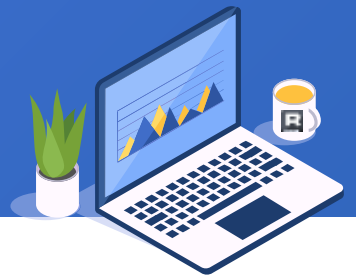
1. Save **9.1.rptx** as **9.3.1.rptx**

3. Delete the parameter reference from select() function

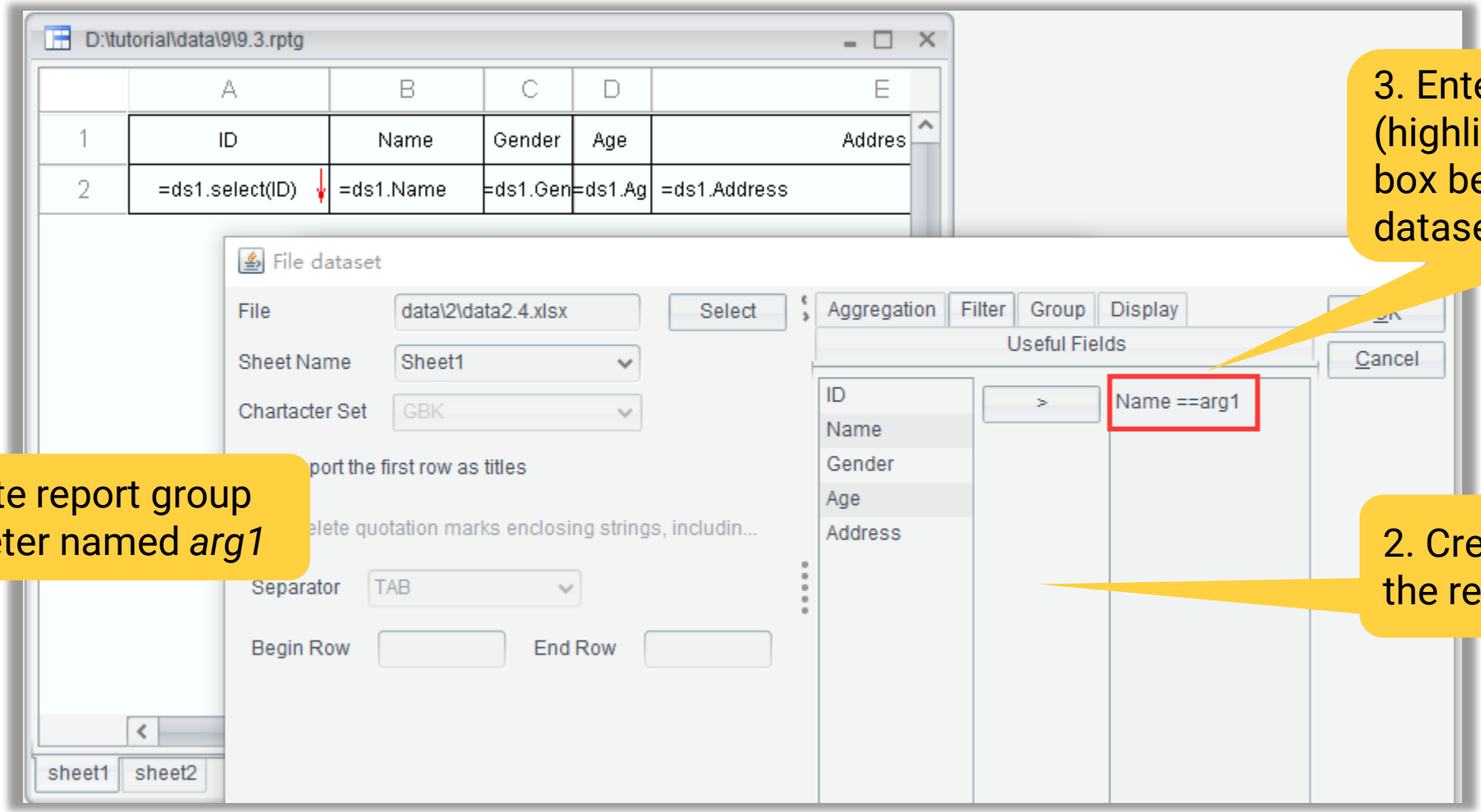
2. Delete the report's parameter as well as the dataset

