

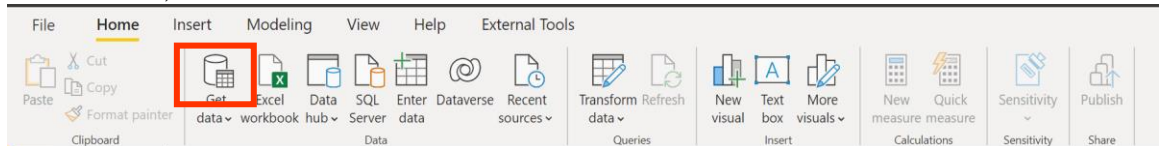
# Laboratory 10

## Power BI

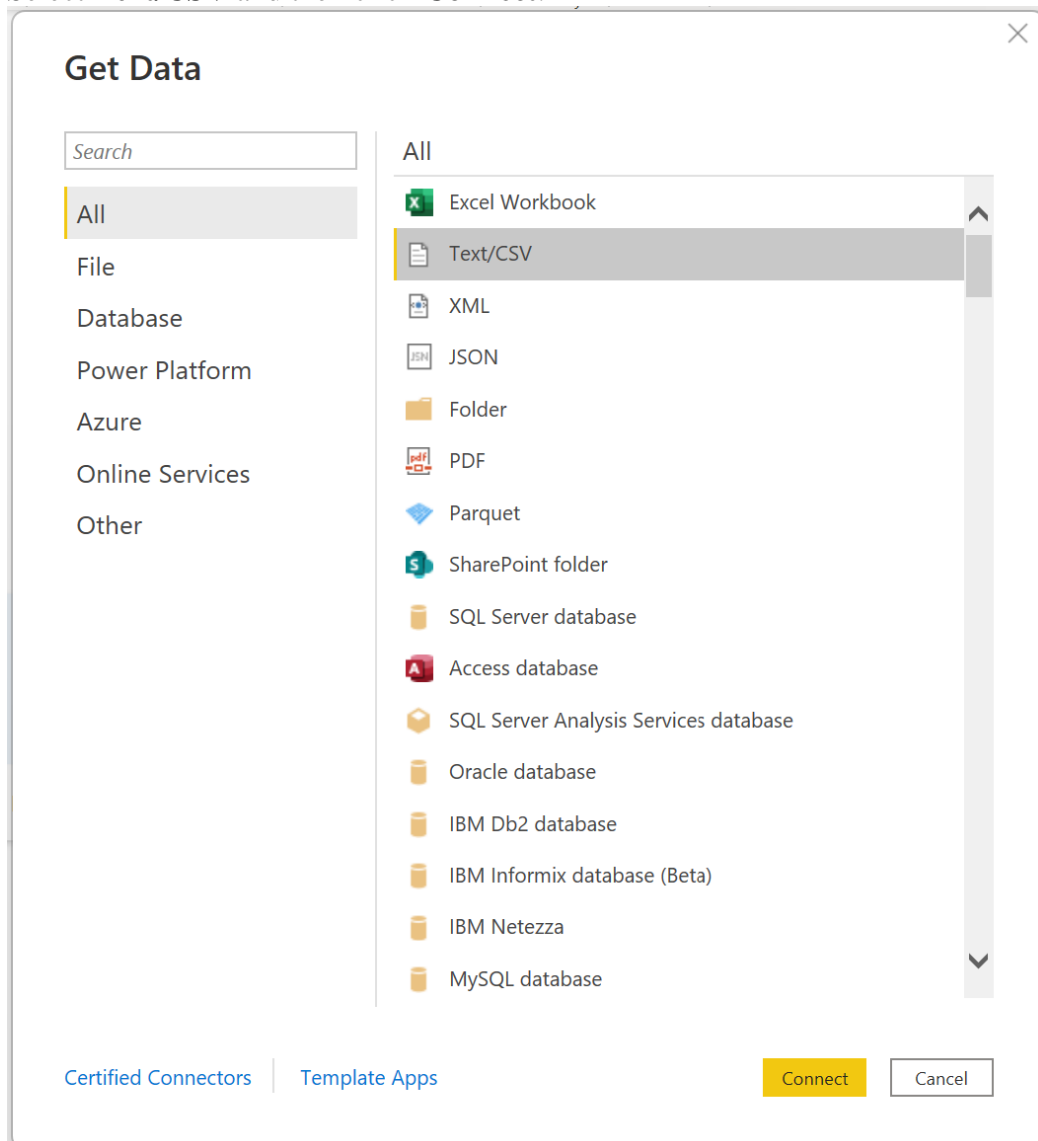
In this lab exercise, you are going to do data visualization using Power BI. The data warehouse's data (Bookshop DW) has been extracted from Oracle SQL and can be downloaded from Moodle under the Week 10 section.

### A. Connecting and Shaping Data

1. In Power BI, select **Home** and then click on the **Get data** icon.



2. Select **Text/CSV** and then click **Connect**.



3. A pop-up window to select files will pop up. Select **booksalesfact.csv**.
4. Select Transform Data.

**booksalesfact.csv**

File Origin: 1252: Western European (Windows) | Delimiter: Comma | Data Type Detection: Based on first 200 rows

CATEGORYID	TIMEID	STOREID	STARID	NUM_OF_BOOKS	TOTAL_SALES
4	201511	2	4	1	26
4	201702	4	4	2	58
4	201703	5	4	2	52
5	201705	2	1	1	38
5	201502	4	1	1	38
1	201601	6	4	2	46
5	201610	2	5	2	52
5	201512	5	5	2	52
2	201705	1	4	3	103
2	201702	5	4	1	39
2	201502	3	3	1	35
2	201610	5	3	2	70
4	201702	1	4	1	32
5	201604	6	4	1	27
5	201612	1	4	1	27
2	201701	1	4	2	64
2	201507	5	4	1	32
4	201610	5	4	3	78
5	201502	2	4	1	36
5	201703	3	4	1	36

*The data in the preview has been truncated due to size limits.*

Extract Table Using Examples | Load | Transform Data | Cancel

5. Power Query Editor will pop up. Check the data types assigned by Power BI.

Power Query Editor - Power Query Editor

Queries [6]: booksalesfact, categorydim, reviewfact, starratingdim, storeidim, timedim

