PowerBI Developer Technical Test

Power BI Dashboard Creation

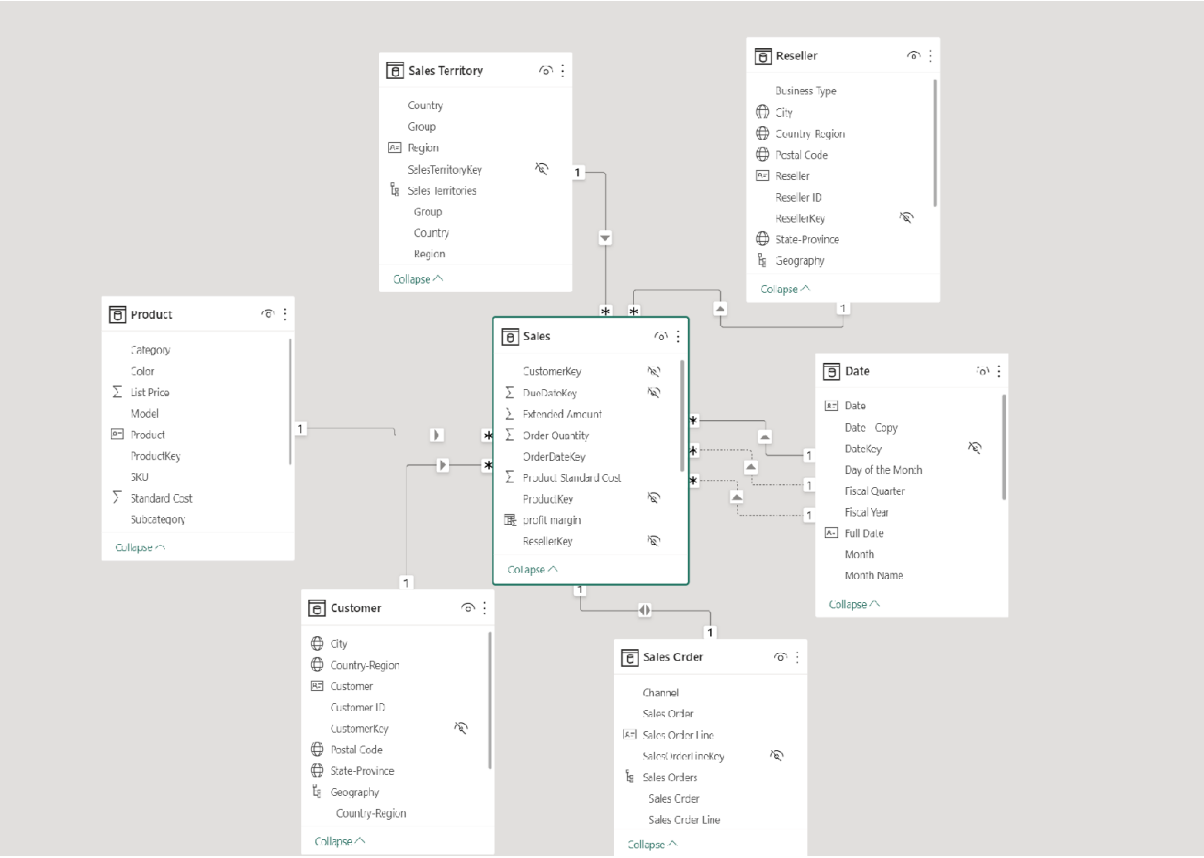
Task 1:

You are given a dataset containing sales data for a fictional company. The dataset includes information such as date, product, quantity sold, and revenue. Your task is to create a Power BI dashboard that displays the following information:

- Total sales revenue by month
- Top 5 products by revenue
- Sales trend over time (line chart)

Answer:

In the first stage, I selected the [Adventure Works DW 2020 dataset]() for the test. The model for this dataset follows a star schema, which is commonly used in data warehousing.