Save the other report as 9.3.2.rptx and make the same modification

9.3 Common datasets & parameters



Use report files 9.3.1.rptx and 9.3.2.rptx to create a new report group and save it as 9.3.rptg :

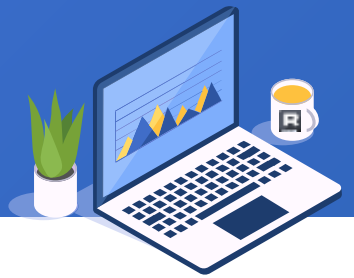


1. Create report group parameter named *arg1*

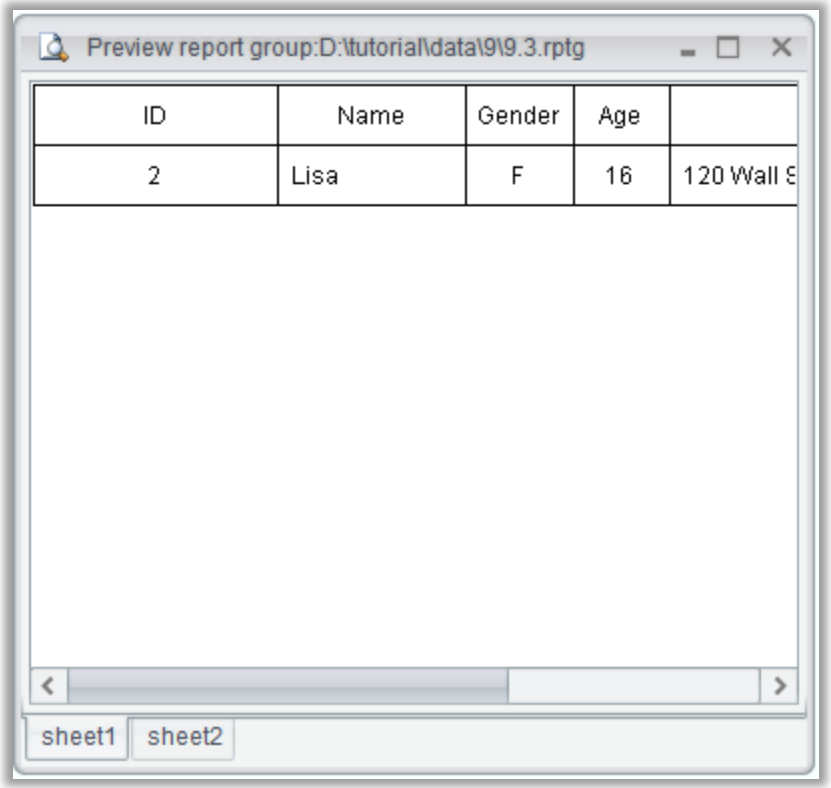
2. Create dataset for the report group

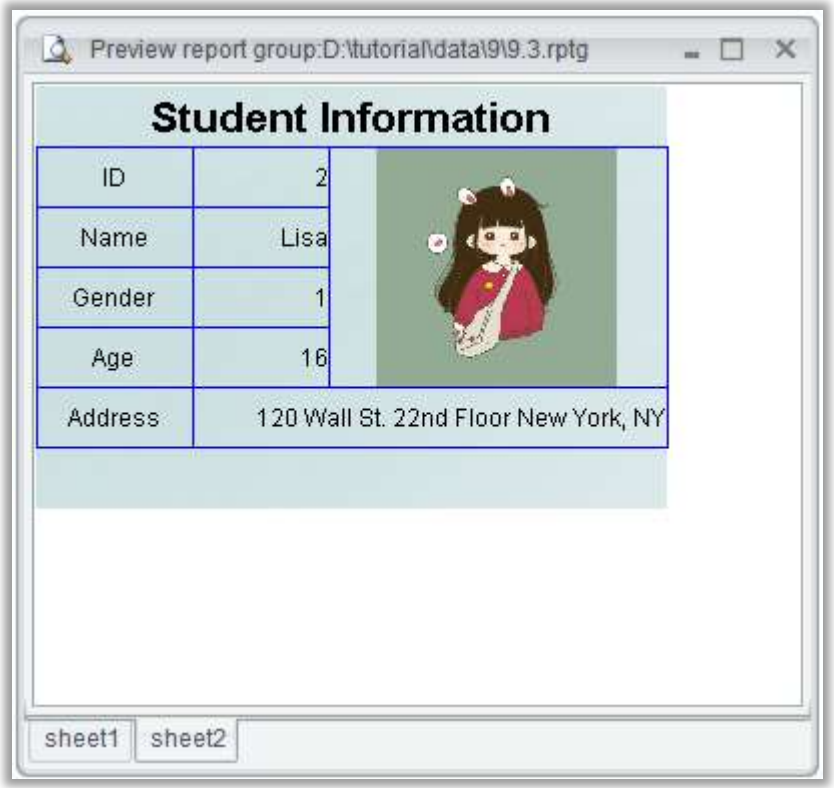
3. Enter filter expression (highlighted by the red box below) for the dataset's filter condition