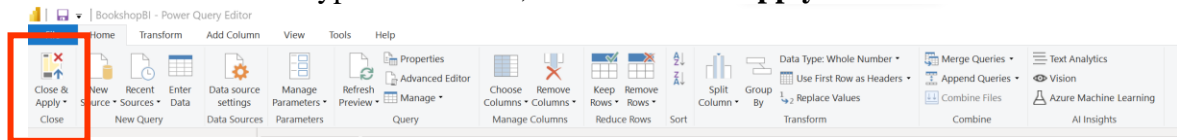
Query: booksalesfact

```
Table.TransformColumnTypes(#Promoted Headers,{{{"CATEGORYID", Int64.Type}, {"TIMEID", Int64.Type}, {"STOREID", Int64.Type}, {"STARID", Int64.Type}, {"NUM_OF_BOOKS", Int64.Type}, {"TOTAL_SALES", Int64.Type}}})
```

	CATEGORYID	TIMEID	STOREID	STARID	NUM_OF_BOOKS	TOTAL_SALES
1	4	201511	2	4	1	26
2	4	201702	4	4	2	58
3	4	201703	5	4	2	52
4	5	201705	2	1	1	38
5	5	201502	4	1	1	38
6	1	201601	6	4	2	46
7	5	201610	2	5	2	52
8	5	201512	5	5	2	52
9	2	201705	1	4	3	103
10	2	201702	5	4	1	39
11	2	201502	3	3	1	35
12	2	201610	5	3	2	70
13	4	201702	1	4	1	32
14	5	201604	6	4	1	27
15	5	201612	1	4	1	27
16	2	201701	1	4	2	64
17	2	201507	5	4	1	32
18	4	201610	5	4	3	78
19	5	201502	2	4	1	36
20	5	201703	3	4	1	36
21	1	201702	1	4	2	46
22	1	201604	2	4	1	23
23	1	201506	4	4	2	48
24	1	201507	6	4	1	23
25	2	201606	3	4	1	117
26	4	201501	2	4	1	32
27	4	201506	4	4	2	64
28	5	201501	6	4	2	54
29	5	201610	5	1	1	38
30	3	201504	1	3	1	28
31	3	201512	1	3	1	28
32	5	201503	2	4	1	36

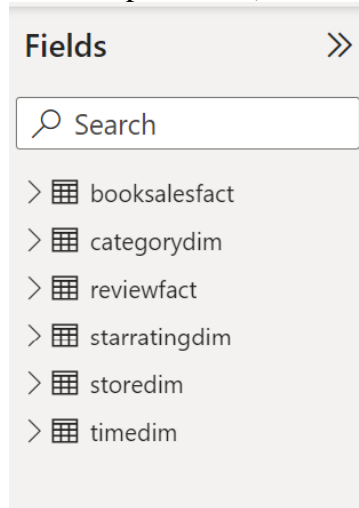
6 COLUMNS, 95 ROWS. Column profiling based on top 1000 rows. PREVIEW DOWNLOADED AT 5:44 PM

6. When all the data types are correct, select **Close & Apply**.



7. Repeat Step 1 to 6 to import the other CSV files: categorydim.csv, reviewfact.csv, reviewfact.csv, starratingdim.csv, storedim.csv, and timedim.csv.

8. Once you imported, the tables should appear on the Fields section (right hand side of the Report View).

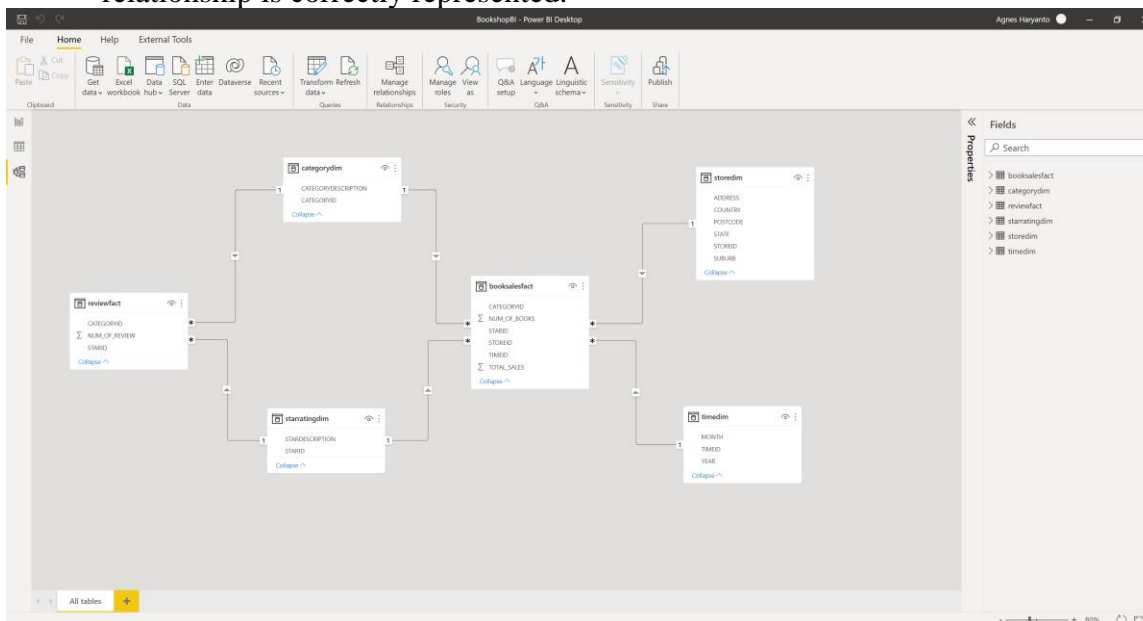


9. Select the Data view and observe the data in each table.

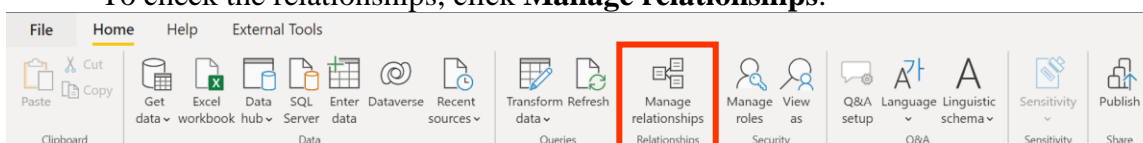
The screenshot shows the Power BI Desktop interface with the 'Data' view selected. The 'booksalesfact' table is displayed, showing columns: CATEGORYID, TIMEID, STOREID, STARRID, NUM\_OF\_BOOKS, and TOTAL\_SALES. The table contains 95 rows of data.

