

# Power BI

## BETA -DAX in a Day

Lab 07

Use DAX time intelligence functions in Power BI Desktop Models

### Overview

The estimated time to complete this lab is: 20 min


## Exercise 21 – TOTALYTD.

The next exercise shows how to create a measure using the TOTALYTD function.

1. Open the **Adventure Works DW 2020 M07.pbix** Power BI Desktop file.
2. Add a new **Revenue YTD** measure to the model.
3. In the formula box, enter the following measure definition and then press the **Enter** key.

```
Revenue YTD =  
TOTALYTD([Revenue], 'Date'[Date], "6-30")
```

4. Format the **Revenue YTD** measure as currency with two decimal places.
5. Add the **Revenue YTD** measure to the table visual found on **Page 1** of the report.

Year	Revenue	Revenue YTD
 <b>FY2018</b>	<b>\$23,860,891.17</b>	<b>\$23,860,891.17</b>
2017 Jul	\$1,423,357.32	\$1,423,357.32
2017 Aug	\$2,057,902.45	\$3,481,259.78
2017 Sep	\$2,523,947.55	\$6,005,207.32
2017 Oct	\$561,681.48	\$6,566,888.80
2017 Nov	\$4,764,920.16	\$11,331,808.96
2017 Dec	\$596,746.56	\$11,928,555.52
2018 Jan	\$1,327,674.63	\$13,256,230.15
2018 Feb	\$3,936,463.31	\$17,192,693.45
2018 Mar	\$700,873.18	\$17,893,566.64
2018 Apr	\$1,519,275.24	\$19,412,841.88
2018 May	\$2,960,378.09	\$22,373,219.97
2018 Jun	\$1,487,671.19	\$23,860,891.17

6. Verify the values in the **Revenue YTD** column of the table visual show a cumulative running total for the financial year.

## Exercise 22 – SAMEPERIODLASTYEAR.

The next exercise shows how to create a measure that uses the SAMEPERIODLASTYEAR functions.

1. Continue with the file used from exercise 14.
2. Add a new **Revenue PY** measure to the model.
3. In the formula box, enter the following measure definition and then press the **Enter** key.

```
Revenue PY =  
VAR RevenuePriorYear =  
CALCULATE(  
    [Revenue],  
    SAMEPERIODLASTYEAR('Date'[Date])  
)  
RETURN  
    RevenuePriorYear
```

4. Format the **Revenue PY** measure as currency with two decimal places.
5. Add the **Revenue PY** measure to the matrix visual found on **Page 1** of the report.

Year	Revenue	Revenue YTD	Revenue PY
<b>FY2018</b>	<b>\$23,860,891.17</b>	<b>\$23,860,891.17</b>	
2017 Jul	\$1,423,357.32	\$1,423,357.32	
2017 Aug	\$2,057,902.45	\$3,481,259.78	
2017 Sep	\$2,523,947.55	\$6,005,207.32	
2017 Oct	\$561,681.48	\$6,566,888.80	
2017 Nov	\$4,764,920.16	\$11,331,808.96	
2017 Dec	\$596,746.56	\$11,928,555.52	
2018 Jan	\$1,327,674.63	\$13,256,230.15	
2018 Feb	\$3,936,463.31	\$17,192,693.45	
2018 Mar	\$700,873.18	\$17,893,566.64	
2018 Apr	\$1,519,275.24	\$19,412,841.88	
2018 May	\$2,960,378.09	\$22,373,219.97	
2018 Jun	\$1,487,671.19	\$23,860,891.17	
<b>FY2019</b>	<b>\$34,070,108.50</b>	<b>\$34,070,108.50</b>	<b>\$23,860,891.17</b>
2018 Jul	\$2,939,691.00	\$2,939,691.00	\$1,423,357.32
2018 Aug	\$3,964,801.20	\$6,904,492.20	\$2,057,902.45
2018 Sep	\$3,287,605.93	\$10,192,098.13	\$2,523,947.55
2018 Oct	\$2,157,287.40	\$12,349,385.53	\$561,681.48
2018 Nov	\$3,611,092.23	\$15,960,477.76	\$4,764,920.16
2018 Dec	\$2,624,078.39	\$18,584,556.15	\$596,746.56
2019 Jan	\$1,847,691.91	\$20,432,248.06	\$1,327,674.63
2019 Feb	\$2,829,361.64	\$23,261,609.70	\$3,936,463.31
2019 Mar	\$2,092,434.35	\$25,354,044.05	\$700,873.18
2019 Apr	\$2,405,970.99	\$27,760,015.05	\$1,519,275.24
2019 May	\$3,459,444.04	\$31,219,459.08	\$2,960,378.09
2019 Jun	\$2,850,649.42	\$34,070,108.50	\$1,487,671.19

