**Power BI Assignment 3**

1. List and explain different PowerBi products?

Here is a list of different Power BI products along with brief explanations:

1. **Power BI Desktop:**
   * **Description:** Power BI Desktop is a free, standalone application for Windows that enables users to create interactive reports and dashboards. It is the primary authoring and designing tool for Power BI.
2. **Power BI Service (Power BI Online):**
   * **Description:** Power BI Service is the cloud-based service provided by Microsoft for sharing, collaborating, and publishing Power BI reports and dashboards. It allows users to view and interact with reports through a web browser.
3. **Power BI Mobile Apps:**
   * **Description:** Power BI Mobile Apps are available for iOS and Android devices, providing a mobile experience for accessing and interacting with Power BI content on the go. Users can view reports, dashboards, and receive notifications.
4. **Power BI Gateway:**
   * **Description:** Power BI Gateway is a tool that facilitates secure data transfer between on-premises data sources and the Power BI Service in the cloud. It is crucial for connecting to data sources behind firewalls.
5. **Power BI Report Server:**
   * **Description:** Power BI Report Server is an on-premises solution that allows organizations to host Power BI reports and dashboards locally. It is suitable for businesses with specific security or compliance requirements.
6. **Power BI Premium:**
   * **Description:** Power BI Premium is a capacity-based licensing offering that provides dedicated cloud resources for enhanced performance and scalability. It is suitable for organizations with large user bases or extensive data processing needs.
7. **Power BI Embedded:**
   * **Description:** Power BI Embedded allows developers to embed Power BI reports and dashboards into custom applications. It is suitable for organizations looking to integrate Power BI functionality seamlessly into their applications.
8. **Power BI Dataflows:**
   * **Description:** Power BI Dataflows enables users to extract, transform, and load (ETL) data within the Power BI Service. It allows for data preparation and cleansing activities directly in the cloud.
9. **Power BI Goals:**
   * **Description:** Power BI Goals is a feature within the Power BI Service that helps organizations set, track, and achieve business goals. It is designed for performance management and metrics tracking.
10. **Power BI Paginated Reports:**

* **Description:** Power BI Paginated Reports (formerly SQL Server Reporting Services or SSRS) is a reporting solution for creating and sharing pixel-perfect, paginated reports. It allows for detailed and printable reports.

1. **Power BI Premium Per User (PPU):**

* **Description:** Power BI Premium Per User is a user-based licensing model that provides individual users with advanced features and dedicated cloud resources without the need for an organization-wide Premium subscription.

2.What limitations of Excel, Microsoft solved by PowerBi?

Power BI addresses several limitations of Excel in the context of business intelligence, data analysis, and reporting. Here are some key limitations of Excel that Power BI helps overcome:

1. **Data Size and Performance:**
   * **Limitation in Excel:** Excel has limitations in handling large datasets efficiently, and as data size increases, performance issues may arise.
   * **How Power BI Addresses It:** Power BI is designed to handle large datasets more efficiently. It uses a columnar data store and in-memory processing to enhance performance, allowing users to analyze and visualize extensive datasets without significant slowdowns.
2. **Data Modeling Complexity:**
   * **Limitation in Excel:** Excel's data modeling capabilities, while present, may become complex and challenging to manage, especially in scenarios involving multiple tables and relationships.
   * **How Power BI Addresses It:** Power BI provides a dedicated environment for advanced data modeling. It introduces the Power Query Editor and Power Pivot, offering more robust tools for shaping and modeling data. The relationships between tables are also more seamlessly managed in Power BI.
3. **Sharing and Collaboration:**
   * **Limitation in Excel:** Sharing Excel files can lead to version control issues, and collaborating on reports can be challenging, especially when working with multiple users.
   * **How Power BI Addresses It:** Power BI Service enables easy sharing and collaboration. Reports and dashboards can be published to the Power BI cloud service, allowing users to access and interact with the latest version of the content. It provides real-time collaboration features and centralized access to reports.
4. **Real-Time Data:**
   * **Limitation in Excel:** Excel is not well-suited for handling real-time data updates and streaming analytics.
   * **How Power BI Addresses It:** Power BI has features like real-time streaming datasets and direct connectivity to data sources that support real-time updates. This allows for dynamic, live dashboards and reports that reflect the latest information.
5. **Advanced Visualizations and Customization:**
   * **Limitation in Excel:** While Excel offers a variety of charts and visualizations, creating highly customized and interactive dashboards may be challenging.
   * **How Power BI Addresses It:** Power BI provides a broad range of customizable visualizations and allows for more interactive dashboards. Users can leverage custom visuals or develop their own using Power BI Developer Tools to create unique and tailored visual representations of data.
6. **Data Source Connectivity:**
   * **Limitation in Excel:** Excel may have limitations in connecting to diverse data sources, especially when dealing with cloud-based or big data sources.
   * **How Power BI Addresses It:** Power BI offers a vast array of connectors, supporting a wide range of data sources, including cloud-based platforms, databases, web services, and more. This makes it easier to import and integrate data from various sources.
7. **Scalability:**
   * **Limitation in Excel:** Excel may encounter limitations when it comes to scaling analytics solutions for enterprise-level use.
   * **How Power BI Addresses It:** Power BI Premium and Power BI Premium Per User (PPU) offer scalability options for enterprise-level deployments. Dedicated cloud resources and enhanced performance are provided, ensuring that the platform can handle the demands of large organizations.
8. **Governance and Security:**
   * **Limitation in Excel:** Excel lacks centralized governance and security controls, which can be critical for managing sensitive business data.
   * **How Power BI Addresses It:** Power BI Service provides robust governance features, including role-based access control (RBAC), data-level security (DLS), and audit logs. This ensures secure and controlled access to data, with centralized administration capabilities.