9.3 Common datasets & parameters



Preview the report group, enter parameter value Lisa, and get a same report as in 9.2 section:

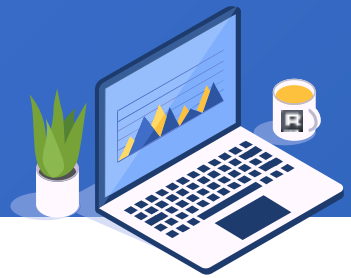




9.4

Continuous page numbers

9.4 Continuous page numbers



Copy report files 9.3.1.rptx and 9.3.2.rptx respectively and save them as 9.4.1.rpt and 9.4.2.rptx separately :

D:/tutorial/data/9/9.4.1.rptx

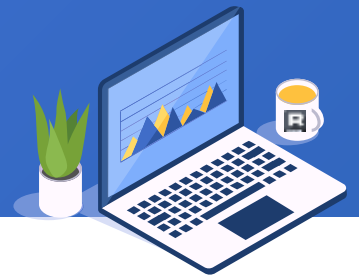
	A	B	C	D	E
1(PH)	ID	Name	Gender	Age	Address
2	=ds1.select(ID)	=ds1.Name	=ds1.Gen	=ds1.Ag	=ds1.Address
3					
4(PF)	="Page "+pno()				

1. Change certain report properties, including header and footer, and so on.

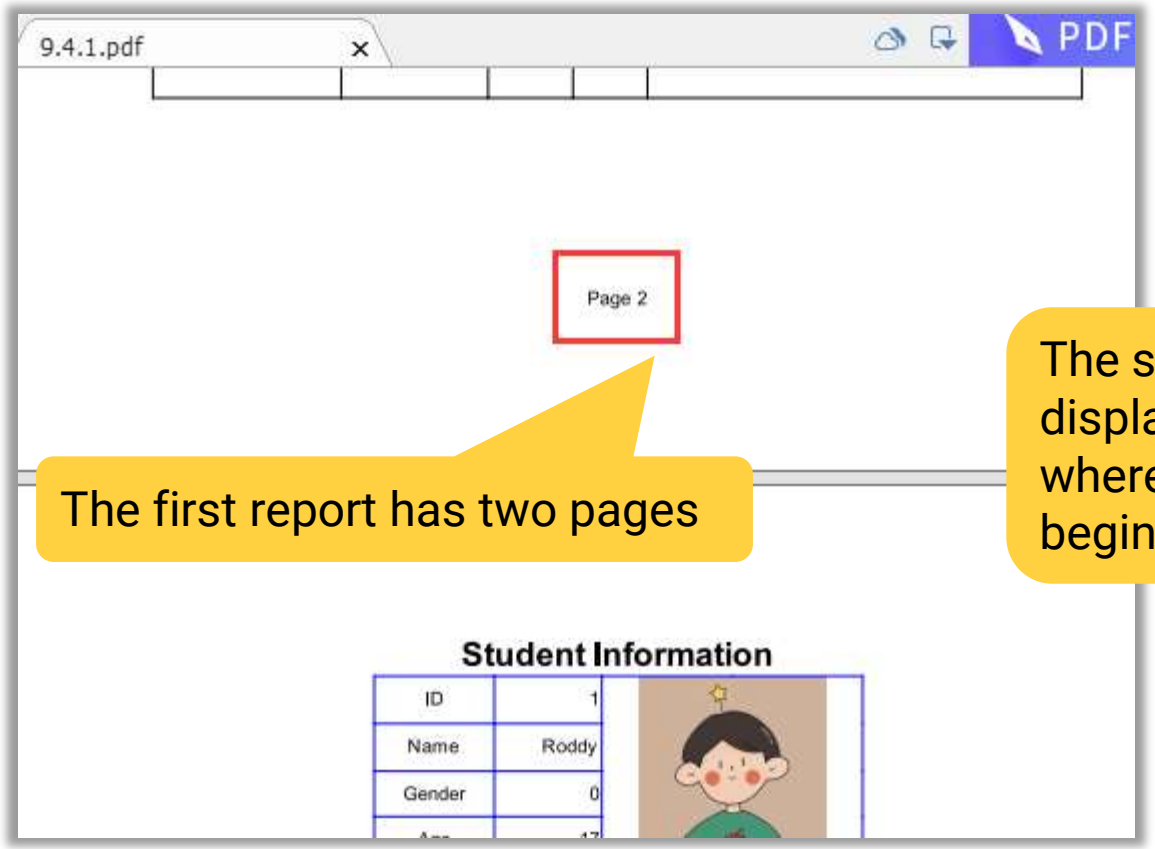
2. Use pagination function pno() at the footer

