Power BI

Section 1 – Quick Start Power BI Service

- **Get Power BI Tools**
- **Introduction to Tools and Terminology**
- **Dashboard in Minutes**
- **Refreshing Power BI Service Data**
- **Interacting with your Dashboards**
- **Sharing Dashboards and Reports**

*1. Create a sales performance dashboard using Power BI Service. Utilize a provided dataset containing sales data for different regions, products, and time periods. Design visualizations that display key metrics such as total sales, top-selling products, and regional performance. Add interactive features such as slicers to allow users to filter data by time period, product category, or region.

*2. Build a social media analytics dashboard using Power BI Service. Acquire data from various social media platforms and analyze metrics such as followers, engagement rates, and post performance. Design visualizations that illustrate trends in social media activity, identify popular content types, and compare performance across different platforms. Incorporate date and platform filters to enable users to analyze specific timeframes and platforms.

*3. Perform customer segmentation analysis using Power BI Service. Utilize a customer dataset with information such as demographics, purchase history, and customer satisfaction ratings. Develop visualizations that reveal customer segments based on different criteria, such as age, location, or purchasing behavior. Apply clustering techniques to identify distinct customer groups and analyze their characteristics and preferences.

#1. Develop a financial analysis report using Power BI Service. Choose a financial dataset with information on revenue, expenses, and profitability for a company. Create visualizations that present trends and patterns in the financial data, such as monthly revenue growth, expense breakdown by category, and profit margin over time. Incorporate appropriate calculations, such as year-over-year growth and expense ratios, to provide deeper insights.

#2. Create an HR recruitment dashboard using Power BI Service. Utilize a dataset containing information about job applicants, including their qualifications, experience, and hiring status. Develop visualizations that provide insights into recruitment metrics such as applicant sources, time-to-fill positions, and candidate diversity. Include filters to allow users to explore specific job roles or time periods.

Section 2 – Getting and Transforming Data with Power BI Desktop

- **Introduction to Power BI Desktop**
- **Getting Data: Excel vs Power BI Desktop & Service**
- **Naming for Q&A**
- **DirectQuery vs Import Data**
- **Recap and What's Next**

.*1. Obtain an Excel dataset containing sales data from multiple regions and import it into Power BI Desktop. Walk through the steps involved in transforming the data, including removing unnecessary columns, renaming columns, and creating calculated columns for additional insights. Explain the advantages of using Power BI Desktop over importing data directly from Excel into Power BI Service.

*2. Demonstrate how to enable and utilize the Q&A feature in Power BI Desktop. Create a sample report that allows users to ask natural language questions and receive relevant visualizations in response. Discuss the importance of choosing appropriate column names and data categorization to enhance the accuracy and usability of the Q&A feature.

*3. Summarize the key concepts and techniques covered in the "Getting and Transforming Data with Power BI Desktop" module. Create a roadmap highlighting the recommended next steps for users to further explore advanced features and capabilities within Power BI Desktop. Include suggestions for learning resources, community forums, and hands-on practice exercises.

#1. Connect Power BI Desktop to an external data source such as a SQL database or an online API. Outline the process of establishing the connection, including providing the necessary credentials and selecting the relevant tables or endpoints. Discuss the benefits of connecting to external data sources using Power BI Desktop compared to using Power BI Service.

#2. Compare and contrast the concepts of DirectQuery and importing data in Power BI Desktop. Create a scenario where DirectQuery would be the preferred approach, and another scenario where importing data would be more suitable. Discuss the implications of each approach on data freshness, performance, and the ability to leverage Power BI Desktop's transformation capabilities.

Section 3 – Modelling with Power BI

- **Introduction to Modeling**
- **Setup and Manage Relationships**
- **Cardinality and Cross Filtering**
- **Default Summarization & Sort by**
- **Creating Calculated Columns**
- **Creating Measures & Quick Measures**
- **Recap and What's Next**

*1. Create a Power BI model using multiple tables and demonstrate how to set up and manage relationships between them. Explain the concept of cardinality and its significance in determining how tables are related. Provide an example where one-to-one, one-to-many, and many-to-many relationships are utilized.

*2. Explore the default summarization and sorting options in Power BI. Choose a specific scenario and modify the default summarization and sorting behavior for a given measure or column. Justify your modifications based on the specific analysis requirements and discuss the potential impact on data visualization and analysis.

*3. Design a Power BI report that includes custom measures for performing calculations on aggregated data. Create measures for calculating metrics such as total sales, average revenue per customer, or year-over-year growth. Additionally, explore the Quick Measures feature in Power BI and demonstrate how to leverage it to quickly generate commonly used calculations.

#1. Develop a Power BI report that showcases the cross-filtering feature. Include visualizations that demonstrate how applying filters on one table affects the data displayed in related tables. Discuss the impact of cardinality on cross-filtering behavior and provide guidelines on handling scenarios where unexpected filtering results occur.

