

Sessions- 5 & 6

Practical-3

DAX-Creating Table, Columns & Matrixes

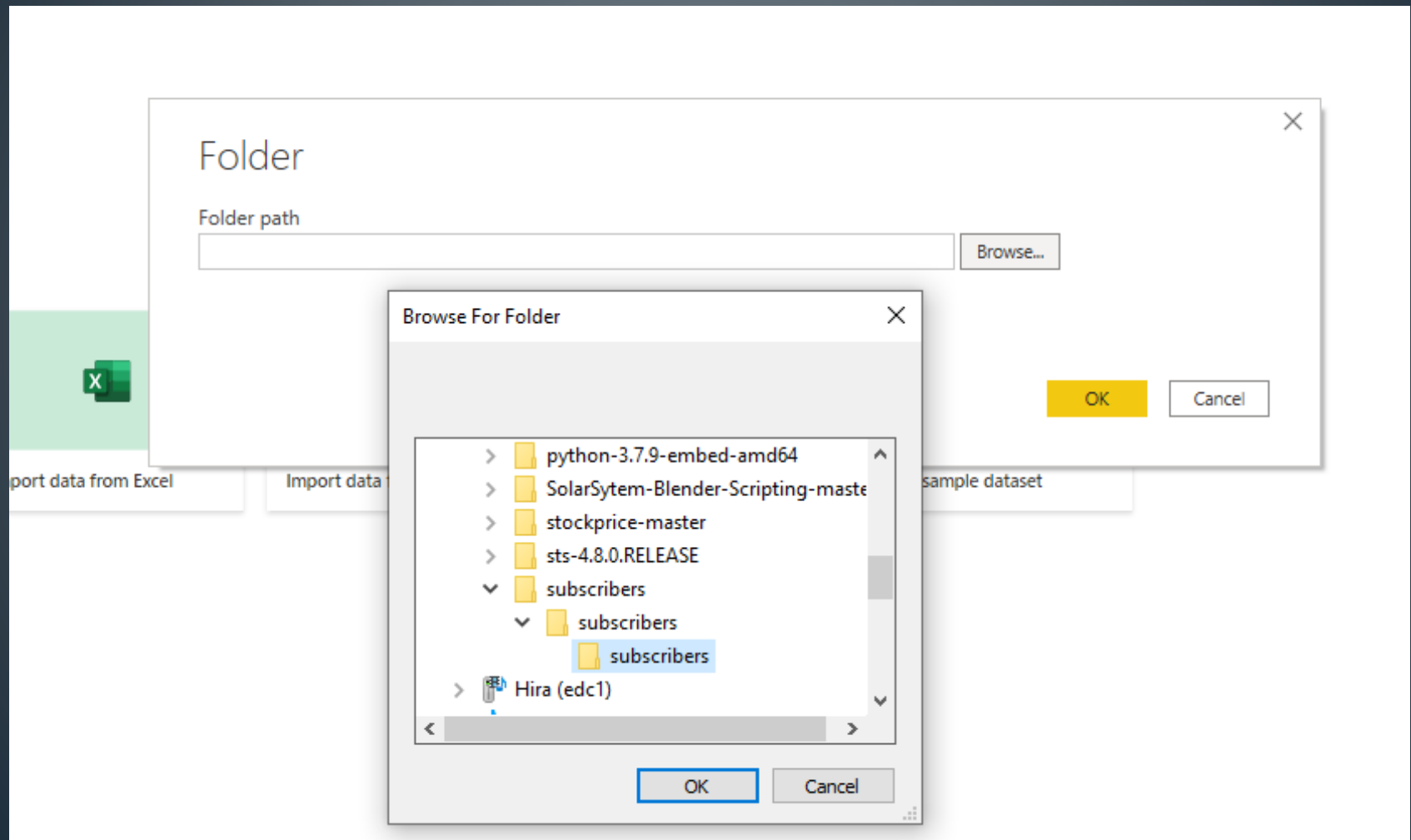
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MS in Data Science (Reading)
(NED University of Engineering & Technology, Karachi)

Road Map

- Follow steps 1 to 31 and Practice them.
- Use Subscribers main Folder for this practical which I shared with you all last sessions which includes three types of files data sources (Folder, Excel and text)



1. Get Data (Subscriber's Folder) → Transform Data → Combine



Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Manage Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Binary Use First Row as Headers Replace Values

Queries [1] subscribers

	Content	Name	Extension	Date accessed	Date modified
1	Binary	new.csv	.csv	2/8/2021 4:32:00 PM	6/10/2019 1:55:38 PM
2	Binary	renewals.csv	.csv	2/8/2021 4:32:01 PM	6/10/2019 1:54:04 PM

Combine Files

Specify the settings for each file. [Learn more](#)

Sample File:
First file

File Origin: 65001: Unicode (UTF-8) Delimiter: Comma Data Type Detection: Based on first 200 rows

Date	Product	Country Code	Years
09/03/2018 00:00	Premium	NZL	0
27/07/2018 00:00	Premium	NZL	0
06/06/2018 00:00	Premium	IND	0
06/06/2018 00:00	Premium	USA	0
12/04/2018 00:00	Premium	USA	0
25/09/2018 00:00	Free	USA	0

☒ Skip files with errors

OK Cancel

2. Source.Name (.csv) → Replace values

The screenshot shows the Power Query Editor interface with a data table and a 'Replace Values' dialog box open.

Power Query Editor Interface:

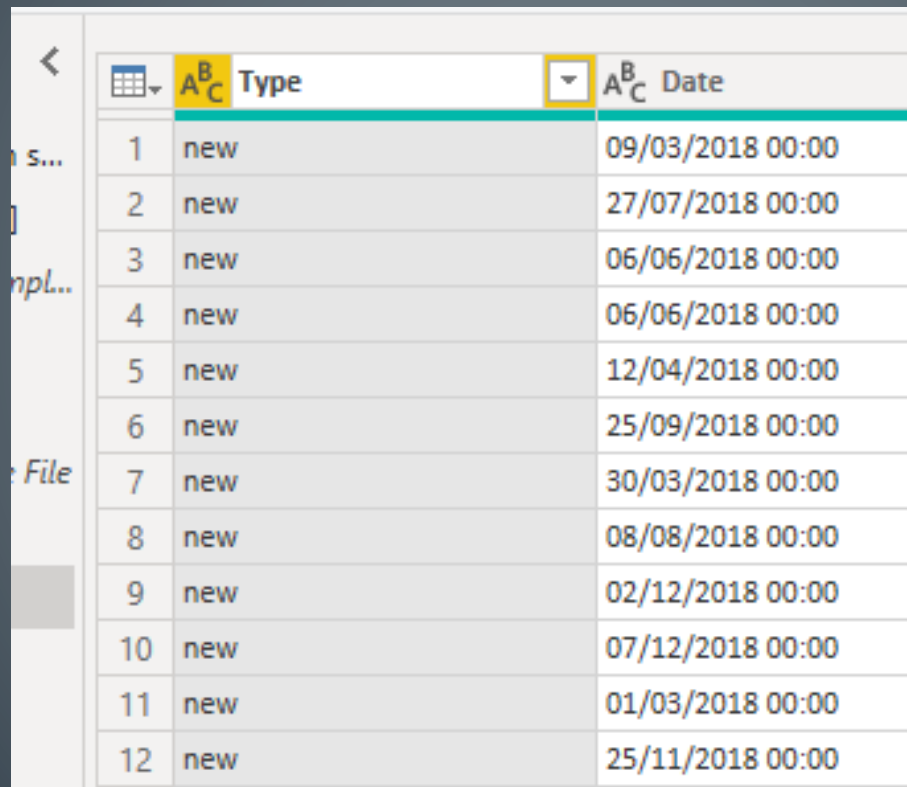
- File Tab:** Close & Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters, Refresh Preview, Properties, Advanced Editor, Manage, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column, Group By, Replace Values, Data Type: Text, Use First Row as Headers.
- Queries [5]:** Transform File from s..., Helper Queries [3] (Parameter1 (Sampl..., Sample File, Transform File, Transform Sample File), Other Queries [1] (subscribers).
- Data Table:**



	Source.Name	Date	Product	Country Code	Years
1	new.csv	09/03/2018 00:00	Premium	NZL	
2	new.csv	27/07/2018 00:00	Premium	NZL	
3	new.csv	05/02/2018 00:00	Premium	ARG	
4	new.csv	06/12/2018 00:00	Premium	AUS	
5	new.csv	23/11/2018 00:00	Free	ARG	
6	new.csv	12/12/2018 00:00	Free	USA	
7	new.csv	25/03/2018 00:00	Free	USA	
8	new.csv	13/03/2018 00:00	Premium	USA	

Replace Values Dialog Box:

- Title:** Replace Values
- Message:** Replace one value with another in the selected columns.
- Value To Find:** .csv
- Replace With:** (empty field)
- Advanced options:** (expandable section)
- Buttons:** OK, Cancel

3. Source.Name → (Rename) Type



	 A ^B _C Type	 A ^B _C Date
1	new	09/03/2018 00:00
2	new	27/07/2018 00:00
3	new	06/06/2018 00:00
4	new	06/06/2018 00:00
5	new	12/04/2018 00:00
6	new	25/09/2018 00:00
7	new	30/03/2018 00:00
8	new	08/08/2018 00:00
9	new	02/12/2018 00:00
10	new	07/12/2018 00:00
11	new	01/03/2018 00:00
12	new	25/11/2018 00:00

4. Date (00:00) → Replace

A ^B _C Date	A ^B _C Product	A ^B _C C
09/03/2018 00:00	Premium	NZL
27/07/2018 00:00	Premium	NZL
06/06/2018 00:00	Premium	IND
06/06/2018 00:00	Premium	USA

Replace Values

Replace one value with another in the selected columns.

