**Power BI Assignment 3**

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

**Ans:--**

As of my last knowledge update in September 2021, Microsoft offers several Power BI products and services to cater to various business needs and use cases. Here is a list of different Power BI products and a brief explanation of each:

1. Power BI Desktop:

- Power BI Desktop is a free Windows application for creating interactive reports and dashboards.

- It provides a powerful environment for data modeling, transformation, and visualization.

- Users can connect to various data sources, create data models, and design rich visualizations for in-depth analysis.

2. Power BI Service (Power BI Cloud):

- Power BI Service, often referred to as the Power BI Cloud, is a cloud-based platform for sharing, collaborating on, and publishing Power BI reports and dashboards.

- It allows users to publish reports created in Power BI Desktop and share them with others.

- Power BI Service offers features like data refresh, collaboration, sharing, and scheduled report delivery.

3. Power BI Mobile Apps:

- Power BI offers mobile apps for iOS and Android devices, as well as a responsive web interface.

- These apps allow users to access and interact with Power BI reports and dashboards on their mobile devices, making it easy to stay connected to data while on the go.

4. Power BI Embedded:

- Power BI Embedded is a developer-focused service that enables developers to embed Power BI reports and dashboards into custom applications.

- It allows organizations to create data-driven applications for their customers or users without requiring them to have Power BI licenses.

5. Power BI Report Server:

- Power BI Report Server is an on-premises solution for deploying Power BI reports and dashboards within an organization's own data center.

- It is suitable for organizations with strict data sovereignty requirements or those that want to keep their data entirely on-premises.

6. Power BI Premium:

- Power BI Premium is a capacity-based licensing model that provides dedicated resources for running Power BI workloads.

- It offers features like enhanced performance, dedicated cloud capacity, and the ability to share reports and dashboards with external users without requiring individual licenses.

7. Power BI Pro:

- Power BI Pro is a per-user licensing model that allows individual users to create, publish, and share Power BI content.

- It provides access to Power BI Service and enables collaboration and content sharing.

8. Power BI Dataflows:

- Power BI Dataflows is a service for data preparation and transformation that is integrated with Power BI.

- It allows users to create dataflows to define, ingest, transform, and load data from various sources before using it in Power BI reports and dashboards.

9. Power BI Premium Per User (PPU):

- Power BI Premium Per User is a licensing option that provides access to premium features for individual users on a subscription basis.

- It offers dedicated cloud capacity, paginated reports, and the ability to share reports with external users without requiring them to have Power BI Pro licenses.

These different Power BI products and services cater to a wide range of user requirements, from creating interactive reports to embedding analytics in custom applications and managing on-premises deployments. Microsoft continues to evolve and expand the Power BI ecosystem, so it's advisable to check for the latest updates and offerings from Microsoft's official Power BI website.

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

**Ans:--**

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

1. Handling Large Datasets:

- Limitation in Excel: Excel can struggle with large datasets, leading to slow performance, crashes, and increased risk of data errors.

- Power BI Solution: Power BI is designed for handling large datasets efficiently. It uses a columnar data storage engine and performs data compression to improve performance and handle millions of rows of data with ease.

2. Data Modeling Complexity:

- Limitation in Excel: Excel lacks robust data modeling capabilities, making it challenging to create complex relationships between tables and calculate advanced measures.

- Power BI Solution: Power BI provides a dedicated data modeling interface with advanced features for creating relationships, hierarchies, and complex calculations using Data Analysis Expressions (DAX).

3. Interactive Data Visualization:

- Limitation in Excel: Excel's charting capabilities, while useful, can be limited when creating interactive and dynamic data visualizations.

- Power BI Solution: Power BI offers a wide range of interactive and customizable visualization options, making it easier to create engaging and insightful reports and dashboards.

4. Data Refresh and Automation:

- Limitation in Excel: Excel requires manual data updates and refreshes, leading to outdated reports and potential data entry errors.

