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".

3. From the main UI, select load Excel data source:
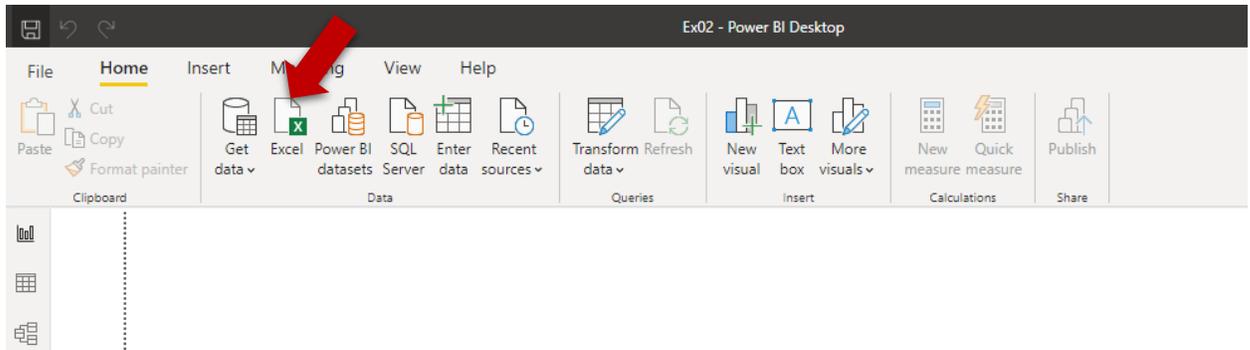
4. In the "Open" dialog box, select excel workbook "Ex03.xlsx" you just created:
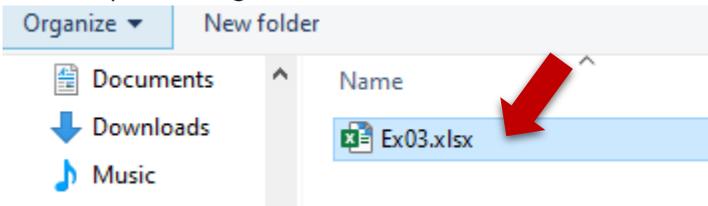
5. Press "Open", in the "Navigator" dialog box, select just TblEmployee. (Don't load at this moment):
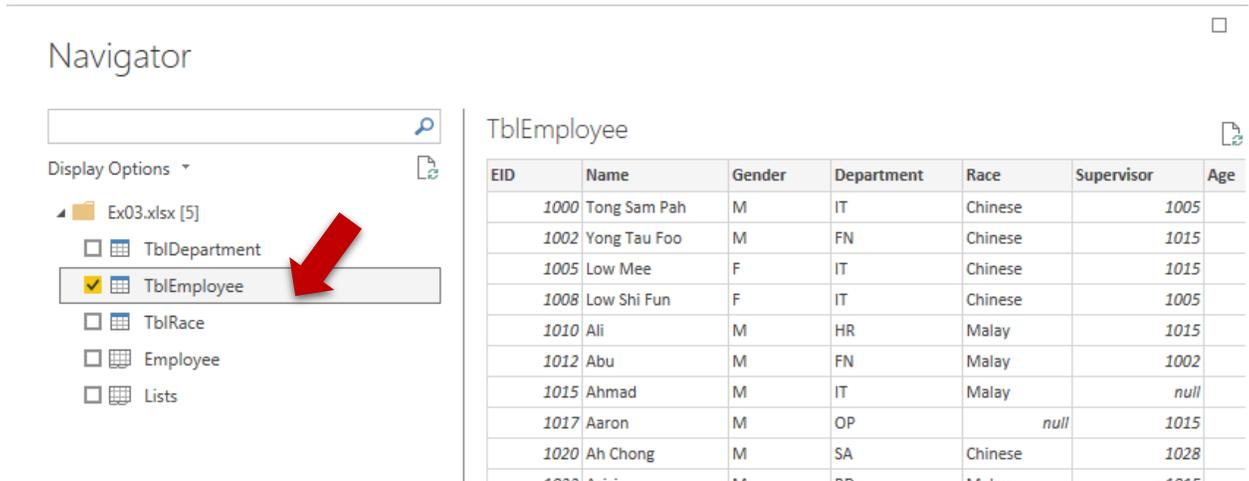
6. Still under "Navigator" dialog box, press the "Transform Data" button at the bottom right of the dialog box:

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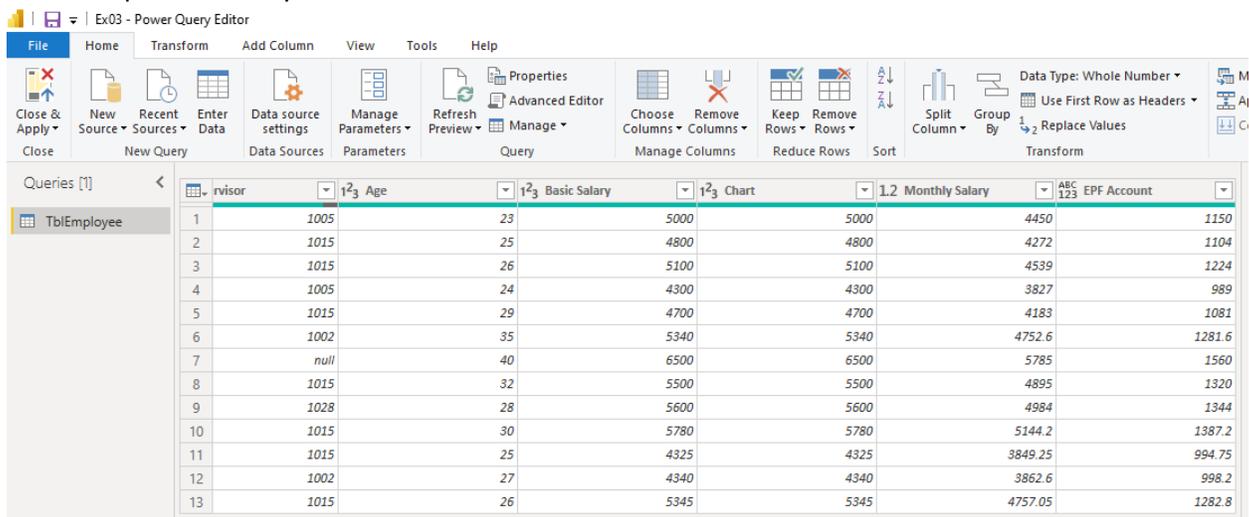
7. From the only table (TblEmployee), right click the column headers to "Remove" the following 3 columns (Need to scroll to far right of the table):
   a. Chart
   b. Monthly Salary
   c. EPF Amount