3.Explain PowerQuery?

Power Query is a data connectivity and transformation tool that is an integral part of the Microsoft Power BI suite. It is also available as a separate add-in for Microsoft Excel and other Microsoft products. Power Query allows users to connect to various data sources, perform data transformations, and shape the data to meet their analysis and reporting needs. Here are key aspects of Power Query:

1. **Data Connectivity:**
   * **Source Variety:** Power Query supports a wide range of data sources, including databases, Excel files, CSV files, JSON, XML, web pages, folders, SharePoint lists, and many others.
   * **Data Source Settings:** Users can easily connect to data sources by providing connection details, credentials, and any required parameters.
2. **Data Transformation:**
   * **Data Shaping:** Power Query enables users to shape and transform data using a visual interface, which is often referred to as the Power Query Editor.
   * **Transformations:** Users can apply various transformations such as filtering, sorting, merging, grouping, pivoting, unpivoting, and adding calculated columns.
3. **Powerful Language:**
   * **M Language:** Power Query uses a functional language called M for expressing data transformations. Users can manually edit M code to create custom transformations or formulas.
   * **Formula Bar:** The Formula Bar in the Power Query Editor allows users to view and edit M code generated by the graphical interface.
4. **Data Profiling and Exploration:**
   * **Data Profiling:** Power Query provides data profiling capabilities, allowing users to quickly understand the structure and quality of their data.
   * **Column Distribution:** Users can view column statistics, distribution, and data type information to make informed decisions about data cleaning and transformation.
5. **Query Folding:**
   * **Optimized Operations:** Power Query attempts to perform operations at the data source level whenever possible. This is known as query folding and can significantly improve performance by pushing operations to the data source instead of bringing all data into memory.
6. **Advanced Editor:**
   * **M Code Editing:** The Advanced Editor allows users to directly edit the M code generated by Power Query transformations. This is useful for advanced users who want more control over the data transformation process.
7. **Data Load and Connection:**
   * **Load to Workbook or Model:** After shaping the data, users can load it into the Excel workbook or the Power BI data model for analysis and visualization.
   * **Connection Only:** Users can choose to create a connection only, keeping the data in its original source but allowing for queries to be refreshed as needed.
8. **Parameters and Functions:**
   * **Parameterized Queries:** Power Query supports the use of parameters, allowing users to create dynamic and reusable queries.
   * **Custom Functions:** Users can create custom functions in Power Query, enabling them to encapsulate and reuse specific transformations across multiple queries.

4.Explain PowerMap?

Here's an overview of Power Map and its transformation into 3D Maps:

**Power Map:**

* **Description:** Power Map was an Excel add-in that allowed users to create interactive 3D visualizations of geographic and temporal data. It allowed users to plot data points on a 3D globe or map, visualize trends over time, and create compelling tours to present data stories.
* **Key Features:**
  + Geographic and temporal data visualization.
  + Integration with Bing Maps for location data.
  + Animated tours to present data over time.
  + Ability to customize visual elements.

**3D Maps (Excel):**

* **Transformation:** Microsoft has integrated Power Map into Excel as a native feature known as 3D Maps.
* **Key Features (3D Maps):**
  + Accessible under the "Insert" tab in Excel.
  + Allows users to create 3D visualizations based on geographical and temporal data.
  + Provides a range of visualization options, including heat maps, columns, and region-based maps.
  + Enables the creation of animated tours to explore data trends over time.
  + Users can plot data points on a 3D map and customize the visual appearance.

**How to Use 3D Maps:**

1. Open Excel and go to the "Insert" tab.
2. Select "3D Maps" from the ribbon.
3. Create a new tour by adding locations and configuring the visualization settings.
4. Customize the appearance of the map, including themes, colors, and data representation.
5. Create animated tours to showcase data changes over time.

5.How powerBi eliminated the need to host SharePoint Server on premises?

