**Power BI Assignment 3**

1. List and explain different PowerBi products?

Power BI offers a range of products that cater to various needs, from individual data analysis to enterprise-level business intelligence.

1. **Power BI Desktop**:
   * A free, standalone tool used to create reports and visualizations on your local machine.
   * **Use Case**: Ideal for analysts to design interactive reports, create dashboards, and perform data modeling.
2. **Power BI Service (Power BI Online)**:
   * A cloud-based service that allows users to share, collaborate, and access reports and dashboards from anywhere.
   * **Use Case**: Used for sharing and publishing reports created in Power BI Desktop. Allows team collaboration and scheduled data refreshes.
3. **Power BI Pro**:
   * A paid version of Power BI Service that includes advanced sharing and collaboration features.
   * **Use Case**: Businesses use Power BI Pro to share reports with users outside the organization and access features like collaboration, peer-to-peer sharing, and governance tools.
4. **Power BI Premium**:
   * A more powerful, enterprise-level version of Power BI. It includes dedicated cloud resources, large storage capacity, and advanced features like paginated reports and AI tools.
   * **Use Case**: Ideal for large organizations that need to scale BI efforts across departments with more capacity and control.
5. **Power BI Mobile**:
   * A mobile app that allows users to access Power BI dashboards and reports on smartphones and tablets.
   * **Use Case**: Business users who need to access reports and make decisions on the go.
6. **Power BI Report Server**:
   * An on-premises version of Power BI, used for organizations that need to keep their data on local servers for compliance or security reasons.
   * **Use Case**: Ideal for companies with strict data governance requirements.
7. **Power BI Embedded**:
   * A service that allows developers to embed Power BI reports and dashboards into their own custom applications.
   * **Use Case**: Used by application developers who want to offer analytics to users within their software.

### 2. **Limitations of Excel Solved by Power BI**

* **Scalability**: Excel has limitations when working with large datasets, while Power BI handles much larger volumes of data.
* **Real-time Data**: Power BI supports real-time data connections and updates, unlike Excel, which requires manual data refresh.
* **Advanced Visualizations**: Power BI offers richer, interactive, and customizable visualizations compared to the limited charting options in Excel.
* **Data Sharing and Collaboration**: Power BI makes sharing dashboards and reports easier via the cloud. In Excel, collaboration typically involves sharing static files.
* **Data Modeling and ETL**: Power BI’s data modeling and transformation tools (Power Query, DAX) are more advanced compared to Excel’s limited capabilities.
* **Cloud Integration**: Power BI integrates seamlessly with cloud services (Azure, Google Analytics, Salesforce), while Excel is more limited in this regard.

### 3. **What is Power Query?**

**Power Query** is a data connection technology used in Power BI, Excel, and other Microsoft products. It allows users to import, clean, and transform data from various sources.

**Key Features**:

* **Data Transformation**: Power Query provides an easy-to-use interface for cleaning and transforming raw data (e.g., removing duplicates, merging tables).
* **ETL Process**: Power Query serves as an Extract, Transform, Load (ETL) tool, which can pull data from different sources and reshape it to be used for reporting or analysis.
* **Automation**: Users can automate data refreshes and transformation processes.

**Example**: Cleaning a dataset by removing null values, changing data types, or combining data from multiple sources into a single table.

### 4. **What is Power Map?**

**Power Map** is a 3D data visualization tool in Excel (now part of Power BI’s broader feature set as well) that allows users to plot geographical data and create interactive 3D visualizations.

**Key Features**:

* **3D Visualizations**: Power Map can create three-dimensional maps with data points plotted across geographic locations.
* **Time-based Visualization**: Users can create animations showing how data changes over time across different geographical locations.
* **Map Customization**: It allows users to create layers of data and customize the appearance of the map to highlight patterns.

**Example**: Displaying global sales data on a map with animated visualizations showing changes in sales over time.

### 5. **How Power BI Eliminated the Need to Host SharePoint Server On-Premises**

Power BI eliminates the need for hosting SharePoint on-premises by offering **cloud-based services** that include:

* **Report Sharing and Collaboration**: With Power BI Service (cloud), users can share reports and dashboards securely without requiring SharePoint on-premises.
* **Data Storage in the Cloud**: Power BI stores reports, datasets, and dashboards in Microsoft’s Azure cloud, allowing users to access data from anywhere.
* **Version Control**: Unlike SharePoint, where version control can be cumbersome, Power BI automatically manages versions and updates.
* **Access on Any Device**: Power BI's mobile capabilities mean users no longer need SharePoint’s web access; reports and dashboards can be viewed on any device via the cloud.

### 6. **Updates in Power BI Service (Power BI 2.0) Compared to Older Version**

Power BI 2.0 introduced several enhancements compared to the older version of Power BI:

1. **Cloud-first Focus**:
   * Power BI shifted from a primarily on-premises model to a cloud-first approach, allowing for more scalability and collaboration.
2. **Interactive Dashboards**:
   * Power BI 2.0 introduced more customizable and interactive dashboards, making data visualization more dynamic compared to static reports.
3. **Improved User Interface**:
   * The interface became more user-friendly, making it easier to create and navigate between reports, dashboards, and datasets.
4. **Advanced Analytics with DAX**:
   * Power BI 2.0 expanded support for **Data Analysis Expressions (DAX)**, giving users more advanced analytics and calculation capabilities.
5. **Integration with Azure and Office 365**:
   * Seamless integration with Microsoft services such as Azure and Office 365 improved, making Power BI a part of the broader Microsoft ecosystem.
6. **Data Refresh Scheduling**:
   * Users could schedule automatic data refreshes in Power BI 2.0, eliminating the need for manual updates.
7. **Real-time Data Streaming**:
   * Power BI 2.0 introduced real-time data streaming for dashboards, allowing for live data feeds from IoT devices, sensors, and other systems.
8. **Custom Visualizations**:
   * Support for custom visualizations through the Power BI marketplace was enhanced, allowing users to create and import unique visuals.