- Verify the values in the **Revenue PY** column of the table visual show the **Revenue** values from the same month in the prior year.
- Modify the **Revenue PY** measure.
- In the formula box, enter the following measure definition and then press the **Enter** key.

```

Revenue YoY % =
VAR RevenuePriorYear =
CALCULATE(
    [Revenue],
    SAMEPERIODLASTYEAR('Date'[Date])
)
RETURN
DIVIDE(
    [Revenue] - RevenuePriorYear,
    RevenuePriorYear
)

```

9. Format the **Revenue YoY %** measure as a percent with two decimal places.
10. Notice the Revenue YoY % measure produces a ratio of change factor over the previous year's monthly revenue.

Year	Revenue	Revenue YTD	Revenue YoY %
<b>FY2018</b>	<b>\$23,860,891.17</b>	<b>\$23,860,891.17</b>	
2017 Jul	\$1,423,357.32	\$1,423,357.32	
2017 Aug	\$2,057,902.45	\$3,481,259.78	
2017 Sep	\$2,523,947.55	\$6,005,207.32	
2017 Oct	\$561,681.48	\$6,566,888.80	
2017 Nov	\$4,764,920.16	\$11,331,808.96	
2017 Dec	\$596,746.56	\$11,928,555.52	
2018 Jan	\$1,327,674.63	\$13,256,230.15	
2018 Feb	\$3,936,463.31	\$17,192,693.45	
2018 Mar	\$700,873.18	\$17,893,566.64	
2018 Apr	\$1,519,275.24	\$19,412,841.88	
2018 May	\$2,960,378.09	\$22,373,219.97	
2018 Jun	\$1,487,671.19	\$23,860,891.17	
<b>FY2019</b>	<b>\$34,070,108.50</b>	<b>\$34,070,108.50</b>	<b>42.79%</b>
2018 Jul	\$2,939,691.00	\$2,939,691.00	106.53%
2018 Aug	\$3,964,801.20	\$6,904,492.20	92.66%
2018 Sep	\$3,287,605.93	\$10,192,098.13	30.26%
2018 Oct	\$2,157,287.40	\$12,349,385.53	284.08%
2018 Nov	\$3,611,092.23	\$15,960,477.76	-24.22%
2018 Dec	\$2,624,078.39	\$18,584,556.15	339.73%
2019 Jan	\$1,847,691.91	\$20,432,248.06	39.17%
2019 Feb	\$2,829,361.64	\$23,261,609.70	-28.12%
2019 Mar	\$2,092,434.35	\$25,354,044.05	198.55%
2019 Apr	\$2,405,970.99	\$27,760,015.05	58.36%
2019 May	\$3,459,444.04	\$31,219,459.08	16.86%
2019 Jun	\$2,850,649.42	\$34,070,108.50	91.62%

## Exercise 23 – Calculate new occurrences.

The next exercise shows how to create a measure that calculates the number of new customers for a time period

1. Continue with the file used from exercise 22.
2. Add a new **Customers LTD** measure to the model.
3. In the formula box, enter the following measure definition and then press the **Enter** key.

```
Customers LTD =
VAR CustomersLTD =
    CALCULATE(
        DISTINCTCOUNT(Sales[CustomerKey]),
        DATESBETWEEN(
            'Date'[Date],
            BLANK(),
            MAX('Date'[Date])
        ),
        'Sales Order'[Channel] = "Internet"
    )
RETURN
    CustomersLTD
```

4. Format the **Customers LTD** measure as whole number with zero decimal places. Enable the thousands separator.
5. Add the **Customers LTD** measure to the matrix visual found on **Page 1** of the report.

