

DR. ALVIN'S PUBLICATIONS

# LEARNING POWER BI

## PART V

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DAX  
DR. ALVIN ANG



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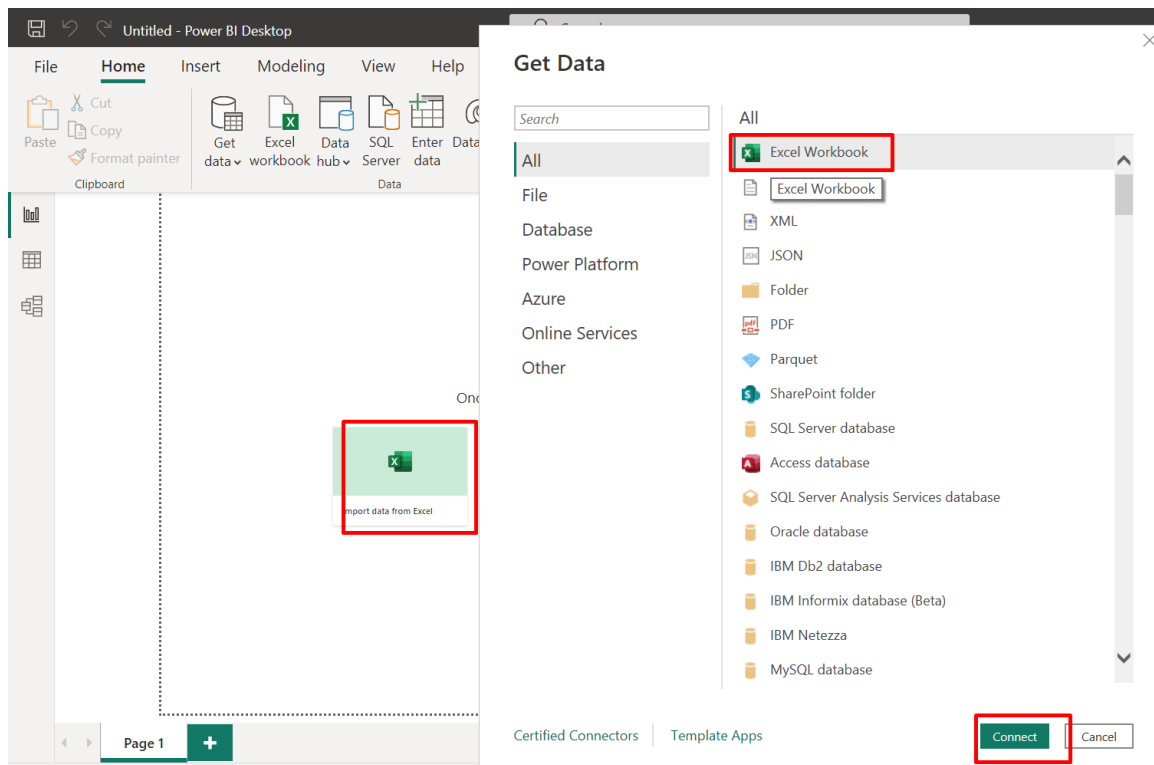
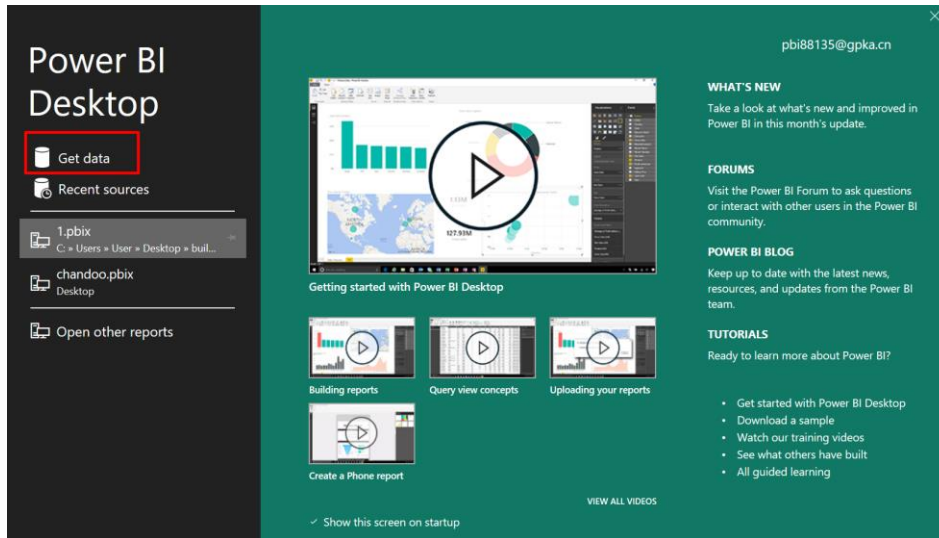
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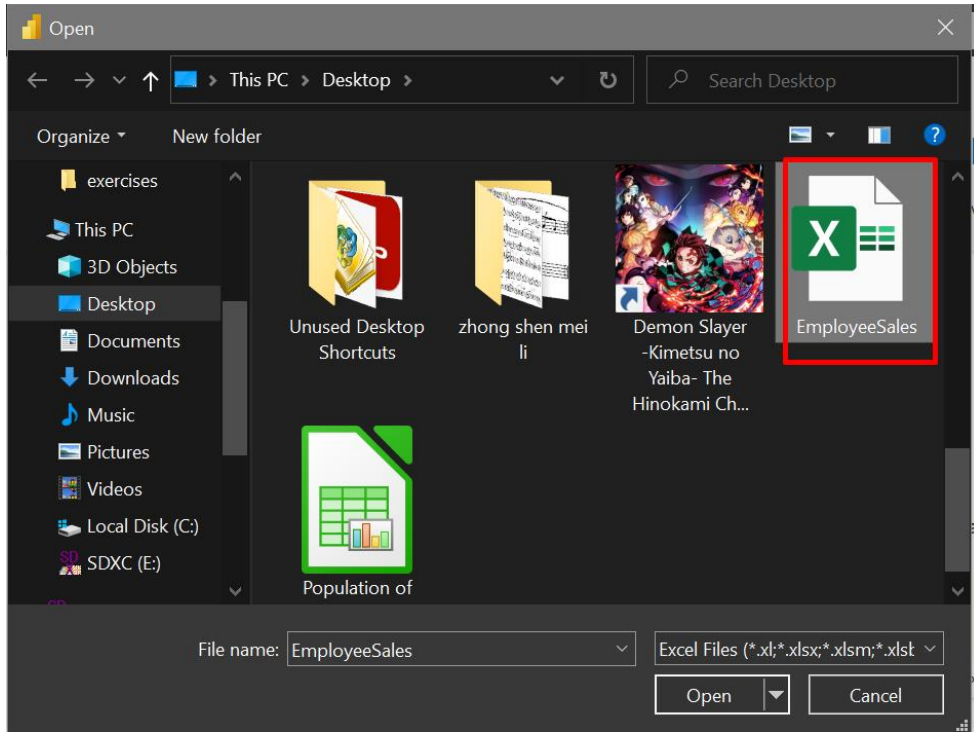
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## I. GET DATA

<https://www.alvinang.sg/s/EmployeeSales.xlsx>





Navigator

EmployeeSales.xlsx [1]

EmployeeSales

FirstName	LastName	Education	Occupation	YearlyIncome
John	Yang	Bachelors	Professional	90000
Rob	Johnson	Bachelors	Management	80000
Ruben	Torres	Partial College	Skilled Manual	50000
Christy	Zhu	Bachelors	Professional	80000
Rob	Huang	High School	Skilled Manual	60000
John	Ruiz	Bachelors	Professional	70000
John	Miller	Masters Degree	Management	80000
Christy	Mehta	Partial High School	Clerical	50000
Rob	Verhoff	Partial High School	Clerical	45000
Christy	Carlson	Graduate Degree	Management	70000
Gail	Erickson	Education	Professional	90000
Barry	Johnson	Education	Management	80000
Peter	Krebs	Graduate Degree	Clerical	50000
Greg	Alderson	Partial High School	Clerical	45000

