Ex03

Introduction: Data can be loaded from different data sources. However, in some special cases, we can create additional columns that based on the existing data columns. These newly created columns are called "Virtual Columns", or "Virtual Fields", or "Calculated Columns/Fields".

Objective: Introduce 2 type of Virtual Columns in Power BI and compare the differences among them.

Pre-requisites:

- 1) Understand how to load data from MS Excel
- 2) Construct the simple Data Model and Simple Table visual element under reporting.

Steps:

Part-1: Prepare Data Workbook

1. Copy from Ex02.xlsx and rename it as "Ex03.xlsx". We will use the same data set from Exercise 2

Part-2: Loading Data from Power BI Desktop

2. Crate new Power BI project with name "Ex03.pbix".



Downloads

Music

3. From the main UI, select load Excel data source:

		2 9					ExC	2 - Powe	r BI Desktop			
	File	Home	Insert I	M ig	View	Help						
1	Caste	X Cut È Copy ≪ Format painte	Get data v	Excel Power BI datasets	SQL Er Server da	nter Recent ata sources ~	Transform Refresh data v	New visual	Text More box visuals v	New Quick measure measure	Publish	
		Clipboard		D	ata		Queries		Insert	Calculations	Share	
4.	In	the "Ope	n" dialo	g box, se	lect ex	cel work	book "Ex03.x	lsx" y	/ou just cre	eated:		
	(Organize 🔻 New folder										
		🚆 Docu	uments	^	Name							

Ex03.xlsx

5. Press "Open", in the "Navigator" dialog box, select just TblEmployee. (Don't load at this moment):

Navigator								
	٩	TblEmple	oyee					L.
Display Options 🔻	C.	EID	Name	Gender	Department	Race	Supervisor	Age
🖌 🗾 Ex03.xlsx [5]		1000	Tong Sam Pah	м	П	Chinese	1005	;
TblDepartment		1002	Yong Tau Foo	м	FN	Chinese	1015	
		1005	Low Mee	F	п	Chinese	1015	1
		1008	Low Shi Fun	F	IT	Chinese	1005	;
🔲 🎹 TblRace		1010	Ali	м	HR	Malay	1015	;
Employee		1012	Abu	м	FN	Malay	1002	
Lists		1015	Ahmad	м	п	Malay	null	1
		1017	Aaron	м	OP	null	1015	;
		1020	Ah Chong	м	SA	Chinese	1028)
		1022	A		20	h delete	1015	

6. Still under "Navigator" dialog box, press the "Transform Data" button at the bottom right of the dialog box:

Load	Transform Data	Cancel

This will open the Query Editor:

📕 🗧 🗧 Ex03 - Power	Query	Editor										
File Home Tran	sform	Add Column	View To	ols Help								
Close & Apply + Source + Source +	t Er	nter ata Data source settings	Manage Parameters •	Refresh Preview + M	operties dvanced Editor lanage 👻	Choose Columns • C	Remove olumns •	Keep Remove Rows • Rows •	Ž↓ Z↓ ſĬ┐ Split Column	Group By 1,2 Re	ype: Whole Number - e First Row as Headers - place Values	5 N
Close New Que	ery	Data Sources	Parameters	Qu	ery	Manage Co	olumns	Reduce Rows	Sort	Trans	form	
Queries [1] 🔨 <		rvisor 💌	1 ² 3 Age		1 ² 3 Basic Salary		1 ² 3 Chart		1.2 Monthly S	Salary 💌	ABC 123 EPF Account	-
TblEmployee	1	1005		23		5000		5000)	4450		1150
	2	1015		25		4800		4800	1	4272		1104
	3	1015		26		5100		5100		4539		1224
	4	1005		24		4300		4300		3827		989
	5	1015		29		4700		4700	1	4183		1081
	6	1002		35		5340		5340)	4752.6		1281.6
	7	nul		40		6500		6500		5785		1560
	8	1015		32		5500		5500)	4895		1320
	9	1028		28		5600		5600		4984		1344
	10	1015		30		5780		5780)	5144.2		1387.2
	11	1015		25		4325		4325	1	3849.25	1	994.75
	12	1002		27		4340		4340	1	3862.6		998.2
	13	1015		26		5345		5345		4757.05		1282.8

- 7. From the only table (TblEmployee), right click the column headers to "Remove" the following 3 columns (Need to scroll to far right of the table):
 - a. Chart
 - b. Monthly Salary
 - c. EPF Amount

Notes: These columns are not needed. We can reproduce from Power BI later.

