**1.List and explain different Power Bi products**?

**Power BI Desktop**: Power BI Desktop is a free, standalone application that allows users to create interactive reports and visualizations using data from various sources. It provides powerful data modelling capabilities and supports a wide range of data connectors.

**Power BI Pro:** Power BI Pro is a subscription-based service that extends the capabilities of Power BI Desktop. It allows users to share and collaborate on reports and dashboards with other Power BI users, publish content to the Power BI service, and access advanced features such as data refresh scheduling and larger storage limits.

**Power BI Premium:** Power BI Premium is a dedicated capacity-based licensing option that provides organizations with enhanced performance, scalability, and security for their Power BI deployments. It offers features such as dedicated cloud resources, larger data refresh limits, and support for larger datasets.

**Power BI Mobile:** Power BI Mobile is a mobile app that allows users to access and interact with Power BI reports and dashboards on their smartphones and tablets. It provides a consistent experience across different devices and platforms, enabling users to stay connected to their data 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 and paginated reports (SSRS) on their own infrastructure. It provides full control over data security and compliance requirements while still leveraging the capabilities of Power BI.

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

Power BI addresses several limitations of Excel, making it a more powerful and efficient tool for data analysis and visualization. Some of the key limitations of Excel that Power BI addresses include:

Scalability: Excel has limitations on the amount of data it can handle efficiently, especially when dealing with large datasets. Power BI is designed to handle large volumes of data more efficiently, allowing users to work with bigger datasets without performance issues.

**Data Modelling:** Excel's data modelling capabilities are limited compared to Power BI. Power BI provides more advanced data modelling features, including relationships, calculated columns, measures, and hierarchies, making it easier to create complex data models and perform advanced analytics.

**Visualization:** While Excel offers basic charting and visualization capabilities, Power BI provides a wide range of interactive and customizable visualizations, including advanced charts, maps, and custom visuals. Power BI also offers more options for formatting and styling visualizations to meet specific design requirements.

**Data Connectivity:** Excel has limited connectivity options for importing data from external sources. Power BI supports a wide range of data connectors, including databases, cloud services, files, and APIs, allowing users to easily connect to and import data from various sources.

**Collaboration and Sharing:** Excel files are often shared via email or stored on shared drives, which can lead to version control issues and data inconsistencies. Power BI offers centralized sharing and collaboration features, allowing users to publish reports and dashboards to the Power BI service and share them securely with colleagues and stakeholders. This ensures that everyone is working with the same up-to-date data and insights.

**3.Explain Power Query?**

Power Query is a data connectivity and preparation tool that is part of the Microsoft Power BI suite. It allows users to easily discover, connect, combine, and transform data from various sources for analysis and reporting purposes. Here's an overview of its key features and capabilities:

**Data Source Connectivity:** Power Query supports a wide range of data sources, including databases (SQL Server, Oracle, MySQL), files (Excel, CSV, XML), online services (Azure, SharePoint, Salesforce), and more. Users can connect to these sources directly from Power Query without needing to write any code.

**Data Discovery:** Power Query provides a user-friendly interface for discovering and browsing data within connected data sources. Users can preview data, view data types, and apply filters to narrow down the dataset before importing it into Power BI or Excel.

**Data Transformation:** One of the core features of Power Query is its ability to transform and clean data before loading it into the analysis tool. Users can perform a wide range of data transformation tasks, including removing duplicates, filtering rows, splitting columns, merging tables, and aggregating data. Power Query uses a graphical user interface with a step-by-step workflow to define and apply data transformations, making it easy for users with varying levels of technical expertise.

**Data Enrichment:** Power Query allows users to enrich their datasets by adding calculated columns, custom columns, and derived values based on existing data. Users can perform complex calculations, apply conditional logic, and create calculated fields using Power Query's formula language, M language.

**Data Loading:** Once data transformation and enrichment tasks are complete, users can load the processed data into Power BI or Excel for further analysis and visualization. Power Query provides options for loading data into memory, loading it to a data model for analysis, or creating a connection-only query for future reference.

**Query Management:** Power Query includes features for managing and organizing queries, including renaming, reordering, and deleting queries. Users can also create reusable query templates, parameterized queries, and functions to streamline the data preparation process and improve productivity.

**4.Explain Power Map?**

Power Map, also known as 3D Maps in Excel, is a data visualization tool that allows users to create interactive 3D maps and geographic visualizations from their data. Here's an overview of its key features and capabilities:

**Geographic Visualization**: Power Map enables users to plot geographic data on a 3D globe or 2D map. Users can map locations, regions, and custom boundaries using latitude and longitude coordinates or geographic hierarchies (e.g., country, state, city).

**Data Mapping:** Users can map their data to various geographic elements, such as points, bubbles, columns, and heat maps, based on the nature of their data and the visualization requirements. Each data point on the map can represent a numeric value or a category, allowing users to visualize patterns, trends, and correlations across geographical locations.

