**Power BI Assignment 3**

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

Power BI is a suite of business analytics tools developed by Microsoft that enables organizations to visualize and share insights from their data. The Power BI suite consists of several products and offerings that cater to different needs and user roles. Here's an overview of the main Power BI products:

* Power BI Desktop: Power BI Desktop is a Windows application that allows users to create interactive data visualizations and reports. It provides a powerful environment for data modelling, transformation, and creating advanced visuals using the DAX (Data Analysis Expressions) language. Users can connect to various data sources, build relationships between tables, and design compelling reports before publishing them to the Power BI service.
* Power BI Service (Power BI Pro and Power BI Premium): The Power BI Service is a cloud-based platform where users can publish, share, collaborate on, and access Power BI reports and dashboards. It allows organizations to distribute reports to a broader audience, both inside and outside the organization. The Power BI Service offers two main licensing options:
  + Power BI Pro: Power BI Pro licenses are for individual users who need to create, publish, and share reports. Each licensed user can create their own content and share it with other Power BI Pro users or consumers.
  + Power BI Premium: Power BI Premium offers dedicated resources and enhanced performance for large-scale deployments. It caters to organizations with a high number of users who need access to reports and dashboards. Premium also includes features like paginated reports, AI capabilities, and dataflow storage.
* Power BI Mobile: Power BI Mobile apps are available for iOS and Android devices, allowing users to access Power BI reports and dashboards on the go. The mobile app ensures that reports are optimized for smaller screens and provides features like offline access, touch-based interactivity, and integration with device-specific capabilities.
* Power BI Report Server: Power BI Report Server is an on-premises solution that enables organizations to host and share Power BI reports within their own infrastructure. It's suitable for organizations with strict data governance requirements or those that prefer to keep their data on-premises.
* Power BI Embedded: Power BI Embedded allows developers to embed Power BI reports and dashboards directly into custom applications, websites, or portals. It's ideal for software vendors and developers who want to integrate data visualization capabilities into their own products.
* Power BI Dataflow: Power BI Dataflow is a cloud-based data preparation and transformation tool that enables users to connect to, transform, and shape data from various sources. Dataflows can be used to create reusable data entities that can be shared across different reports and dashboards.
* Power BI Paginated Reports: Power BI Paginated Reports (formerly SQL Server Reporting Services) allow users to create pixel-perfect, print-ready reports for operational and financial reporting needs. These reports offer a more structured format compared to interactive Power BI reports.

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

Microsoft Power BI addresses several limitations of Excel, especially when it comes to advanced data visualization, collaboration, and handling large and diverse datasets. Here are some key limitations of Excel that Power BI aims to solve:

1. Data Volume and Performance:

- Excel Limitation: Excel has limitations in handling large datasets, which can lead to slow performance and crashes.

- Power BI Solution: Power BI is designed to handle large and diverse datasets efficiently, thanks to its in-memory data model and columnar storage. It can process and visualize data at a much faster rate compared to Excel.

2. Data Modelling and Relationships:

- Excel Limitation: In Excel, creating and managing complex data models with multiple tables and relationships can become challenging and error-prone.

- Power BI Solution: Power BI provides a dedicated data modelling environment where users can easily create relationships between tables, define hierarchies, and perform data transformations using the Power Query Editor.

3. Advanced Data Visualization:

- Excel Limitation: While Excel offers basic charting and visualization capabilities, creating advanced and interactive visualizations can be complex and limited.

- Power BI Solution: Power BI offers a wide range of built-in visuals and custom visualizations from its marketplace. Users can create interactive and dynamic reports and dashboards with ease.

4. Data Refresh and Automation:

- Excel Limitation: In Excel, refreshing data from external sources can be manual and time-consuming, especially when dealing with multiple sources.

- Power BI Solution: Power BI allows users to schedule and automate data refreshes from various sources, ensuring that reports and dashboards always display up-to-date information.

5. Collaboration and Sharing:

- Excel Limitation: Sharing Excel files can lead to version control issues, and collaborating on the same file simultaneously can be challenging.

- Power BI Solution: Power BI provides a cloud-based platform (Power BI Service) where users can publish and share reports and dashboards securely. Collaboration features allow multiple users to work on the same report simultaneously.

6. Data Governance and Security:

- Excel Limitation: Excel lacks centralized data governance and security controls, making it difficult to enforce data access and privacy policies.

- Power BI Solution: Power BI offers robust data governance features, allowing administrators to control access to data, define security roles, and implement row-level security.

7. Ad Hoc Analysis:

- Excel Limitation: Excel is primarily designed for ad hoc analysis, which can lead to inconsistencies and a lack of data integrity.