Change the name of newly created **Applied Step** as "Removed unwanted Columns":

- ▲ APPLIED STEPS
 Source
 Navigation
 Changed Type
 ★ Removed Unwanted Columns
- 8. Select "Custom Column" under "Add Column" ribbon tab:



9. Under "Custom Column" dialog box, prepare the following, the press "OK":

		×
Custom Column		
Add a column that is proputed from the other columns.		
New column name		
Monthly Salary		
Custom column formula 🕕	Available columns	
= (1.0-0.11)*[Basic Salary]	EID	
	Name	
	Gender	
	Department	
	Race	
	Supervisor	
	Age	\sim
	D. C.	
	<< Insert	
Learn about Power Query formulas		
 No syntax errors have been detected. 	ОК	Cancel

10. Change the name of newly create Applied Step as "Added Monthly Salary Column":
APPLIED STEPS



11. Select the type icon at the right side of the newly created column, select "Fixed decimal number".



12. Rename the Step as "Change Monthly Salary Type"

▲ APPLIED STEPS

Source	-#÷
Navigation	-#-
Changed Type	
Removed Unwanted Columns	
Added Monthly Salary Column	
≻ Change Monthly Salary Type	

13. Select "Conditional Column" under "Add Column" ribbon tab:



14. Under "Add Conditional Column" dialog box, prepare the following, then press "OK":



- 15. Change the name of newly create Applied Step as "Added EPF From Employer Column".
 - Added Monthly Salary Column 🚸
 - Change Monthly Salary Type
 - ➤ Added EPF Employer Column

Observe the newly created column.

16. Change the newly created column to "Decimal number".



17. Change the step name to "Change EPF Employer Type".



- ➤ Change EPF Employer Type
- 18. Add another new Column.



Notes: The Else if is generated by pressing "Add Clause" button.

23. Change the name of newly create Applied Step as "Added Socso Column":

Added EPF Account Column * Change EPF Account Type

× Added Socso Column

24. Change the newly created column type to "Fixed decimal number".



25. Change the name of newly create Applied Step as "Change Socso Type":

Change EPF Account Type Added Socso Column

🗡 Change Socso Type

26. The 4 newly created columns here are Virtual Columns:

	asic Salary 💌	\$ Mo	onthly Salary 💌	1.2 EPFEmployer 💌	\$ EPF Account	\$ Socso 💌
1	5,000.00		4,450.00	0.12	1,150.00	10.00
2	4,800.00		4,272.00	0.13	1,152.00	10.00
3	5,100.00		4,539.00	0.12	1,173.00	20.00
4	4,300.00		3,827.00	0.13	1,032.00	10.00
5	4,700.00		4,183.00	0.13	1,128.00	20.00
6	5,340.00		4,752.60	0.12	1,228.20	30.00
7	6,500.00		<u>5,785.00</u>	0.12	1,495.00	30.00
8	5,500.00		4,895.00	0.12	1,265.00	30.00

These virtual columns are created during data loading time by M-Script. The actual data will be generated and stored. Therefore, upon creation no distinction with others loaded columns from data source.

27. The Applied Steps should look like this now:

APPLIED STEPS



28. Select the "Close & Apply" under "Home" ribbon tab to start the loading and transformation:

📔 д 🗧 Ex02 - Power Query Editor									
File	Aome	Transf	orm	Add Column	Vie				
		6			[
Close & Apply •	New Source •	Recent Sources •	Enter Data	Data source settings	M. Para				
Close	N	lew Query	Data Sourc	Para					
Close & A Close ti apply a	Apply he Query E ny pending	D							

- 29. Wait until the loading process finish.
- 30. Back to main UI, select the Model View. There should be only one table in the model. Can you see any different between real columns and virtual columns?
- 31. Select the Report View.
- 32. Right click TblEmployee from right most "Field Panel" to select "New Column":



34. Another new Virtual column is generated:



Notes: This is Virtual column at the reporting level. The system wouldn't store the data, the data will be generated during report rendering. Therefore, it will consume less memory but more CPU power. The advantages of this type of virtual column are:

- a) Can use DAX functions
- b) Can refer to Measures
- 35. Create a Table visual element to test this Virtual Column:

000					
	< Β	Back to report			
_	EID	Name	Basic Salary	EPF Account	EPF Amount
唱	1000	Tong Sam Pah	\$5,000	\$1,150	\$1,150
	1002	Yong Tau Foo	\$4,800	\$1,152	\$1,152
	1005	Low Mee	\$5,100	\$1,173	\$1,173
	1008	Low Shi Fun	\$4,300	\$1,032	\$1,032
	1010	Ali	\$4,700	\$1,128	\$1,128
	1012	Abu	\$5,340	\$1,228.2	\$1,228.2
	1015	Ahmad	\$6,500	\$1,495	\$1,495
	1017	Aaron	\$5,500	\$1,265	\$1,265
	1020	Ah Chong	\$5,600	\$1,288	\$1,288
	1022	Azizi	\$5,780	\$1,329.4	\$1,329.4
	1028	Shila Hamzah	\$4,325	\$1,038	\$1,038
	1030	Narayanan	\$4,340	\$1,041.6	\$1,041.6
	1032	Fatimah	\$5,345	\$1,229.35	\$1,229.35
	Total		\$66,630	\$15,549.55	\$15,549.55