Load Transform Data Cancel

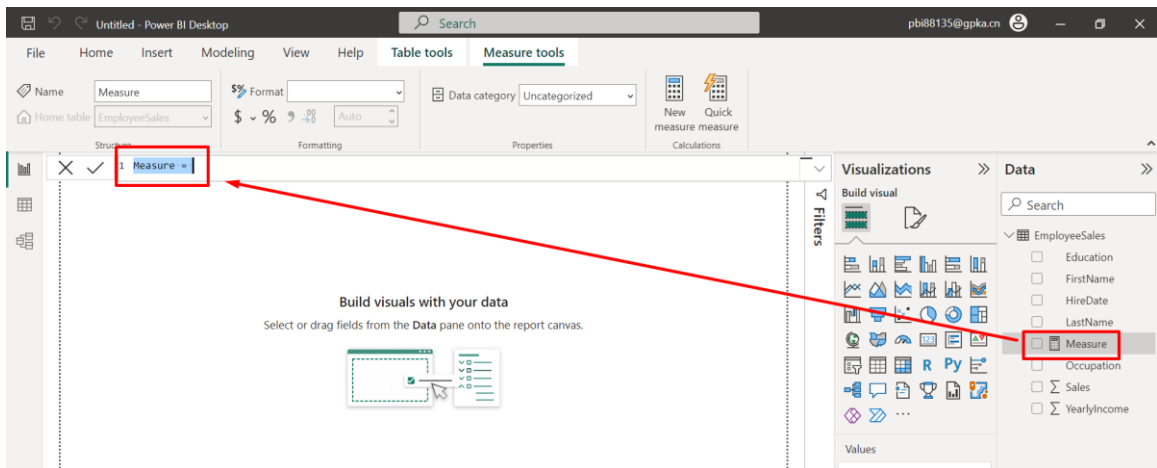
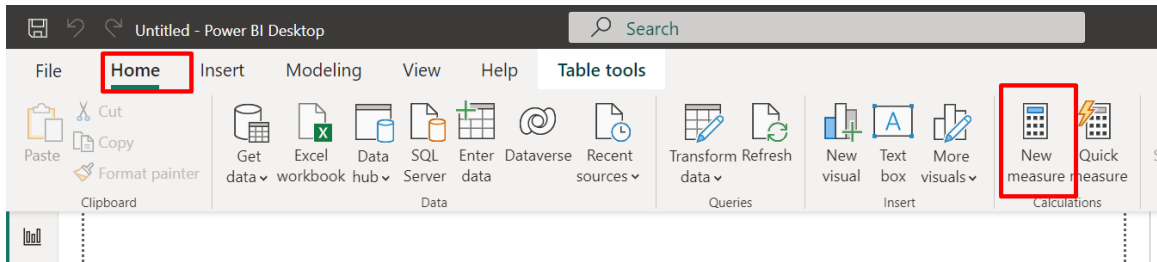
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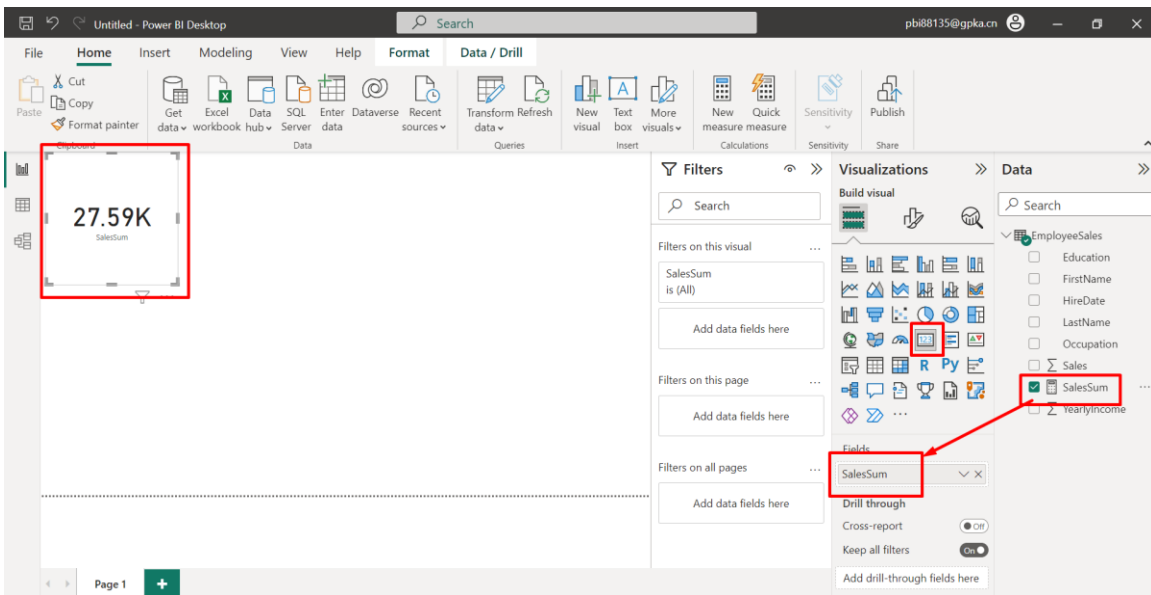
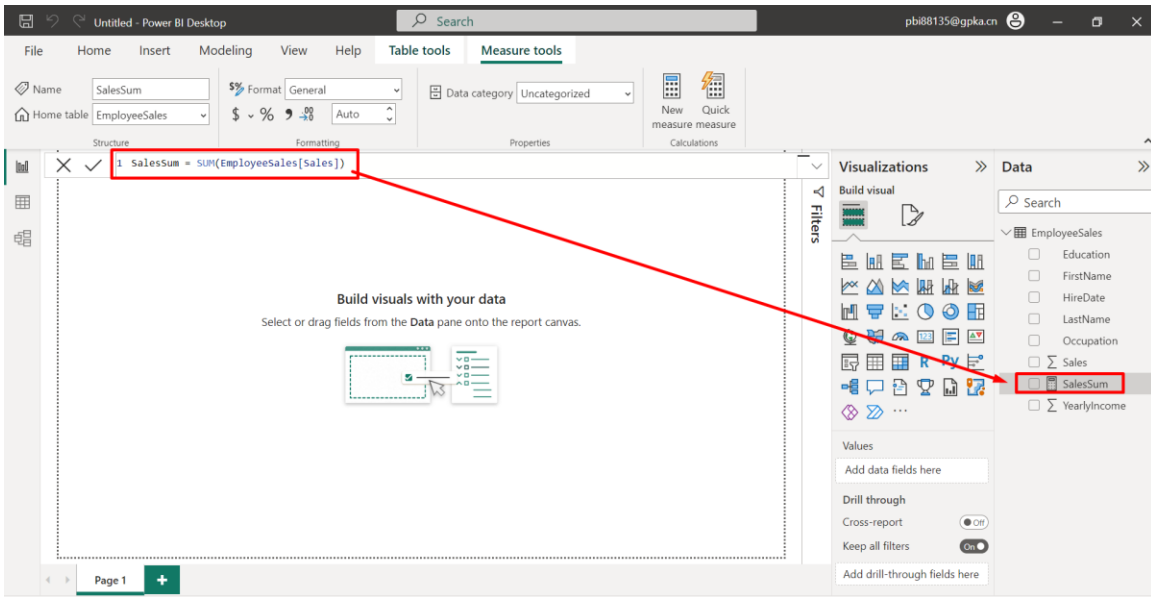
## II. DAX AGGREGATE FUNCTIONS

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### A. DAX SUM

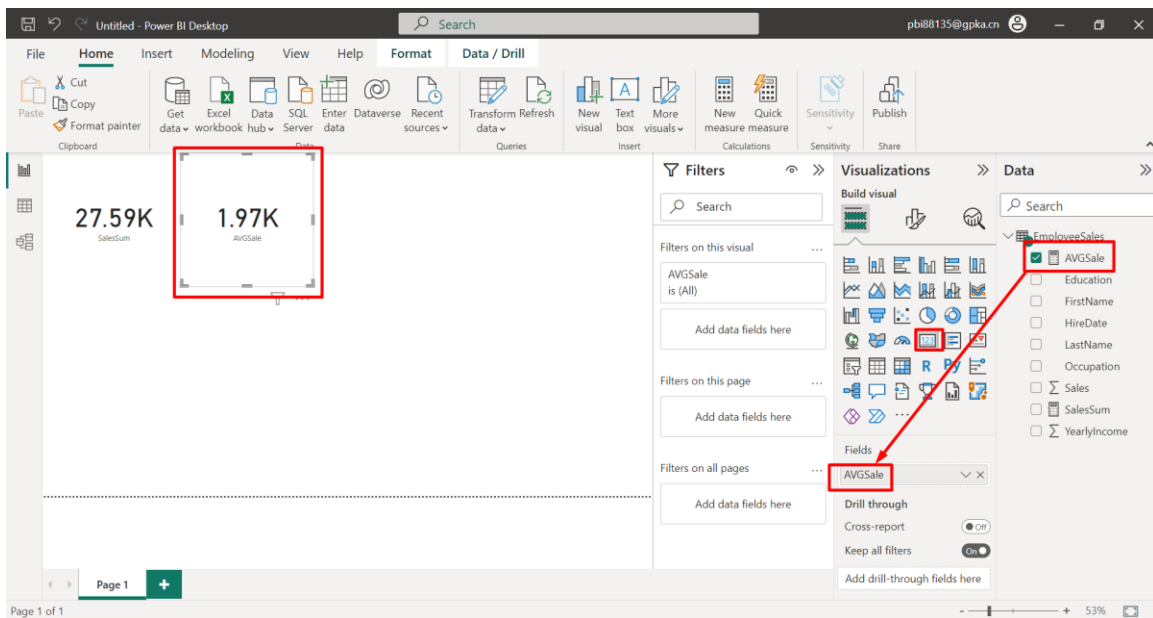
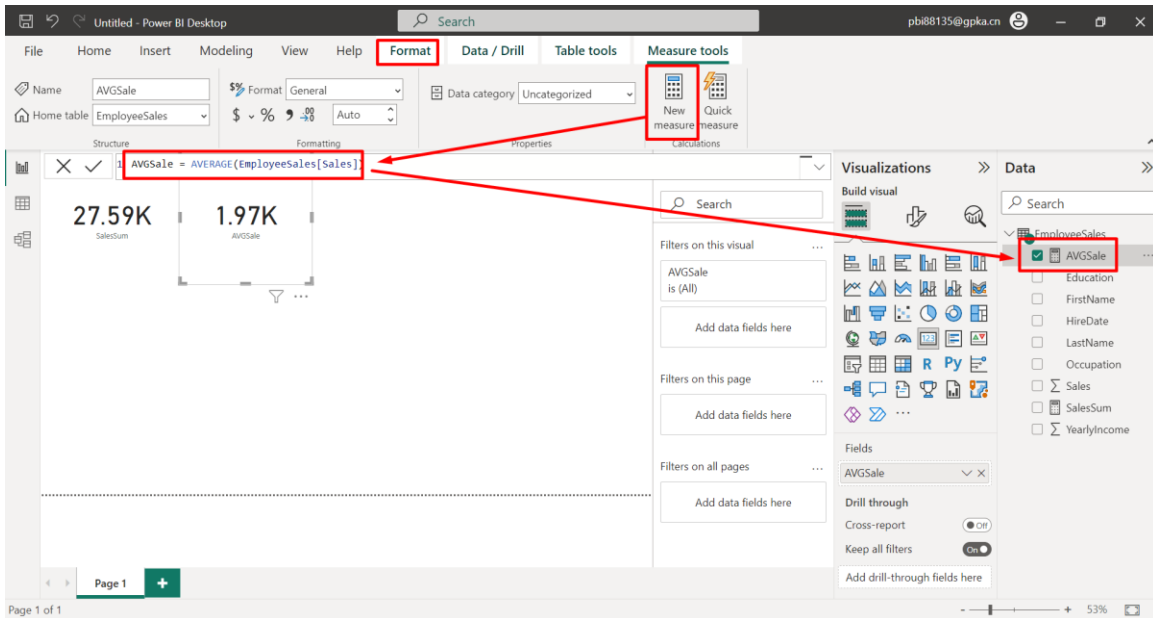
**SalesSum = SUM(EmployeeSales[Sales])**





