**Power BI Assignment 3**

**1. List and explain different PowerBi products?**

Ans. Microsoft Power BI offers a suite of products and services that cater to different user needs and scenarios. Here are the main Power BI products:  
  
Power BI Desktop: Power BI Desktop is a powerful Windows application used for creating interactive reports and data visualizations. It provides a comprehensive set of tools and features for data modeling, transformation, and report design. Users can connect to various data sources, create relationships, define calculations, and build interactive visualizations using a drag-and-drop interface.

Power BI Service: Power BI Service, also known as Power BI Online or Power BI Cloud, is a web-based platform for publishing, sharing, and collaborating on Power BI reports and dashboards. Users can upload Power BI Desktop files (.pbix) to the service, create dashboards, schedule data refreshes, and share content with others. It also provides additional features like natural language queries, collaboration tools, and the ability to embed reports in other applications.

Power BI Mobile: Power BI Mobile enables users to access their Power BI content on smartphones and tablets. It offers native apps for iOS and Android devices, allowing users to view and interact with reports and dashboards on the go. Power BI Mobile provides a responsive and touch-friendly experience, enabling users to stay connected and make data-driven decisions from anywhere.

Power BI Report Server: Power BI Report Server is an on-premises reporting solution that allows organizations to host and manage Power BI reports within their own infrastructure. It provides the capability to deploy Power BI reports on a local server, ensuring data privacy and compliance for sensitive data. Power BI Report Server also includes features for managing report access, scheduling data refreshes, and integrating with other on-premises data sources.

Power BI Embedded: Power BI Embedded is a platform-as-a-service (PaaS) offering that allows developers to integrate Power BI capabilities directly into their own applications. It provides APIs and SDKs that enable embedding Power BI reports, dashboards, and visualizations into custom applications, websites, or portals. Power BI Embedded offers flexible licensing models, scalability, and customization options for embedding rich analytics experiences.

Power BI Premium: Power BI Premium is a licensing option that provides dedicated capacity and enhanced features for organizations with demanding or enterprise-level needs. It offers increased data capacity, faster performance, and the ability to share reports and dashboards with users who don't have Power BI Pro licenses. Power BI Premium also includes features like paginated reports, advanced AI capabilities, and the ability to distribute content externally.  
These are the primary Power BI products that cater to different user roles, from report creators and analysts to consumers and developers. Each product offers unique features and capabilities to empower users with data-driven insights and facilitate collaboration and decision-making across organizations.

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

Ans.

Power BI was developed by Microsoft to address several limitations of Excel when it comes to data analysis, visualization, and sharing. Here are some limitations of Excel that Power BI helps to overcome:  
  
Data Volume and Performance: Excel has limitations in handling large volumes of data, and as the data size increases, performance can be negatively impacted. Power BI is designed to handle large datasets efficiently, with optimized performance for data processing and visualizations.

Data Connectivity and Integration: Excel provides connectivity to various data sources, but it can be time-consuming and complex to import, transform, and merge data from different sources. Power BI offers a more streamlined and comprehensive approach to data connectivity, supporting a wide range of data sources and providing intuitive tools for data transformation and integration.

Data Modeling and Relationships: Excel has limited capabilities for creating complex data models and managing relationships between different data tables. Power BI provides advanced data modeling features, including the ability to define relationships, create hierarchies, and apply calculations using the DAX language, allowing for more sophisticated data analysis and reporting.

Interactive Visualizations: Excel provides basic charting and visualization capabilities, but it can be challenging to create interactive and dynamic visualizations that allow users to explore data and gain insights. Power BI offers a wide variety of interactive visualizations, customizable dashboards, and interactive features like cross-filtering and drill-through, enabling users to analyze data more effectively and interactively.

Collaboration and Sharing: Excel files are typically shared via email or file-sharing platforms, which can lead to version control issues and difficulties in collaboration. Power BI provides a centralized platform for sharing and collaborating on reports and dashboards. With Power BI, users can publish reports to the Power BI Service, share them with specific users or groups, and collaborate in real-time, ensuring everyone has access to the latest insights.

Data Refresh and Automation: Excel requires manual data refreshing, which can be time-consuming and prone to errors. Power BI offers automated data refresh capabilities, allowing users to schedule data refreshes from various sources, ensuring that reports and dashboards always reflect the latest data.  
Scalability and Performance Optimization: Excel is limited in terms of scalability and performance optimization for large-scale data analysis and reporting. Power BI provides scalable solutions through Power BI Premium, which offers dedicated capacity, faster performance, and the ability to handle larger datasets, allowing organizations to scale their analytics capabilities as needed.

Overall, Power BI addresses these limitations of Excel by providing a dedicated platform designed for data analysis, visualization, sharing, collaboration, and automation. It offers a more robust and scalable solution for organizations that require advanced data analytics capabilities.

**3. Explain PowerQuery?**

Ans.

Power Query is a data transformation and data preparation tool that is integrated into various Microsoft products, including Power BI, Excel, and Power Apps. It allows users to easily import, transform, and shape data from various sources before loading it into a data model or analysis tool.  
  
Here are some key aspects of Power Query:  
  
Data Source Connectivity: Power Query supports a wide range of data sources, including databases, files (such as Excel, CSV, and JSON), web sources, cloud services, and more. It provides a user-friendly interface to connect to these sources and retrieve data.

Data Transformation: Power Query enables users to perform various data transformation operations to clean, shape, and enhance the data. It offers a wide range of transformation functions and operations, such as filtering, sorting, grouping, pivoting, merging, splitting, and aggregating data. Users can apply these transformations step-by-step or create reusable transformation steps to automate the data preparation process.