- Power BI Solution: Power BI provides automated data refresh options, ensuring that reports and dashboards always reflect the latest data from connected sources.

5. Sharing and Collaboration:

- Limitation in Excel: Sharing Excel files can be cumbersome, with version control challenges, email attachments, and limited collaboration features.

- Power BI Solution: Power BI Service offers cloud-based sharing and collaboration features, allowing multiple users to collaborate on reports, provide feedback, and access reports from anywhere.

6. Security and Row-Level Security:

- Limitation in Excel: Excel lacks granular security controls, making it challenging to implement row-level security for sensitive data.

- Power BI Solution: Power BI offers robust security features, including role-based access control and row-level security, to control access to data at a granular level.

7. Real-Time Data Streaming:

- Limitation in Excel: Excel is primarily a static tool, making it challenging to work with real-time data streams and dynamic data sources.

- Power BI Solution: Power BI supports real-time data streaming, allowing users to monitor and analyze data as it's generated, making it suitable for real-time analytics scenarios.

8. Mobile Accessibility:

- Limitation in Excel: Excel's mobile experience is limited, and reports may not render well on mobile devices.

- Power BI Solution: Power BI offers dedicated mobile apps for iOS and Android devices, providing a responsive and user-friendly mobile experience.

9. Custom Development and Embedding:

- Limitation in Excel: Excel does not easily support custom application development or embedding analytics into other applications.

- Power BI Solution: Power BI offers Power BI Embedded and APIs, allowing developers to embed Power BI reports and dashboards into custom applications, websites, and portals.

Overall, Power BI complements Excel by providing advanced data analytics and visualization capabilities, robust data modeling, cloud-based collaboration and sharing, and support for real-time data, making it a more suitable tool for modern business intelligence and data-driven decision-making.

1. **Explain PowerQuery?**

**Ans:--**

Power Query is a data transformation and manipulation tool that is part of the Microsoft Power BI suite, as well as other Microsoft products such as Excel and Power Apps. It is used to extract, transform, and load (ETL) data from various sources, clean and reshape it, and prepare it for analysis or reporting. Power Query simplifies and automates the process of importing and transforming data, making it easier for users to work with data from multiple sources.

Here are some key features and functions of Power Query:

1. Data Source Connectivity: Power Query supports a wide range of data sources, including databases (SQL Server, Oracle, MySQL), files (Excel, CSV, JSON), online services (SharePoint, web services), and many more. Users can connect to multiple sources simultaneously.

2. Data Transformation: Power Query provides a user-friendly interface for data transformation. Users can apply various data manipulation operations, such as filtering, sorting, grouping, merging, pivoting, and aggregating, to shape the data to their needs.

3. Data Cleaning and Profiling: Power Query includes tools for data cleansing, such as removing duplicates, handling missing values, and performing text transformations. It also offers data profiling capabilities to analyze and understand the data's quality and structure.

4. Formula Language (M): Power Query uses a formula language known as "M" to define data transformation steps. Users can write custom M formulas for advanced transformations, or they can use the built-in functions and transformations provided in the Power Query user interface.

5. Query Folding: Power Query optimizes data retrieval by pushing certain data transformations back to the data source (when supported). This can improve query performance, especially when dealing with large datasets.

6. Parameterization: Users can parameterize queries, allowing them to create dynamic queries that accept input values. This is useful for scenarios where queries need to be reused with different filter criteria.

7. Data Loading: After data transformation is complete, users can load the data into a destination, such as a Power BI data model, an Excel worksheet, or a data warehouse.

8. Query Dependencies: Power Query allows users to create query dependencies, enabling the creation of complex data transformation workflows. One query can depend on the output of another query, allowing for modular and organized data preparation processes.

9. Custom Functions: Users can create custom functions in Power Query, which can be reused across multiple queries. This simplifies the transformation of data and ensures consistency.