**Time Animation:** Power Map supports time-based animation, allowing users to visualize how data changes over time. Users can create dynamic animations that show data trends, movements, and fluctuations over different time intervals, such as days, months, or years. This feature is particularly useful for analysing temporal data, such as sales trends, population growth, or weather patterns.

**Customization Options:** Power Map offers various customization options for enhancing the appearance and interactivity of maps. Users can customize map styles, colours,legends, and labels to improve readability and visual appeal. They can also add annotations, callouts, and tooltips to provide additional context and insights to map viewers.

**Interactive Exploration:** Power Map provides interactive navigation tools that allow users to explore and interact with their maps dynamically. Users can zoom in and out, rotate the map, pan across different regions, and filter data interactively using slicers and filters. This interactive exploration capability enables users to gain deeper insights from their geographic data and identify patterns that may not be apparent from static visualizations.

**Integration with Excel:** Power Map is integrated with Microsoft Excel, allowing users to create and edit maps directly within the Excel interface. Users can import data from Excel spreadsheets, Power Pivot models, or external data sources, and then visualize that data using Power Map's rich set of mapping and visualization features. They can also combine Power Map with other Excel features, such as PivotTables, charts, and formulas, to perform comprehensive data analysis and reporting tasks.

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

Power BI eliminated the need to host SharePoint Server on-premises by providing cloud-based solutions for data storage, sharing, and collaboration. Here's how Power BI achieves this:

**Cloud-Based Infrastructure:** Power BI operates on Microsoft Azure, a cloud computing platform that provides scalable and reliable infrastructure for hosting applications and data services. By leveraging Azure's infrastructure, Power BI eliminates the need for organizations to maintain on-premises servers and hardware for hosting SharePoint environments.

**Power BI Service:** The Power BI service, also known as Power BI cloud, is a web-based platform that allows users to publish, share, and collaborate on reports and dashboards in the cloud. Users can access the Power BI service from any web browser, enabling seamless collaboration and data sharing across distributed teams and locations.

**Data Refresh and Connectivity:** Power BI enables users to connect to a wide range of data sources, including cloud-based services (e.g., Azure SQL Database, Dynamics 365, Salesforce), on-premises databases (e.g., SQL Server, Oracle, MySQL), and various file formats (e.g., Excel, CSV, XML). Users can schedule automatic data refreshes directly from the Power BI service, ensuring that their reports and dashboards are always up to date with the latest data.

**Secure Data Sharing:** Power BI provides robust security features to protect data both in transit and at rest. Users can define security roles and permissions to control access to sensitive data and ensure that only authorized users can view or interact with specific reports and datasets. Additionally, Power BI supports encryption, multi-factor authentication, and integration with Azure Active Directory for user authentication and identity management.

**Hybrid Solutions:** For organizations with existing on-premises SharePoint deployments, Power BI offers hybrid solutions that allow seamless integration between on-premises and cloud-based environments. Users can embed Power BI reports and dashboards directly into SharePoint Online sites or SharePoint Server pages, enabling a unified and consistent user experience across both platforms.

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

Power BI Service, often referred to as Power BI 2.0, introduced several updates and enhancements compared to its older versions. Some of the key updates include:

**Improved User Interface:** Power BI Service received a significant overhaul in its user interface, making it more intuitive and user-friendly. Navigation menus, report layouts, and configuration options were redesigned to streamline the user experience and improve accessibility.

**Enhanced Collaboration Features:** Power BI 2.0 introduced enhanced collaboration features, allowing users to share and collaborate on reports and dashboards more efficiently. New sharing options, such as sharing with specific users or groups, were added to provide greater control over data sharing and access permissions.

**Expanded Data Connectivity:** Power BI Service expanded its data connectivity options, allowing users to connect to a broader range of data sources, including cloud-based services, on-premises databases, and various file formats. This enhanced connectivity enables users to access and analyze data from diverse sources more easily.

**Advanced Analytics Capabilities:** Power BI 2.0 introduced advanced analytics capabilities, such as predictive analytics and machine learning integration, enabling users to perform more sophisticated data analysis and gain deeper insights into their data. New visualization types and statistical functions were also added to support advanced analytical tasks.

**Real-Time Data Streaming:** Power BI Service introduced real-time data streaming capabilities, allowing users to visualize and analyze streaming data in real time. This feature enables organizations to monitor and respond to changes in their data streams immediately, leading to more timely and informed decision-making.

**Mobile Enhancements:** Power BI 2.0 included significant enhancements to its mobile app, providing users with a more responsive and feature-rich mobile experience. New mobile-specific features, such as offline access, touch-friendly navigation, and enhanced security options, were added to improve usability and performance on mobile devices.