## B. DAX AVERAGE

**AVGSale = AVERAGE(EmployeeSales[Sales])**





### C. DAX MIN

$$\text{MinSale} = \text{MIN}(\text{EmployeeSales}[\text{Sales}])$$

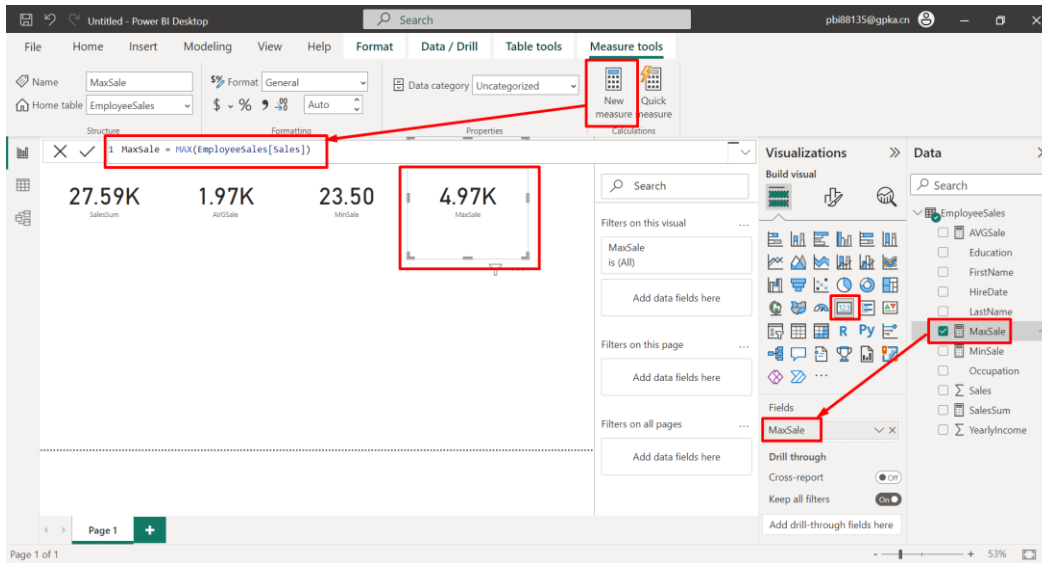
Screenshot of Power BI Desktop showing the DAX formula bar with the formula `MinSale = MIN(EmployeeSales[Sales])`. The formula is highlighted with a red box. The main visual area shows a card with three values: 27.59K, 1.97K, and 23.50. The 23.50 value is highlighted with a red box. The Data pane on the right shows the MinSale measure selected, also highlighted with a red box.

Screenshot of Power BI Desktop showing a table view of the EmployeeSales data. The table has columns for FirstName, LastName, Education, Occupation, YearlyIncome, Sales, and HireDate. The Sales column is highlighted with a red box, and the value 23.5 is highlighted with a red box. Below the table, the text "the minimum sales is indeed 23.5" is written in red.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate
John	Yang	Bachelors	Professional	90000	3578.27	28-01-06
Rob	Johnson	Bachelors	Management	80000	3399.99	29-12-10
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	29-12-11
Christy	Zhu	Bachelors	Professional	80000	3078.27	28-12-12
Rob	Huang	High School	Skilled Manual	60000	2319.99	22-09-08
John	Ruiz	Bachelors	Professional	70000	539.99	06-07-09
John	Miller	Masters Degree	Management	80000	2320.49	12-08-09
Christy	Mehta	Partial High School	Clerical	50000	24.99	05-07-07
Rob	Verhoff	Partial High School	Clerical	45000	24.99	15-09-13
Christy	Carlson	Graduate Degree	Management	70000	2234.99	25-01-14
Gail	Erickson	Education	Professional	90000	4319.99	02-10-06
Barry	Johnson	Education	Management	80000	4968.59	15-05-14
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	14-01-13
Greg	Alderson	Partial High School	Clerical	45000	23.5	05-07-13

## D. DAX MAX

**MaxSale = MAX(EmployeeSales[Sales])**



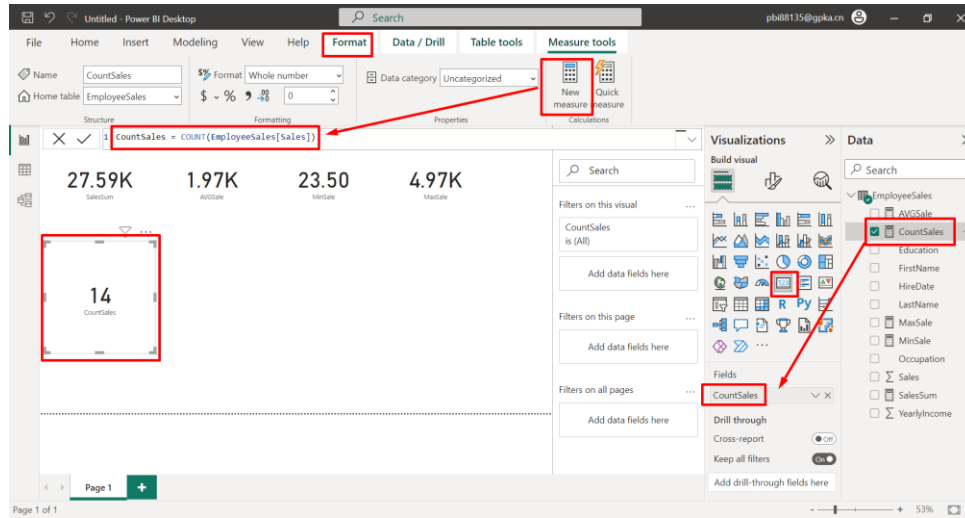
The screenshot shows the 'Data view' in Power BI Desktop. The table displays the following data:

	LastName	Education	Occupation	YearlyIncome	Sales	HireDate
	Yang	Bachelors	Professional	90000	3578.27	28-01-06
	Rob Johnson	Bachelors	Management	80000	3399.99	29-12-10
	Ruben Torres	Partial College	Skilled Manual	50000	699.0982	29-12-11
	Christy Zhu	Bachelors	Professional	80000	3078.27	28-12-12
	Rob Huang	High School	Skilled Manual	60000	2319.99	22-09-08
	John Ruiz	Bachelors	Professional	70000	539.99	06-07-09
	John Miller	Masters Degree	Management	80000	2320.49	12-08-09
	Christy Mehta	Partial High School	Clerical	50000	24.99	05-07-07
	Rob Verhoff	Partial High School	Clerical	45000	24.99	15-09-13
	Christy Carlson	Graduate Degree	Management	70000	2234.99	25-01-14
	Gail Erickson	Education	Professional	90000	4319.99	02-10-06
	Barry Johnson	Education	Management	80000	4968.59	15-05-14
	Peter Krebs	Graduate Degree	Clerical	50000	59.53	14-01-13
	Greg Alderson	Partial High School	Clerical	45000	23.5	05-07-13

The 'Sales' column is highlighted, and the value 4968.59 is circled in red. Below the table, the text 'the maximum sales is indeed 4.97K' is written in red.

## E. DAX COUNT

**CountSales = COUNT(EmployeeSales[Sales])**



The screenshot shows the 'Table tools' ribbon in Power BI Desktop. The formula bar contains the DAX measure: `1 CountSales = COUNT(EmployeeSales[Sales])`. Below the ribbon is a data table with the following columns: FirstName, LastName, Education, Occupation, YearlyIncome, Sales, and HireDate. The 'Sales' column is highlighted with a red box.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate
John	Yang	Bachelors	Professional	90000	3578.27	28-01-06
Rob	Johnson	Bachelors	Management	80000	3399.99	29-12-10
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	29-12-11
Christy	Zhu	Bachelors	Professional	80000	3078.27	28-12-12
Rob	Huang	High School	Skilled Manual	60000	2319.99	22-09-08
John	Ruiz	Bachelors	Professional	70000	539.99	06-07-09
John	Miller	Masters Degree	Management	80000	2320.49	12-08-09
Christy	Mehta	Partial High School	Clerical	50000	24.99	05-07-07
Rob	Verhoff	Partial High School	Clerical	45000	24.99	15-09-13
Christy	Carlson	Graduate Degree	Management	70000	2234.99	25-01-14
Gail	Erickson	Education	Professional	90000	4319.99	02-10-06
Barry	Johnson	Education	Management	80000	4968.59	15-05-14
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	14-01-13
Greg	Alderson	Partial High School	Clerical	45000	23.5	05-07-13

ther are indeed 14 Sales Count

## F. DAX STANDARD DEVIATION

$$\text{StdevSIncome} = \text{STDEV.P}(\text{EmployeeSales}[\text{YearlyIncome}])$$

The screenshot shows the Power BI Desktop interface. The formula bar at the top contains the DAX measure: `StdevIncome = STDEV.P(EmployeeSales[YearlyIncome])`. The main visual area displays a card with the value **16.12K** for `StdevIncome`. The background features a dashboard with four summary cards: **27.59K** (SalesSum), **1.97K** (AVGSale), **23.50** (MinSale), and **4.97K** (MaxSale). The left sidebar shows the 'Data' pane with the 'EmployeeSales' table expanded, listing fields like AVGSale, CountSales, Education, etc. The 'Fields' pane on the right shows the 'StdevIncome' measure selected. Red annotations include a box around the formula bar, a box around the '16.12K' value, and red text explaining the difference between STDEV.P and STDEV.S.