CATEGORYID	TIMEID	STOREID	STARRID	NUM_OF_BOOKS	TOTAL_SALES
4	201511	2	4	1	26
4	201702	4	4	2	58
4	201703	5	4	2	52
1	201601	6	4	2	46
2	201705	1	4	3	103
2	201702	5	4	1	39
4	201702	1	4	1	32
5	201604	6	4	1	27
5	201612	1	4	1	27
2	201701	1	4	2	64
2	201507	5	4	1	32
4	201610	5	4	3	78
5	201502	2	4	1	36
5	201703	3	4	1	36
1	201703	1	4	2	46
1	201604	2	4	1	23
1	201506	4	4	2	48
1	201507	6	4	1	23
2	201606	3	4	3	117
4	201501	2	4	1	32
4	201506	4	4	2	64
5	201501	6	4	2	54
5	201503	2	4	1	36
1	201609	1	4	3	71
1	201708	6	4	1	23
2	201509	6	4	1	39
2	201510	6	4	1	39
1	201504	1	4	2	50
4	201612	3	4	1	32
4	201502	4	4	1	32
5	201509	6	4	3	63
5	201707	2	4	1	18
4	201501	1	4	2	52
5	201601	3	4	1	36
1	201502	4	4	2	46

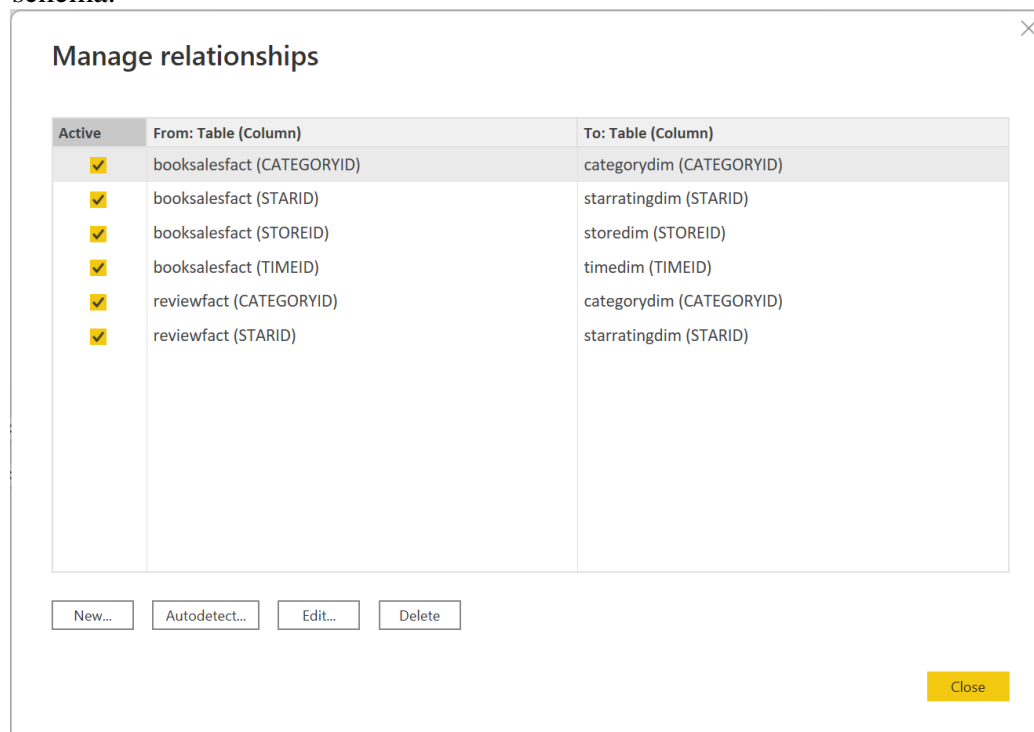
10. Select the Model view. Check relationships between tables. Normally the relationship is automatically assigned, however you should check if the relationship is correctly represented.



To check the relationships, click **Manage relationships**.

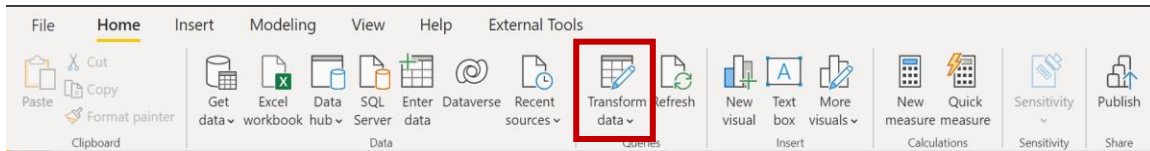


A window will pop up where you can edit or add new relationships of your star schema.

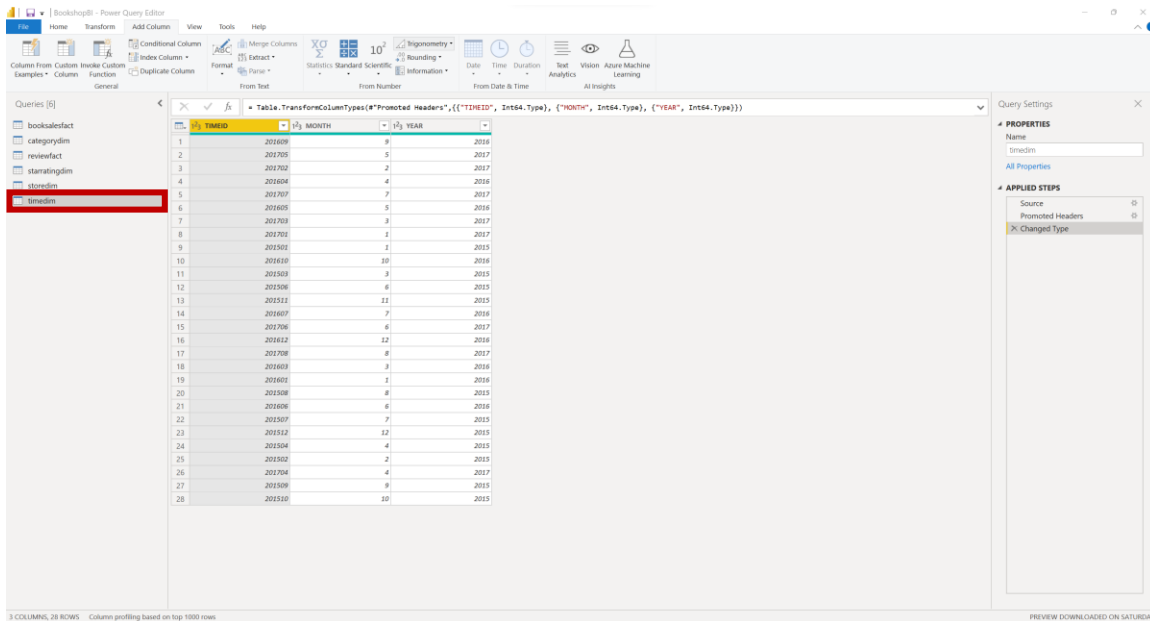


## B. Modifying Data using Power Query Editor

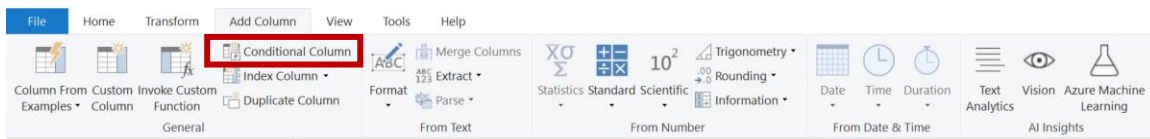
### 1. In the Report view, select **Transform data**.