- Power BI Solution: Power BI encourages the creation of reusable data models and reports, promoting consistent analysis and better data integrity.

8. Custom Development and Integration:

- Excel Limitation: Excel is not well-suited for custom development and integration into applications or websites.

- Power BI Solution: Power BI offers Power BI Embedded, which allows developers to integrate Power BI reports directly into custom applications and websites.

1. **Explain PowerQuery?**

Power Query is a data transformation and data preparation tool developed by Microsoft. It is an integral part of various Microsoft products, including Excel, Power BI, and other Microsoft Data Platform technologies. Power Query allows users to connect to various data sources, transform and shape the data, and load it into a desired destination for analysis, reporting, or visualization.

Key features and capabilities of Power Query include:

* Data Source Connectivity:
  + Power Query supports connectivity to a wide range of data sources, including databases (SQL Server, Oracle, MySQL), files (Excel, CSV, XML), cloud services (Azure, SharePoint), and web services (REST, OData).
  + Users can easily connect to these data sources directly from within Excel, Power BI, or other compatible applications.
* Data Transformation and Shaping:
  + Power Query enables users to perform various data transformation and shaping operations, such as filtering, sorting, grouping, merging, appending, and pivoting.
  + Users can apply these transformations using a user-friendly interface without writing complex code.
* Advanced Data Transformations:
  + Power Query provides advanced data transformation capabilities, including splitting columns, merging queries, unpivoting, custom calculations using the M formula language, and more.
  + Users can create custom functions and expressions to manipulate and cleanse data according to their specific requirements.
* Query Folding and Optimization:
  + Power Query includes query folding, which means that it optimizes the data retrieval process by pushing some of the data transformation tasks back to the data source, improving performance.
  + Query folding is particularly beneficial when working with databases, as it minimizes data transfer and processing.
* Data Preview and Profiling:
  + Users can preview data during the transformation process, ensuring that the desired transformations are applied accurately.
  + Power Query also offers data profiling capabilities, allowing users to analyze the data's characteristics, such as data types, value distribution, and data quality.
* Parameterization and Automation:
  + Power Query supports parameterization, allowing users to create dynamic queries by passing parameters and variables.
  + Queries created in Power Query can be automated to refresh data from source systems on a scheduled basis.
* Reusable Queries and Functions:
  + Users can create reusable queries and functions that can be applied across multiple datasets or reports.
  + This promotes consistency and reduces the effort required to perform similar transformations.
* Integration with Power BI and Excel:
  + Power Query is seamlessly integrated into Power BI and Excel, allowing users to create data models and reports with transformed and shaped data.
  + Queries created in Power Query can be loaded into Power BI's data model for visualization and analysis.

1. **Explain Power Map?**

Power Map, now known as "3D Maps," is a visualization tool in Microsoft Excel that allows users to create interactive 3D geographical and temporal data visualizations. It enables users to plot data on a 3D map, view data changes over time, and gain insights into patterns and trends that might not be immediately apparent in traditional 2D charts and graphs.

Key features and capabilities of Power Map (3D Maps) include:

* Geographical Visualization:
  + Users can plot data points on a 3D map using geographic locations such as latitude and longitude coordinates or place names (city, country, etc.).
  + This visualization approach helps users understand spatial relationships and distribution of data across geographical regions.
* Data Mapping and Colour Coding:
  + Users can assign data values to different visual elements on the map, such as bubbles, columns, and heatmaps.
  + Colour coding and shading can be applied based on data ranges to highlight variations and patterns.
* Time Series Animation:
  + Power Map allows users to create animated visualizations that show how data changes over time.
  + Users can define a time dimension and watch the data points move and change on the map as time progresses.
* Customization and Interaction:
  + Users can customize the appearance of the 3D map, including changing colours, fonts, and map themes.
  + Interactivity is supported, allowing users to click on data points to view details or filter data dynamically.
* Layered Visualization:
  + Users can add multiple layers to the 3D map, enabling the comparison of different datasets or attributes within the same visualization.
* Integration with Excel Data:
  + Power Map integrates seamlessly with Excel, allowing users to leverage their existing data stored in Excel worksheets or data models.
  + Users can import data from various sources or use data they have prepared using other Excel features, such as Power Query.
* Storytelling and Presentation:
  + Power Map supports creating "tours," which are sequences of scenes that guide viewers through the data visualization story.
  + Users can use tours to present insights and narratives based on the data.
* Export and Sharing:
  + Users can export Power Map visualizations as video files or static images for sharing or presentation purposes.
  + Power Map visualizations can also be embedded in PowerPoint presentations.