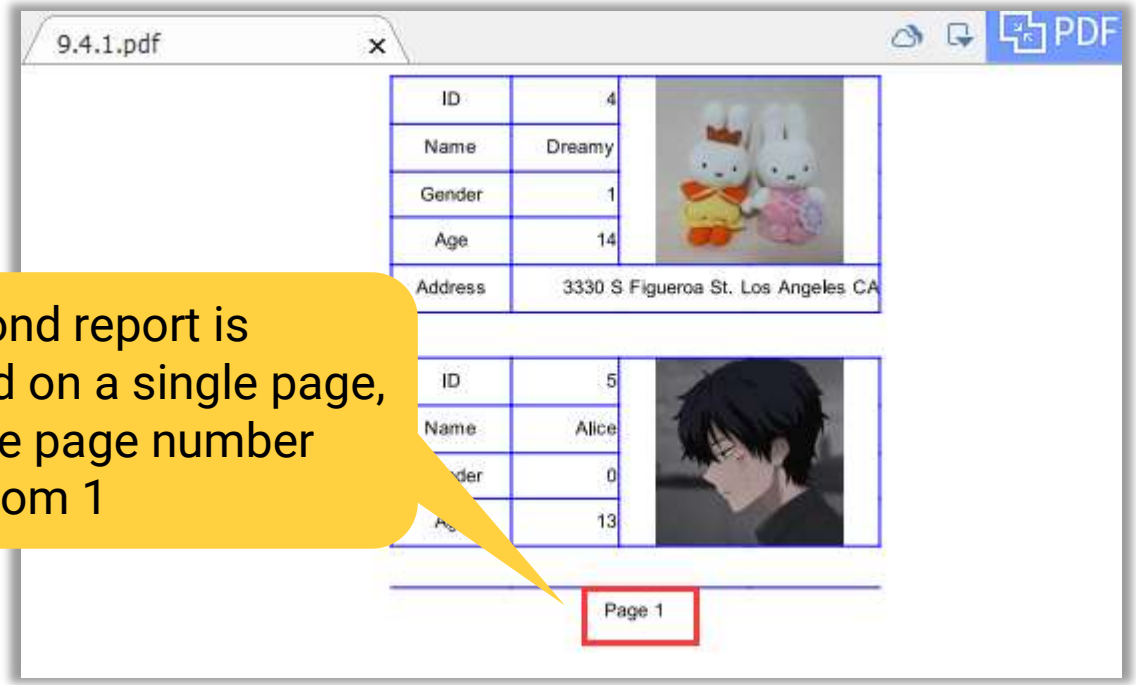
Note:
The pagination function and the display of header & footer only take effect in the output paginated file.