### 2. The Power Query Editor will appear. Select **timedim**.



### 3. We are going to add a new column based on the current MONTH column in timedim. The new column will contain the individual month name (e.g. January, February, etc.). To do this, select **Add Column** tab and then **Conditional Column**.



4. The conditional column pop-up window will appear. In the **New column name** section, insert Month\_Name as the column name. In the clause section, select **MONTH** for Column Name, **equals** for the Operator, and insert each value to match the month name in the output. Your conditional column should look like the following screenshot. Once finish, click **OK**.

**Add Conditional Column**

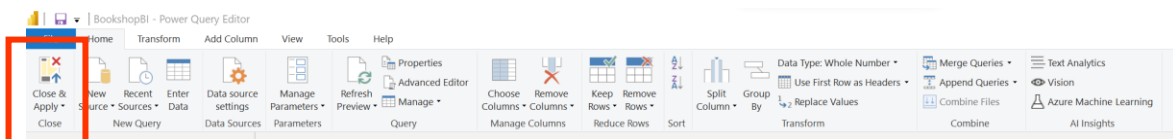
Add a conditional column that is computed from the other columns or values.

New column name  
Month\_Name

Column Name	Operator	Value	Output
If MONTH	equals	1	January
Else If MONTH	equals	2	February
Else If MONTH	equals	3	March
Else If MONTH	equals	4	April
Else If MONTH	equals	5	May
Else If MONTH	equals	6	June
Else			December

OK Cancel

5. Go back to **Home** tab, then select **Close & Apply**.



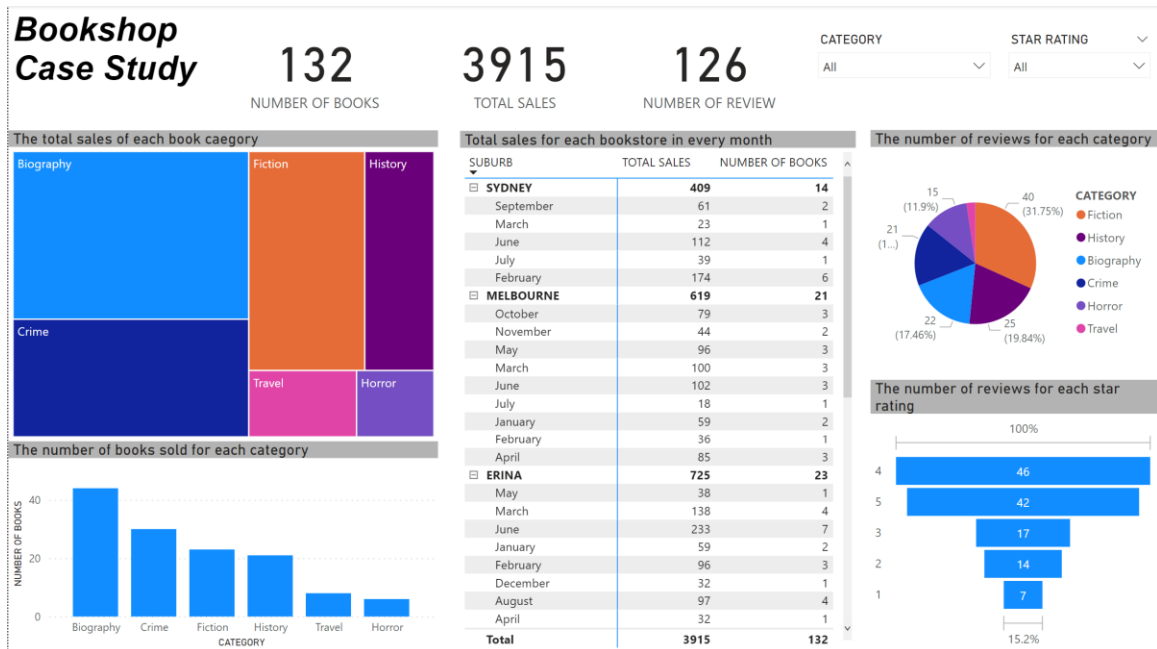
6. Go to Data view and select timedim. The Month\_Name column is also reflected in the Data view.

Table: timedim (28 rows) Columns: Month\_Name (12 distinct values)

Year	Month	Day
201609	9	2016 September
201705	5	2017 May
201702	2	2017 February
201604	4	2016 April
201707	7	2017 July
201606	6	2016 June
201703	3	2017 March
201701	1	2017 January
201601	1	2016 January
201610	10	2016 October
201603	3	2016 March
201606	6	2016 June
201511	11	2015 November
201607	7	2016 July
201706	6	2017 June
201612	12	2016 December
201708	8	2017 August
201609	9	2016 September
201602	2	2016 February
201608	8	2016 August
201606	6	2016 June
201607	7	2016 July
201512	12	2015 December
201604	4	2016 April
201602	2	2016 February
201704	4	2017 April
201606	6	2016 June
201609	9	2016 September
201610	10	2016 October

## C. Creating Reports

In this section, we are building the Bookshop dashboard as shown below.