Year	Revenue	Revenue YTD	Revenue YoY %	Customers LTD
<b>FY2018</b>	<b>\$23,860,891.17</b>	<b>\$23,860,891.17</b>		<b>2,459</b>
2017 Jul	\$1,423,357.32	\$1,423,357.32		289
2017 Aug	\$2,057,902.45	\$3,481,259.78		448
2017 Sep	\$2,523,947.55	\$6,005,207.32		609
2017 Oct	\$561,681.48	\$6,566,888.80		783
2017 Nov	\$4,764,920.16	\$11,331,808.96		1,013
2017 Dec	\$596,746.56	\$11,928,555.52		1,201
2018 Jan	\$1,327,674.63	\$13,256,230.15		1,394
2018 Feb	\$3,936,463.31	\$17,192,693.45		1,571
2018 Mar	\$700,873.18	\$17,893,566.64		1,790
2018 Apr	\$1,519,275.24	\$19,412,841.88		1,992
2018 May	\$2,960,378.09	\$22,373,219.97		2,214
2018 Jun	\$1,487,671.19	\$23,860,891.17		2,459

6. Notice the **Customers LTD** column of the matrix visual shows a result of distinct customers until the end of each month.
7. Modify the **Customers LTD** measure.
8. In the formula box, enter the following measure definition and then press the **Enter** key.

```

New Customers =
VAR CustomersLTD =
    CALCULATE(
        DISTINCTCOUNT(Sales[CustomerKey]),
        DATESBETWEEN(
            'Date'[Date],
            BLANK(),
            MAX('Date'[Date])
        ),
        'Sales Order'[Channel] = "Internet"
    )
VAR CustomersPrior =
    CALCULATE(
        DISTINCTCOUNT(Sales[CustomerKey]),
        DATESBETWEEN(
            'Date'[Date],
            BLANK(),
            MIN('Date'[Date]) - 1
        ),
        'Sales Order'[Channel] = "Internet"
    )
RETURN
    CustomersLTD - CustomersPrior