Power BI eliminates the need to host SharePoint Server on-premises by providing a cloud-based business intelligence platform that offers secure and scalable data visualization, sharing, and collaboration features. Here are several ways in which Power BI has contributed to reducing the dependence on hosting SharePoint Server on-premises:

1. **Power BI Service in the Cloud:**
   * With Power BI, organizations can leverage the Power BI Service, a cloud-based platform that allows users to publish, share, and collaborate on Power BI reports and dashboards.
   * This eliminates the need for organizations to invest in and maintain their own on-premises SharePoint Server infrastructure for sharing and collaboration.
2. **Centralized Data Storage:**
   * Power BI allows organizations to store and manage their Power BI datasets and reports centrally in the cloud.
   * Users can upload Power BI files directly to the Power BI Service, eliminating the need for on-premises SharePoint Server storage.
3. **Sharing and Collaboration:**
   * Power BI Service provides secure sharing and collaboration features, allowing users to share reports and dashboards with colleagues, clients, or stakeholders.
   * The sharing and collaboration features in Power BI Service reduce the reliance on SharePoint Server for document sharing and collaboration.
4. **Embedding Power BI Content:**
   * Power BI supports embedding reports and dashboards into other applications and websites.
   * Organizations can embed Power BI content directly into their applications without the need for SharePoint Server, streamlining integration.
5. **Power BI Mobile Apps:**
   * Power BI Mobile Apps enable users to access and interact with Power BI content on the go.
   * Users can view reports and dashboards directly from the Power BI Service, reducing the dependence on an on-premises SharePoint infrastructure.
6. **No SharePoint Server Licensing Requirement:**
   * Power BI operates independently of SharePoint Server, meaning organizations can choose to use Power BI without the need for SharePoint Server licenses or infrastructure.
7. **Power BI Embedded:**
   * For organizations that want to embed Power BI reports into custom applications, Power BI Embedded provides a cloud-based solution without relying on SharePoint Server for embedding capabilities.
8. **Data Refresh and Connectivity:**
   * Power BI supports scheduled data refresh for datasets stored in the cloud, allowing organizations to keep their data up-to-date without relying on on-premises data sources or SharePoint Server for data refresh.
9. **Power BI Premium:**
   * Power BI Premium offers dedicated cloud resources for enhanced performance and scalability.
   * Organizations can opt for Power BI Premium instead of investing in on-premises infrastructure like SharePoint Server for scaling their Power BI deployments.

6.Explain the updates done in Power Bi Service(power BI 2.0) as compared to older version ?

Here are some key areas of improvement:

1. **Enhanced User Interface:**
   * Microsoft periodically updates the Power BI Service user interface to improve navigation, accessibility, and user experience. Changes may include updates to the home page, report view, and other aspects of the service.
2. **New and Advanced Visualizations:**
   * Power BI Service regularly introduces new and advanced visualizations to enhance data exploration and storytelling. Custom visuals created by the community or Microsoft partners are also integrated.
3. **Performance Improvements:**
   * Microsoft focuses on optimizing the performance of the Power BI Service, ensuring faster load times for reports and dashboards. This includes improvements to data refresh, query execution, and rendering.
4. **Power BI Apps:**
   * Power BI Apps have been introduced, allowing organizations to package and distribute content packs with predefined dashboards, reports, and datasets. This feature streamlines the deployment of analytics solutions.
5. **Integration with Power Platform:**
   * Power BI is part of the Microsoft Power Platform, and updates often include improved integration with other Power Platform components such as Power Automate (formerly Flow) and Power Apps.
6. **Enhancements to Data Connectivity:**
   * Additional connectors for various data sources are regularly added to Power BI Service, expanding the range of supported data connections. This includes both cloud-based and on-premises data sources.
7. **Advanced AI and Machine Learning Features:**
   * Microsoft incorporates advanced AI and machine learning capabilities into Power BI Service. This includes features like AutoML, Q&A (natural language querying), and integration with Azure Machine Learning.
8. **Power BI Premium and Power BI Premium Per User (PPU):**
   * Power BI Premium has undergone updates, introducing enhanced capabilities for larger organizations. The introduction of Power BI Premium Per User (PPU) provides dedicated resources for individual users without requiring an organization-wide Premium subscription.
9. **Enhanced Sharing and Collaboration:**
   * Updates to sharing and collaboration features include improvements to sharing dashboards, commenting on reports, and collaborating in real-time. Features like shared datasets and data lineage enhance collaboration within organizations.
10. **Row-Level Security and Security Features:**
    * Enhancements to security features, including improvements to row-level security (RLS), data protection, and audit logs, provide organizations with more control over data access and governance.
11. **Deployment Pipelines:**
    * Deployment Pipelines provide a streamlined process for moving content (datasets, reports, and dashboards) between development, test, and production environments.