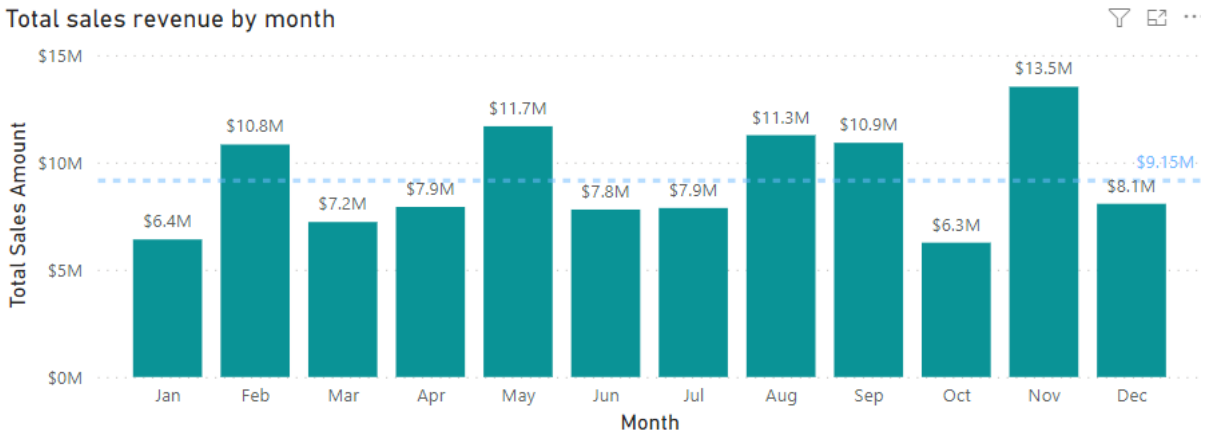
Model structure

The model has seven tables:

- **Customer**: Describes customers and their geographic location. Customers purchase products online (Internet sales).
- **Date**: There are three relationships between the Date and Sales tables, for order date, ship date, and due date. The order date relationship is active. **Product**
  Stores finished products only.
- **Reseller**: Describes resellers and their geographic location. Reseller on sell products to their customers.
- **Sales**: Stores rows at sales order line grain. All financial values are in US dollars (USD). The earliest order date is July 1, 2017, and the latest order date is June 15, 2020.
- **Sales Order:** Describes sales order and order line numbers, and also the sales channel, which is either Reseller or Internet. This table has a one-to-one relationship with the Sales table.
- **Sales:** Territory Sales territories are organized into groups (North America, Europe, and Pacific), countries, and regions. Only the United States sells products at the region level.
- **Sales Territory:** Sales territories are organized into groups (North America, Europe, and Pacific), countries, and regions. Only the United States sells products at the region level.

Total sales revenue by month:

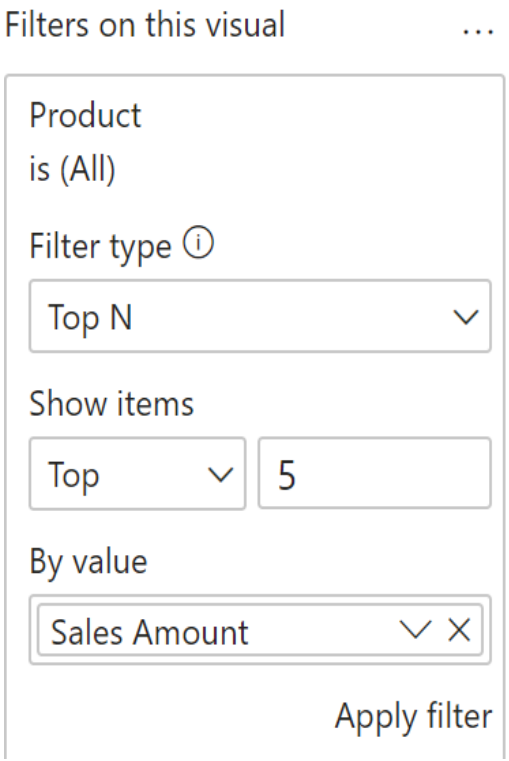
I selected a cluster column chart to display sales revenue by month, where the month names are represented on the y-axis and the revenue values are shown on the x-axis.



Top 5 products by revenue:

There are two ways to display the top 5 products.