**STDEV.P = std dev for Population**  
**STDEV.S = std dev for Sample**  
**they are both different formulas used in Statistics**

**we shall not dwell on differences between .P [sigma] vs .S[s] here but we shall generally use the Population Std Deviation**

**for more information, check out Dr. Alvin's Statistics Publications**

### III. DAX DATE FUNCTIONS

<https://www.alvinang.sg/s/EmployeeSales.xlsx>

#### A. BRING IN THE DATA FROM A FRESH NEW START

we bring in the data as per fresh start

before we created any new measures [as per previous section]

We see that the moment we bring in 'HireDate' column automatically Power BI is able to detect it as Date/Time format

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2005 5:03:10 AM

## B. CHANGE TO TEXT FORMAT

but we want to change it to TEXT format

FirstNa	Education	Occupation	YearlyIncome	Sales	HireDate
John	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM
Rob	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM
Ruben	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM
Christy	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM
Rob	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM
John	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM
John	Posters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM
Christy	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM
Rob	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM
Christy	Carlson	Graduate Degree	70000	2234.99	1/25/2014 4:01:14 PM
Gail	Erickson	Education	90000	4319.99	10/2/2006 5:03:10 AM
Barry	Johnson	Education	80000	4968.59	5/15/2014 5:03:10 AM
Peter	Krebs	Graduate Degree	50000	59.53	1/14/2013 5:03:10 AM
Greg	Alderson	Partial High School	45000	23.5	7/5/2013 5:03:10 AM
					7/5/2005 5:03:10 AM

## C. CREATE A TABLE

FirstName	LastName	Occupation	Sum of YearlyIncome	HireDate
Barry	Johnson	Management	80000	5/15/2014 5:03:10 AM
Christy	Carlson	Management	70000	1/25/2014 4:01:14 PM
Christy	Mehta	Clerical	50000	7/5/2007 3:13:14 PM
Christy	Zhu	Professional	80000	12/28/2012 7:04:22 PM
Gail	Erickson	Professional	90000	10/2/2006 5:03:10 AM
Greg	Alderson	Clerical	45000	7/5/2013 5:03:10 AM
John	Miller	Management	80000	8/12/2009 3:13:14 PM
John	Ruiz	Professional	70000	7/6/2009 12:09:14 PM
John	Yang	Professional	90000	1/28/2006 1:10:02 PM
Peter	Krebs	Clerical	50000	1/14/2013 5:03:10 AM
Rob	Huang	Skilled Manual	60000	9/22/2008 7:04:22 PM
Rob	Johnson	Management	80000	12/29/2010 3:10:02 PM
Rob	Verhoff	Clerical	45000	9/15/2013 3:13:14 PM
Ruben	Torres	Skilled Manual	50000	12/29/2011 10:14:02 PM
<b>Total</b>			<b>940000</b>	

## D. DAX NOW() Today = NOW()

The screenshot shows the Power BI Desktop interface with a table named 'EmployeeSales'. A new column named 'Today' has been added to the table, containing the current date and time for each row. The formula bar shows the DAX formula `=NOW()`. The 'Today' column is highlighted in green, and the 'New column' button in the ribbon is also highlighted.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	Today
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	3/18/2023 12:44:13 AM
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	3/18/2023 12:44:13 AM
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	3/18/2023 12:44:13 AM
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	3/18/2023 12:44:13 AM
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	3/18/2023 12:44:13 AM
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	3/18/2023 12:44:13 AM
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	3/18/2023 12:44:13 AM
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	3/18/2023 12:44:13 AM
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	3/18/2023 12:44:13 AM
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	3/18/2023 12:44:13 AM
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	3/18/2023 12:44:13 AM
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	3/18/2023 12:44:13 AM
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	3/18/2023 12:44:13 AM
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	3/18/2023 12:44:13 AM
						7/5/2005 5:03:10 AM	3/18/2023 12:44:13 AM

Table: EmployeeSales (15 rows) Column: Today (1 distinct values)

The screenshot shows the context menu for the 'Today' column. The 'Delete' option is highlighted in red. The menu includes options such as 'Sort ascending', 'Sort descending', 'Clear sort', 'Clear filter', 'Clear all filters', 'Copy', 'Copy table', 'New measure', 'New column', 'Refresh data', 'Edit query', 'Rename', 'Delete', 'Hide in report view', 'Unhide all', and 'New group'.

### E. DAX DAY()

$$\text{DayinDate} = \text{DAY}(\text{EmployeeSales}[\text{HireDate}])$$

The screenshot shows the Power BI Desktop interface. The formula bar contains `DayinDate = DAY(EmployeeSales[HireDate])`. The data table below has columns: **FirstName**, **LastName**, **Education**, **Occupation**, **YearlyIncome**, **Sales**, **HireDate**, and **DayinDate**. The **DayinDate** column contains values ranging from 5 to 29. A red box highlights the formula bar and the **DayinDate** column. Another red box highlights the **DayinDate** column in the Data pane on the right.

word of advice: since Microsoft is US company, their default is MM/DD/YYYY unlike Singapore that follows UK DD/MM/YYYY, we should try to follow them else whether in Excel or Power Query, Date format is a big headache to wrangle with

Table: EmployeeSales (15 rows) Column: DayinDate (10 distinct values)

### F. DAX MONTH()

$$\text{MonthinDate} = \text{MONTH}(\text{EmployeeSales}[\text{HireDate}])$$

The screenshot shows the Power BI Desktop interface. The formula bar contains `MonthinDate = MONTH(EmployeeSales[HireDate])`. The data table below has columns: **FirstName**, **LastName**, **Education**, **Occupation**, **YearlyIncome**, **Sales**, **HireDate**, **DayinDate**, and **MonthinDate**. The **MonthinDate** column contains values ranging from 5 to 12. A red box highlights the formula bar and the **MonthinDate** column. Another red box highlights the **MonthinDate** column in the Data pane on the right.

Table: EmployeeSales (15 rows) Column: MonthinDate (7 distinct values)



### G. DAX YEAR()

**YearInDt = YEAR(EmployeeSales[ HireDate])**

The screenshot shows the Power BI Desktop interface. In the 'Column tools' ribbon, the 'Name' field is set to 'YearInDt' and the 'Data type' is 'Whole number'. The formula bar contains the DAX expression: `YearInDt = YEAR(EmployeeSales[ HireDate])`. The 'Data' pane on the right shows the 'EmployeeSales' table with a new column 'YearInDt' highlighted. The main data table displays the following data:

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	15	2014
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	5	2013
						7/5/2005 5:03:10 AM	5	2005

### H. DAX HOUR()

**Hour = HOUR(EmployeeSales[ HireDate])**

The screenshot shows the Power BI Desktop interface. In the 'Column tools' ribbon, the 'Name' field is set to 'Hour' and the 'Data type' is 'Whole number'. The formula bar contains the DAX expression: `Hour = HOUR(EmployeeSales[ HireDate])`. The 'Data' pane on the right shows the 'EmployeeSales' table with a new column 'Hour' highlighted. The main data table displays the following data:

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt	Hour
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006	13
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010	15
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011	22
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012	19
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008	19
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009	12
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009	15
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007	15
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013	15
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014	16
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006	5
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	15	2014	5
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013	5
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	5	2013	5
						7/5/2005 5:03:10 AM	5	2005	5

## I. DAX MINUTE()

**Min = MINUTE(EmployeeSales[HireDate])**

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt	Min
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006	10
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010	10
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011	14
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012	4
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008	4
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009	9
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009	13
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007	13
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013	13
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014	1
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006	3
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	15	2014	3
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013	3
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2007 5:03:10 AM	5	2007	3
						7/5/2005 5:03:10 AM	5	2005	3

## J. DAX DATE()

**Date = DATE(YEAR(EmployeeSales[HireDate]),  
MONTH(EmployeeSales[HireDate]),  
DAY(EmployeeSales[HireDate]))**

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt	Min	Date
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006	10	1/28/2006 12:00:00 AM
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010	10	12/29/2010 12:00:00 AM
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011	14	12/29/2011 12:00:00 AM
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012	4	12/28/2012 12:00:00 AM
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008	4	9/22/2008 12:00:00 AM
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009	9	7/6/2009 12:00:00 AM
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009	13	8/12/2009 12:00:00 AM
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007	13	7/5/2007 12:00:00 AM
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013	13	9/15/2013 12:00:00 AM
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014	1	1/25/2014 12:00:00 AM
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006	3	10/2/2006 12:00:00 AM
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	15	2014	3	5/15/2014 12:00:00 AM
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013	3	1/14/2013 12:00:00 AM
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2007 5:03:10 AM	5	2007	3	7/5/2007 12:00:00 AM
						7/5/2005 5:03:10 AM	5	2005	3	7/5/2005 12:00:00 AM

## K. DAX WEEKDAY()

**WeekDay = WEEKDAY(EmployeeSales[HireDate], 1)**

If Number = 1, then 1 refers to Sunday  
 If Number = 2, then 1 refers to Monday  
 If Number = 3, then 0 refers to Monday... so we choose '1' to let 1 represent Sunday

which means this date is a TUESDAY

### A. DAX WEEKNUM()

$$\text{WeekNum} = \text{WEEKNUM}(\text{EmployeeSales}[\text{HireDate}], 1)$$

The screenshot shows the Power BI Desktop interface with the following data table:

Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt	Min	Date	WeekDay	WeekNum
Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006	10	1/28/2006 12:00:00 AM	7	4
Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010	10	12/29/2010 12:00:00 AM	4	53
Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011	14	12/29/2011 12:00:00 AM	5	53
Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012	4	12/28/2012 12:00:00 AM	6	52
Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008	4	9/22/2008 12:00:00 AM	2	39
Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009	9	7/6/2009 12:00:00 AM	2	28
Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009	13	8/12/2009 12:00:00 AM	4	33
Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007	13	7/5/2007 12:00:00 AM	5	27
Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013	13	9/15/2013 12:00:00 AM	1	38
Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014	1	1/25/2014 12:00:00 AM	7	4
Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006	3	10/2/2006 12:00:00 AM	2	40
Management	80000	4968.27	5/15/2014 5:03:10 AM	15	2014	3	5/15/2014 12:00:00 AM	5	20
Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013	3	1/14/2013 12:00:00 AM	2	3
Clerical	45000	23.5	7/5/2013 5:03:10 AM	5	2013	3	7/5/2013 12:00:00 AM	6	27
Clerical			7/5/2005 5:03:10 AM	5	2005	3	7/5/2005 12:00:00 AM	3	28

Annotations in the screenshot include:

- A red box around the formula bar: `WeekNum = WEEKNUM(EmployeeSales[HireDate], 1)`
- A red box around the 'New column' button in the ribbon.
- Blue circles around the 'Date' column values: '1/28/2006', '1/14/2013', and '7/5/2013'.
- Blue text annotations: '4th week in that year 2006' (pointing to the 4th row), '3rd Week in that year 2013' (pointing to the 13th row), and '28' (pointing to the 13th row's WeekNum value).