9.4 Continuous page numbers

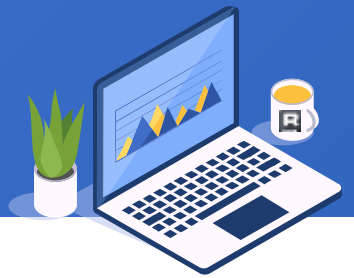


Add footer to report file 9.4.2.rptx,too. Then use the two paginated reports to create a report group 9.4.rptg. Preview the report group and output it as a paginated PDF file named 9.4.1.pdf :





9.4 Continuous page numbers



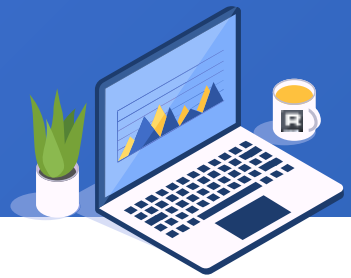
Yet pno() function alone cannot implement continuous page numbers. You need to use pcount() in report 9.4.1rptx to get the report's total number of pages and assign it variable *arg1*.

D:/tutorial/data/9/9.4.1.rptx

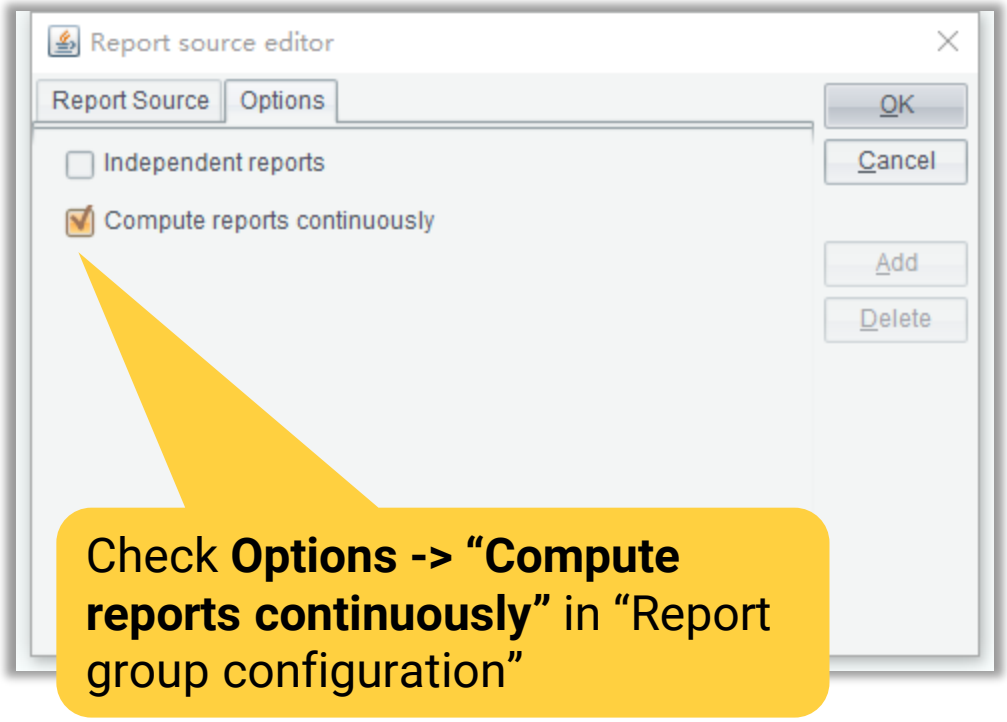
	A	B	C	D	E
1(PH)	ID	Name	Gender	Age	Address
2	=ds1.select(ID)	=ds1.Name	=ds1.Gen	=ds1.Ag	=ds1.Address
3	=arg1=pcount()				
4(PF)	="Page "+pno()				