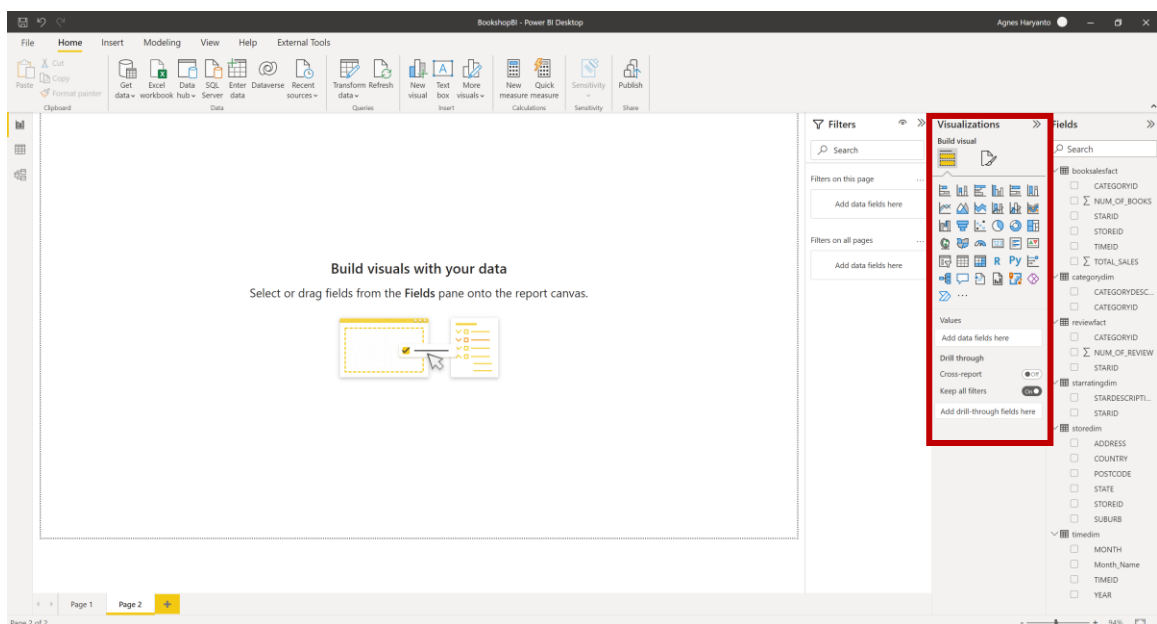


The dashboard should support the management's requirements, which are as follows:

- What are the total sales for each bookstore in a month?
- What is the number of books sold for each category?
- What is the book category that has the highest total sales?
- What is the number of reviews for each category?
- How many 5-star reviews for each category?

### C.1. Creating Chart

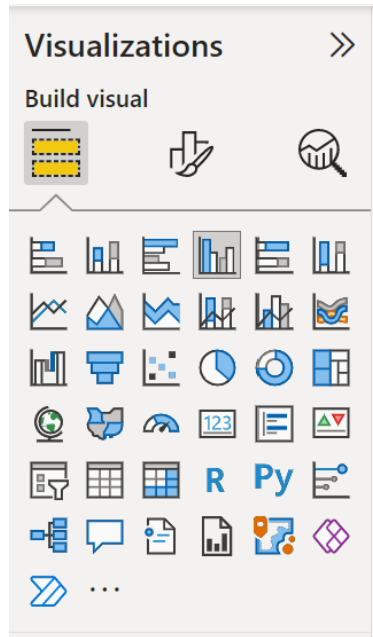
1. In the Report view, make sure that **Visualizations** is available.



If **Visualizations** is not available, then select Home then choose **New visual**.



2. In the **Visualizations**, select **Clustered Column Chart**.



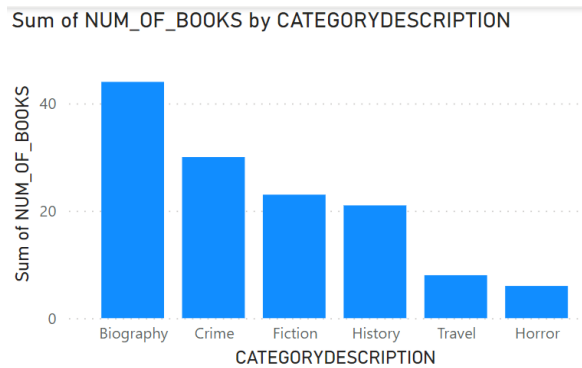


3. We are going to create a chart that displays the number of books sold for each category. In the **Fields** section, choose **CATEGORYDESCRIPTION** attribute and place it to the **X-axis**. Choose **NUM\_OF\_BOOKS** in the Fields section and place it to the **Y-axis**.

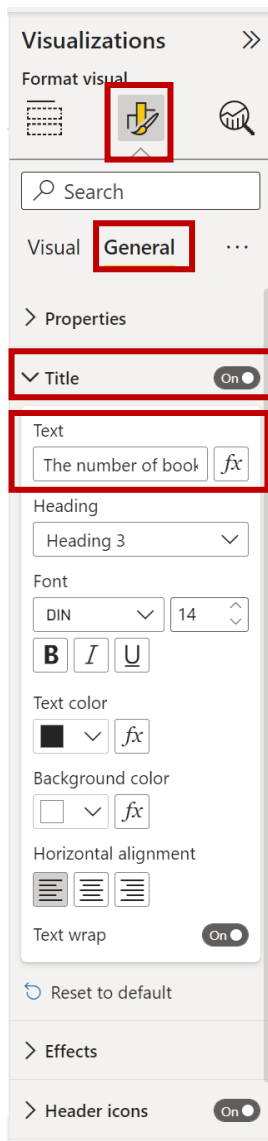
The screenshot displays the Tableau interface with the following configuration:

- Visualizations**
  - Build visual: Bar chart icon selected.
  - X-axis: CATEGORYDESCRIPTION
  - Y-axis: Sum of NUM\_OF\_BOOKS
  - Legend: Add data fields here
  - Small multiples: Add data fields here
  - Tooltips: Add data fields here
  - Drill through:
    - Cross-report: Off
    - Keep all filters: On
    - Add drill-through fields here
- Fields**
  - booksalesfact
    - ☐ CATEGORYID
    - ☒ Σ NUM\_OF\_BOOKS
    - ☐ STARID
    - ☐ STOREID
    - ☐ TIMEID
    - ☐ Σ TOTAL\_SALES
  - categorydim
    - ☒ CATEGORYDESC...
    - ☐ CATEGORYID
  - reviewfact
    - ☐ CATEGORYID
    - ☐ Σ NUM\_OF\_REVIEW
    - ☐ STARID
  - starratingdim
    - ☐ STARDESCRIPTI...
    - ☐ STARID
  - storedim
    - ☐ ADDRESS
    - ☐ COUNTRY
    - ☐ POSTCODE
    - ☐ STATE
    - ☐ STOREID
    - ☐ SUBURB
  - timedim
    - ☐ MONTH
    - ☐ Month\_Name
    - ☐ TIMEID
    - ☐ YEAR

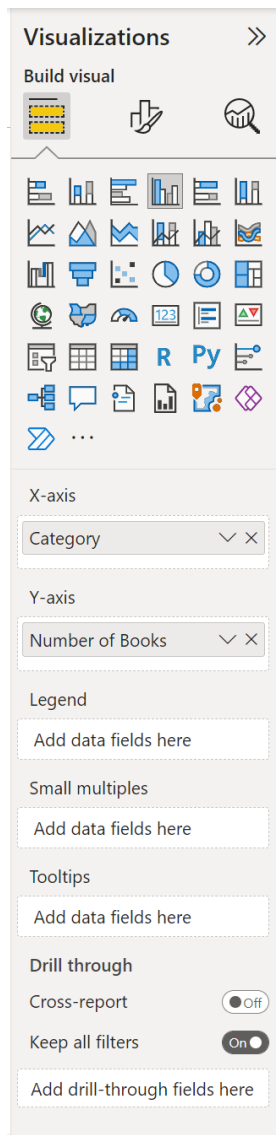
4. The visual you created would look like the following chart.