#2. Create a calculated column in Power BI based on a given dataset. Explain the purpose of calculated columns and provide step-by-step instructions on how to define and implement the calculation using DAX expressions. Discuss the considerations for choosing between calculated columns and measures in different analytical scenarios.

#3. Summarize the key concepts and techniques covered in the "Modeling with Power BI" module. Provide a summary of the best practices for designing an efficient and effective data model in Power BI. Discuss advanced modeling features, such as calculated tables, bidirectional relationships, and role-playing dimensions, and suggest further resources for users to explore these advanced topics.

Section 4 – Power BI Desktop Vusualisations

- **Creating Visualisations**
- **Color & Conditional Formatting**
- **Setting Sort Order**
- **Scatter & Bubble Charts & Play Axis**
- **Slicers**
- **Tooltips**
- **Cross Filtering and Highlighting**
- **Visual, Page and Report Level Filters**
- **Drill Down/Up**
- **Hierarchies**
- **Constant Lines**
- **Tables, Matrices & Table Conditional Formatting**
- **KPI's, Cards & Gauges**
- **Map Visualisations**
- **Custom Visuals**
- **Managing and Arranging**
- **Drillthrough**
- **Custom Report Themes**
- **Grouping and Binning**
- **Bookmarks & Buttons**
- **Decomposition Tree**

.*1. Develop an interactive sales dashboard using Power BI Desktop. Include visualizations such as bar charts, line charts, and scatter plots to display sales performance over time, by product category, and by region. Apply conditional formatting to highlight top-performing products and regions. Add slicers for users to filter data by time period, product category, or region.

*2. Visualize employee performance metrics using Power BI Desktop. Create KPI visualizations to track metrics such as sales targets, customer retention rates, or call resolution time. Utilize custom visuals or gauges to display performance against targets. Apply tooltips to provide additional context or explanations for each metric.

*3. Build a custom visual dashboard using Power BI Desktop. Explore the Power BI marketplace for custom visuals and select a custom visual that aligns with your project requirements. Incorporate the custom visual into your dashboard and integrate it with other native visualizations. Apply advanced functionalities such as cross-filtering and hierarchical drill-down to enhance the interactivity of the custom visual dashboard.

#1. Analyze customer satisfaction ratings using Power BI Desktop. Create a gauge or card visualization to display the overall satisfaction score. Utilize conditional formatting to visually indicate different satisfaction levels. Apply drill-down functionality to allow users to explore satisfaction scores by different dimensions such as product, region, or customer segment.

#2. Create a geographic sales map using Power BI Desktop. Import a dataset with location information and sales data. Utilize the map visualization to display sales figures by region or city. Apply color coding to represent sales intensity or growth rates. Implement tooltips to display detailed sales information when hovering over specific locations.

Section 5 – Power BI Service Visualisation Tools

- **Introduction to the Power BI Service**
- **Standalone Tiles**
- **Data Driven Alerts (Power BI Pro/Premium)**
- **Quick and Related Insights**
- **Custom Q&A**

.*1. Create a standalone tile dashboard in Power BI Service using relevant datasets. Choose key metrics, such as sales revenue, customer satisfaction, or website traffic, and create visually appealing tiles to display these metrics. Configure the tiles to refresh automatically and provide drill-through capabilities for detailed analysis.

*2. Explore the Quick Insights and Related Insights features in Power BI Service. Choose a dataset containing various dimensions and measures, such as sales data by region and product category. Use Quick Insights to automatically generate visualizations and identify patterns or trends in the data. Then, utilize Related Insights to discover additional relevant information or correlations within the dataset.

*3. Develop an interactive insights dashboard in Power BI Service using a combination of visualizations and the features mentioned in the topic. Choose a dataset with rich dimensions and measures, such as customer behavior data or financial metrics. Design a comprehensive dashboard that incorporates standalone tiles, data-driven alerts, quick and related insights, and a custom Q&A experience to provide a holistic and interactive analytics solution.

#1. Configure data-driven alerts in Power BI Service based on specific metrics or thresholds. Choose a dataset with real-time or regularly updated data, such as stock prices or website performance metrics. Set up alerts to notify users when certain conditions are met, such as stock prices exceeding a certain threshold or website downtime exceeding a specified duration.

#2. Create a custom Q&A experience in Power BI Service for a specific dataset. Design a set of natural language questions and provide appropriate answers using Power BI's Q&A capabilities. Incorporate synonyms and alternative phrasing to ensure accurate and intuitive responses. Test and refine the custom Q&A experience based on user feedback and improvement opportunities.

Section 6 – Publishing and Sharing

- **Sharing Options Overview**
- **Publish from Power BI Desktop**
- **Publish Reports to Web**
- **Sharing Reports & Dashboards (Power BI Pro/Premium)**

- **Workspaces (Power BI Pro/Premium)**
- **Apps (Power BI Pro/Premium)**
- **Printing, PDFs and Exporting to PowerPoint**
- **Row Level Security (Power BI Pro)**
- **Export Data from a Visualisation**
- **Publishing for Mobile Apps**
- **Sharing Options Summary**

.*1. Publish a sales report created in Power BI Desktop to the Power BI Service. Walk through the steps involved in publishing, including signing in to Power BI, selecting the appropriate workspace, and configuring the necessary settings. Discuss the benefits of publishing from Power BI Desktop compared to creating reports directly in the Power BI Service.