Value To Find

Replace With

▸ Advanced options

5. Date (00:00) → Replace

▼ A ^B _C Date	▼ A ^B _C Product	▼ A ^B _C C
09/03/2018 00:00	Premium	NZL
27/07/2018 00:00	Premium	NZL
06/06/2018 00:00	Premium	IND
06/06/2018 00:00	Premium	USA

Replace Values

Replace one value with another in the selected columns.

Value To Find

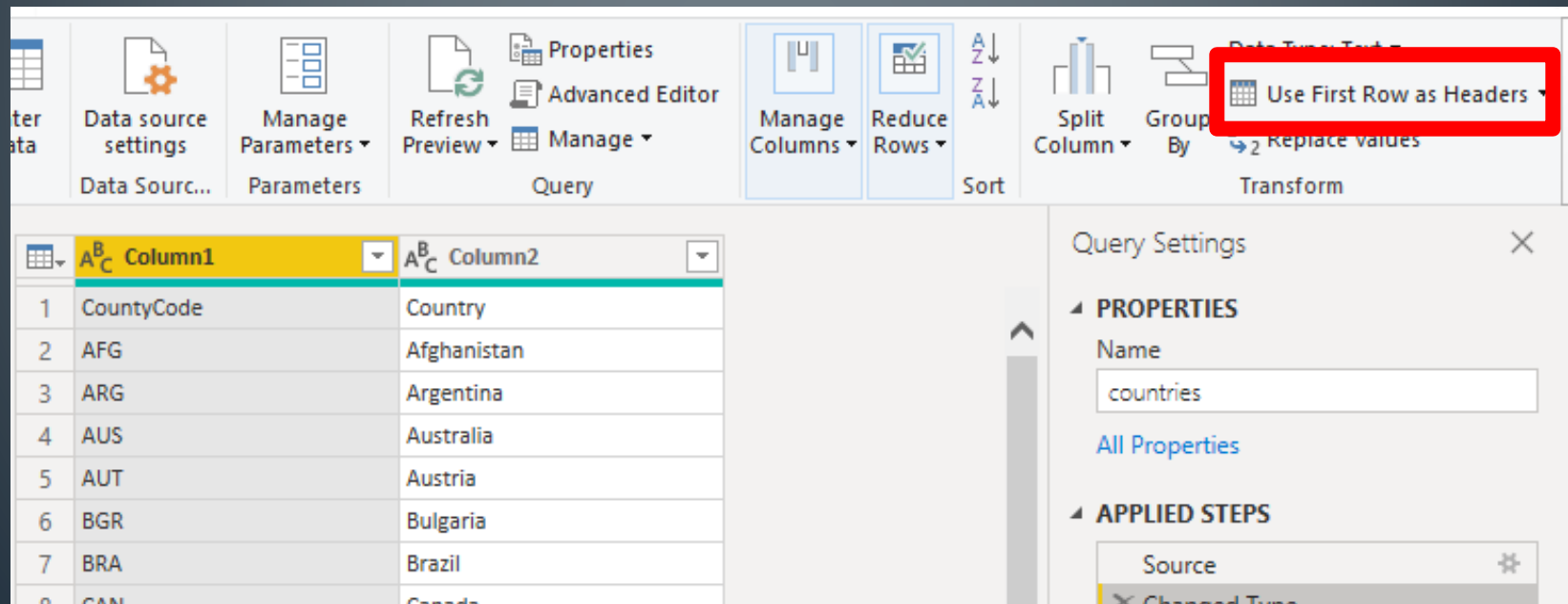
Replace With

▸ Advanced options

6. Get Data from Excel(packages) file

7. Get Data from Text(countries) file

8. Change Column Header in text file



The screenshot displays the Power Query Editor interface. The ribbon at the top includes tabs for Data source settings, Manage Parameters, Query, Sort, and Transform. The 'Transform' tab is active, and the 'Use First Row as Headers' option is highlighted with a red rectangle. Below the ribbon, a data table is visible with two columns: 'Column1' and 'Column2'. The first row of data contains 'CountyCode' and 'Country'. The 'Query Settings' pane on the right shows the query name 'countries' and a list of applied steps, including 'Source' and 'Changed Type'.

Column1	Column2
CountyCode	Country
AFG	Afghanistan
ARG	Argentina
AUS	Australia
AUT	Austria
BGR	Bulgaria
BRA	Brazil
CAN	Canada

9. Rename countries → dcountries

10. Date (Type) → Date

11. Format it in to dd/mm/yyyy

[illegible]

Home
Help
Table tools
Column tools

Date

\$% Format
14/03/2001 (dd/mm/yy)

Σ Summarization
Don't summarize

Date

\$ %

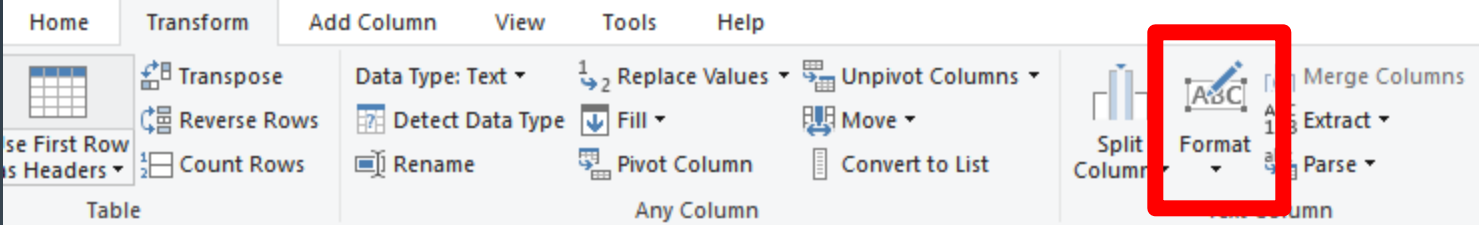
Structure

Date
Product
Country Code

Date formats

*3/14/2001 (m/d/yyyy)
Wednesday, March 14, 2001 (dddd, mmmm d, yyyy)
March 14, 2001 (mmmm d, yyyy)
Wednesday, 14 March, 2001 (dddd, d mmmm, yyyy)
14 March, 2001 (d mmmm, yyyy)
3/14/01 (m/d/yy)
03/14/01 (mm/dd/yy)
03/14/2001 (mm/dd/yyyy)
01/03/14 (yy/mm/dd)
2001-03-14 (yyyy-mm-dd)
14-Mar-01 (dd-mmm-yy)
14/03/2001 (dd/mm/yyyy)
March 2001 (mmmm yyyy)
2001-03 (yyyy-mm)
March 14 (mmmm d)
01 (yy)
2001 (yyyy)

12. Type(new, renew) → Capitalize values(New, Renew)

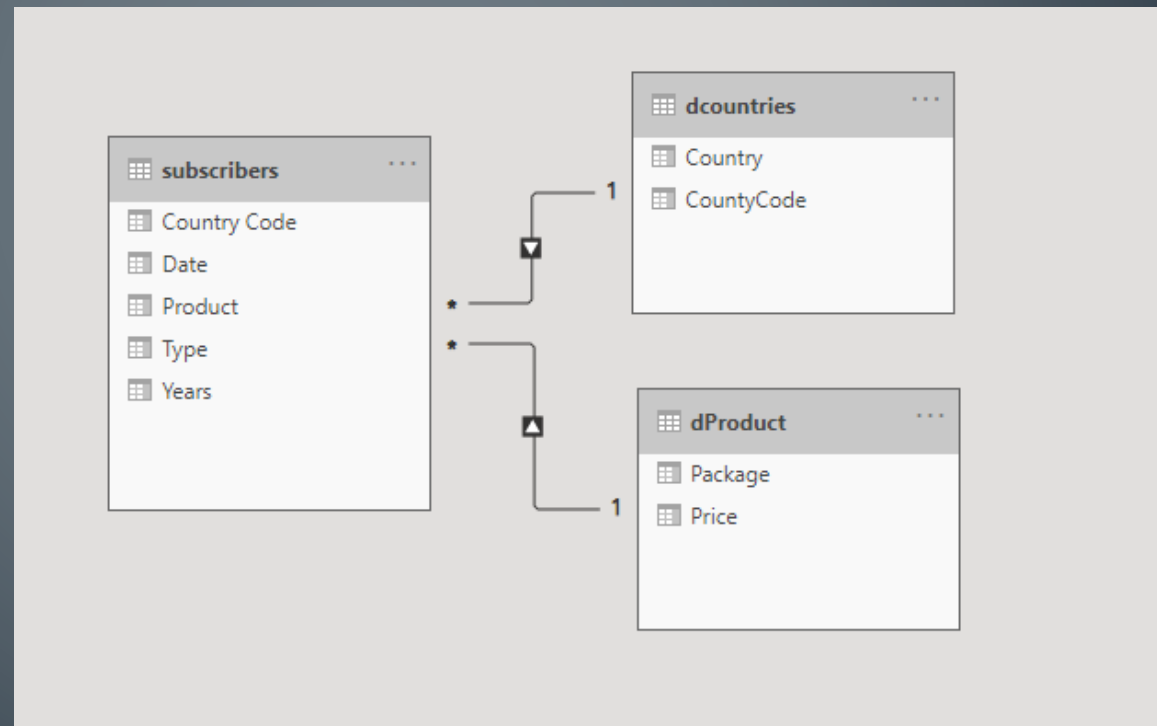


The screenshot shows the Power Query ribbon with the 'Format' button highlighted by a red rectangle. The ribbon includes tabs for Home, Transform, Add Column, View, Tools, and Help. The 'Format' button is located in the 'Tools' group, next to the 'Split Column' button. The data table below shows a list of records with columns for Type, Date, Product, and Country Code.