Data Profiling and Cleaning: Power Query includes data profiling capabilities that help users understand the structure and quality of their data. It can detect and highlight potential data quality issues, such as missing values, duplicates, and inconsistencies, allowing users to clean and correct the data as needed.

Custom Functions and Advanced Transformations: Power Query allows users to create custom functions and apply advanced transformations using the M language (also known as Power Query formula language). This enables users to perform complex data transformations and calculations based on their specific requirements.

Query Folding and Performance Optimization: Power Query optimizes query execution by applying query folding, which pushes certain data transformations back to the data source. This improves performance by reducing the amount of data transferred and processed in Power Query.

Data Mashup and Data Modeling: Power Query supports data mashup, which allows users to combine data from multiple sources and create unified datasets. This enables users to build comprehensive data models for analysis and reporting in tools like Power BI or Excel.

Power Query provides a user-friendly and intuitive interface, allowing users to build data transformation workflows without requiring extensive programming knowledge. It simplifies the process of data preparation, saving time and effort in extracting, cleaning, and shaping data from various sources before analysis or visualization.

**4. Explain PowerMap?**

Ans.

Power Map, previously known as 3D Maps, is a data visualization tool in Microsoft Excel that allows users to create interactive 3D geospatial visualizations based on geographic and time-based data. It is a part of the Power BI suite of tools and is available in certain versions of Excel, such as Excel 2013 and later.  
  
Here are the key features and functionalities of Power Map:  
  
Geospatial Visualization: Power Map enables users to plot data points on a 3D globe or custom maps, allowing for geospatial analysis and visualization. Users can map locations, regions, and custom boundaries to represent data geographically.

Time-based Analysis: Power Map supports time-based data analysis, allowing users to animate their data over time. This feature enables users to visualize and analyze data trends, patterns, and changes across different time periods.

Data Exploration: Users can interact with the visualizations by zooming, panning, and rotating the 3D globe or map. This interactive experience provides the ability to explore data from different angles and perspectives, gaining insights that may not be apparent in traditional 2D charts or maps.

Data Integration: Power Map integrates with other Excel features, such as Power Query and Power Pivot, allowing users to import and transform data from various sources and create rich visualizations based on the combined datasets.

Storytelling and Presentations: Power Map provides a storytelling feature that allows users to create guided tours or presentations by sequencing specific views or scenes in the 3D visualization. This helps users effectively communicate their data insights and narratives to others.

Data Filtering and Highlighting: Users can apply filters to focus on specific subsets of data within the Power Map visualizations. Additionally, they can use color gradients, heat maps, and data bars to highlight and differentiate data points based on their values.

Power Map is a powerful tool for visualizing geospatial and time-based data directly within Excel. It offers an interactive and immersive experience that enables users to uncover patterns, trends, and insights from their data in a unique way.

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

Ans.

Power BI eliminates the need to host SharePoint Server on-premises by providing a cloud-based platform for data visualization, sharing, and collaboration. Here's how Power BI replaces the need for hosting SharePoint Server on-premises:  
  
Cloud-Based Environment: Power BI operates in the cloud, which means users don't have to manage and maintain an on-premises infrastructure like SharePoint Server. Power BI is hosted and managed by Microsoft, allowing users to access their reports and dashboards from anywhere with an internet connection.  
Data Storage and Management: Power BI provides its own data storage and management capabilities, including data modeling, transformation, and storage in the Power BI cloud service. Users can directly connect to various data sources, import data, create relationships, and perform data transformations within the Power BI environment, eliminating the need for an on-premises SharePoint Server for data management.  
Sharing and Collaboration: Power BI enables easy sharing and collaboration of reports and dashboards without relying on SharePoint Server. Users can publish their Power BI reports to the Power BI service, share them with specific users or groups, and collaborate in real-time. Power BI provides granular access control and sharing options, ensuring that the right people have access to the right information.  
Embedded Analytics: Power BI offers embedded analytics capabilities that allow users to integrate Power BI reports, dashboards, and visualizations into other applications, websites, or portals. This means you can embed Power BI content directly within SharePoint Online or other platforms without the need for hosting SharePoint Server on-premises.  
Updates and Enhancements: Power BI is a cloud service that receives regular updates and enhancements from Microsoft. Users automatically benefit from new features, improvements, and security updates without the need for on-premises maintenance and upgrades associated with SharePoint Server.  
By leveraging the cloud-based Power BI platform, organizations can eliminate the need for hosting and managing an on-premises SharePoint Server infrastructure. Power BI provides a scalable, secure, and feature-rich environment for data visualization, sharing, and collaboration, making it a suitable alternative to hosting SharePoint Server on-premises.

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

Ans.

Redesigned User Interface: The Power BI service has undergone several UI updates to improve usability and navigation. The updated interface provides a modern and intuitive experience for users to interact with their reports, dashboards, and datasets.

Collaboration and Sharing Enhancements: Power BI has introduced several collaboration features, such as the ability to create and share content with workspaces, share dashboards and reports with specific individuals or groups, and collaborate in real-time with colleagues on shared content.

Natural Language Query: Power BI has incorporated natural language query capabilities, allowing users to ask questions about their data using everyday language. This feature enables users to create visualizations and generate insights without the need for complex queries or data modeling.

Power Automate Integration: Power BI integrates with Power Automate (previously known as Microsoft Flow), enabling users to automate workflows and take actions based on data insights. This integration allows for the creation of automated notifications, alerts, and data-driven processes.