10. Integration with Power BI and Excel: Power Query is integrated into Power BI Desktop and Excel, making it easy to import and transform data directly within these applications. The same Power Query queries can be used in both tools.

11. Refresh and Data Loading Options: Power Query queries can be refreshed manually or on a schedule. Users can also define parameters for data source credentials to ensure secure access.

Power Query simplifies the data preparation process and helps ensure that data used for analysis or reporting is clean, structured, and ready for use. It reduces the need for manual data manipulation and scripting, making it a valuable tool for data professionals and analysts working with diverse datasets from various sources.

1. **Explain PowerMap?**

**Ans:--**

Power Map, formerly known as "GeoFlow," is a 3D data visualization tool and add-in for Microsoft Excel. It allows users to create interactive geographical and temporal visualizations of their data on a 3D map. Power Map is part of the Microsoft Power BI suite and is available as a feature in Microsoft Excel for Office 365 ProPlus subscribers.

Key features and capabilities of Power Map include:

1. Geospatial Data Visualization: Power Map enables users to visualize their data on a map. It supports various geographical elements, such as countries, regions, cities, and custom locations using latitude and longitude coordinates.

2. 3D Mapping: Power Map provides a 3D mapping environment that allows users to create dynamic and interactive 3D visualizations of their data. Users can rotate, zoom, and pan the map to explore data from different angles.

3. Time-Based Animation: Users can animate their data over time using a timeline feature. This is particularly useful for visualizing data that changes over different time periods, such as sales by month or population growth by year.

4. Layering and Filtering: Power Map allows users to add multiple layers to their maps, each representing different datasets or aspects of the data. Layers can be filtered to focus on specific data points or time periods.

5. Custom Symbols: Users can customize map symbols and data points, making it easier to distinguish between various categories or values in the data.

6. Heat Maps: Power Map supports the creation of heat maps, which visually represent data density in a specific area on the map. Heat maps are useful for identifying concentration patterns in data.

7. Data Integration: Power Map seamlessly integrates with other Excel features and data sources. Users can import data from Excel tables, Power Pivot models, or external sources.

8. Tour Creation: Users can create guided tours of their 3D maps, allowing them to narrate and share their insights with others. Tours can be saved and shared as video files.

9. Sharing and Export: Maps and tours created in Power Map can be shared with others, including those who don't have Power Map installed, by exporting them to video or embedding them in PowerPoint presentations.

Power Map is particularly valuable for organizations and professionals who need to analyze and communicate data with geographical and temporal dimensions. It helps users gain deeper insights into location-based data trends and patterns and provides a visually engaging way to present data to stakeholders and decision-makers.

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

**Ans:--**

Power BI has not eliminated the need to host SharePoint Server on premises, but it has provided organizations with an alternative option for data storage, sharing, and collaboration in the cloud. While SharePoint and Power BI can complement each other, they serve different purposes, and organizations can choose how to leverage them based on their specific requirements.

Here's how Power BI and SharePoint relate to each other, and how Power BI has influenced data hosting and sharing:

1. SharePoint for On-Premises Data Hosting:

- SharePoint is a powerful platform for document management, collaboration, and content sharing. In the past, organizations often hosted SharePoint Server on their own premises to manage and store documents, reports, and other content.

2. Power BI for Cloud-Based Analytics:

- Power BI, on the other hand, is a cloud-based business intelligence and data visualization tool provided by Microsoft. It allows users to connect to various data sources, create interactive reports and dashboards, and share them with others in the cloud.

3. Power BI Integration with SharePoint:

- Power BI and SharePoint can work together to provide a comprehensive solution for data storage and reporting. Organizations can use Power BI to connect to data sources, create reports, and then embed those reports into SharePoint Online (the cloud version of SharePoint).

4. SharePoint Online and SharePoint Server:

- With the introduction of SharePoint Online as part of Microsoft 365 (formerly Office 365), organizations have the option to host SharePoint in the cloud. SharePoint Online offers features and integration options with Power BI and other Microsoft 365 services.