	Type	Date	Product	Country Code
1	New	09/03/2018	Premium	NZL
2	New	27/07/2018	Premium	NZL
3	New	06/06/2018	Premium	IND
4	New	06/06/2018	Premium	USA
5	New	12/04/2018	Premium	USA
6	New	25/09/2018	Free	USA
7	New	30/03/2018	Free	USA
8	New	08/08/2018	Free	USA

13. Data Model Relationship

subscribers	dcountries	dProduct
Country Code	Country Code	
Product		Package



14. Creating New Table Using DAX

Create a table which includes 365 Days in the year using CALENDAR()

- A. CALENDAR(start date, end date)
- B. Date(year, month, day)
- C. Year() → we used existing data year
- D. Arguments expected. So, min & max we used

Structure



Calendars

Relationships



Calculations

15. Creating new columns in new table

A. Number of Month column

Structure		Formatting
 		1 MonthNumber = MONTH([dDate[Date]])
Date	MonthNumber	
1/1/2018 12:00:00 AM	1	
1/2/2018 12:00:00 AM	1	
1/3/2018 12:00:00 AM	1	
1/4/2018 12:00:00 AM	1	

B. Name of Month column

 		1 MonthName = FORMAT([dDate[Date]], "MMM")
Date	MonthNumber	MonthName
1/1/2018 12:00:00 AM	1	Jan
1/2/2018 12:00:00 AM	1	Jan
1/3/2018 12:00:00 AM	1	Jan
1/4/2018 12:00:00 AM	1	Jan
1/5/2018 12:00:00 AM	1	Jan

15. Creating new columns in new table

C. Day number in Week column

Structure		Formatting	
X ✓		1 DayNumWeek = WEEKDAY(dDate[Date],2)	
Date	MonthNumber	MonthName	DayNumWeek
1/1/2018 12:00:00 AM	1	Jan	1
1/2/2018 12:00:00 AM	1	Jan	2
1/3/2018 12:00:00 AM	1	Jan	3
1/4/2018 12:00:00 AM	1	Jan	4
1/5/2018 12:00:00 AM	1	Jan	5

D. Name of Day number in Week column

Structure		Formatting		Properties	
X ✓		1 NameDayNumWeek = FORMAT(dDate[Date],"DDD")			
Date	MonthNumber	MonthName	DayNumWeek	NameDayNumWeek	
1/1/2018 12:00:00 AM	1	Jan	1	Mon	
1/2/2018 12:00:00 AM	1	Jan	2	Tue	
1/3/2018 12:00:00 AM	1	Jan	3	Wed	
1/4/2018 12:00:00 AM	1	Jan	4	Thu	
1/5/2018 12:00:00 AM	1	Jan	5	Fri	
1/6/2018 12:00:00 AM	1	Jan	6	Sat	

16. According to Name of Day number in Week column Sort the new table.

17. Mark as data table new table.

Untitled - Power BI Desktop

File Home Help **Table tools** Column tools

Name: dDate

Mark as date table Manage relationships New measure Quick measure New column New table

Calendars Relationships Calculations

Structure

1 Name

Date

1/1/2018 12:00:00 AM
1/2/2018 12:00:00 AM
1/3/2018 12:00:00 AM
1/4/2018 12:00:00 AM
1/5/2018 12:00:00 AM
1/6/2018 12:00:00 AM
1/7/2018 12:00:00 AM
1/8/2018 12:00:00 AM
1/9/2018 12:00:00 AM
1/10/2018 12:00:00 AM
1/11/2018 12:00:00 AM
1/12/2018 12:00:00 AM
1/13/2018 12:00:00 AM
1/14/2018 12:00:00 AM
1/15/2018 12:00:00 AM
1/16/2018 12:00:00 AM
1/17/2018 12:00:00 AM
1/18/2018 12:00:00 AM

1 Jan 2 Tue
1 Jan 3 Wed
1 Jan 4 Thu

Mark as date table

Select a column to be used for the date. The column must be of the data type 'date' and must contain only unique values. [Learn more](#)

Date column

Date

Validated successfully

When you mark this as a date table, the built-in date tables that were associated with this table are removed. Visuals or DAX expressions referring to them may break. [Learn how to fix visuals and DAX expressions](#)

OK Cancel

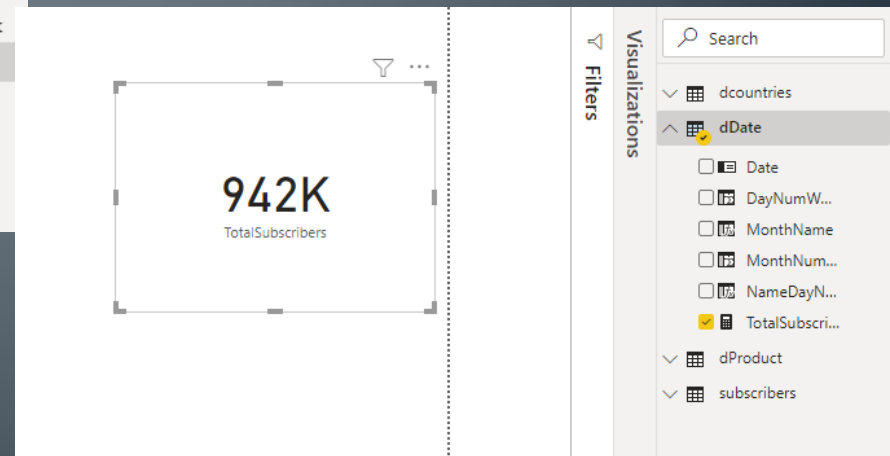
18. We can hide some columns from report view if we don't need. In Model view Table columns right click Hide View. WE can do this in many ways also

19. Creating New Measure Using DAX in subscribers Table (I by mistakenly created it dDate Table. You don't create in dDate Table)

A. We have to create a matrix for total subscribers

1 TotalSubscribers = COUNTROWS(subscribers)				
	MonthNumber	MonthName	DayNumWeek	NameDay
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu
00:00 AM	1	Jan	5	Fri
00:00 AM	1	Jan	6	Sat
00:00 AM	1	Jan	7	Sun
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu
00:00 AM	1	Jan	5	Fri
00:00 AM	1	Jan	6	Sat
00:00 AM	1	Jan	7	Sun
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu

We have to check measure from visualization (Report View)



19. Creating New Measure Using DAX

B. We have to create a matrix for counting total **Free** subscribers.

1 TotalFree = COUNTROWS(FILTER(subscribers,subscribers[Product]					
Date	MonthNumber	MonthName	DayNumWeek	NameDayNumWeek	
1/1/2018 12:00:00 AM	1	Jan		1 Mon	
1/2/2018 12:00:00 AM	1	Jan		2 Tue	
1/3/2018 12:00:00 AM	1	Jan		3 Wed	
1/4/2018 12:00:00 AM	1	Jan		4 Thu	
1/5/2018 12:00:00 AM	1	Jan		5 Fri	
1/6/2018 12:00:00 AM	1	Jan		6 Sat	
1/7/2018 12:00:00 AM	1	Jan		7 Sun	
1/8/2018 12:00:00 AM	1	Jan		1 Mon	
1/9/2018 12:00:00 AM	1	Jan		2 Tue	
1/10/2018 12:00:00 AM	1	Jan		3 Wed	
1/11/2018 12:00:00 AM	1	Jan		4 Thu	
1/12/2018 12:00:00 AM	1	Jan		5 Fri	
1/13/2018 12:00:00 AM	1	Jan		6 Sat	
1/14/2018 12:00:00 AM	1	Jan		7 Sun	
1/15/2018 12:00:00 AM	1	Jan		1 Mon	
1/16/2018 12:00:00 AM	1	Jan		2 Tue	

Fields

Search

dcountries

dDate

Date

DayNumWeek

MonthName

MonthNumber

NameDayNumWeek

TotalFree

TotalSubscribers

dProduct

subscribers

19. Creating New Measure Using DAX

C. We have to create a matrix for counting total **Premium** subscribers.

1 TotalPremium = COUNTROWS(FILTER(subscribers,subscribers[Product]="Premium"))

	MonthNumber	MonthName	DayNumWeek	NameDayNumWeek
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu
00:00 AM	1	Jan	5	Fri
00:00 AM	1	Jan	6	Sat
00:00 AM	1	Jan	7	Sun
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu
00:00 AM	1	Jan	5	Fri
00:00 AM	1	Jan	6	Sat
00:00 AM	1	Jan	7	Sun
00:00 AM	1	Jan	1	Mon
00:00 AM	1	Jan	2	Tue
00:00 AM	1	Jan	3	Wed
00:00 AM	1	Jan	4	Thu

Fields

Search

- dcountries
- dDate
- Date
- DayNumWeek
- MonthName
- MonthNumber
- NameDayNumWeek
- TotalFree
- TotalPremium
- TotalSubscribers
- dProduct
- subscribers

19. Creating New Measure Using DAX

D. We have to create a matrix for counting total revenue.

In here we have to use sum or max aggregation function.