```

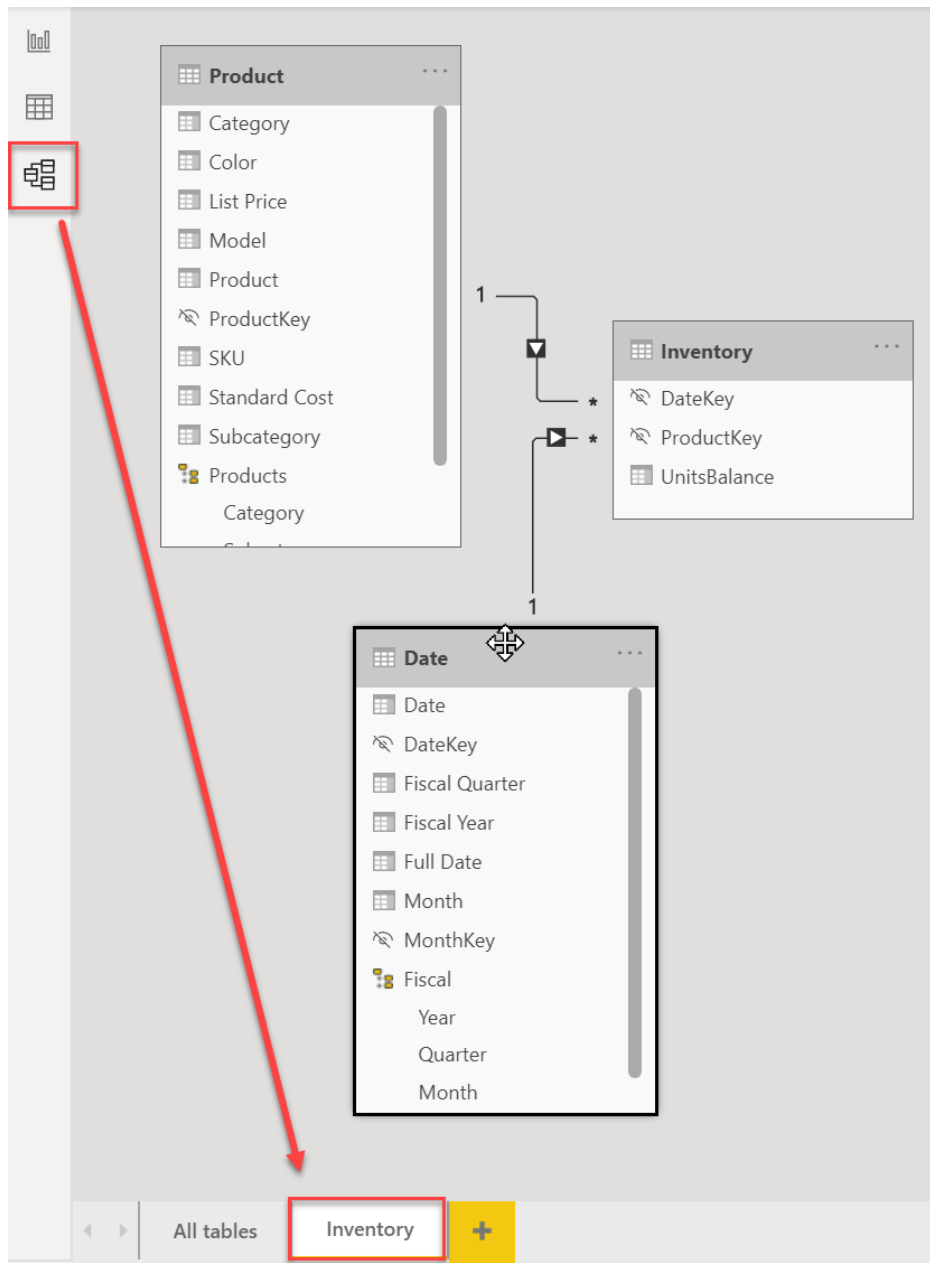
9. Notice the New Customers measure now shows the number of new customers per month.

Year	Revenue	Revenue YTD	Revenue YoY %	New Customers
☐ FY2018	\$23,860,891.17	\$23,860,891.17		2,459
2017 Jul	\$1,423,357.32	\$1,423,357.32		289
2017 Aug	\$2,057,902.45	\$3,481,259.78		159
2017 Sep	\$2,523,947.55	\$6,005,207.32		161
2017 Oct	\$561,681.48	\$6,566,888.80		174
2017 Nov	\$4,764,920.16	\$11,331,808.96		230
2017 Dec	\$596,746.56	\$11,928,555.52		188
2018 Jan	\$1,327,674.63	\$13,256,230.15		193
2018 Feb	\$3,936,463.31	\$17,192,693.45		177
2018 Mar	\$700,873.18	\$17,893,566.64		219
2018 Apr	\$1,519,275.24	\$19,412,841.88		202
2018 May	\$2,960,378.09	\$22,373,219.97		222
2018 Jun	\$1,487,671.19	\$23,860,891.17		245

## Exercise 24 – Snapshot calculations.

The next exercise shows how to create a measure that calculates the number of new customers for a time period