1. By using the available filtering options: You can view the top products based on profitability by applying filters to the dataset. This allows you to see the top products directly based on predefined criteria.



Top N products by revenue (default is 5)

Category	Revenue
Bikes	**$18,976,501**
Mountain Bikes	**$18,976,501**
Mountain-200	**$18,976,501**
Mountain-200 Black, 38	$4,400,593
Mountain-200 Black, 42	$4,009,495
Mountain-200 Silver, 38	$3,693,678
Mountain-200 Silver, 42	$3,438,479
Mountain-200 Silver, 46	$3,434,257
Total	**$18,976,501**

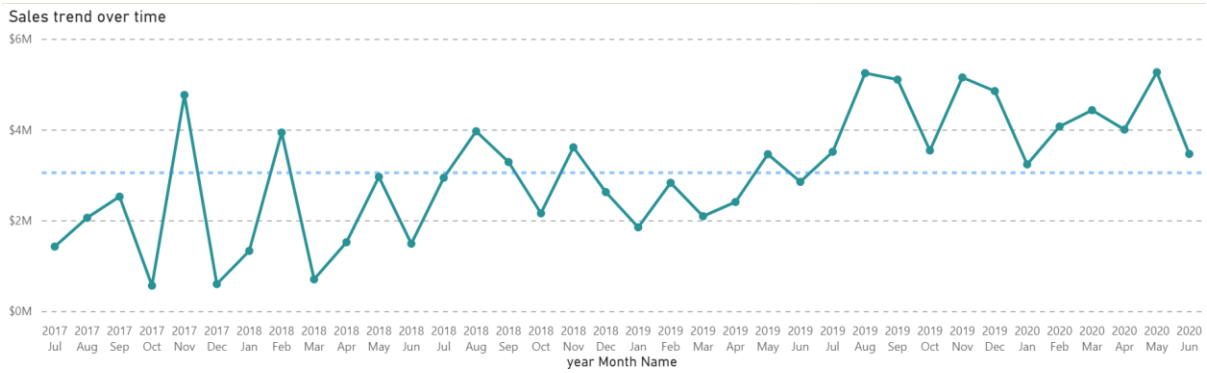
2. I preferred a more interactive approach where the number of top products can be adjusted by the user. Therefore, I chose the second method, which is a bit challenging. In this approach, a virtual table was created that includes a column for product names and another column indicating whether the products belong to the top group or the remaining products, providing better categorization. Afterward, I created a parameter with a range from 0 to 20. Finally, I created a measure where the sales values of the top products were filtered based on the adjustable parameter, which determined the number of products to be included in the calculation.

Top N products by revenue (defa t

Ranking group	Revenue
Best Products	**$18,976,501**
Mountain-200 Black, 38	$4,400,593
Mountain-200 Black, 42	$4,009,495
Mountain-200 Silver, 38	$3,693,678
Mountain-200 Silver, 42	$3,438,479
Mountain-200 Silver, 46	$3,434,257
Others	**$90,832,773**
Total	**$109,809,274**

Sales trend over time (line chart):

To visualize the sales trend over time, I utilized the date columns of "year" and "month" in the dataset. By using the values of these columns, I plotted the sales values over time using a line chart. This allowed me to display the sales figures and observe how they vary over different time periods.

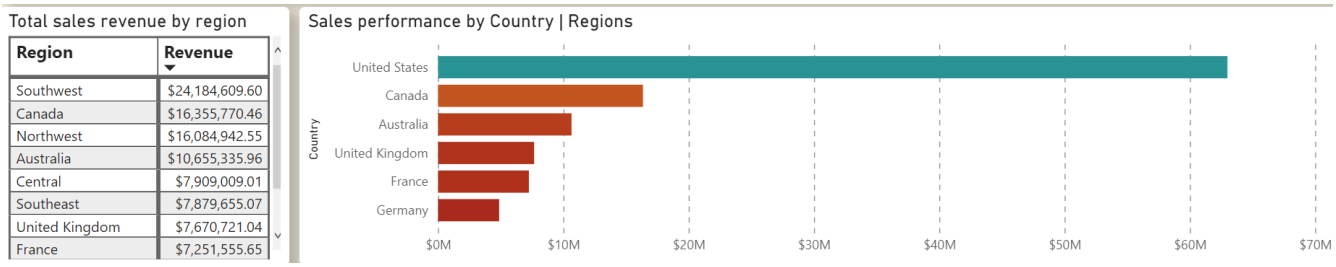


Task 2:

The company has multiple sales regions across different countries. Extend the dashboard from Task 1 to include the following:

- Total sales revenue by region
- Sales performance comparison between regions (bar chart)

I used a table to display the total sales by region. To accomplish the second part of the task, I utilized a bar chart to compare different regions and countries. By using the bar chart, I was able to visualize and compare the sales performance across various regions and countries.



Task 3:

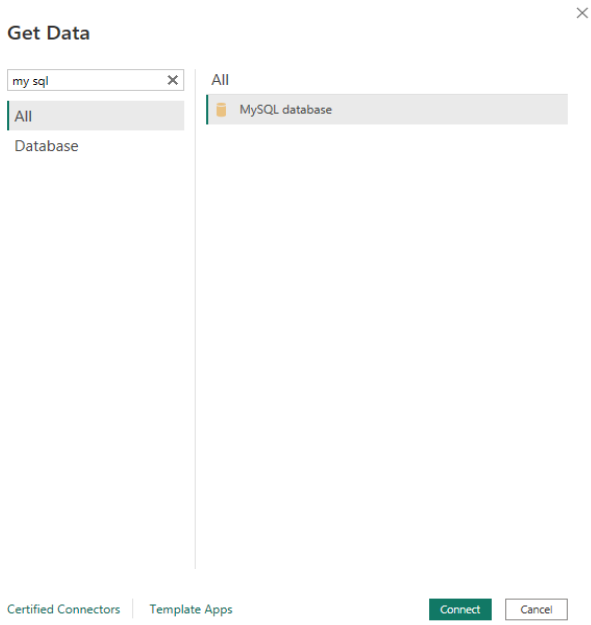
The company's sales data is stored in a MySQL database. Implement a data integration solution to fetch the sales data from the MySQL database and load it into Power BI for visualization. Provide a step-by-step guide on how to configure the data connection and automate the data refresh process.

Answer:

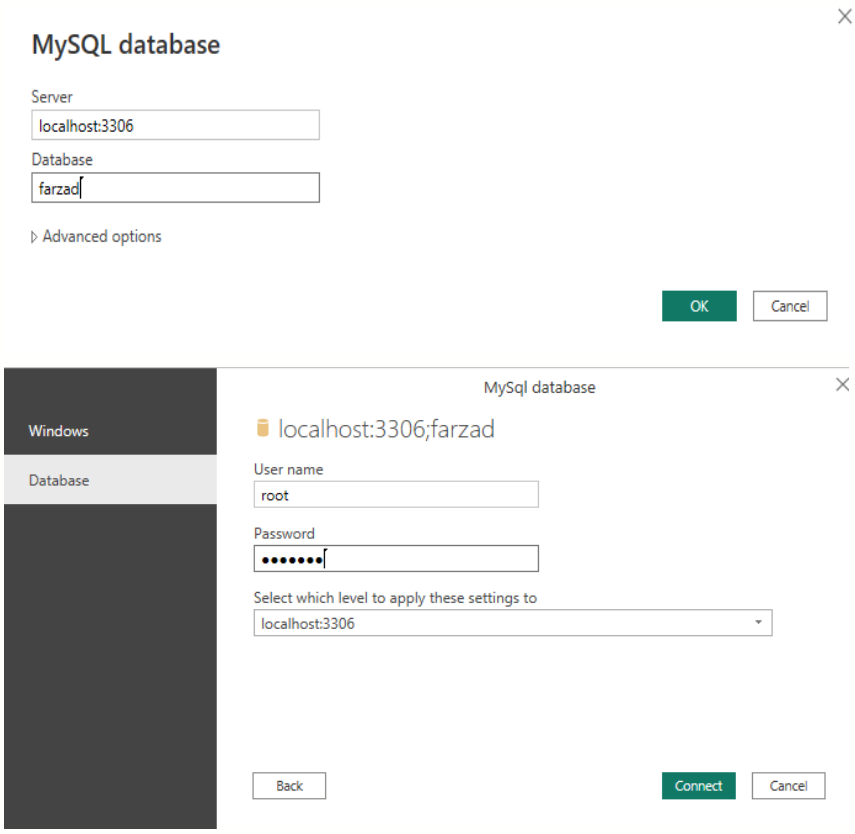
To fetch data from a MySQL database and load it into Power BI for visualization, and automate the data refresh process for publishing on a report server, you can follow these step-by-step instructions:

1. Install MySQL Connector/ODBC: Download and install the MySQL Connector/ODBC driver on your machine. This driver enables communication between MySQL and Power BI.
2. Connect to MySQL:

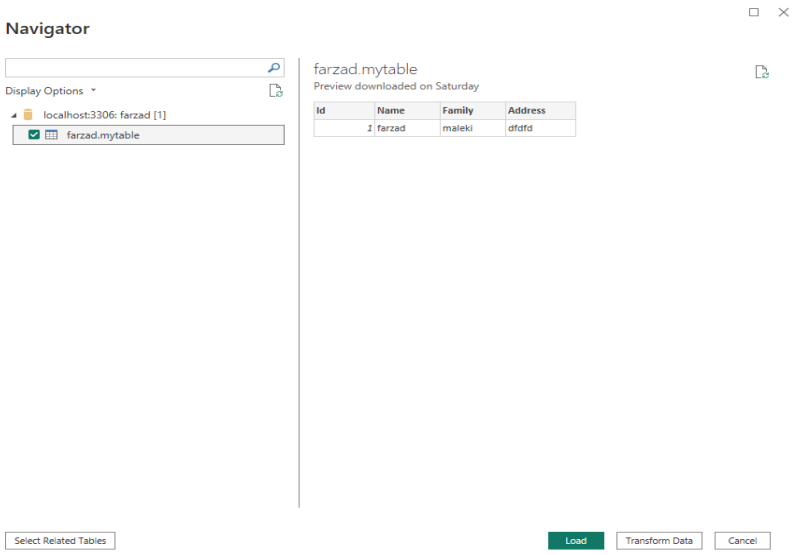
1. In “Get Data” find MySQL database and click on Connect



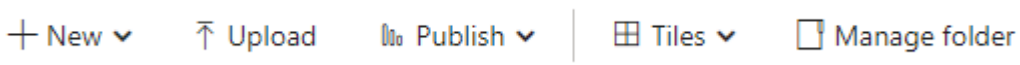
2. Enter the credentials required to access the MySQL database



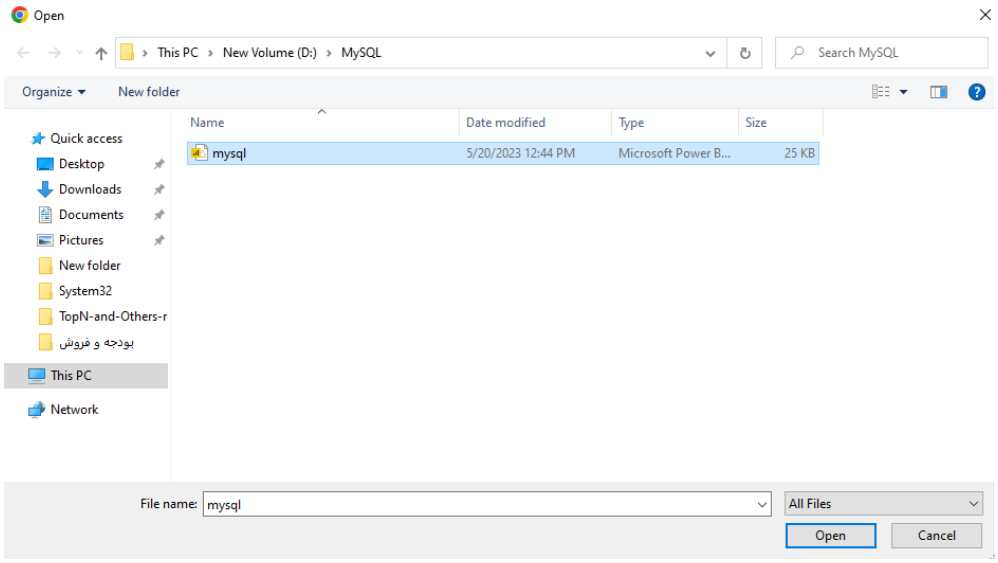
3. Choose tables and click on “Load”