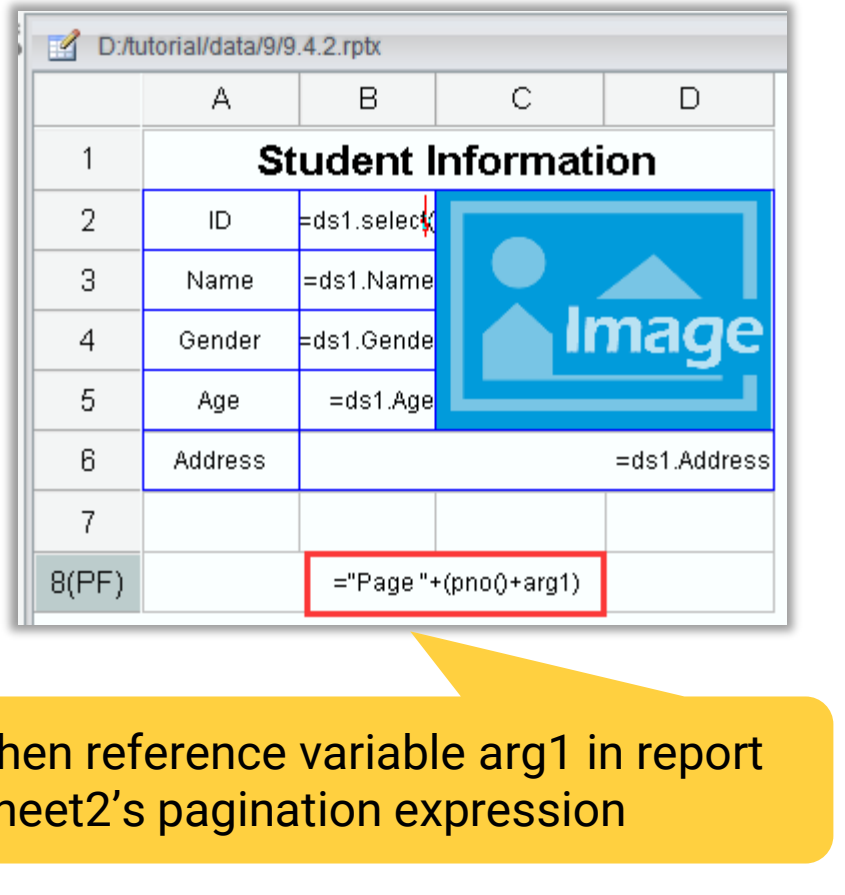
Use expression =arg1=pcount() to assign the total number of pages in report sheet1 to variable arg1

9.4 Continuous page numbers

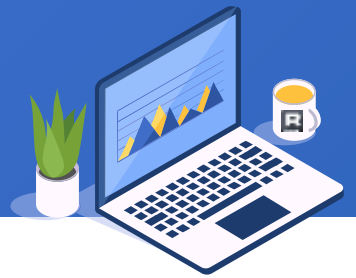


To reference variable arg1 defined in the previous report in report 9.4.2.rptx :