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":
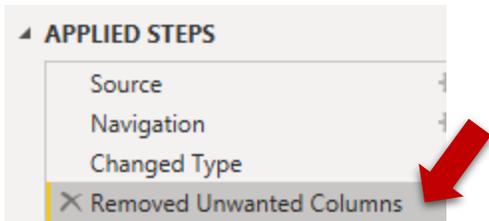
8. Select "Custom Column" under "Add Column" ribbon tab:
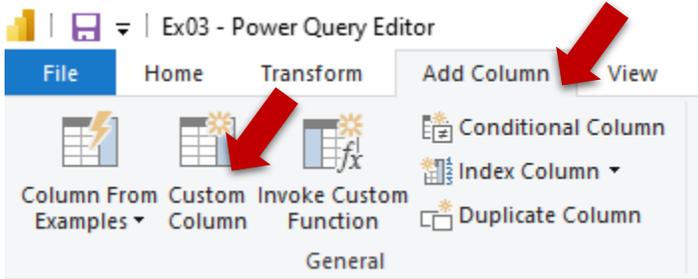
9. Under "Custom Column" dialog box, prepare the following, the press "OK":
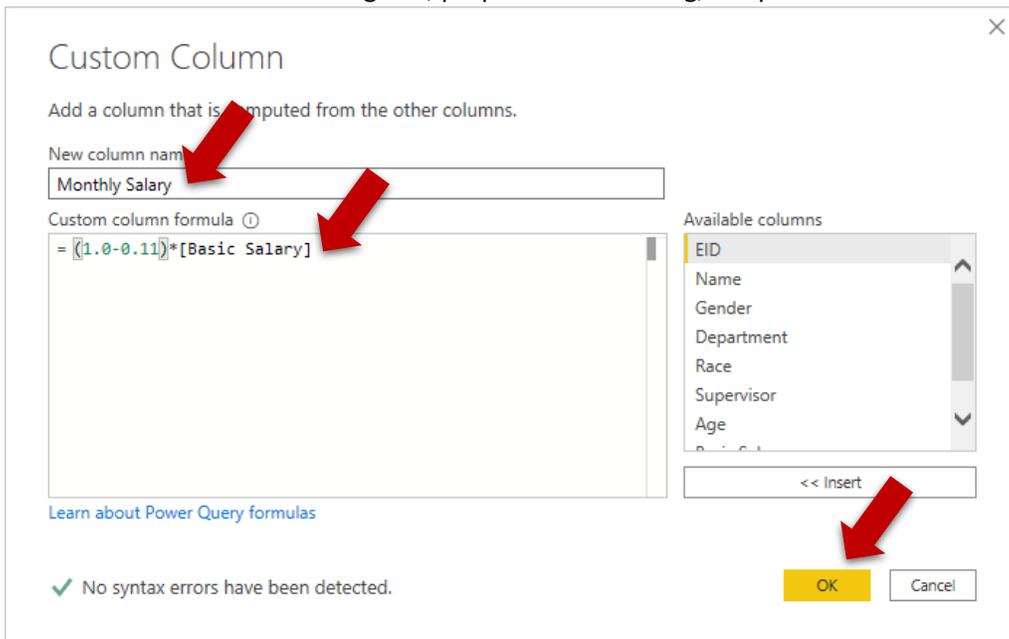
10. Change the name of newly create Applied Step as "Added Monthly Salary Column":
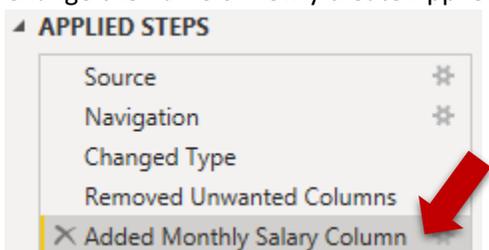
Also observe the newly created column.
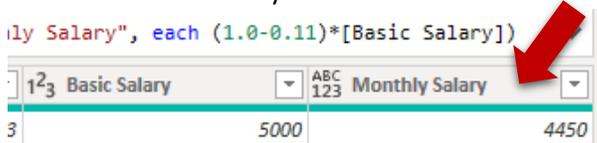
11. Select the type icon at the right side of the newly created column, select "Fixed decimal number".