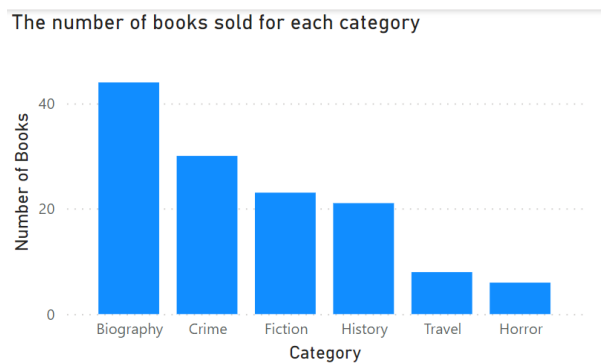
5. Change the title of the visual to a proper title by selecting the “**Format your visual**” option and then **General**. Expand the **Title** drop-down menu and then change the Title’s **Text** to “The number of books sold for each category”.



6. Go back to “**Add data to your visual**” and change CATEGORYDESCRIPTION in the **X-axis** to “Category”. Change the Sum\_of\_NUM\_OF\_BOOKS in the **Y-axis** to “Number of books”.

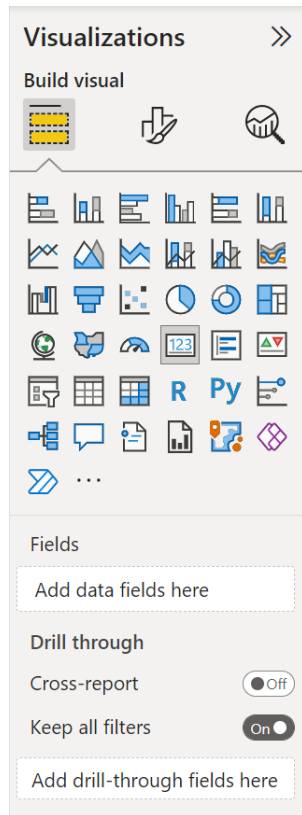


7. The visual will look like below.

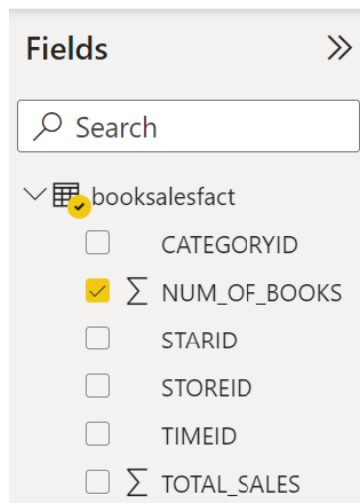


## C.2. Creating Card

1. In the **Visualizations**, select **Card**.



2. We are going to create a visual that displays the overall number of books sold. In the **Fields** section, choose NUM\_OF\_BOOKS attribute.



3. The visual you created would look like the following.

132  
Sum of NUM\_OF\_BOOKS

4. Change the card label from “Sum of NUM\_OF\_BOOKS” to “Number of Books Sold”

The screenshot shows the Power BI 'Visualizations' pane on the left. The 'Fields' section is highlighted with a red box, showing 'Number of Books Sold' selected. Below it, the 'Drill through' section has 'Cross-report' set to 'Off' and 'Keep all filters' set to 'On'. The main preview area on the right shows a card visual with the value '132' and the label 'Number of Books Sold'.

5. Create cards for Total Sales and Number of Reviews too.

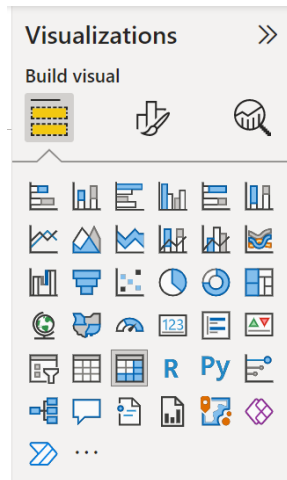
132  
NUMBER OF BOOKS

3915  
TOTAL SALES

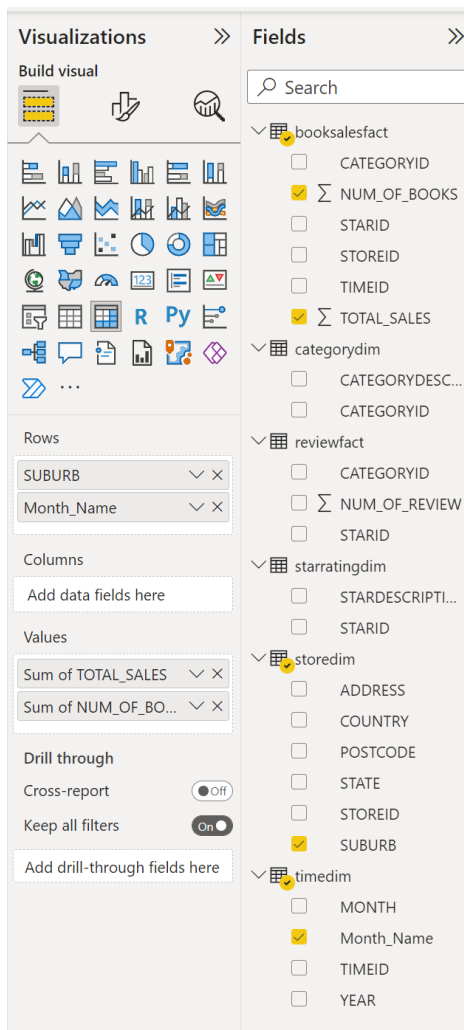
126  
NUMBER OF REVIEW

### C.3. Creating Matrix

1. In the **Visualizations**, select **Matrix**.



2. We are going to create a matrix that displays the total sales for each bookstore in every month. In the **Fields** section, drag **SUBURB** and **Month\_Name** to **Rows**. Drag the **NUM\_OF\_BOOKS** and **TOTAL\_SALES** to **Values**.