The screenshot shows the Power BI Desktop interface with the following data table:

Occupation	YearlyIncome	Sales	HireDate	DayInDate	YearInDt	Min	Date	WeekDay	WeekNum
Professional	90000	3578.27	1/28/2006 1:10:02 PM	28	2006	10	1/28/2006 12:00:00 AM	7	4
Management	80000	3399.99	12/29/2010 3:10:02 PM	29	2010	10	12/29/2010 12:00:00 AM	4	53
Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	29	2011	14	12/29/2011 12:00:00 AM	5	53
Professional	80000	3078.27	12/28/2012 7:04:22 PM	28	2012	4	12/28/2012 12:00:00 AM	6	52
Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	22	2008	4	9/22/2008 12:00:00 AM	2	39
Professional	70000	539.99	7/6/2009 12:09:14 PM	6	2009	9	7/6/2009 12:00:00 AM	2	28
Management	80000	2320.49	8/12/2009 3:13:14 PM	12	2009	13	8/12/2009 12:00:00 AM	4	33
Clerical	50000	24.99	7/5/2007 3:13:14 PM	5	2007	13	7/5/2007 12:00:00 AM	5	27
Clerical	45000	24.99	9/15/2013 3:13:14 PM	15	2013	13	9/15/2013 12:00:00 AM	1	38
Management	70000	2234.99	1/25/2014 4:01:14 PM	25	2014	1	1/25/2014 12:00:00 AM	7	4
Professional	90000	4319.99	10/2/2006 5:03:10 AM	2	2006	3	10/2/2006 12:00:00 AM	2	40
Management	80000	4968.27	5/15/2014 5:03:10 AM	15	2014	3	5/15/2014 12:00:00 AM	5	20
Clerical	50000	59.53	1/14/2013 5:03:10 AM	14	2013	3	1/14/2013 12:00:00 AM	2	3
Clerical	45000	23.5	7/5/2013 5:03:10 AM	5	2013	3	7/5/2013 12:00:00 AM	6	27
Clerical			7/5/2005 5:03:10 AM	5	2005	3	7/5/2005 12:00:00 AM	3	28

Annotations in the screenshot include:

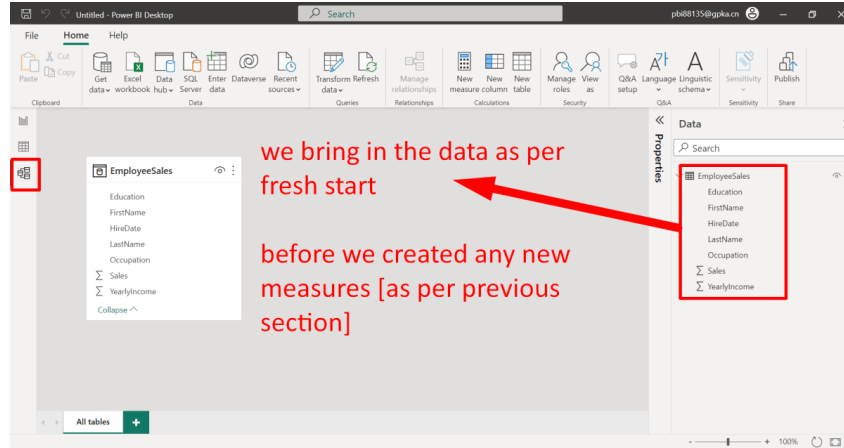
- A blue box around the formula bar: `1 WeekNum = WEEKNUM(EmployeeSales[HireDate], 1)`
- A blue arrow pointing from the text below to the 'WeekNum' column header.

If Number = 1 then that Week begins on Sunday  
 If Number = 2 then that Week begins on Monday

## IV. DAX LOGICAL FUNCTIONS

<https://www.alvinang.sg/s/EmployeeSales.xlsx>

### A. BRING IN THE DATA FROM A FRESH NEW START



### B. DAX IF

IfExample = IF(EmployeeSales[Sales] > 3000, "Good", "Bad")

Table: EmployeeSales (15 rows) Column: IfExample (2 distinct values)

firstName	lastName	Education	Occupation	YearlyIncome	Sales	HireDate	IfExample
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	Good
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	Good
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	Bad
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	Good
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	Bad
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	Bad
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	Bad
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	Bad
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	Bad
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	Bad
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	Good
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	Good
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	Bad
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	Bad
						7/5/2005 5:03:10 AM	Bad

### C. DAX NEST IF

**NestedIfEx =**

**IF(EmployeeSales[Sales] < 1000, "Very Bad",**

**IF(EmployeeSales[Sales] > 3000, "Good",  
"Average" ))**

The screenshot shows the Power BI Desktop interface. The formula bar contains the DAX formula: `NestedIfEx = IF(EmployeeSales[Sales] < 1000, "Very Bad", IF(EmployeeSales[Sales] > 3000, "Good", "Average" ))`. The data table below has columns: `FirstName`, `LastName`, `Education`, `Occupation`, `YearlyIncome`, `Sales`, `HireDate`, `IfExample`, and `NestedIfEx`. The `NestedIfEx` column contains values: Good, Good, Very Bad, Good, Average, Very Bad, Average, Very Bad, Very Bad, Average, Good, Good, Very Bad, Very Bad, Very Bad.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	IfExample	NestedIfEx
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	Good	Good
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	Good	Good
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	Bad	Very Bad
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	Good	Good
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	Bad	Average
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	Bad	Very Bad
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	Bad	Average
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	Bad	Very Bad
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	Bad	Very Bad
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	Bad	Average
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	Good	Good
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	Good	Good
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	Bad	Very Bad
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	Bad	Very Bad
						7/5/2005 5:03:10 AM	Bad	Very Bad



D. DAX AND

**AndSales**

=

**IF(AND(**

**EmployeeSales[Sales] > AVERAGE(EmployeeSales[Sales]),**

**EmployeeSales[YearlyIncome] >= 70000),**

**"Good Job", "Bad Job")**

The screenshot shows the Power BI Desktop interface. The DAX formula bar contains the following formula:

```
AndSales = IF(AND(EmployeeSales[Sales] > AVERAGE(EmployeeSales[Sales]), EmployeeSales[YearlyIncome] >= 70000), "Good Job", "Bad Job")
```

The data table below shows the results of this formula. The 'AndSales' column is highlighted in red. The 'EmployeeSales' table is also visible in the Data pane on the right.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	IfExample	NestedIfEx	AndSales
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	Good	Good	Good Job
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	Good	Good	Good Job
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	Bad	Very Bad	Bad Job
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	Good	Good	Good Job
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	Bad	Average	Bad Job
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	Bad	Very Bad	Bad Job
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	Bad	Average	Good Job
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	Bad	Very Bad	Bad Job
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	Bad	Very Bad	Bad Job
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	Bad	Average	Good Job
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	Good	Good	Good Job
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	Good	Good	Good Job
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	Bad	Very Bad	Bad Job
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	Bad	Very Bad	Bad Job
						7/5/2005 5:03:10 AM	Bad	Very Bad	Bad Job

**E. DAX OR**  
**OrSales**  
**=**  
**IF(OR(**  
**EmployeeSales[Sales] < AVERAGE(EmployeeSales[Sales]),**  
**EmployeeSales[YearlyIncome] >= 90000),**  
**"Watchlist", "Doing Good")**

The screenshot shows the Power BI Desktop interface. The formula bar contains the DAX formula: `OrSales = IF(OR(EmployeeSales[Sales] < AVERAGE(EmployeeSales[Sales]), EmployeeSales[YearlyIncome] >= 90000), "Watchlist", "Doing Good")`. The data table below shows columns for Name, LastName, Education, Occupation, YearlyIncome, Sales, HireDate, IfExample, NestedIfEx, AndSales, and OrSales. The OrSales column contains values like "Watchlist" and "Doing Good".