1 TotalRevenue = [TotalPremium]*SUM(dProduct[Price])				
	▼ MonthNumber ▼	▼ MonthName ▼	▼ DayNumWeek ▼	▼ NameDayNumWeek ▼
:00:00 AM	1	Jan	1	Mon

19. Creating New Measure Using DAX

E. We have to create a matrix for Premium Percent.

Structure

Formatting

Properties

✕

✓

1 %Premium = [TotalPremium]/[TotalSubscribers]

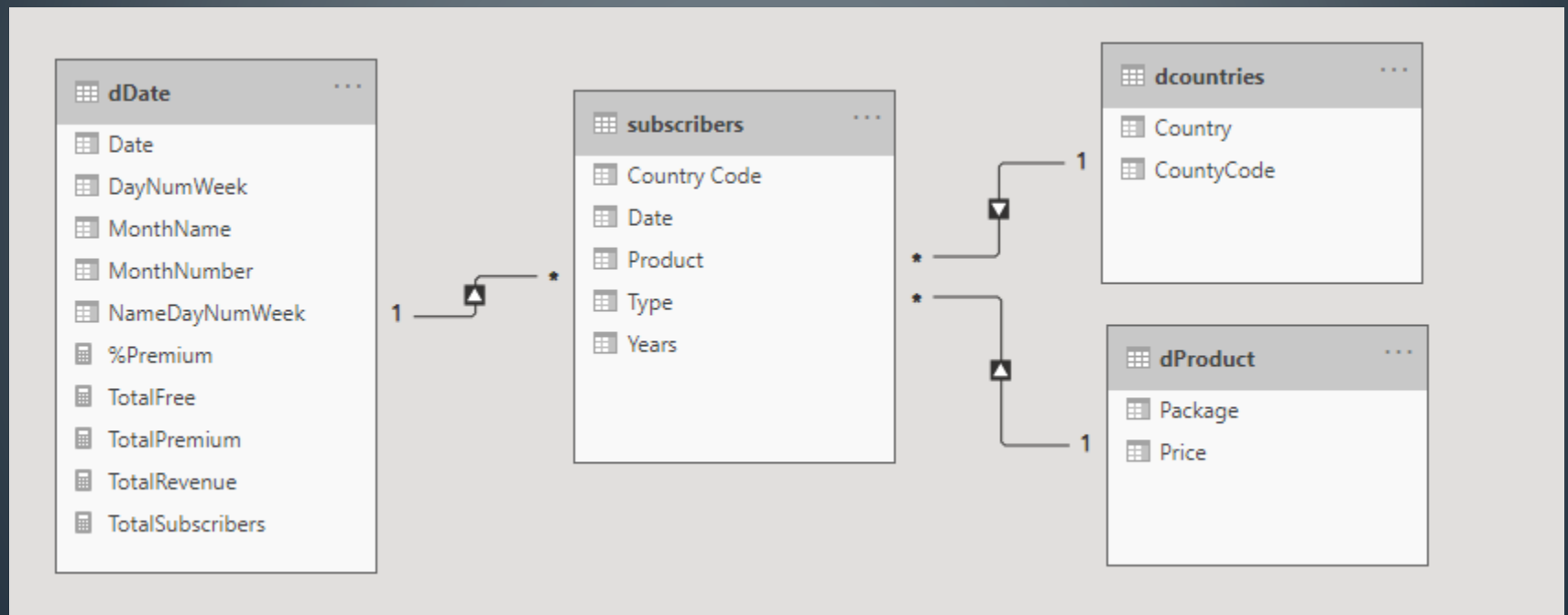
Date	MonthNumber	MonthName	DayNumWeek	NameDayNumWeek
1/1/2018 12:00:00 AM	1	Jan	1	Mon
1/2/2018 12:00:00 AM	1	Jan	2	Tue
1/3/2018 12:00:00 AM	1	Jan	3	Wed
1/4/2018 12:00:00 AM	1	Jan	4	Thu

We can do this in DAX different method also.

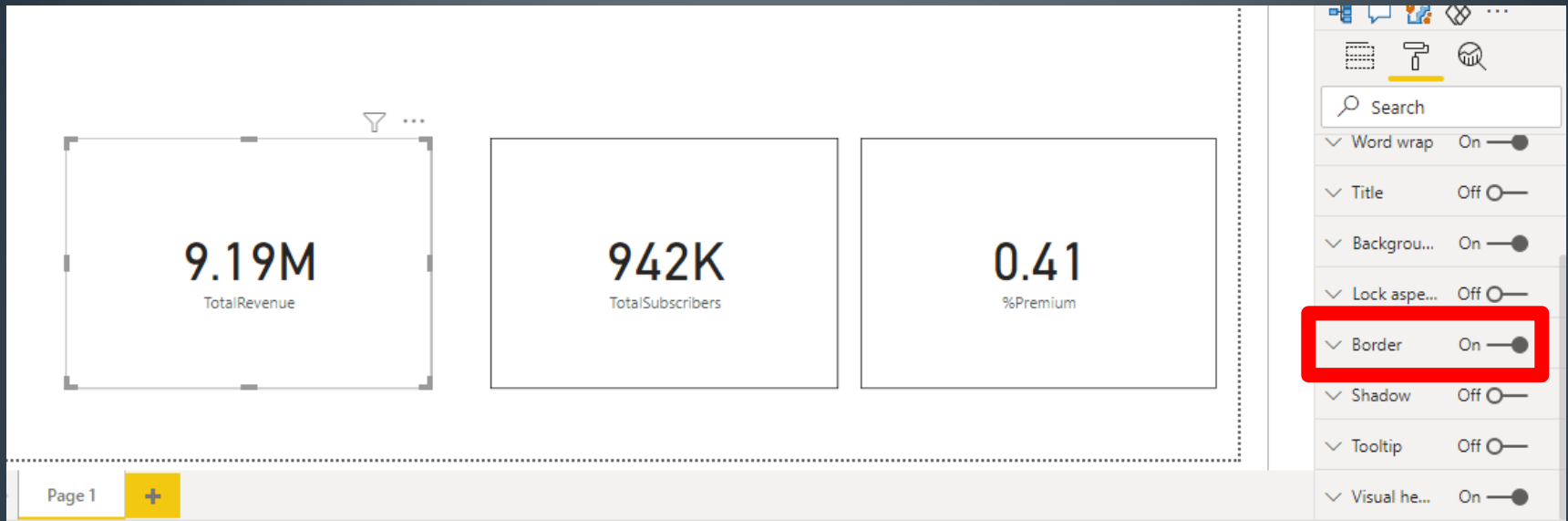
1 %Premium = DIVIDE([TotalPremium],[TotalSubscribers],1)					
Date	MonthNumber	MonthName	DayNumWeek	NameDayNumWeek	
1/1/2018 12:00:00 AM	1	Jan	1	Mon	
1/2/2018 12:00:00 AM	1	Jan	2	Tue	
1/3/2018 12:00:00 AM	1	Jan	3	Wed	