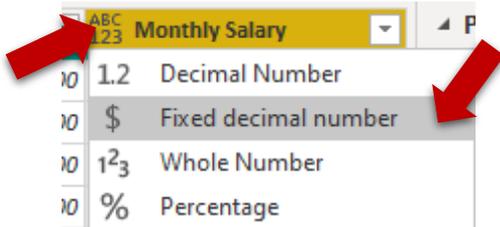
12. Rename the Step as "Change Monthly Salary Type"
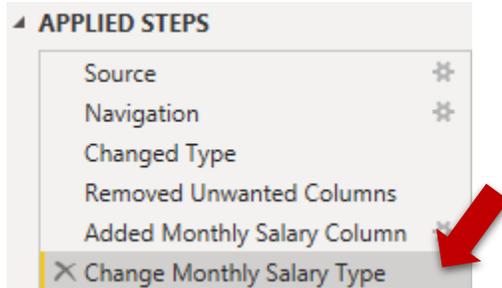
13. Select "Conditional Column" under "Add Column" ribbon tab:
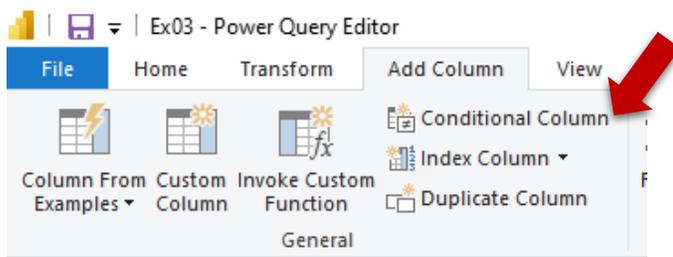
14. Under "Add Conditional Column" dialog box, prepare the following, then press "OK":
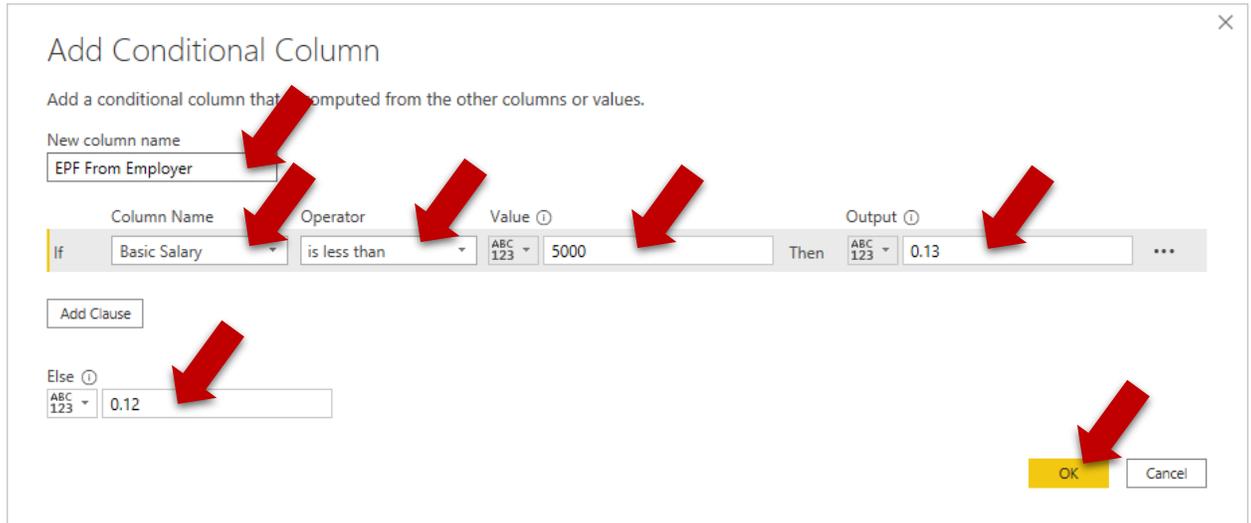
15. Change the name of newly create Applied Step as "Added EPF From Employer Column".
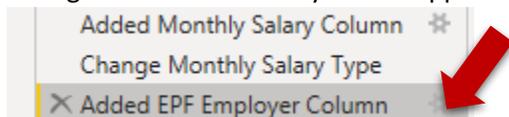
Observe the newly created column.