*2. Share a report and dashboard with specific collaborators in Power BI Service. Demonstrate the process of granting access to selected individuals, controlling their level of permissions, and managing their access rights. Discuss the collaborative features available in Power BI Pro and Power BI Premium, such as real-time collaboration and commenting.

*3. Apply row-level security in a Power BI report to restrict data access based on user roles and permissions. Create multiple user roles and demonstrate how to define security rules that filter data based on the logged-in user's role. Discuss the considerations for implementing row-level security and the limitations based on the Power BI license type.

#1. Publish a report to the web in Power BI Service, making it publicly accessible without requiring user authentication. Explain the considerations and limitations of sharing reports publicly, such as data privacy and security concerns. Discuss how to embed the published report on a website or share the link for wider dissemination.

#2. Create an app in Power BI Service to bundle and distribute reports and dashboards to a specific audience. Walk through the steps of creating an app workspace, adding reports and dashboards to it, and configuring access and navigation settings. Discuss the benefits of using apps for targeted content distribution and the differences between Power BI Pro and Power BI Premium for app creation and consumption.

Section 7 – Refreshing Datasets

- **Understanding Data Refresh**
- **Personal Gateway (Power BI Pro and 64-bit Windows)**
- **Replacing a Dataset**
- **Troubleshooting Refreshing**

*1. Configure data refresh settings for a dataset in Power BI Service. Walk through the steps involved in setting up scheduled refreshes and selecting the appropriate refresh frequency. Discuss the factors to consider when determining the refresh frequency based on the data source's update frequency and the business requirements.

*2. Implement incremental refresh for large datasets in Power BI Premium. Choose a dataset with a significant volume of data and demonstrate how to configure incremental refresh settings to load only the delta or updated data. Discuss the benefits of using incremental refresh, such as improved performance and reduced data storage requirements, and any limitations or considerations associated with its implementation.

*3. Replace an existing dataset with an updated version while maintaining the existing reports and dashboards. Demonstrate the steps involved in replacing the dataset, ensuring that the reports and dashboards continue to function correctly after the replacement. Discuss the considerations for managing refresh dependencies and minimizing disruption during the dataset replacement process.

#1. Install and configure the Personal Gateway in Power BI Service for refreshing datasets hosted on an on-premises data source. Discuss the prerequisites, installation process, and configuration steps involved. Highlight any potential challenges or troubleshooting tips that may arise during the setup.

#2. Encounter and troubleshoot common dataset refresh issues in Power BI Service. Choose specific scenarios, such as connection failures, data source authentication errors, or data transformation issues, and provide step-by-step guidance on identifying and resolving the problems. Discuss best practices for troubleshooting refresh issues and provide tips for proactive monitoring and maintenance.

Section 8 – Power BI and Excel Together

- **Options for Publishing from Excel**
- **Import Excel Power Query & Power Pivot Models**
- **Analyze in Excel (Power BI Pro or Premium)**
- **Excel Publish: Upload and Export to Power BI**
- **Sharing Published Excel Dashboards (Power BI Pro or Premium**

*1. Explore the options for publishing data from Excel to Power BI Service. Compare and contrast the methods available, such as uploading Excel files directly to Power BI, using Power Query and Power Pivot models, or utilizing the "Analyze in Excel" feature. Discuss the advantages and limitations of each method in terms of data connectivity, data modeling capabilities, and visualization options.

*2. Utilize the "Analyze in Excel" feature in Power BI Service to connect and analyze Excel data. Select a dataset from Excel and analyze it using Excel's familiar interface and advanced features. Discuss the advantages of using "Analyze in Excel" for users who are more comfortable with Excel's functionalities and explore the possibilities of creating interactive reports and dashboards within Excel.

*3. Share an Excel-based dashboard published in Power BI Service with other users. Walk through the steps of granting access, managing permissions, and defining collaboration settings for the shared Excel dashboard. Discuss the collaboration and sharing capabilities available in Power BI Pro and Power BI Premium when working with published Excel dashboards.

#1. Import an Excel file containing Power Query and Power Pivot models into Power BI Desktop. Walk through the process of connecting to the Excel file, selecting the relevant tables or queries, and importing them into Power BI Desktop. Discuss the benefits of leveraging Power Query transformations and Power Pivot data modeling capabilities when working with Excel data in Power BI.

#2. Upload an Excel dashboard to Power BI Service and explore the process of exporting Excel dashboards to Power BI. Discuss the steps involved in uploading the Excel file, configuring the data refresh settings, and publishing the dashboard. Explore the benefits and limitations of using Excel as a dashboard creation tool in conjunction with Power BI Service.