20. Model Relationship

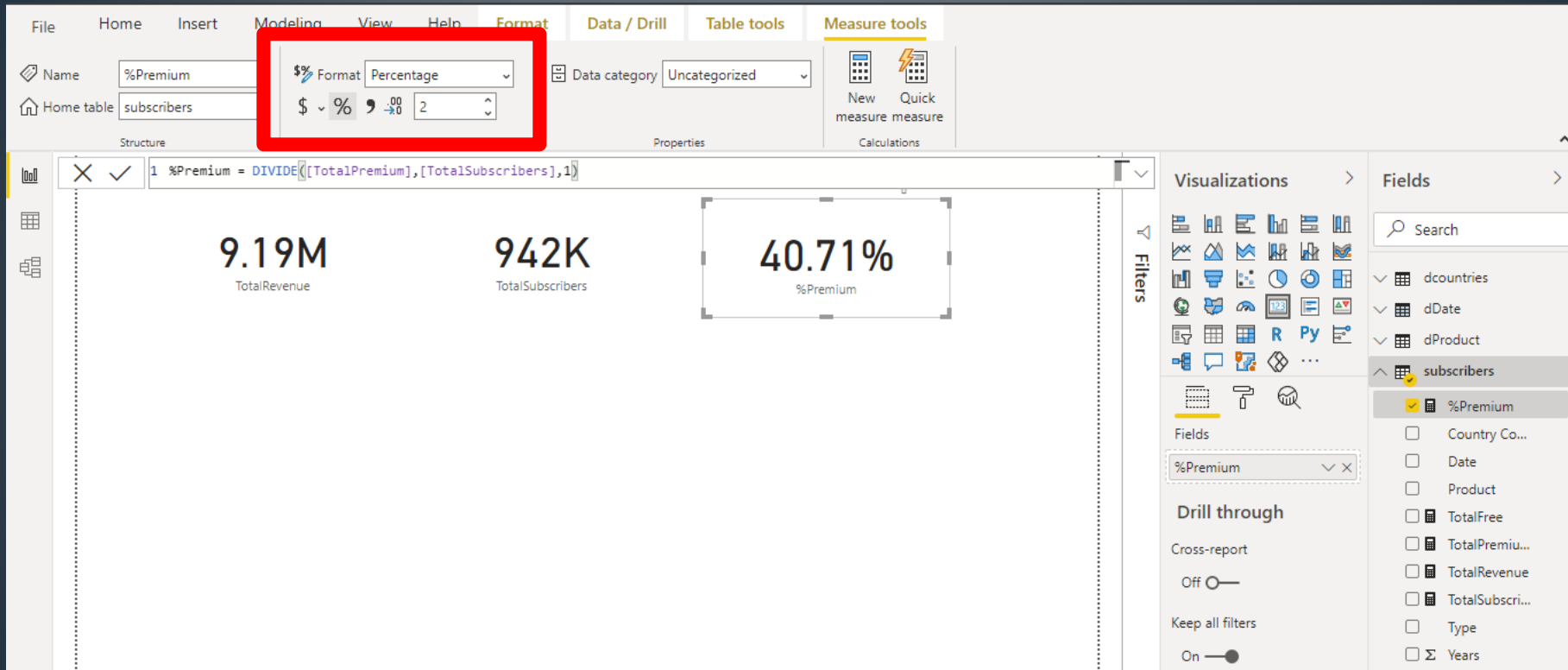
subscribers	dDate
Date	Date



21. Create Card Visualizations for below 3 Measures with borders

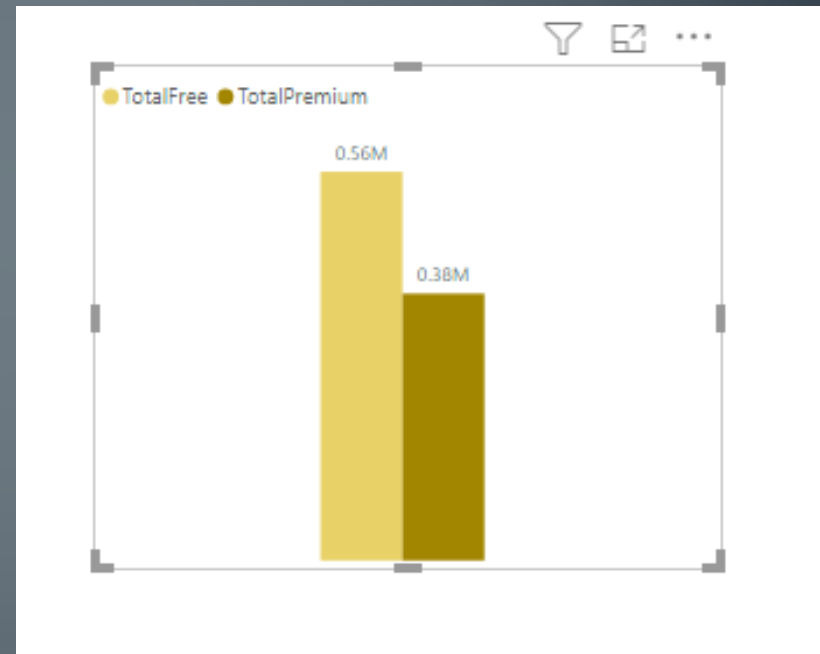


22. %Premium Measure change to % with 2 decimals.



23. Column Chart

- Drag TotalFree and TotalPremium measures in to Column Chart
- Format→
 - Title off
 - y axis & title off
 - data label on
 - change the data colors



24. Map

942K

TotalSubscribers

40.71%

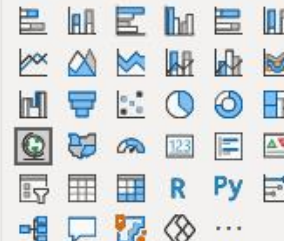
%Premium

TotalSubscribers by Country



< Filters

Visualizations



Location

Country

Legend

Add data fields here

Latitude

Add data fields here

Longitude

Add data fields here

Size

TotalSubscribers

Fields

Search

dcountries

☒ Country

☐ CountyCode

dDate

dProduct

subscribers

☐ %Premium

☐ Country Co...

☐ Date

☐ Product

☐ TotalFree

☐ TotalPremiu...

☐ TotalRevenue

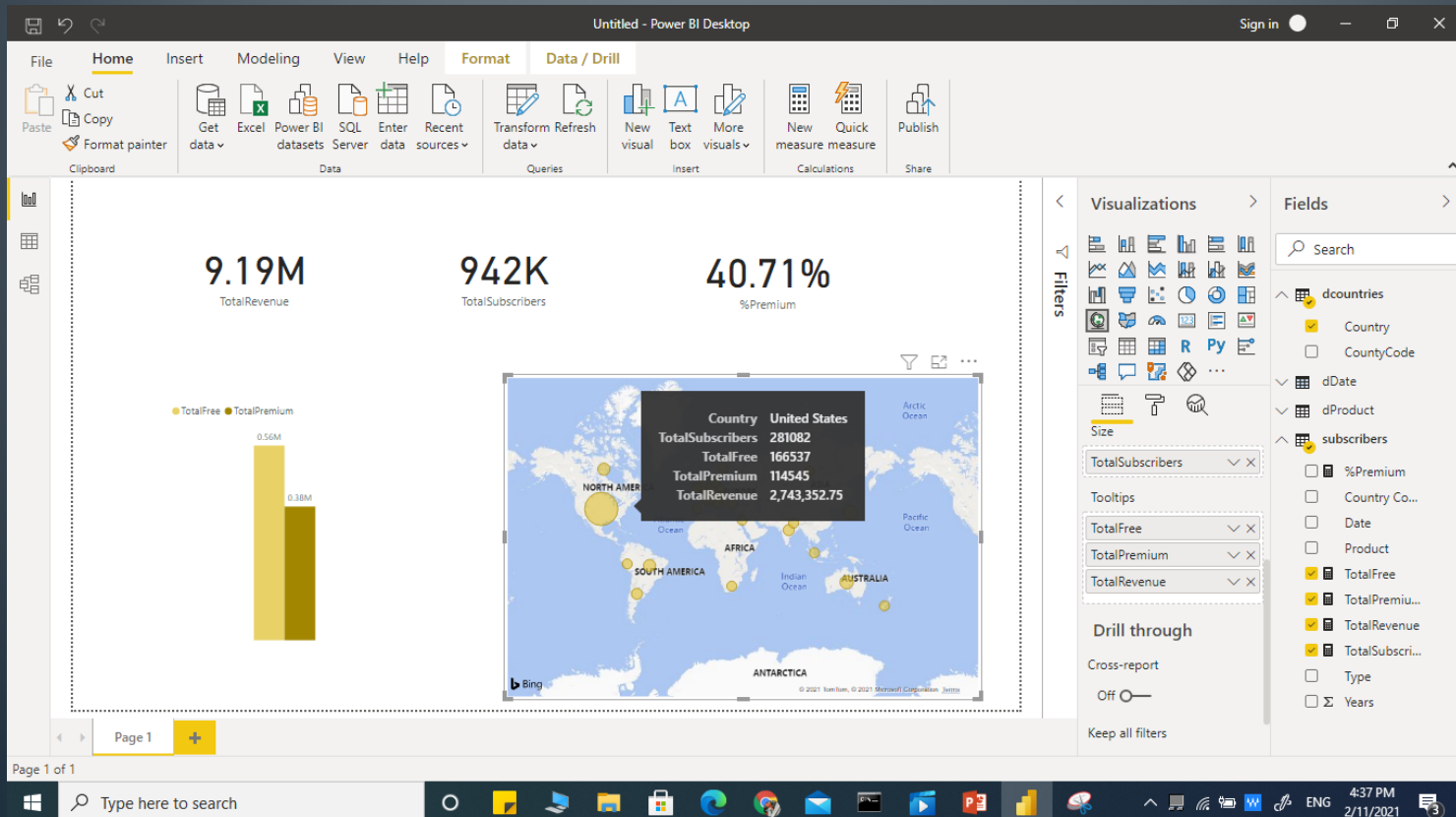
☒ TotalSubscri...