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

17. Change the step name to "Change EPF Employer Type".
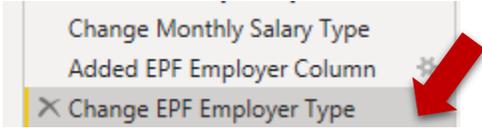
18. Add another new Column.

Custom Column

Add a column that is computed from the other columns.

New column name

EPF Account

Custom column formula ⓘ

= (0.11 + [EPFEmployer])*[Basic Salary]

19. Change the step name to "Added EPF Account Column".
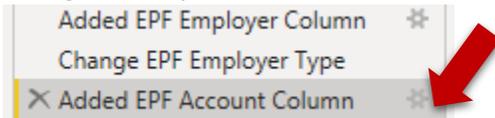
20. Change the newly created column type to "Fixed decimal number".

21. Change the step name to "Change EPF Account Type".
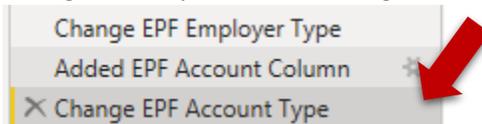
22. Create another "Conditional Column", and prepare the following:

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

Socso

	Column Name	Operator	Value ⓘ		Output ⓘ	
If	Age	is less than	25	Then	10	...
Else If	Age	is greater than	30	Then	30	

Add Clause

Else ⓘ

20

OK   Cancel

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

23. Change the name of newly create Applied Step as "Added Socso Column":
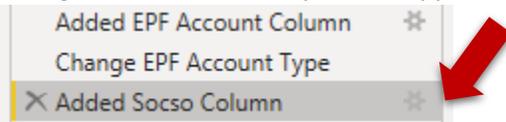
24. Change the newly created column type to "Fixed decimal number".

25. Change the name of newly create Applied Step as "Change Socso Type":
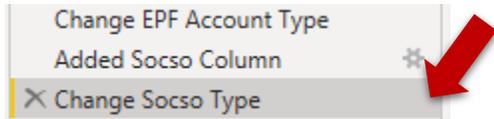
26. The 4 newly created columns here are Virtual Columns:

asic Salary	Monthly 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	5,785.00	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:
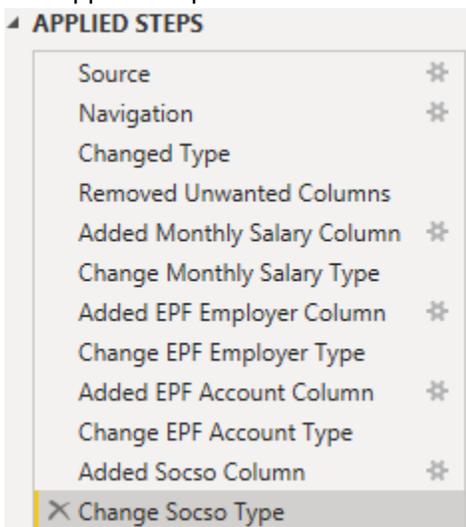
28. Select the "Close & Apply" under "Home" ribbon tab to start the loading and transformation:
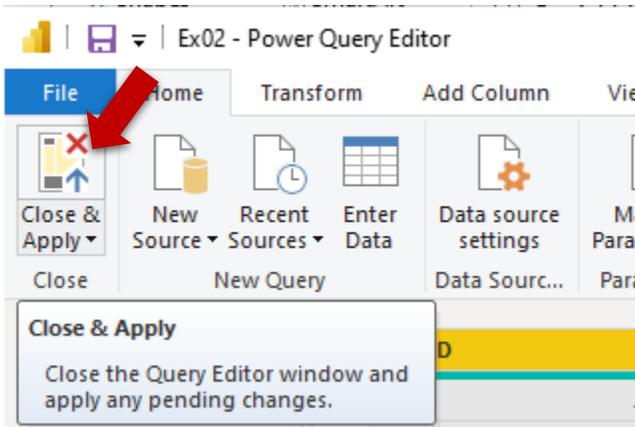
29. Wait until the loading process finish.