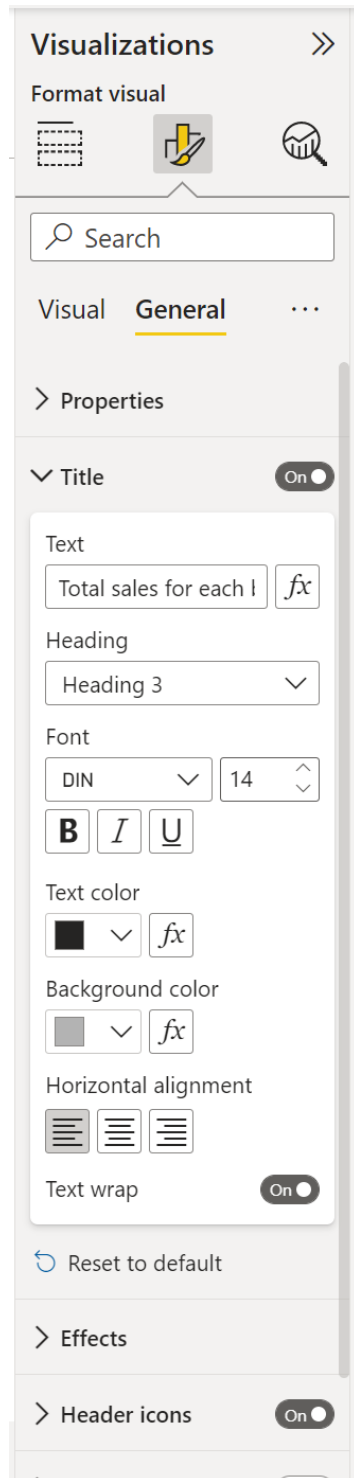
3. The visual you created would look like the following.

SUBURB	Sum of TOTAL_SALES	Sum of NUM_OF_BOOKS
<input type="checkbox"/> BENTLEIGH	818	28
<input type="checkbox"/> BLACK TOWN	747	26
<input type="checkbox"/> CLAYTON	597	20
<input type="checkbox"/> ERINA	725	23
<input type="checkbox"/> MELBOURNE	619	21
<input type="checkbox"/> SYDNEY	409	14
<b>Total</b>	<b>3915</b>	<b>132</b>

4. As we have included two attributes in the **Rows**, Power BI Matrix provides the expand option. You can expand the suburbs to look at every month's performance.

SUBURB	Sum of TOTAL_SALES	Sum of NUM_OF_BOOKS
<input type="checkbox"/> <b>BENTLEIGH</b>	<b>818</b>	<b>28</b>
April	110	4
December	55	2
February	129	5
January	151	5
March	32	1
May	199	6
September	142	5
<input type="checkbox"/> <b>BLACK TOWN</b>	<b>747</b>	<b>26</b>
April	56	2
August	62	2
January	282	10
July	23	1
June	32	1
March	32	1
October	62	2
September	198	7
<input type="checkbox"/> <b>CLAYTON</b>	<b>597</b>	<b>20</b>
<input type="checkbox"/> <b>ERINA</b>	<b>725</b>	<b>23</b>
<input type="checkbox"/> <b>MELBOURNE</b>	<b>619</b>	<b>21</b>
<input type="checkbox"/> <b>SYDNEY</b>	<b>409</b>	<b>14</b>
<b>Total</b>	<b>3915</b>	<b>132</b>

5. Add title to this Matrix by selecting the “**Format your visual**” option and then **General**. Enable the **Title**, then expand the drop-down menu. Change the Title’s **Text** to “Total sales for each bookstore in every month”. You can also change the Background color of the title.



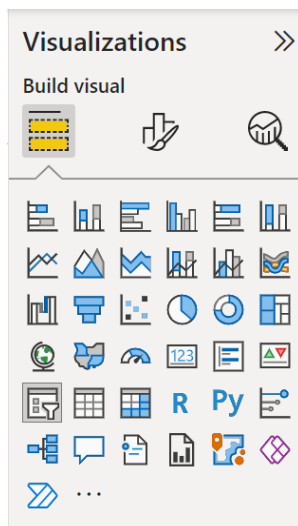


6. The final visual will look like below.

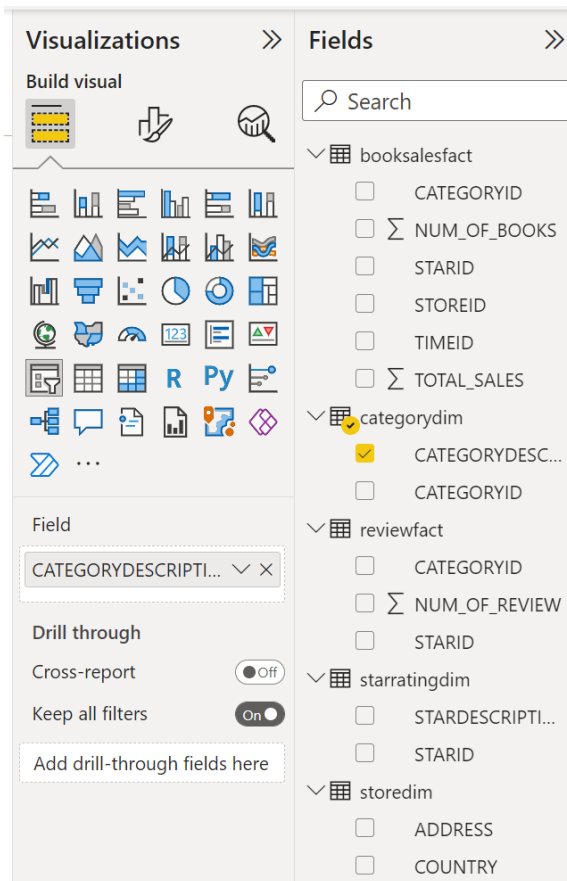
Total sales for each bookstore in every month		
SUBURB	Sum of TOTAL_SALES	Sum of NUM_OF_BOOKS
<input type="checkbox"/> <b>BENTLEIGH</b>	<b>818</b>	<b>28</b>
April	110	4
December	55	2
February	129	5
January	151	5
March	32	1
May	199	6
September	142	5
<input type="checkbox"/> <b>BLACK TOWN</b>	<b>747</b>	<b>26</b>
April	56	2
August	62	2
January	282	10
July	23	1
June	32	1
March	32	1
October	62	2
September	198	7
<input type="checkbox"/> <b>CLAYTON</b>	<b>597</b>	<b>20</b>
<input type="checkbox"/> <b>ERINA</b>	<b>725</b>	<b>23</b>
<input type="checkbox"/> <b>MELBOURNE</b>	<b>619</b>	<b>21</b>
<input type="checkbox"/> <b>SYDNEY</b>	<b>409</b>	<b>14</b>
<b>Total</b>	<b>3915</b>	<b>132</b>

#### C.4. Creating filters using Slicer

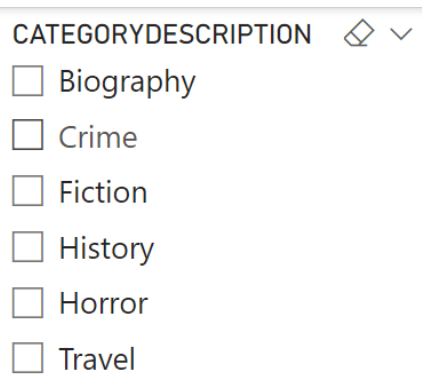
1. You can use **Slicer** to create filters on your dashboard. In the **Visualizations**, select **Slicer**.