☐ Type

☐ Σ Years

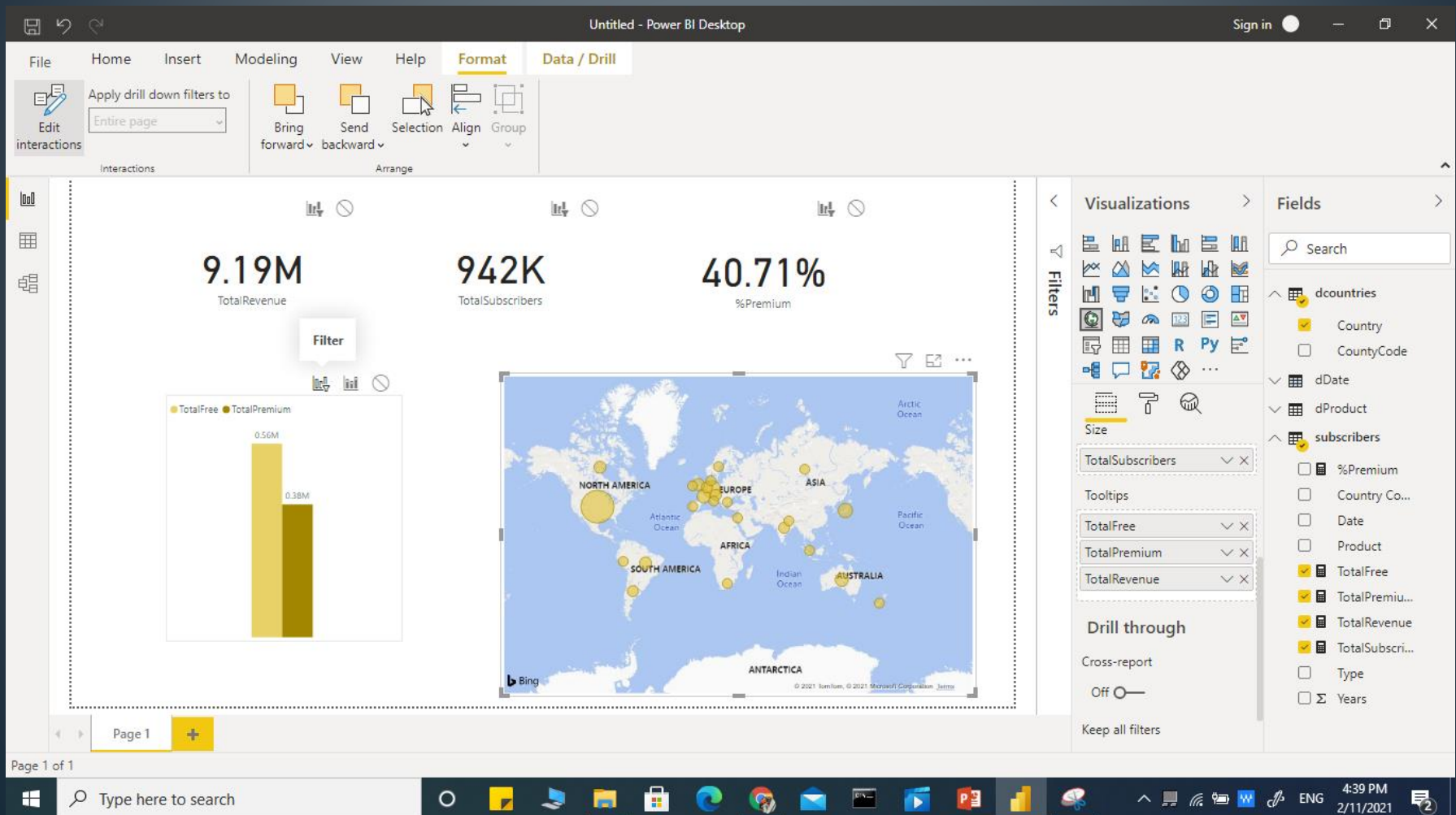
24. Map

- We have to check our relationship in model right or wrong.
- Format →
 - Title off
 - Bubbles ← Size increase & change Data colors
- Fields → Tooltips (3 measures)



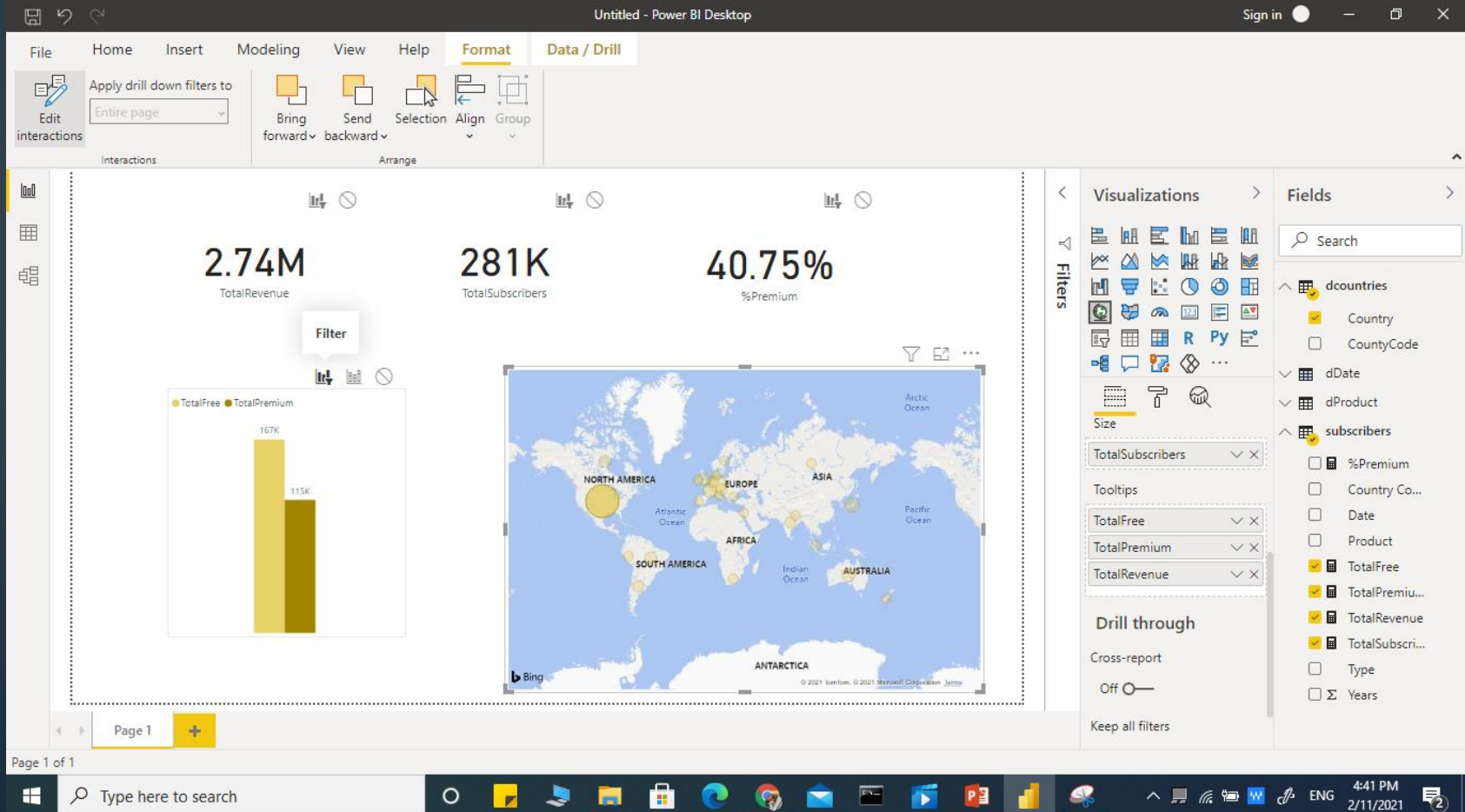
24. Map

- From map Format → Edit Interactions (Filter, Highlight & None)