3. Publish the Power BI report to the Power BI Report Server:
    1. Click on "Upload" in the Power BI Report Server.

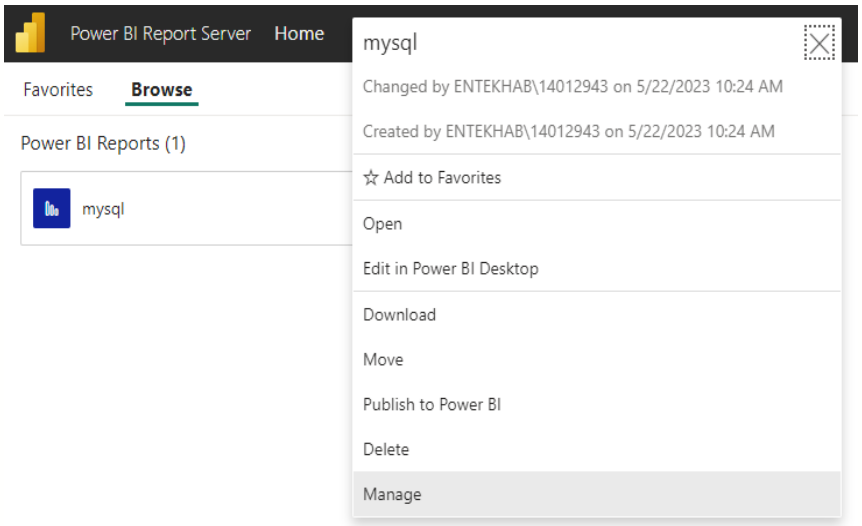


    2. Browse and select the Dashboard file you want to publish to.
    3.

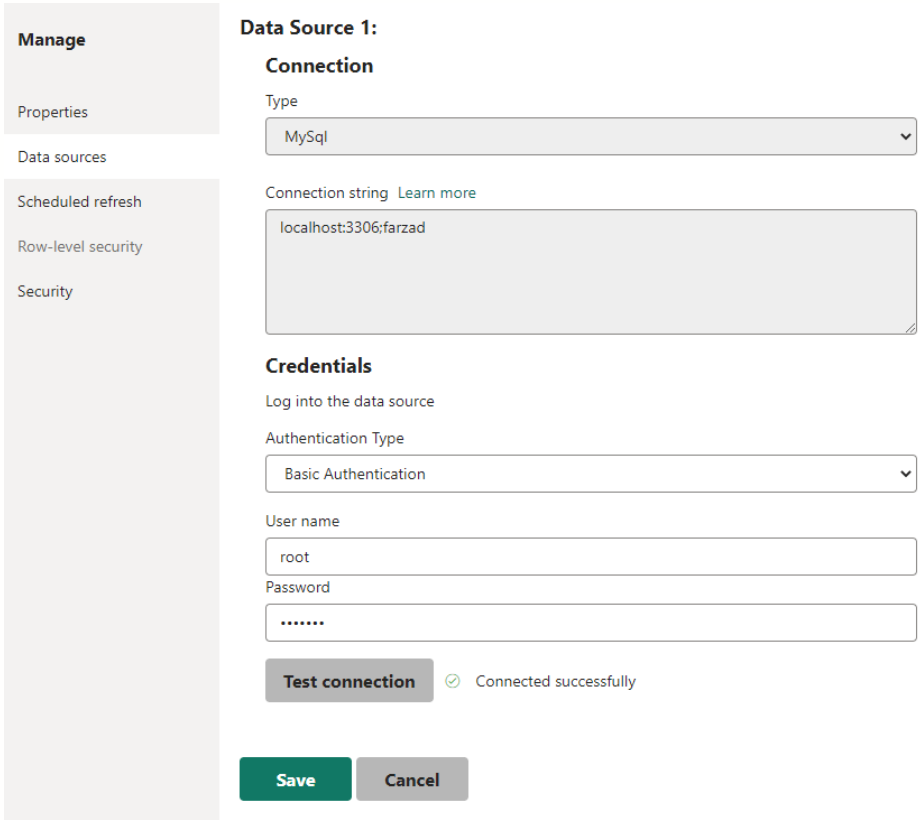


4. Schedule the data refresh on the Power BI Report Server:

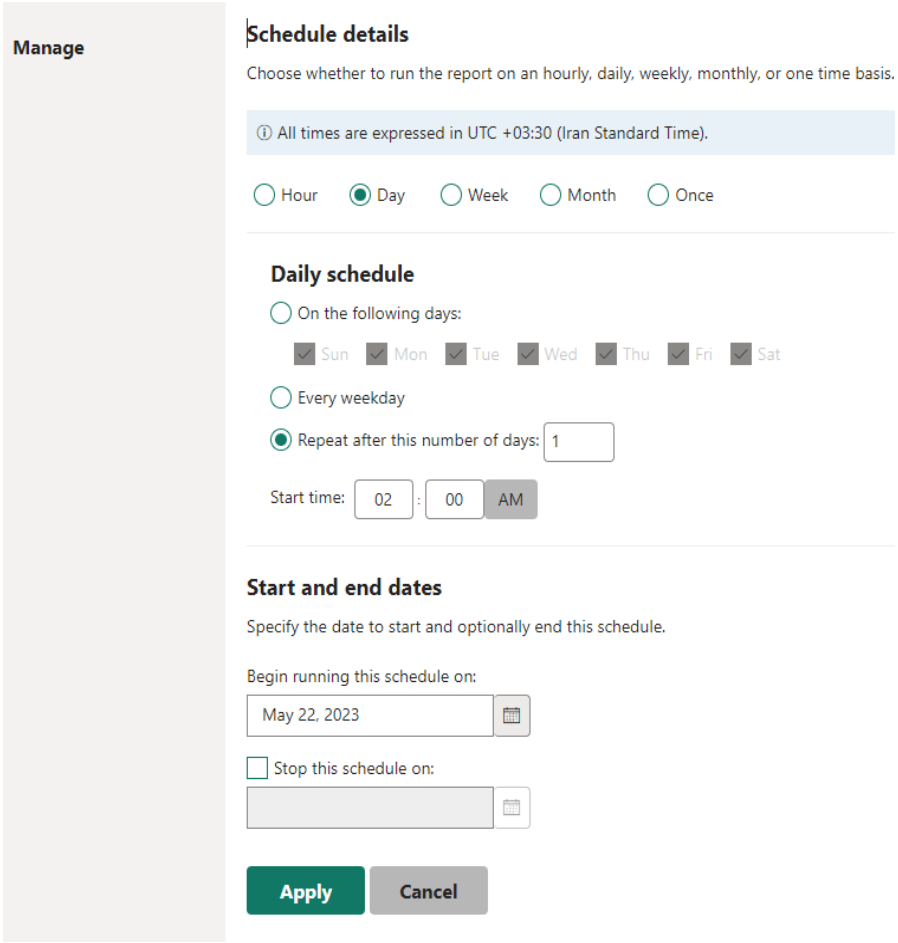
1. In Report Server Locate the published report and click on "Manage"



2. Under “Data Sources” section, choose “Basic Authentication” and enter your credential.



3. Under the "Scheduled Refresh" section, click on "Edit Refresh Schedule."
    1. Configure the refresh schedule based on your requirements, such as the frequency and time of the data refresh.



