**POWER BI – ASSIGNMENT 3**

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

1. **Power BI Desktop:**

* Power BI Desktop is a free application that you install on your computer.
* It allows to connect to various data sources, transform data, create interactive visualizations, and build reports and dashboards.
* This is primarily used by analysts and report creators to author reports and prepare data models.

1. **Power BI Pro**:

* Power BI Pro is a subscription-based service that allows users to share and collaborate on reports and dashboards.
* It offers additional features such as larger data capacity limits, on-premises data gateway connectivity, and more frequent data refresh rates.
* Power BI Pro is suitable for small to medium-sized businesses and individual users who require sharing and collaboration capabilities.

1. **Power BI Premium:**

* Power BI Premium is a capacity-based licensing model designed for larger organizations or enterprises.
* It provides dedicated cloud resources for running Power BI workloads, ensuring consistent performance and scalability.
* With Power BI Premium, organizations can distribute content broadly without requiring individual Pro licenses for each user.

1. **Power BI Report Server:**

* Power BI Report Server is an on-premises solution that allows organizations to host and manage Power BI reports within their own infrastructure.
* It provides similar capabilities to Power BI Pro, including report authoring, sharing, and collaboration, but within the organization's firewall.
* Power BI Report Server is often chosen by organizations with strict data sovereignty or compliance requirements.

1. **Power BI Mobile App:**

* Power BI offers mobile apps for iOS, Android, and Windows devices.
* These apps allow users to access their Power BI reports and dashboards on the go, providing real-time insights anytime, anywhere.
* Users can interact with visualizations, drill down into data, and receive notifications based on data alerts.

1. **Power BI Embedded:**

* Power BI Embedded is a platform-as-a-service (PaaS) offering that enables developers to embed Power BI reports and dashboards directly into custom applications.
* It allows for seamless integration of Power BI analytics within custom web and mobile applications, providing a white-label solution for embedding data visualizations.
* Power BI Embedded is suitable for independent software vendors (ISVs) and developers building data-driven applications for their customers.

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

* Power BI addresses several limitations of Excel, particularly when it comes to analyzing and visualizing large and complex datasets, collaborating on data-driven insights, and building interactive dashboards.
* Here are some key limitations of Excel that Power BI aims to solve:

1. **Handling Large Datasets:**

* Excel has limitations in handling large datasets efficiently, leading to performance issues and potential crashes.
* Power BI can handle much larger datasets, leveraging in-memory data models and advanced compression techniques for faster data processing and analysis.

1. **Data Connectivity:**

* Excel's data connectivity options are limited compared to Power BI, especially for connecting to a wide range of data sources, including cloud-based services, databases, and big data platforms.
* Power BI offers extensive connectivity options, with built-in connectors for hundreds of data sources, allowing users to easily import and refresh data from various sources.

1. **Data Modeling and Transformation:**

* Excel's data modeling capabilities are limited, making it challenging to create complex data models and perform advanced data transformations.
* Power BI provides robust data modeling capabilities, allowing users to create relationships between tables, define calculated columns and measures, and perform complex data transformations using Power Query.

1. **Visualization and Interactivity:**

* Excel's charting and visualization capabilities are relatively basic, limiting the types of visualizations that can be created and the interactivity of reports and dashboards.
* Power BI offers a wide range of interactive visualizations, including advanced charts, maps, and custom visuals, enabling users to create more engaging and insightful reports and dashboards.

1. **Performance and Scalability:**

* Excel's performance can degrade when working with large datasets or complex calculations, especially in multi-user environments.
* Power BI is optimized for performance and scalability, leveraging cloud-based resources to handle large volumes of data and concurrent user access efficiently. Additionally, Power BI Premium offers dedicated capacity options for organizations with high-scale requirements.

**Q.3 Explain Power Query?**

* Power Query is a data connectivity and preparation tool that is part of the Microsoft Power BI suite, as well as Excel, and other Microsoft products.
* It enables users to easily discover, connect, combine, and refine data from various sources for analysis and reporting purposes.

1. **Data Connectivity:**

* Power Query provides a wide range of built-in connectors to connect to various data sources, including databases (SQL Server, Oracle, MySQL), cloud services (Azure, Salesforce, Google Analytics), files (Excel, CSV, JSON), and more.
* Users can connect to multiple data sources simultaneously and merge or append data from different sources into a single dataset.

1. **Data Transformation:**

* Power Query offers a user-friendly interface for performing data transformation tasks without writing complex code.
* Users can clean, reshape, and transform data using a wide range of built-in transformation functions and operations. These include filtering, sorting, removing duplicates, splitting columns, merging queries, unpivoting data, and more.
* Power Query's intuitive interface provides a visual representation of each transformation step, making it easy to track and modify the data transformation process.

1. **Custom Column and Function Creation:**

* Users can create custom columns in Power Query by defining calculations using the M language (also known as Power Query Formula Language).
* Power Query also supports the creation of custom functions, allowing users to encapsulate reusable transformation logic and apply it across multiple datasets.