2. Drag CATEGORYDESCRIPTION in categorydim to the **Field**.



3. The Slicer will look like below.



4. To change the Slicer type, click on the drop-down arrow. You can choose either List or Dropdown.

CATEGORYDESCRIPTION

☐ Biography
 

List

☐ Crime
 

Dropdown

☐ Fiction

☐ History

☐ Horror

☐ Travel

The Dropdown option will look like the following.

CATEGORYDESCRIPTION

All ▼

5. Change the field label from CATEGORYDESCRIPTION to Category.

**Visualizations** >>

Build visual

Field

Category ▼ ×

Drill through

Cross-report ☐ Off

Keep all filters ☒ On

Add drill-through fields here

## 6. Create another Slicer to Star Rating,

CATEGORY

▼

All

▼

STAR RATING

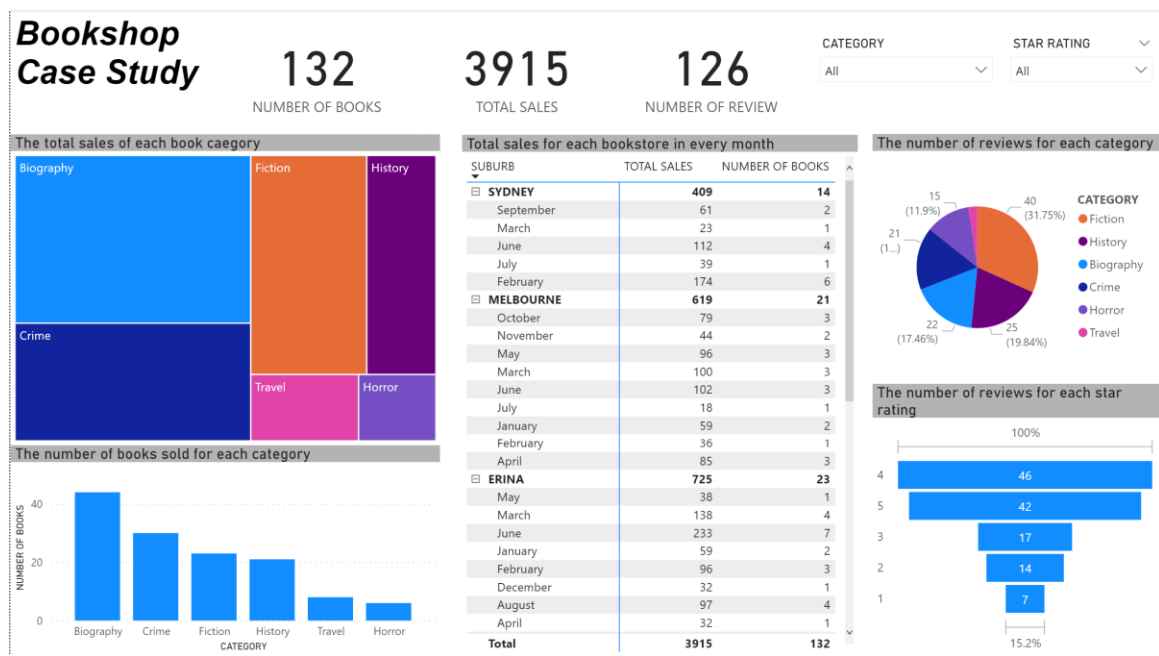
▼

All

▼

### C.5. Task

Now you have some basic knowledge on how to create visuals in Power BI, hence, complete the dashboard to reflect the following.



The total sales of each book category

The number of books sold for each category

CATEGORY	NUMBER OF BOOKS
Biography	40
Crime	30
Fiction	25
History	20
Travel	10
Horror	5

Total sales for each bookstore in every month

SUBURB	TOTAL SALES	NUMBER OF BOOKS
<b>SYDNEY</b>	<b>409</b>	<b>14</b>
September	61	2
March	23	1
June	112	4
July	39	1
February	174	6
<b>MELBOURNE</b>	<b>619</b>	<b>21</b>
October	79	3
November	44	2
May	96	3
March	100	3
June	102	3
July	18	1
January	59	2
February	36	1
April	85	3
<b>ERINA</b>	<b>725</b>	<b>23</b>
May	38	1
March	138	4
June	233	7
January	59	2
February	96	3
December	32	1
August	97	4
April	32	1
<b>Total</b>	<b>3915</b>	<b>132</b>

The number of reviews for each category

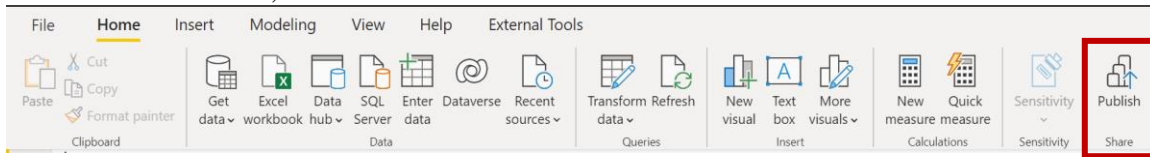
CATEGORY	Reviews	Percentage
Fiction	40	31.75%
History	15	11.9%
Biography	21	17.46%
Crime	22	17.46%
Horror	23	19.84%
Travel	25	19.84%

The number of reviews for each star rating

Star Rating	Number of Reviews	Percentage
4	46	36.5%
5	42	33.3%
3	17	13.5%
2	14	11.1%
1	7	5.6%

## D. Power BI Portal

### 1. Select **Home**, then click on **Publish**.



2. Power BI will prompt you with a notification window to save your work. Click **save**.
3. Another window will pop up where you can choose where to publish your work. For now, select **"My workspace"**.
4. Once published, Power BI will provide you with a link to your Power BI Cloud copy of the report.

### Publishing to Power BI

✓ Success!

[Open 'BookshopBI.pbix' in Power BI](#)

[Get Quick Insights](#)



#### Did you know?

You can create a portrait view of your report, tailored for mobile phones. On the **View** tab, select **Mobile Layout**. [Learn more](#)

Got it

### 5. Click on the link to get into the Power BI Cloud Portal.