1. **How PowerBi eliminated the need to host SharePoint Server on premises?**

Power BI, a part of Microsoft's Power Platform, offers a cloud-based solution for data visualization, reporting, and business intelligence. While it doesn't directly replace all the functionalities of SharePoint Server, it does provide several features that reduce the need for hosting SharePoint Server on premises in certain scenarios. Here's how Power BI contributes to eliminating the need for hosting SharePoint Server on premises:

1. Cloud-Based Solution:

Power BI is a cloud-based service that allows organizations to publish and share interactive reports and dashboards securely over the internet. This eliminates the need for maintaining and managing an on-premises SharePoint Server infrastructure.

2. Data Visualization and Reporting:

Power BI is specifically designed for data visualization and reporting. It provides a user-friendly interface for creating dynamic and interactive visualizations, which can be embedded into websites, applications, or shared directly with stakeholders.

3. Self-Service BI:

Power BI empowers business users to create their own reports and dashboards without relying on IT or developers. This self-service capability reduces the burden on IT departments and accelerates decision-making.

4. Native Integration with SharePoint Online:

Power BI seamlessly integrates with SharePoint Online, the cloud-based version of SharePoint. Users can embed Power BI reports and dashboards directly within SharePoint Online sites, enhancing the data visualization capabilities of SharePoint without the need for an on-premises server.

5. Data Gateway:

Power BI provides a Data Gateway that allows secure data connectivity between cloud-based Power BI services and on-premises data sources. This enables organizations to access on-premises data without the need to expose internal servers or deploy complex infrastructure.

6. Data Refresh and Automation:

Power BI supports scheduled data refresh, which ensures that reports and dashboards display up-to-date information. This eliminates the need for manual data updates and reduces the complexity of managing data in an on-premises SharePoint environment.

7. Collaboration and Sharing:

Power BI allows users to collaborate on reports and dashboards in real-time. It offers advanced sharing options, including content embedding, which enhances collaboration capabilities and reduces the need for SharePoint-based collaboration in certain cases.

8. Scalability and Maintenance:

By leveraging Power BI's cloud infrastructure, organizations can benefit from Microsoft's expertise in managing and maintaining a scalable, highly available, and secure environment. This reduces the need for on-premises server maintenance and ensures reliable access to reports and dashboards.

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

As of my last knowledge update in September 2021, there is no "Power BI 2.0" version released. Power BI is an evolving platform, and updates and improvements are regularly made to both Power BI Desktop (the authoring tool) and Power BI Service (the cloud-based platform for sharing and collaboration). However, there is no distinct version called "Power BI 2.0" that can be directly compared to older versions.

Instead, Microsoft releases updates, features, and enhancements on an ongoing basis. These updates can include improvements to visualization capabilities, data connectivity options, collaboration features, performance enhancements, and more. Some of the general updates that have been made to Power BI Service over time include:

* Enhanced Data Modelling and Transformations:
  + Improved data modelling capabilities, including the ability to create calculated tables and columns directly in Power BI Service.
  + Enhancements to the Power Query Editor, allowing users to perform data transformations within the service.
* Advanced Analytics and AI Integration:
  + Integration with AI and machine learning capabilities, such as Azure Machine Learning and cognitive services, for advanced analytics within Power BI reports.
* New Visualizations and Customization:
  + Regular addition of new built-in visualizations and charts, as well as the ability to import custom visuals from the Power BI marketplace.
  + Improved formatting and customization options for visuals to enhance the design and user experience of reports.
* Performance and Query Optimization:
  + Continual improvements to enhance report performance, data refresh speeds, and query optimization for large datasets.
* Dataflow Enhancements:
  + Expansion of dataflow capabilities, allowing users to create and manage dataflows directly within Power BI Service for centralized data preparation and transformation.
* Advanced Sharing and Collaboration:
  + Enhanced sharing options, including the ability to share reports and dashboards with users outside the organization using secure guest access.
  + Integration with Microsoft Teams and SharePoint for seamless collaboration.
* Power BI Apps and Templates:
  + Introduction of Power BI apps and templates for specific industries and use cases, allowing users to quickly deploy pre-built solutions.
* Paginated Reports:
  + Integration of paginated reports (formerly SQL Server Reporting Services) into Power BI Service, enabling users to create and share pixel-perfect, printable reports.

Please note that the Power BI platform is continuously evolving, and new features and updates are introduced regularly. To get the most up-to-date information on the latest updates and enhancements, I recommend visiting the official Power BI blog or the Microsoft Power BI website.