Name	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	IfExample	NestedIfEx	AndSales	OrSales
hn	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	Good	Good	Good Job	Watchlist
lb	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	Good	Good	Good Job	Doing Good
lben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	Bad	Very Bad	Bad Job	Watchlist
risty	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	Good	Good	Good Job	Doing Good
lb	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	Bad	Average	Bad Job	Doing Good
hn	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	Bad	Very Bad	Bad Job	Watchlist
hn	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	Bad	Average	Good Job	Doing Good
risty	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	Bad	Very Bad	Bad Job	Watchlist
lb	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	Bad	Very Bad	Bad Job	Watchlist
risty	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	Bad	Average	Good Job	Doing Good
il	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	Good	Good	Good Job	Watchlist
rry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	Good	Good	Good Job	Doing Good
ter	Krebs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	Bad	Very Bad	Bad Job	Watchlist
eg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	Bad	Very Bad	Bad Job	Watchlist
						7/5/2005 5:03:10 AM	Bad	Very Bad	Bad Job	Watchlist



F. DAX NOT

NotSale

=

NOT(IF(

EmployeeSales[Sales] > 2000,

"TRUE", "FALSE"))

The screenshot shows the Power BI Desktop interface. The formula bar at the top contains the DAX formula: `NotSale = NOT(IF(EmployeeSales[Sales] > 2000, "TRUE", "FALSE"))`. The data table below has columns for Employee details and a calculated 'NotSale' column. The 'NotSale' column contains 'True' for employees with sales greater than 2000 and 'False' otherwise. The 'Data' pane on the right shows the 'NotSale' column selected.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	NotSale
John	Yang	Bachelors	Professional	90000	3578.27	False
Rob	Johnson	Bachelors	Management	80000	3399.99	False
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	True
Christy	Zhu	Bachelors	Professional	80000	3078.27	False
Rob	Huang	High School	Skilled Manual	60000	2319.99	False
John	Ruiz	Bachelors	Professional	70000	539.99	True
John	Miller	Masters Degree	Management	80000	2320.49	False
Christy	Mehta	Partial High School	Clerical	50000	24.99	True
Rob	Verhoff	Partial High School	Clerical	45000	24.99	True
Christy	Carlson	Graduate Degree	Management	70000	2234.99	False
Gail	Erickson	Education	Professional	90000	4319.99	False
Barry	Johnson	Education	Management	80000	4968.59	False
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	True
Greg	Alderson	Partial High School	Clerical	45000	23.5	True
						True

G. DAX CALCULATE IN

SalesIN

=

CALCULATE(SUM(

EmployeeSales[YearlyIncome]),

'EmployeeSales'[Education]

IN {

"Education", "Bachelors", "Masters Degree"})

1 SalesIN = CALCULATE(SUM(EmployeeSales[YearlyIncome]),  
2 'EmployeeSales'[Education] IN {"Education", "Bachelors", "Masters Degree"})

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SalesIN
John	Yang	Bachelors	Professional	90000	3578.22	90000
Rob	Johnson	Bachelors	Management	80000	3399.99	80000
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	
Christy	Zhu	Bachelors	Professional	80000	3078.22	80000
Rob	Huang	High School	Skilled Manual	60000	2319.99	
John	Ruiz	Bachelors	Professional	70000	539.99	70000
John	Miller	Masters Degree	Management	80000	2320.45	80000
Christy	Mehta	Partial High School	Clerical	50000	24.99	
Rob	Verhoff	Partial High School	Clerical	45000	24.99	
Christy	Carlson	Graduate Degree	Management	70000	2234.99	
Gail	Erickson	Education	Professional	90000	4319.99	90000
Barry	Johnson	Education	Management	80000	4968.53	80000
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	
Greg	Alderson	Partial High School	Clerical	45000	23.53	

## H. DAX TRUE

**TRUESale =**  
**IF(**  
**EmployeeSales[Sales] > AVERAGE(EmployeeSales[Sales]),**  
**TRUE(), FALSE() )**

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	TRUESale
John	Yang	Bachelors	Professional	90000	3578.27	True
Rob	Johnson	Bachelors	Management	80000	3399.99	True
Ruben	Torres	Partial College	Skilled Manual	50000	499.058	False
Christy	Zhu	Bachelors	Professional	80000	3078.27	True
Rob	Huang	High School	Skilled Manual	60000	2319.99	True
John	Ruiz	Bachelors	Professional	70000	539.99	False
John	Miller	Masters Degree	Management	80000	2320.43	True
Christy	Mehra	Partial High School	Clerical	50000	24.99	False
Rob	Verhoff	Partial High School	Clerical	45000	24.99	False
Christy	Carlson	Graduate Degree	Management	70000	2234.99	True
Gail	Erickson	Education	Professional	90000	4319.99	True
Barry	Johnson	Education	Management	80000	4968.53	True
Peter	Krebs	Graduate Degree	Clerical	50000	59.63	False
Greg	Alderson	Partial High School	Clerical	45000	23.3	False

## I. DAX IFERROR

**ErrorSale = IFERROR(**  
**EmployeeSales[Sales]/0, 100)**

if there's an error  
it will display 100

indeed all errors because  
we divide Sales by 0

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	ErrorSale
John	Yang	Bachelors	Professional	90000	3578.2	100
Rob	Johnson	Bachelors	Management	80000	3399.9	100
Ruben	Torres	Partial College	Skilled Manual	50000	1098.0	100
Christy	Zhu	Bachelors	Professional	80000	3078.2	100
Rob	Huang	High School	Skilled Manual	60000	2319.9	100
John	Ruiz	Bachelors	Professional	70000	539.9	100
John	Miller	Masters Degree	Management	80000	2320.4	100
Christy	Mehtha	Partial High School	Clerical	50000	24.9	100
Rob	Verhoff	Partial High School	Clerical	45000	24.9	100
Christy	Carlson	Graduate Degree	Management	70000	2234.9	100
Gail	Erickson	Education	Professional	90000	4319.9	100
Barry	Johnson	Education	Management	80000	4968.5	100
Peter	Krebs	Graduate Degree	Clerical	50000	59.5	100
Greg	Alderson	Partial High School	Clerical	45000	23.0	100

## J. DAX SWITCH

### SwitchMonth

=

SWITCH(MONTH(

EmployeeSales[HireDate]),

1, "January", 2, "February", 3, "March", 4, "April", 5,

"May", 12, "December",

"Unknown")

SwitchMonth = SWITCH(MONTH(EmployeeSales[HireDate]), 1, "January", 2, "February", 3, "March", 4, "April", 5, "May", 12, "December", "Unknown")

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	SwitchMonth
John	Yang	Bachelors	Professional	90000	3578.27	1/28/2006 1:10:02 PM	January
Rob	Johnson	Bachelors	Management	80000	3399.99	12/29/2010 3:10:02 PM	December
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	12/29/2011 10:14:02 PM	December
Christy	Zhu	Bachelors	Professional	80000	3078.27	12/28/2012 7:04:22 PM	December
Rob	Huang	High School	Skilled Manual	60000	2319.99	9/22/2008 7:04:22 PM	Unknown
John	Ruiz	Bachelors	Professional	70000	539.99	7/6/2009 12:09:14 PM	Unknown
John	Miller	Masters Degree	Management	80000	2320.49	8/12/2009 3:13:14 PM	Unknown
Christy	Mehta	Partial High School	Clerical	50000	24.99	7/5/2007 3:13:14 PM	Unknown
Rob	Verhoff	Partial High School	Clerical	45000	24.99	9/15/2013 3:13:14 PM	Unknown
Christy	Carlson	Graduate Degree	Management	70000	2234.99	1/25/2014 4:01:14 PM	January
Gail	Erickson	Education	Professional	90000	4319.99	10/2/2006 5:03:10 AM	Unknown
Barry	Johnson	Education	Management	80000	4968.59	5/15/2014 5:03:10 AM	May
Peter	Krejs	Graduate Degree	Clerical	50000	59.53	1/14/2013 5:03:10 AM	January
Greg	Alderson	Partial High School	Clerical	45000	23.5	7/5/2013 5:03:10 AM	Unknown

If Month of Hire date is 1, then below statement returns January,  
2 means February,  
3 means march, 4 means April, 5 means May,  
12 means December  
otherwise, Unknown.

## V. DAX STRING FUNCTIONS

### A. DAX LEN

**LEN = LEN(EmployeeSales[FirstName])**

counts the number of characters in the FIRST NAME

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	LEN
John	Yang	Bachelors	Professional	90000	3578.27	4
Rob	Johnson	Bachelors	Management	80000	3399.99	3
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	5
Christy	Zhu	Bachelors	Professional	80000	3078.27	7
Rob	Huang	High School	Skilled Manual	60000	2319.99	3
John	Ruiz	Bachelors	Professional	70000	539.99	4
John	Miller	Masters Degree	Management	80000	2320.49	4
Christy	Mehta	Partial High School	Clerical	50000	24.99	7
Rob	Verhoff	Partial High School	Clerical	45000	24.99	3
Christy	Carlson	Graduate Degree	Management	70000	2234.99	7
Gail	Erickson	Education	Professional	90000	4319.99	4
Barry	Johnson	Education	Management	80000	4968.59	5
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	5
Greg	Alderson	Partial High School	Clerical	45000	23.5	4

### B. DAX LOWER

**LOWER = LOWER(EmployeeSales[Occupation])**

changes all to LOWER CASE

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	LOWER
John	Yang	Bachelors	Professional	90000	3578.27	professional
Rob	Johnson	Bachelors	Management	80000	3399.99	management
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	skilled manual
Christy	Zhu	Bachelors	Professional	80000	3078.27	professional
Rob	Huang	High School	Skilled Manual	60000	2319.99	skilled manual
John	Ruiz	Bachelors	Professional	70000	539.99	professional
John	Miller	Masters Degree	Management	80000	2320.49	management
Christy	Mehta	Partial High School	Clerical	50000	24.99	clerical
Rob	Verhoff	Partial High School	Clerical	45000	24.99	clerical
Christy	Carlson	Graduate Degree	Management	70000	2234.99	management
Gail	Erickson	Education	Professional	90000	4319.99	professional
Barry	Johnson	Education	Management	80000	4968.59	management
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	clerical
Greg	Alderson	Partial High School	Clerical	45000	23.5	clerical

### C. DAX UPPER

**UPPER = UPPER(EmployeeSales[Education])**

The screenshot shows the Power BI Desktop interface with the DAX formula bar containing `UPPER = UPPER(EmployeeSales[Education])`. The table below displays the results of this formula, where the 'UPPER' column contains uppercase versions of the 'Education' column values. Red boxes highlight the formula bar, the 'Education' column, and the 'UPPER' column. A red text annotation 'change to UPPER CASE' is placed to the right of the table.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	UPPER
John	Yang	Bachelors	Professional	90000	3578.2	BACHELORS
Rob	Johnson	Bachelors	Management	80000	3399.99	BACHELORS
Ruben	Torres	Partial College	Skilled Manual	50000	699.0983	PARTIAL COLLEGE
Christy	Zhu	Bachelors	Professional	80000	3078.2	BACHELORS
Rob	Huang	High School	Skilled Manual	60000	2319.99	HIGH SCHOOL
John	Ruiz	Bachelors	Professional	70000	539.99	BACHELORS
John	Miller	Masters Degree	Management	80000	2320.45	MASTERS DEGREE
Christy	Mehta	Partial High School	Clerical	50000	24.99	PARTIAL HIGH SCHOOL
Rob	Verhoff	Partial High School	Clerical	45000	24.99	PARTIAL HIGH SCHOOL
Christy	Carlson	Graduate Degree	Management	70000	2234.99	GRADUATE DEGREE
Gail	Erickson	Education	Professional	90000	4319.99	EDUCATION
Barry	Johnson	Education	Management	80000	4968.55	EDUCATION
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	GRADUATE DEGREE
Greg	Alderson	Partial High School	Clerical	45000	23.5	PARTIAL HIGH SCHOOL