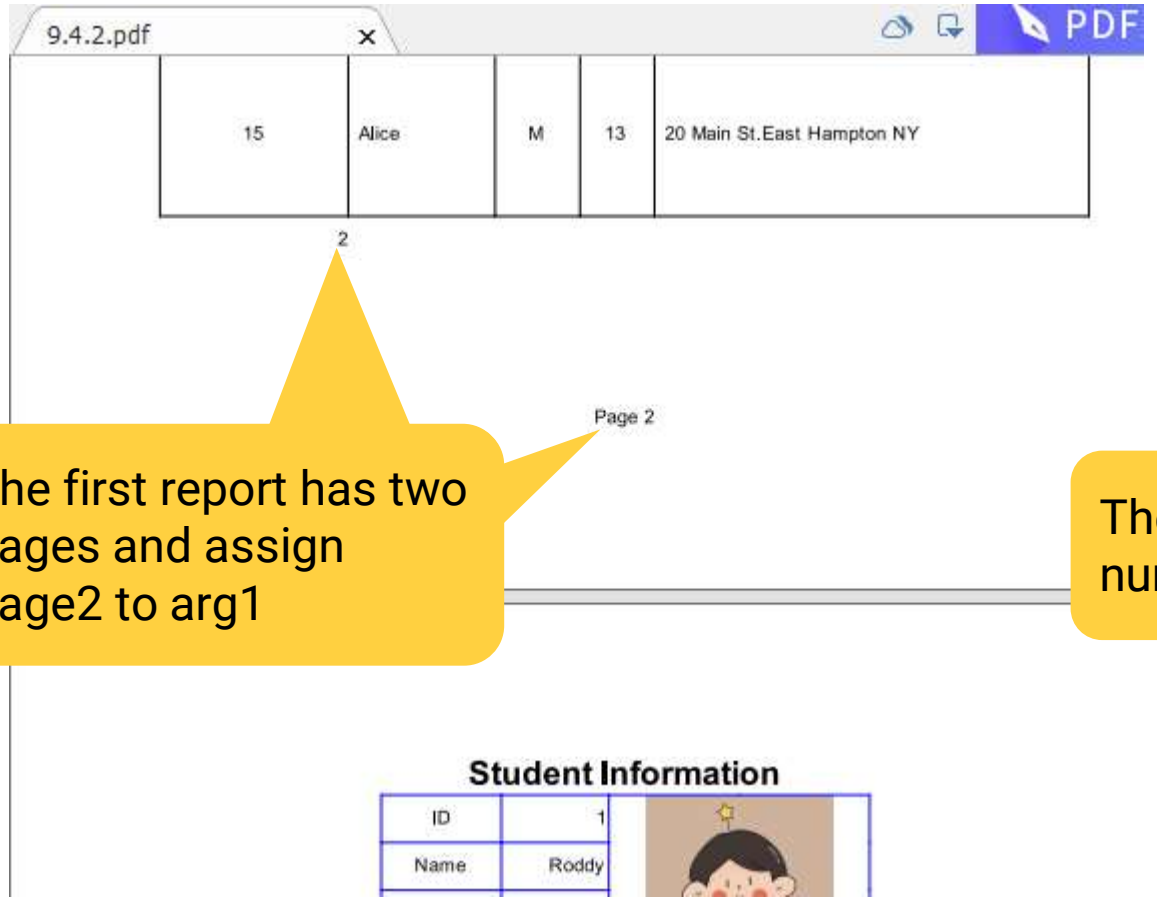




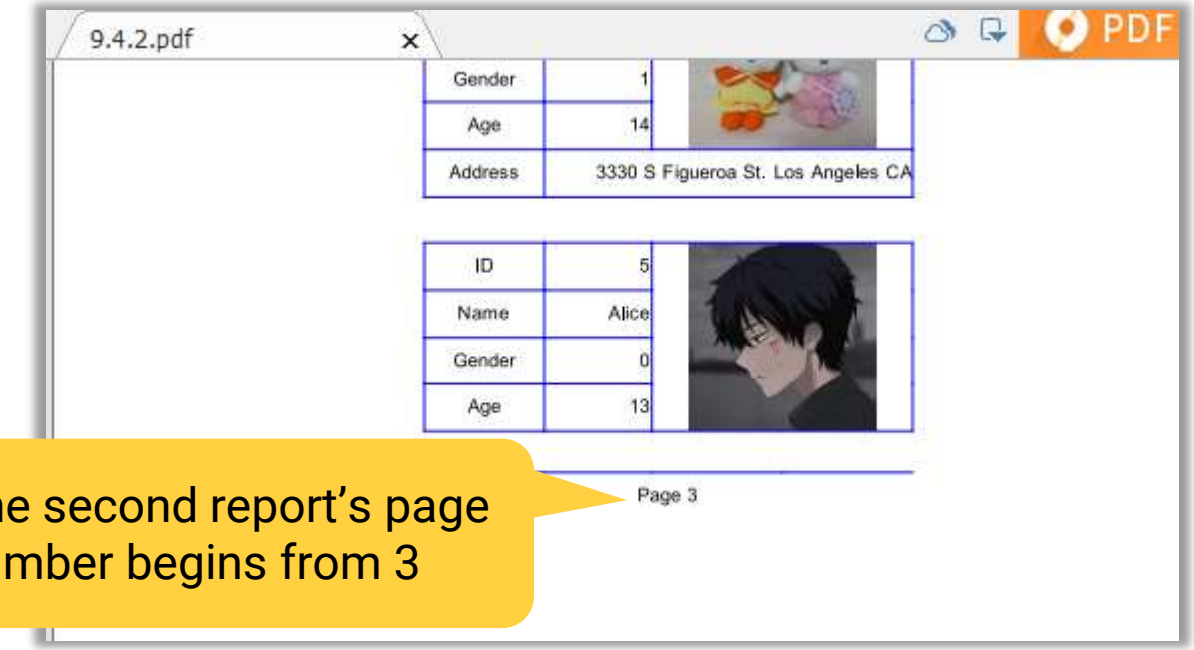
9.4 Continuous page numbers



Preview report group 9.4.rptg and output it as a paginated PDF named 9.4.2.pdf :



The first report has two pages and assign page2 to arg1



The second report's page number begins from 3

Tip:
Once "Compute reports continuously" is checked, a variable generated in a report can only be referenced by the next report.

THANKS

For Viewing