    2. Save the settings to automate the data refresh process.

Task 4:

In addition to MySQL, the company has data stored in other data sources such as CSV files and Excel spreadsheets. Add support for these additional data sources in the Power BI dashboard. Describe the process of connecting to CSV files and Excel spreadsheets and explain any considerations for data refresh.

Answer:

Connecting to CSV Files:

1. Open Power BI Desktop and click on "Get Data" in the home tab.
2. Select "Text/CSV" from the available data source options.
3. Browse and select the CSV file you want to connect to.
4. Configure the import settings, such as delimiter, encoding, and data types, based on the structure of the CSV file.
5. Click on "Load" to load the data into Power BI.

Considerations for Data Refresh:

- If the CSV file is static and doesn't change frequently, you can manually refresh the data whenever needed.
- If the CSV file is regularly updated, you can schedule periodic data refreshes to keep the data up-to-date.
- To schedule data refresh, you can follow the same steps mentioned in the previous response for configuring data refresh in Power BI.
- Making changes to a CSV file should be done in coordination with the dashboard designer. Otherwise, updating and displaying the dashboard may encounter issues

Connecting to Excel Spreadsheets:

1. Open Power BI Desktop and click on "Get Data" in the home tab.
2. Select "Excel" from the available data source options.
3. Browse and select the Excel spreadsheet you want to connect to.
4. Select the specific sheet or range within the Excel file that contains the data.
5. Configure the import settings, such as column headers, data types, and transformations, if necessary.
6. Click on "Load" to load the data from the Excel spreadsheet into Power BI.

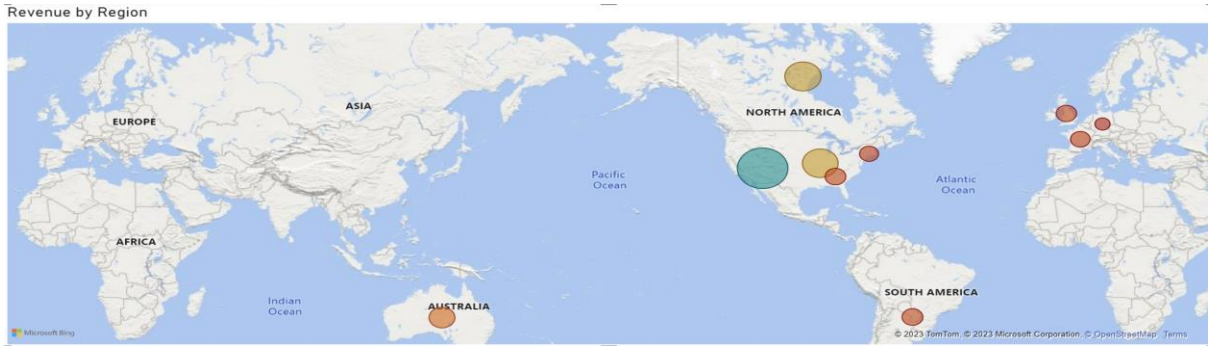
Considerations for Data Refresh:

- Similar to CSV files, if the Excel spreadsheet is static and doesn't change frequently, you can manually refresh the data.
- if the Excel spreadsheet is regularly updated, you can schedule periodic data refreshes to keep the data up-to-date.
- Consider keeping the Excel file in a shared location accessible by the Power BI service for seamless data refresh in the published report.
- Making changes to a Excel file should be done in coordination with the dashboard designer. Otherwise, updating and displaying the dashboard may encounter issues

Task 5:

The company wants to analyse the sales data using geographical information. Integrate a map visualization into the Power BI dashboard to display sales revenue by region/country. Show the top-performing regions/countries using a heat map or bubble map.

Answer:



Task 6:

Create a drill-through report that allows users to click on a specific product from the dashboard and navigate to a detailed report showing sales performance for that product. Include relevant metrics such as revenue, quantity sold, and sales growth.

Create the Detailed Report:

1. I created a new report for the selected product.

2. I Designed the report with relevant metrics, such as revenue, quantity sold, and sales growth, using appropriate visualizations.
3. Under “Drill through” section I dragged “product”
4. On the Main Page Right Click on the product and choose “Drill through” users can navigate to the Detailed report for the selected product.