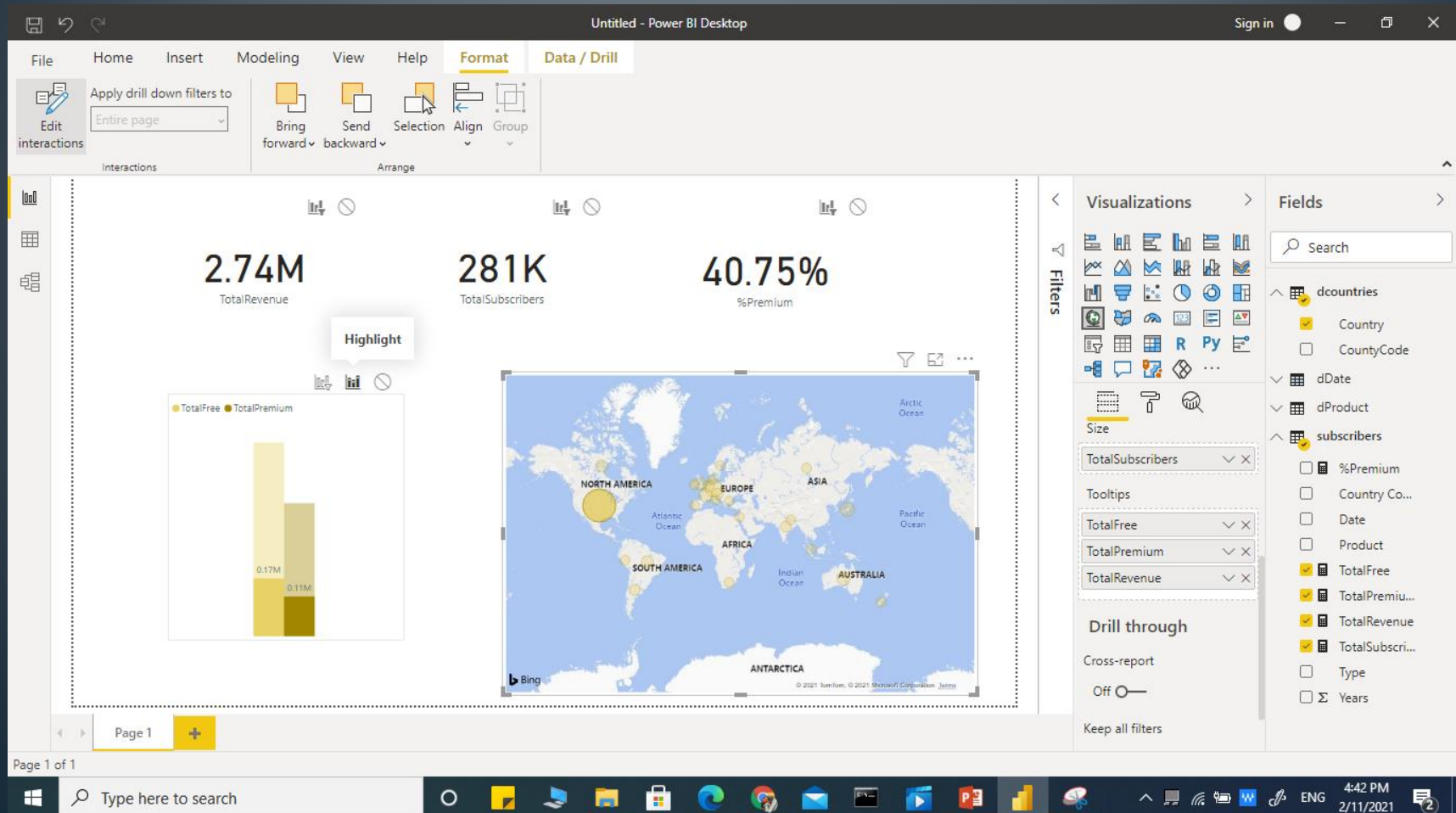
24. Map

- Filter



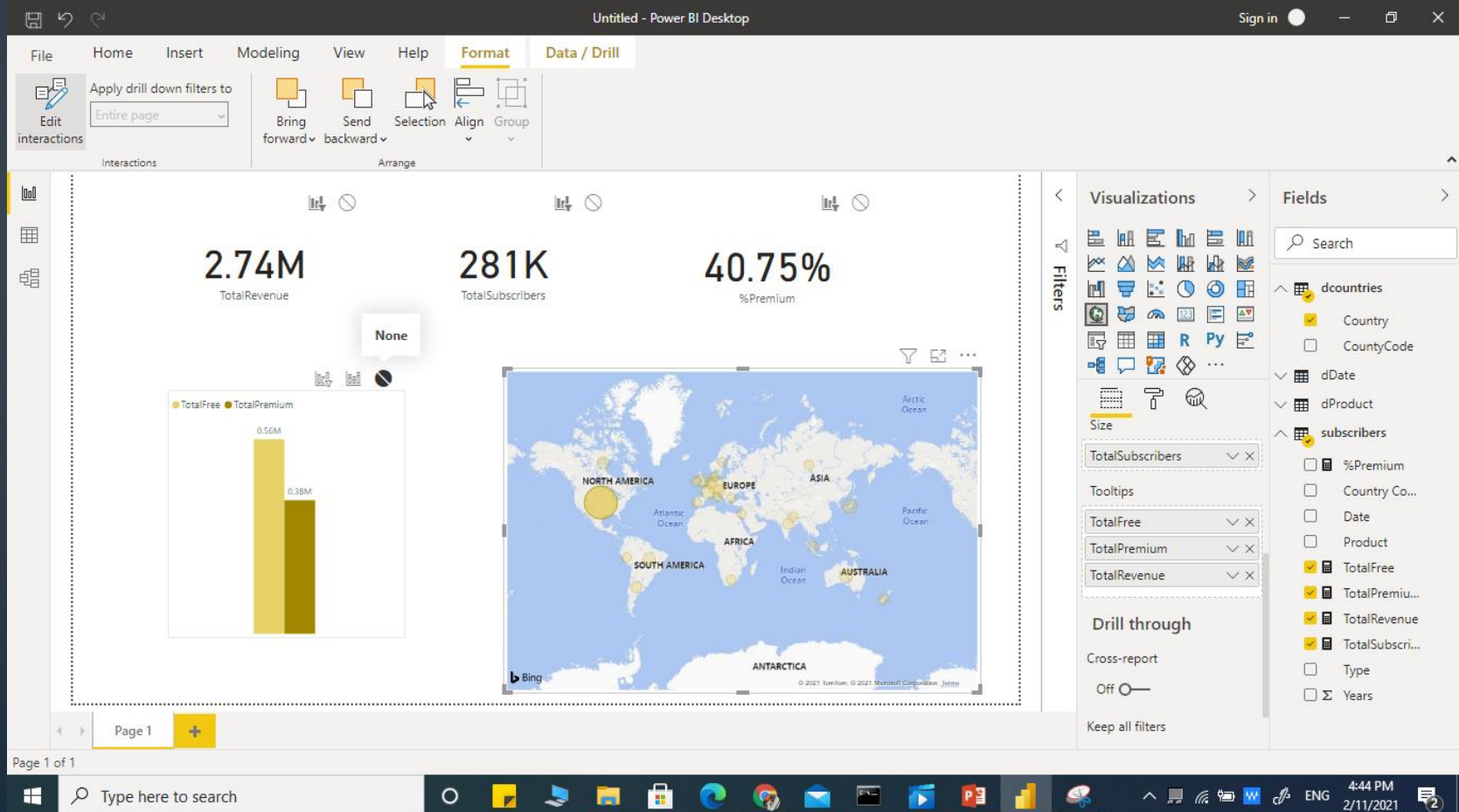
24. Map

- Highlights



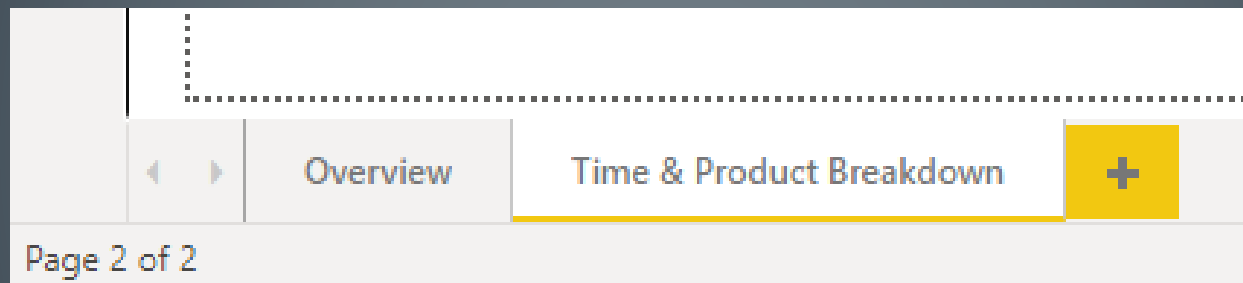
24. Map

- None

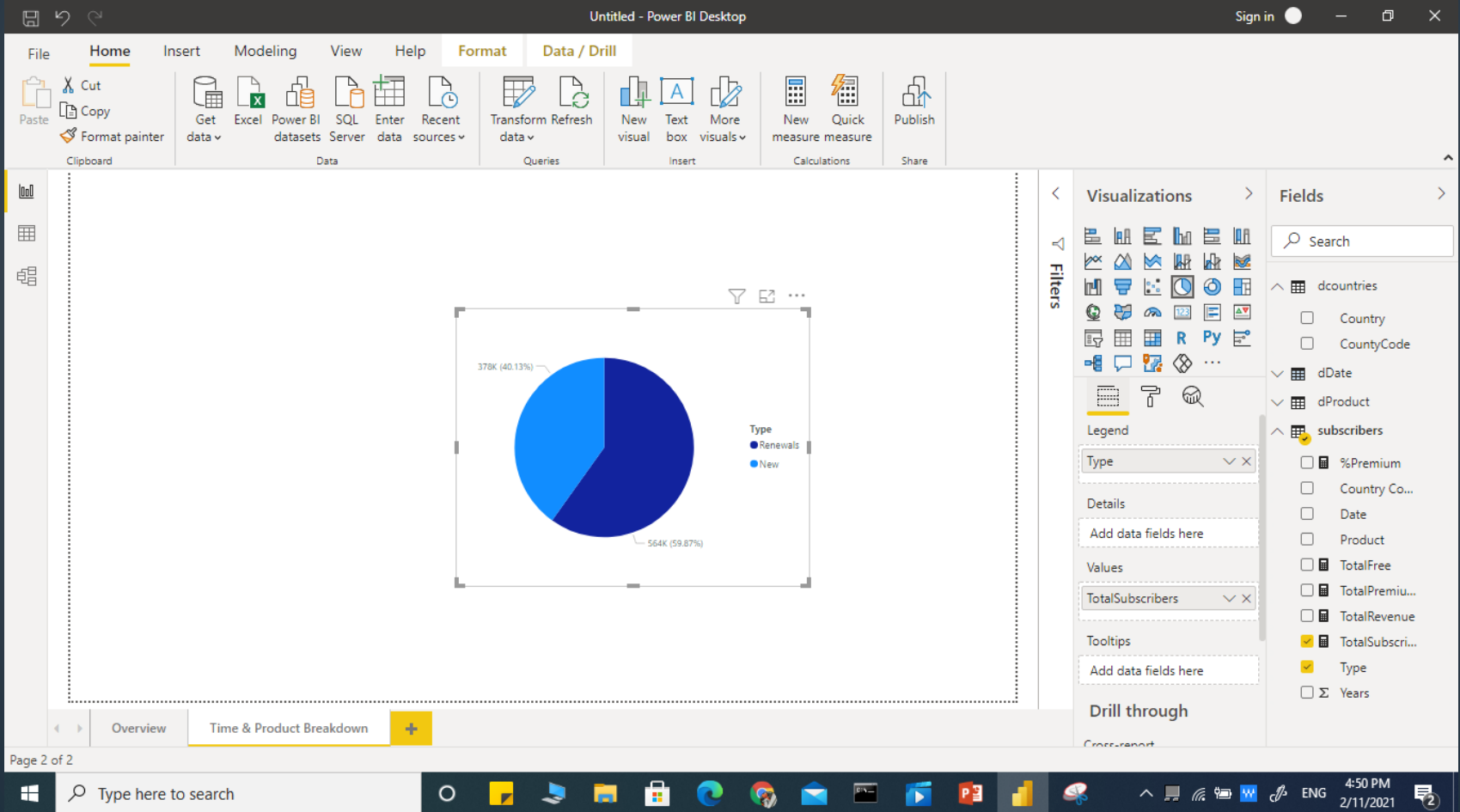


25. Page-1 rename in to **Overview**

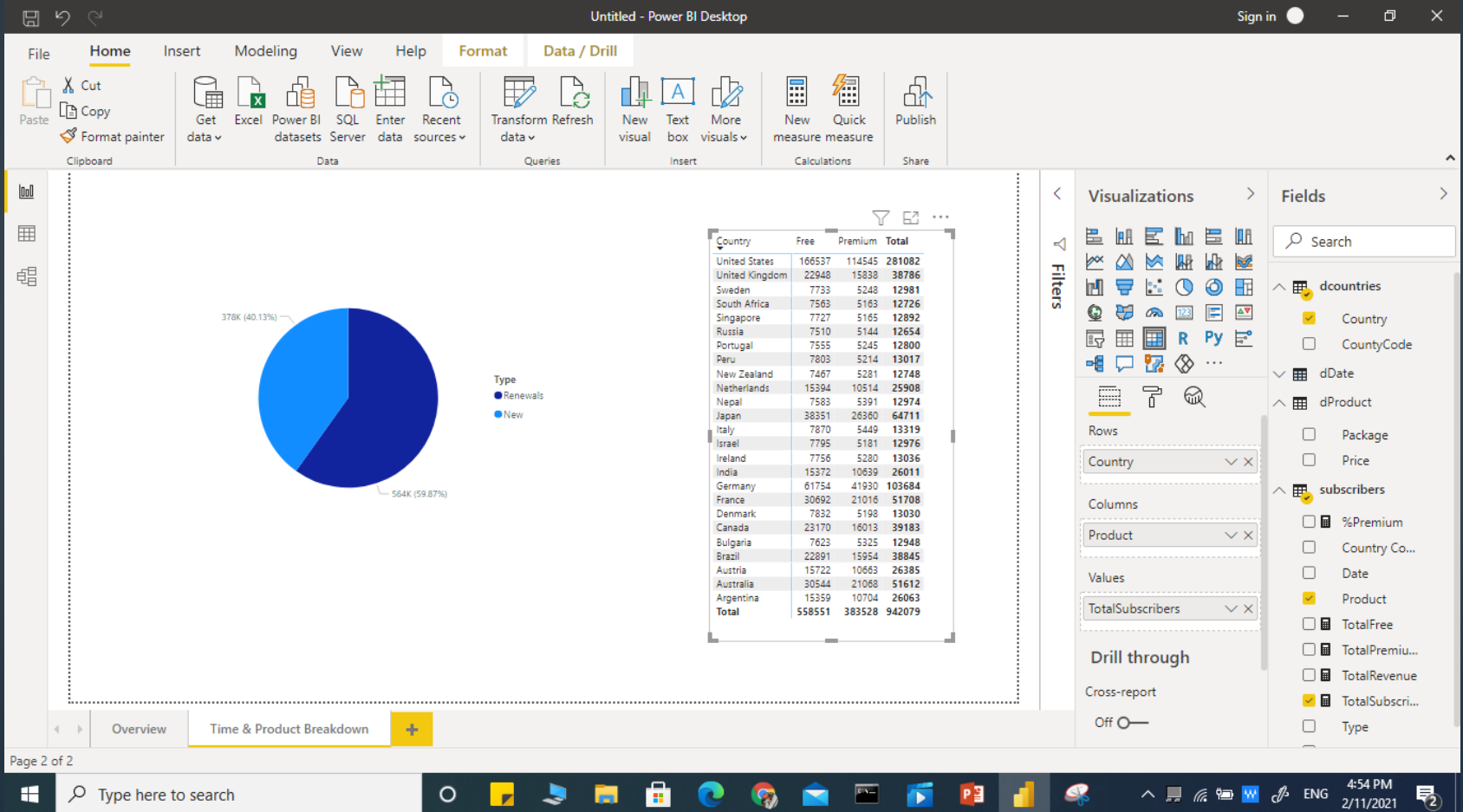
26. Page-2 rename in to **Time & Product Breakdown**



27. Pie Chart without Title (Format)



28. Matrix



29. Slicer

Untitled - Power BI Desktop

Sign in

File Home Insert Modeling View Help Format Data / Drill

Paste Cut Copy Format painter Clipboard

Get data Excel Power BI datasets SQL Server Enter data Recent sources Data

Transform data Refresh Queries

New visual Text box More visuals Insert

New measure Quick measure Calculations

Publish Share

Country	Free	Premium	Total
United States	166537	114545	281082
United Kingdom	22948	15838	38786
Sweden	7733	5248	12981
South Africa	7563	5163	12726
Singapore	7272	5165	12892
Russia	7510	5144	12654
Portugal	7555	5245	12800
Peru	7803	5214	13017
New Zealand	7467	5281	12748
Netherlands	15394	10514	25908
Nepal	7583	5391	12974
Japan	38351	26360	64711
Italy	7870	5449	13319
Israel	7795	5181	12976
Ireland	7756	5280	13036
India	15372	10639	26011
Germany	61754	41930	103684
France	30692	21016	51708
Denmark	7832	5198	13030
Canada	23170	16013	39183
Bulgaria	7623	5325	12948
Brazil	22891	15954	38845
Austria	15722	10663	26385
Australia	30544	21068	51612
Argentina	15359	10704	26063
Total	558551	383528	942079

378K (40.13%)

564K (59.87%)

Type

- Renewals
- New

NameDayNumWeek

- Fri
- Mon
- Sat
- Sun
- Thu
- Tue
- Wed

Visualizations

Fields

Search

dcountries

dDate

- Date
- DayNumW...
- MonthName
- MonthNum...
- NameDayN...

dProduct

subscribers

Field

NameDayNumWeek

Drill through

Cross-report

Off

Keep all filters

On

Add drill-through fields here

Overview Time & Product Breakdown

Page 2 of 2

Type here to search

ENG 4:56 PM 2/11/2021

30. Export To PDF

The image shows the Microsoft Power BI Desktop interface. On the left is a dark sidebar with navigation options: New, Open report, Save, Save as, Get data, Import, Export (highlighted with a white border), Publish, Options and settings, Get started, About, and Sign in. The main area displays the 'Export' menu, which includes 'Power BI template' and 'Export to PDF' (highlighted with a light gray background). On the right, the 'Fields' pane