### D. DAX REPT

**REPT = REPT(EmployeeSales[LastName], 2)**

The screenshot shows the Power BI Desktop interface with the DAX formula bar containing `REPT = REPT(EmployeeSales[LastName], 2)`. The table below displays the results of this formula, where the 'REPT' column contains the last name from the 'LastName' column repeated twice. Red boxes highlight the formula bar, the 'LastName' column, and the 'REPT' column. A red text annotation 'repeat the last name TWICE' is placed to the right of the table.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	REPT
John	Yang	Bachelors	Professional	90000	3578.2	YangYang
Rob	Johnson	Bachelors	Management	80000	3399.99	JohnsonJohnson
Ruben	Torres	Partial College	Skilled Manual	50000	699.0983	TorresTorres
Christy	Zhu	Bachelors	Professional	80000	3078.2	ZhuZhu
Rob	Huang	High School	Skilled Manual	60000	2319.99	HuangHuang
John	Ruiz	Bachelors	Professional	70000	539.99	RuizRuiz
John	Miller	Masters Degree	Management	80000	2320.45	MillerMiller
Christy	Mehta	Partial High School	Clerical	50000	24.99	MehtaMehta
Rob	Verhoff	Partial High School	Clerical	45000	24.99	VerhoffVerhoff
Christy	Carlson	Graduate Degree	Management	70000	2234.99	CarlsonCarlson
Gail	Erickson	Education	Professional	90000	4319.99	EricksonErickson
Barry	Johnson	Education	Management	80000	4968.55	JohnsonJohnson
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	KrebsKrebs
Greg	Alderson	Partial High School	Clerical	45000	23.5	AldersonAlderson

E. DAX SUBSTITUTE

**SUBSTITUTE**

=

**SUBSTITUTE(**

**EmployeeSales[Education],**

**"Education", "DUNNO")**

substituted the word 'Education' with 'DUNNO'

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SUBSTITUTE
John	Yang	Bachelors	Professional	90000	3578.27	Bachelors
Rob	Johnson	Bachelors	Management	80000	3399.99	Bachelors
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	Partial College
Christy	Zhu	Bachelors	Professional	80000	3078.27	Bachelors
Rob	Huang	High School	Skilled Manual	60000	2319.99	High School
John	Ruiz	Bachelors	Professional	70000	539.99	Bachelors
John	Miller	Masters Degree	Management	80000	2320.49	Masters Degree
Christy	Mehta	Partial High School	Clerical	50000	24.99	Partial High School
Rob	Verhoff	Partial High School	Clerical	45000	24.99	Partial High School
Christy	Carlson	Graduate Degree	Management	70000	2234.99	Graduate Degree
Gail	Erickson	Education	Professional	90000	4319.99	DUNNO
Barry	Johnson	Education	Management	80000	4968.55	DUNNO
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	Graduate Degree
Greg	Alderson	Partial High School	Clerical	45000	23.5	Partial High School



## F. DAX EXACT

**EXACT**

**=**

**EXACT(**

**EmployeeSales[Education],**

**LEFT(**

**EmployeeSales[SUBSTITUTE], 20))**

EXACT = EXACT(EmployeeSales[Education], LEFT(EmployeeSales[SUBSTITUTE], 20))

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SUBSTITUTE	EXACT
John	Yang	Bachelors	Professional	90000	3578.27	Bachelors	True
Rob	Johnson	Bachelors	Management	80000	3399.99	Bachelors	True
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	Partial College	True
Christy	Zhu	Bachelors	Professional	80000	3078.27	Bachelors	True
Rob	Huang	High School	Skilled Manual	60000	319.99	High School	True
John	Ruiz	Bachelors	Professional	70000	539.99	Bachelors	True
John	Miller	Masters Degree	Management	80000	2320.49	Masters Degree	True
Christy	Mehta	Partial High School	Clerical	50000	24.99	Partial High School	True
Rob	Verhoff	Partial High School	Clerical	50000	24.99	Partial High School	True
Christy	Carlson	Graduate Degree	Management	70000	2234.99	Graduate Degree	True
Gail	Erickson	Education	Professional	90000	4319.99	DUNNO	False
Barry	Johnson	Education	Management	80000	4968.59	DUNNO	False
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	Graduate Degree	True
Greg	Alderson	Partial High School	Clerical	45000	23.5	Partial High School	True

compares the first 20 characters.. are they exactly the same? if YES, then TRUE but if there's a difference in the first 20 characters.. then NO, is FALSE

## G. DAX CONCATENATE

# CONCAT

=

**CONCATENATE(  
EmployeeSales[FirstName],  
EmployeeSales[LastName])**

The screenshot shows the Power BI Desktop interface with the 'Column tools' ribbon active. A new column named 'CONCAT' is being created with the following DAX formula:

```
CONCAT = CONCATENATE(EmployeeSales[FirstName], EmployeeSales[LastName])
```

The resulting table displays the concatenated names in the 'CONCAT' column. The names are concatenated without spaces, such as 'JohnYang', 'RobJohnson', etc.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SUBSTITUTE	CONCAT
John	Yang	Bachelors	Professional	90000	3578.27	Bachelors	JohnYang
Rob	Johnson	Bachelors	Management	80000	3399.99	Bachelors	RobJohnson
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	Partial College	RubenTorres
Christy	Zhu	Bachelors	Professional	80000	3078.27	Bachelors	ChristyZhu
Rob	Huang	High School	Skilled Manual	60000	2319.99	High School	RobHuang
John	Ruiz	Bachelors	Professional	70000	539.99	Bachelors	JohnRuiz
John	Miller	Masters Degree	Management	80000	2320.49	Masters Degree	JohnMiller
Christy	Mehta	Partial High School	Clerical	50000	24.99	Partial High School	ChristyMehta
Rob	Verhoff	Partial High School	Clerical	45000	24.99	Partial High School	RobVerhoff
Christy	Carlson	Graduate Degree	Management	70000	2234.99	Graduate Degree	ChristyCarlson
Gail	Erickson	Education	Professional	90000	4319.99	DUNNO	GailErickson
Barry	Johnson	Education	Management	80000	4968.59	DUNNO	BarryJohnson
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	Graduate Degree	PeterKrebs
Greg	Alderson	Partial High School	Clerical	45000	23.5	Partial High School	GregAlderson

Unfortunately, CONCAT doesn't allow you to put a SPACE in between 2 words!

Try using this instead:

**Full Name**

=

**EmployeeSales[FirstName] &**

**" " & EmployeeSales[LastName]**

The screenshot shows the Power BI Desktop interface. The ribbon is set to 'Table tools' > 'Column tools'. The 'Name' field is 'Full Name' and the 'Data type' is 'Text'. The 'Format' is set to 'Text'. The 'Summarization' is 'Don't summarize' and the 'Data category' is 'Uncategorized'. A 'New column Calculations' button is highlighted in the ribbon. The formula bar contains the DAX formula: `Full Name = EmployeeSales[FirstName] & " " & EmployeeSales[LastName]`. Below the formula bar is a table with columns: **FirstName**, **LastName**, **Education**, **Occupation**, **YearlyIncome**, **Sales**, **SUBSTITUTE**, **CONCAT**, and **Full Name**. The 'Full Name' column contains the concatenated first and last names of the employees.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SUBSTITUTE	CONCAT	Full Name
John	Yang	Bachelors	Professional	90000	3578.27	Bachelors	JohnYang	John Yang
Rob	Johnson	Bachelors	Management	80000	3399.99	Bachelors	RobJohnson	Rob Johnson
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	Partial College	RubenTorres	Ruben Torres
Christy	Zhu	Bachelors	Professional	80000	3078.27	Bachelors	ChristyZhu	Christy Zhu
Rob	Huang	High School	Skilled Manual	60000	2319.99	High School	RobHuang	Rob Huang
John	Ruiz	Bachelors	Professional	70000	539.99	Bachelors	JohnRuiz	John Ruiz
John	Miller	Masters Degree	Management	80000	2320.49	Masters Degree	JohnMiller	John Miller
Christy	Mehta	Partial High School	Clerical	50000	24.99	Partial High School	ChristyMehta	Christy Mehta
Rob	Verhoff	Partial High School	Clerical	45000	24.99	Partial High School	RobVerhoff	Rob Verhoff
Christy	Carlson	Graduate Degree	Management	70000	2234.99	Graduate Degree	ChristyCarlson	Christy Carlson
Gail	Erickson	Education	Professional	90000	4319.99	DUNNO	GailErickson	Gail Erickson
Barry	Johnson	Education	Management	80000	4968.59	DUNNO	BarryJohnson	Barry Johnson
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	Graduate Degree	PeterKrebs	Peter Krebs
Greg	Alderson	Partial High School	Clerical	45000	23.5	Partial High School	GregAlderson	Greg Alderson