5. Reducing On-Premises Infrastructure:

- Power BI's cloud capabilities have made it easier for organizations to reduce their reliance on on-premises infrastructure for data storage and reporting. Instead of hosting reports and dashboards on their own servers, organizations can leverage Power BI Service (cloud-based) for sharing and collaboration.

6. Hybrid Scenarios:

- Some organizations may choose hybrid scenarios where they continue to use SharePoint Server on premises for certain purposes, such as document management, while leveraging Power BI in the cloud for data analytics and reporting.

In summary, while Power BI has not eliminated the need for on-premises SharePoint Server entirely, it has provided organizations with more flexibility in how they host and share data and reports. Organizations can choose to use SharePoint Online and Power BI together in the cloud or continue to use SharePoint Server on premises, depending on their specific IT infrastructure, data security requirements, and collaboration needs.

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

**Ans:--**

As of my last knowledge update in September 2021, Microsoft Power BI had gone through several updates and versions. While the naming convention "Power BI 2.0" is not a recognized version name, I can provide an overview of some of the significant updates and improvements made to Power BI Service compared to earlier versions.

Please note that Microsoft regularly releases updates and new features for Power BI Service, so the information may have evolved since my last update. Here are some general improvements and features that were introduced in Power BI Service over time:

1. Enhanced Data Connectivity:

- Power BI Service continually added support for more data connectors, allowing users to connect to a broader range of data sources, including cloud services, databases, and web services.

2. Improved Data Modeling:

- Power BI Service improved its data modeling capabilities, including support for many-to-many relationships, bidirectional filtering, and cross-filtering, making it easier to create complex data models.

3. Advanced Analytics with DAX:

- Power BI Service continued to enhance its support for Data Analysis Expressions (DAX), enabling users to create sophisticated calculations and measures for deeper data analysis.

4. Integration with Power BI Desktop:

- Power BI Desktop and Power BI Service became tightly integrated, making it easier for users to create reports in Power BI Desktop and publish them directly to the Power BI Service for sharing and collaboration.

5. Custom Visuals:

- Power BI Service introduced support for custom visuals, allowing users to create or download custom chart types and visuals to enhance their reports and dashboards.

6. Power BI Apps:

- Power BI Apps, formerly known as Content Packs, were introduced to simplify content distribution and sharing within organizations. Apps enable packaged dashboards, reports, and datasets to be shared with specific user groups.

7. Enhanced Security and Compliance:

- Power BI Service improved its security and compliance features, including support for row-level security, encryption, audit logs, and integration with Azure Active Directory for user authentication and authorization.

8. Power BI Embedded:

- Power BI Embedded, a service for embedding Power BI reports and dashboards into custom applications, was enhanced with improved APIs and scalability options.

9. Paginated Reports:

- Power BI Service introduced support for paginated reports, allowing users to create and share pixel-perfect, paginated reports similar to traditional SSRS (SQL Server Reporting Services) reports.

10. AI and Machine Learning Integration:

- Power BI Service integrated with AI and machine learning capabilities, including automated machine learning (AutoML) and AI-driven insights, to help users gain more insights from their data.

11. Dataflows:

- Power BI Dataflows was introduced as a service for data preparation and transformation, enabling users to create reusable data transformation logic.

12. Power Automate Integration:

- Integration with Power Automate (formerly Microsoft Flow) allows users to automate workflows and processes based on events in Power BI.

13. Enhanced Mobile Experience:

- Power BI Service continued to improve its mobile apps, providing a responsive and user-friendly mobile experience for accessing reports and dashboards on smartphones and tablets.

These are some of the notable updates and improvements made to Power BI Service over time. Microsoft regularly releases updates and new features to enhance the capabilities of Power BI, so it's important to check the official Power BI blog or documentation for the latest information on updates and features.