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":
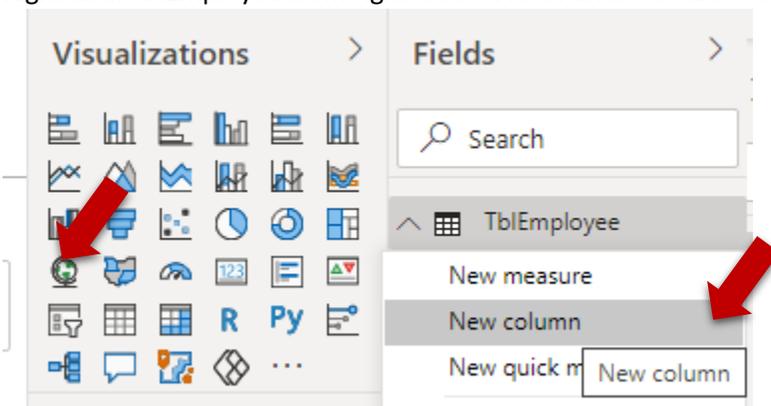
33. An entry appears just under the ribbon. Key-in the following:

EPF Amount = (0.11 + IF([Basic Salary]<5000,0.13,0.12)) * [Basic Salary]
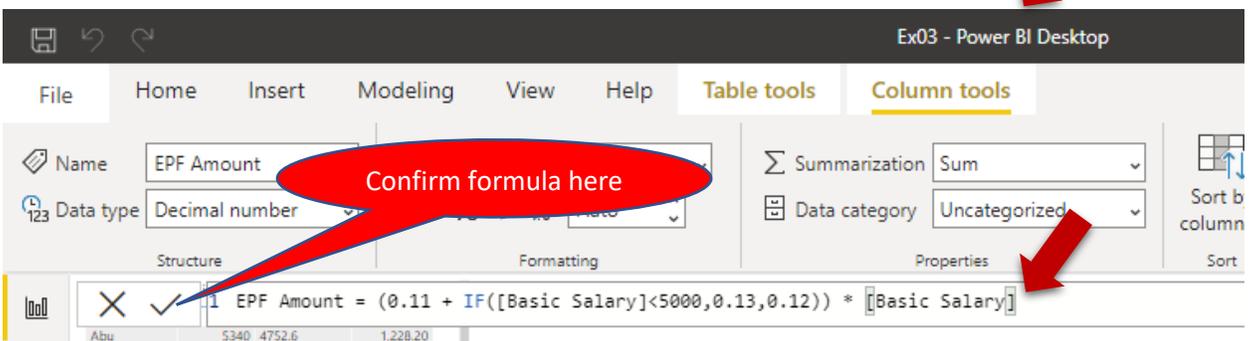
34. Another new Virtual column is generated:
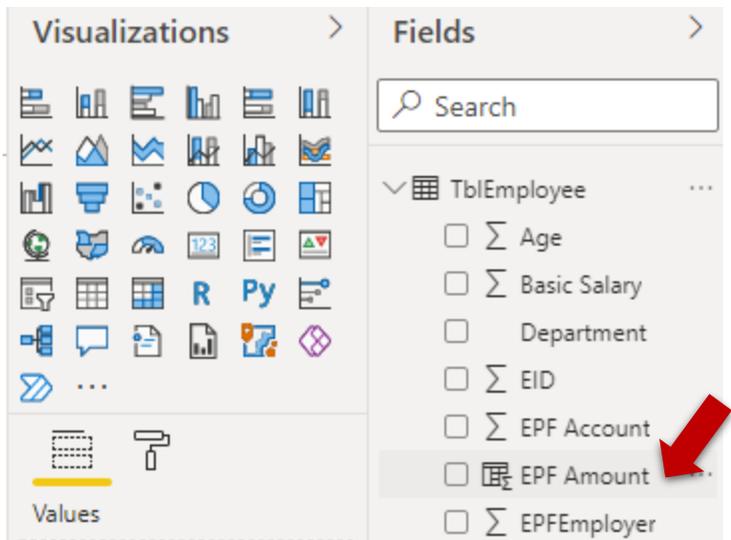
Notes: This is Virtual column at the reporting level. The system wouldn't store the data, the data will be generated during report rendering. Therefore, it will consume less memory but more CPU power. The advantages of this type of virtual column are:

a) Can use DAX functions
b) Can refer to Measures

35. Create a Table visual element to test this Virtual Column:

EID	Name	Basic Salary	EPF Account	EPF Amount
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**