## H. DAX COMBINE

# COMBINE

=

COMBINEVALUES(

" , " ,

EmployeeSales[FirstName],

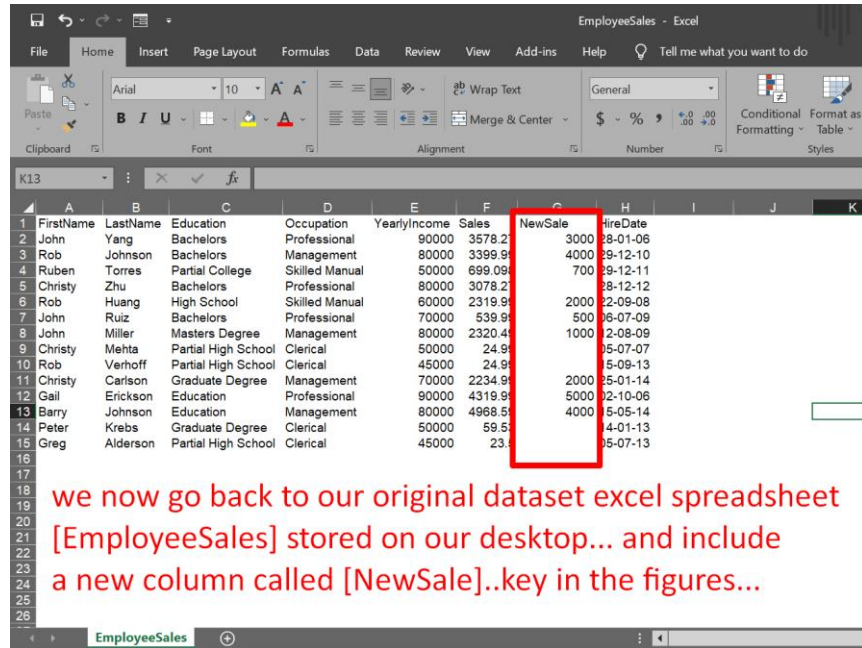
EmployeeSales[LastName],

EmployeeSales[Education])

The screenshot shows the Power BI Desktop interface. The ribbon is set to 'Table tools' > 'Column tools'. The formula bar contains the DAX formula: `COMBINE = COMBINEVALUES(" , " , EmployeeSales[FirstName], EmployeeSales[LastName], EmployeeSales[Education])`. A table with 8 columns is displayed below. The new column 'COMBINE' is highlighted in green and contains concatenated strings of the first three columns. A red box highlights the formula bar and the 'COMBINE' column.

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	SUBSTITUTE	COMBINE
John	Yang	Bachelors	Professional	90000	3578.27	Bachelors	John , Yang , Bachelors
Rob	Johnson	Bachelors	Management	80000	3399.99	Bachelors	Rob , Johnson , Bachelors
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	Partial College	Ruben , Torres , Partial College
Christy	Zhu	Bachelors	Professional	80000	3078.27	Bachelors	Christy , Zhu , Bachelors
Rob	Huang	High School	Skilled Manual	60000	2319.99	High School	Rob , Huang , High School
John	Ruiz	Bachelors	Professional	70000	539.99	Bachelors	John , Ruiz , Bachelors
John	Miller	Masters Degree	Management	80000	2320.49	Masters Degree	John , Miller , Masters Degree
Christy	Mehta	Partial High School	Clerical	50000	24.99	Partial High School	Christy , Mehta , Partial High School
Rob	Verhoff	Partial High School	Clerical	45000	24.99	Partial High School	Rob , Verhoff , Partial High School
Christy	Carlson	Graduate Degree	Management	70000	2234.99	Graduate Degree	Christy , Carlson , Graduate Degree
Gail	Erickson	Education	Professional	90000	4319.99	DUNNO	Gail , Erickson , Education
Barry	Johnson	Education	Management	80000	4968.59	DUNNO	Barry , Johnson , Education
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	Graduate Degree	Peter , Krebs , Graduate Degree
Greg	Alderson	Partial High School	Clerical	45000	23.5	Partial High School	Greg , Alderson , Partial High School

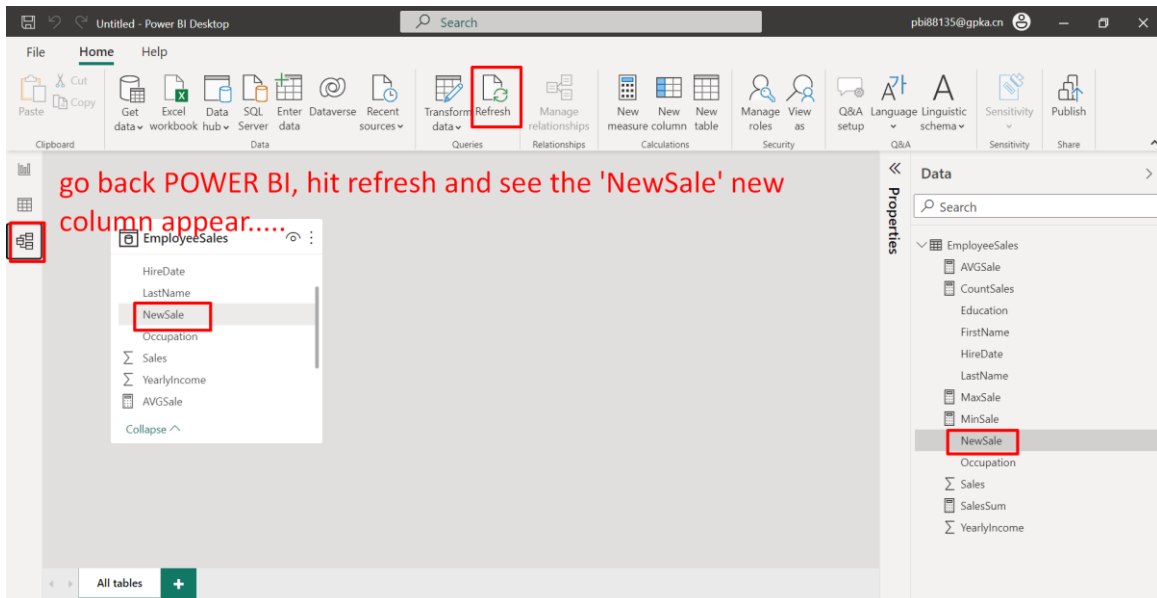
## VI. APPENDIX: CREATE A NEW COLUMN [NEW SALES]



EmployeeSales - Excel

	A	B	C	D	E	F	G	H	I	J	K
1	FirstName	LastName	Education	Occupation	YearlyIncome	Sales	NewSale	HireDate			
2	John	Yang	Bachelors	Professional	90000	3578.2	3000	28-01-06			
3	Rob	Johnson	Bachelors	Management	80000	3399.9	4000	29-12-10			
4	Ruben	Torres	Partial College	Skilled Manual	50000	699.09	700	29-12-11			
5	Christy	Zhu	Bachelors	Professional	80000	3078.2		28-12-12			
6	Rob	Huang	High School	Skilled Manual	60000	2319.9	2000	22-09-08			
7	John	Ruiz	Bachelors	Professional	70000	539.9	500	06-07-09			
8	John	Miller	Masters Degree	Management	80000	2320.4	1000	12-08-09			
9	Christy	Mehta	Partial High School	Clerical	50000	24.9		05-07-07			
10	Rob	Verhoff	Partial High School	Clerical	45000	24.9		15-09-13			
11	Christy	Carlson	Graduate Degree	Management	70000	2234.9	2000	25-01-14			
12	Gail	Erickson	Education	Professional	90000	4319.9	5000	02-10-06			
13	Barry	Johnson	Education	Management	80000	4968.5	4000	15-05-14			
14	Peter	Krebs	Graduate Degree	Clerical	50000	59.5		14-01-13			
15	Greg	Alderson	Partial High School	Clerical	45000	23.1		05-07-13			

we now go back to our original dataset excel spreadsheet [EmployeeSales] stored on our desktop... and include a new column called [NewSale]..key in the figures...



Untitled - Power BI Desktop

go back POWER BI, hit refresh and see the 'NewSale' new column appear.....

EmployeeSales

- HireDate
- LastName
- NewSale
- Occupation
- Σ Sales
- Σ YearlyIncome
- AVGSale
- Collapse ^

Data

- EmployeeSales
  - AVGSale
  - CountSales
  - Education
  - FirstName
  - HireDate
  - LastName
  - MaxSale
  - MinSale
  - NewSale
  - Occupation
  - Σ Sales
  - SalesSum
  - Σ YearlyIncome

do not that creating a New column with customized values is not possible here....

neither is it possible to add new column in Power Query because they require you to have added relationships to currently available columns [but which u don't have those relationships]

the NewSale column has appeared....

FirstName	LastName	Education	Occupation	YearlyIncome	Sales	HireDate	NewSale
John	Yang	Bachelors	Professional	90000	3578.27	28-01-06	3000
Rob	Johnson	Bachelors	Management	80000	3399.99	29-12-10	4000
Ruben	Torres	Partial College	Skilled Manual	50000	699.0982	29-12-11	700
Christy	Zhu	Bachelors	Professional	80000	3078.27	28-12-12	
Rob	Huang	High School	Skilled Manual	60000	2319.99	22-09-08	2000
John	Ruiz	Bachelors	Professional	70000	539.99	06-07-09	500
John	Miller	Masters Degree	Management	80000	2320.49	12-08-09	1000
Christy	Mehta	Partial High School	Clerical	50000	24.99	05-07-07	
Rob	Verhoff	Partial High School	Clerical	45000	24.99	15-09-13	
Christy	Carlson	Graduate Degree	Management	70000	2234.99	25-01-14	2000
Gail	Erickson	Education	Professional	90000	4319.99	02-10-06	5000
Barry	Johnson	Education	Management	80000	4968.59	15-05-14	4000
Peter	Krebs	Graduate Degree	Clerical	50000	59.53	14-01-13	
Greg	Alderson	Partial High School	Clerical	45000	23.5	05-07-13	

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## ABOUT DR. ALVIN ANG

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Dr. Alvin Ang earned his Ph.D., Masters and Bachelor degrees from NTU, Singapore. He is a scientist, entrepreneur, as well as a personal/business advisor. More about him at [www.AlvinAng.sg](http://www.AlvinAng.sg).