is visible, showing a search bar and a list of data fields: dcountries, dDate (expanded to show Date, DayNumW..., MonthName, MonthNum..., and NameDayN...), dProduct, and subscribers. The 'NameDayN...' field is selected with a checkmark. Below the fields pane, the 'Visualizations' pane shows a grid of visualization icons, and the 'Drill through' section has a 'Cross-report' toggle set to 'Off' and a 'Keep all filters' toggle set to 'On'.

Export

- Power BI template
- Export to PDF

Fields

- dcountries
- dDate
 - ☐ Date
 - ☐ DayNumW...
 - ☐ MonthName
 - ☐ MonthNum...
 - ☒ NameDayN...
- dProduct
- subscribers

Visualizations

Drill through

Cross-report
Off

Keep all filters
On

Add drill-through fields here

31. From the Publish Icon we can publish to PowerBI web. Then, we can access this report from anywhere from any device.

Untitled - Power BI Desktop

File Home Insert Modeling View Help

Paste Cut Copy Format painter

Get data Excel Power BI datasets SQL Enter data Recent sources

Transform Refresh data Queries

New visual Text box More visuals

New measure Quick measure Publish

Publish this report online in the Power BI service.

Country	Free	Premium	Total
United States	166537	114545	281082
United Kingdom	22848	15838	38786
Sweden	7733	5248	12981
South Africa	7563	5163	12726
Singapore	7727	5165	12892
Russia	7510	5144	12654
Portugal	7555	5245	12800
Peru	7803	5214	13017
New Zealand	7467	5281	12748
Netherlands	15394	10514	25908
Nepal	7583	5391	12974
Japan	38351	26380	64731
Italy	7870	5449	13319
Israel	7795	5181	12976
Ireland	7756	5280	13036
India	15372	10639	26011
Germany	61754	41930	103684
France	30692	21016	51708
Denmark	7832	5198	13030
Canada	23170	16013	39183
Bulgaria	7623	5325	12948
Brazil	22891	15954	38845
Austria	15722	10663	26385
Australia	30544	21068	51612
Argentina	15359	10704	26063
Total	558551	383528	942079

378K (40.13%)

564K (59.87%)

Type

- Renewals
- New

NameDayNumWeek

- Fri
- Mon
- Sat
- Sun
- Thu
- Tue
- Wed

Visualizations

Fields

Search

dcountries

dDate

- Date
- DayNumW...
- MonthName
- MonthNum...
- NameDayN...

dProduct

subscribers

Add data fields here

Drill through

Cross-report

Off

Keep all filters

On

Add drill-through fields here

Overview Time & Product Breakdown

Page 2 of 2

Type here to search

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Final Output (Colors & organizing as ur wish)