1. **Data Profiling and Quality Checks:**

* Power Query includes data profiling capabilities that enable users to analyze the quality and characteristics of their data.
* Users can identify data inconsistencies, missing values, outliers, and other data quality issues using built-in profiling statistics and visualizations.

1. **Advanced Data Source Options:**

* Power Query offers advanced options for working with specific data sources, such as web scraping, accessing APIs, connecting to OData feeds, and performing data extraction from semi-structured and unstructured sources.

1. **Integration with Power BI and Excel:**

* In Power BI Desktop and Excel, Power Query is integrated seamlessly into the data preparation workflow, allowing users to load transformed data directly into data models for analysis and visualization.
* Power Query transformations can be easily applied to refreshable datasets, ensuring that reports and dashboards reflect the latest data.

**Q.4 Explain Power Map.**

Power Map is a 3D data visualization tool developed by Microsoft that allows users to create interactive geographical and temporal visualizations of their data on maps. It is part of the Microsoft Power BI suite and is available as an add-in for Excel.

1. **Geospatial Mapping:**

* Power Map enables users to plot their data on interactive maps using geographical coordinates such as latitude and longitude.
* Users can visualize data points as markers on the map, with each marker representing a specific location or geographic region.

1. **3D Visualization:**

* One of the standout features of Power Map is its ability to create 3D visualizations of data on maps.
* Users can view their data in a three-dimensional space, allowing for a more immersive and engaging analysis experience.

1. **Time Animation:**

* Power Map supports time-based animations, enabling users to visualize how data changes over time.
* Users can create dynamic animations that show the evolution of data trends or patterns over different time intervals.

1. **Layering and Filtering:**

* Power Map allows users to overlay multiple data layers on the map and customize the appearance of each layer.
* Users can apply filters to display specific subsets of data on the map, making it easier to focus on relevant information.

1. **Customization and Styling:**

* Users can customize the appearance of their maps by adjusting colors, symbols, labels, and other visual elements.
* Power Map provides various styling options to enhance the clarity and visual appeal of the maps.

1. **Integration with Excel and Power BI:**

* Power Map seamlessly integrates with Excel, allowing users to create maps directly from their Excel data.
* In Power BI, users can import Power Map visualizations created in Excel and incorporate them into Power BI reports and dashboards.

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

* Power BI, Microsoft's business analytics service, has significantly reduced the need for organizations to host SharePoint Server on-premises through its cloud-based capabilities and integration with Office 365.
* Here's how Power BI has contributed to this shift:

1. **Cloud-based Analytics**: Power BI is a cloud-based service that allows users to analyze and visualize data from a variety of sources without the need for on-premises infrastructure. This eliminates the need for organizations to maintain and host their own SharePoint Server on-premises solely for the purpose of data analysis and reporting.
2. **Integration with Office 365**: Power BI seamlessly integrates with other Office 365 services, including SharePoint Online. This integration allows users to embed Power BI reports and dashboards directly into SharePoint Online sites, providing a unified experience for accessing and interacting with data.
3. **Self-Service BI:** Power BI empowers users to create their own reports and dashboards through a user-friendly interface, reducing the reliance on IT departments to develop and maintain custom solutions within SharePoint Server. This self-service approach enables organizations to quickly derive insights from their data without the need for extensive development efforts.
4. **Scalability and Maintenance**: By leveraging Power BI in the cloud, organizations can benefit from the scalability and reliability of Microsoft's infrastructure, eliminating the need to invest in and manage on-premises hardware for hosting SharePoint Server. Additionally, Microsoft handles maintenance and updates for Power BI, further reducing the administrative burden on organizations.

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

1. **Improved User Interface:** Over time, Power BI Service has undergone several UI enhancements to improve usability and make it more intuitive for users to navigate, explore data, and create reports and dashboards.
2. **Enhanced Collaboration**: Power BI Service has introduced features to enhance collaboration among users, such as the ability to share reports and dashboards securely, co-authoring capabilities, commenting features, and integration with Microsoft Teams for seamless communication and collaboration.
3. **Advanced Analytics**: Power BI Service has expanded its capabilities for advanced analytics, including the integration of machine learning models, support for R

and Python scripts, and the introduction of AI-powered features like Quick Insights and Q&A to derive deeper insights from data.

1. **Data Connectivity**: There have been continuous updates to data connectivity options in Power BI Service, enabling users to connect to a wide range of data sources, both on-premises and in the cloud. This includes native connectors for popular services like SQL Server, Azure, Salesforce, Google Analytics, and many others.
2. **Improved Performance and Scalability:** Power BI Service has undergone performance optimizations to improve report rendering speed, responsiveness, and scalability, allowing users to work with larger datasets and handle complex analytics workloads more efficiently.
3. **Governance and Security:** Microsoft has introduced enhancements to governance and security features in Power BI Service, including fine-grained access controls, row-level security, data encryption, auditing capabilities, and compliance with industry standards and regulations like GDPR and HIPAA.
4. **Mobile Experience**: Power BI Service has continued to improve its mobile experience, with updates to the Power BI mobile app for iOS, Android, and Windows devices. These updates include performance improvements, new visualization features, offline access, and integration with mobile device management (MDM) solutions for enhanced security.