1. Continue with the file used from exercise 23.
2. Switch to the model view and select the Inventory diagram.



3. Switch to the report view and select **Page 2** of the report.



4. Add the **UnitsBalance** column of the **Inventory** table to the matrix visual.

FY2020 Mountain-200 Bike Stock

Product	2019 Jul	2019 Aug	2019 Sep	2019 Oct	2019 Nov	2019 Dec	2020 Jan	2020 Feb	2020 Mar	2020 Apr	2020 May	2020 Jun	Total
Mountain-200 Black, 38	4,884	4,649	4,784	4,873	4,605	4,943	5,208	4,872	5,208	5,040	5,208	2,520	56,794
Mountain-200 Black, 42	5,248	5,175	5,246	5,382	5,200	5,415	5,177	4,843	5,177	5,010	5,177	2,505	59,555
Mountain-200 Black, 46	5,523	5,617	5,287	5,419	5,273	5,663	5,890	5,510	5,890	5,700	5,890	2,850	64,512
Mountain-200 Silver, 38	5,412	5,190	5,114	5,245	5,220	5,406	5,890	5,510	5,890	5,700	5,890	2,850	63,317
Mountain-200 Silver, 42	5,252	5,262	5,043	5,266	5,072	5,208	5,022	4,698	5,022	4,860	5,022	2,430	58,157
Mountain-200 Silver, 46	5,004	5,019	4,960	5,012	4,847	5,231	5,053	4,727	5,053	4,890	5,053	2,445	57,294
<b>Total</b>	<b>31,323</b>	<b>30,912</b>	<b>30,434</b>	<b>31,197</b>	<b>30,217</b>	<b>31,866</b>	<b>32,240</b>	<b>30,160</b>	<b>32,240</b>	<b>31,200</b>	<b>32,240</b>	<b>15,600</b>	<b>359,629</b>

5. Notice the default summarization of this column is SUM, and does not produce a meaningful result.
6. Remove the **UnitsBalance** column from the matrix visual.
7. Add a new **Stock on Hand** measure to the model.
8. In the formula box, enter the following measure definition and then press the **Enter** key.

```
Stock on Hand =
CALCULATE(
    SUM(Inventory[UnitsBalance]),
    LASTDATE('Date'[Date])
)
```

9. Format the **Stock on Hand** measure as whole number with zero decimal places. Enable the thousands separator.
10. Add the **Stock on Hand** measure to the matrix visual found on **Page 2** of the report.

FY2020 Mountain-200 Bike Stock

Product	2019 Jul	2019 Aug	2019 Sep	2019 Oct	2019 Nov	2019 Dec	2020 Jan	2020 Feb	2020 Mar	2020 Apr	2020 May	2020 Jun	Total
Mountain-200 Black, 38	151	171	99	172	30	168	168	168	168	168	168		
Mountain-200 Black, 42	165	186	116	176	76	167	167	167	167	167	167		
Mountain-200 Black, 46	182	184	131	172	111	190	190	190	190	190	190		
Mountain-200 Silver, 38	171	173	129	190	85	190	190	190	190	190	190		
Mountain-200 Silver, 42	177	169	109	170	120	162	162	162	162	162	162		
Mountain-200 Silver, 46	181	158	126	178	88	163	163	163	163	163	163		
<b>Total</b>	<b>1,027</b>	<b>1,041</b>	<b>710</b>	<b>1,058</b>	<b>510</b>	<b>1,040</b>	<b>1,040</b>	<b>1,040</b>	<b>1,040</b>	<b>1,040</b>	<b>1,040</b>		

11. Notice the blank values in the **2020 Jun** and **Total** columns of the matrix visual.
12. Modify the **Stock on Hand** measure.
13. In the formula box, enter the following measure definition and then press the **Enter** key.

```

Stock on Hand =
CALCULATE(
    SUM(Inventory[UnitsBalance]),
    LASTNONBLANK(
        'Date'[Date],
        CALCULATE(SUM(Inventory[UnitsBalance]))
    )
)

```

14. Verify the values in the **2020 Jun** and **Total** columns of the table visual show values instead of blank.

2020 Apr	2020 May	2020 Jun	Total
168	168	168	<b>168</b>
167	167	167	<b>167</b>
190	190	190	<b>190</b>
190	190	190	<b>190</b>
162	162	162	<b>162</b>
163	163	163	<b>163</b>
<b>1,040</b>	<b>1,040</b>	<b>1,040</b>	<b>1,040</b>

15. Hide the **UnitsBalance** column in the **Inventory** to prevent report authors from inappropriately summarizing snapshot unit balances.

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