1. **Compare and contrast tableau and Power BI**

Power BI

Power BI is a business analytics service by Microsoft. It provides interactive visualizations and business intelligence capabilities with an interface simple enough for end-users to create reports and dashboards

Tableau

Tableau is a data visualization and business intelligence tool that enables users to connect, visualize and share data in a highly interactive and intuitive way. It allows users to quickly analyze and explore large and complex datasets using a drag-and-drop interface without requiring coding or programming skills.

<u>Features shared by Power BI and Tableau</u>

- Data Visualization

Power BI and Tableau offer a variety of chart types, including bar charts, line charts, pie charts, maps, and many more which help users to gain insights from data.

- Data Exploration

Power BI and Tableau allow users to explore data in depth by drilling into data points, filtering data, and creating hierarchies

- Data Modeling

Power BI and Tableau enables users to create and manage relationships between different data sources, define calculations, and develop measures and KPIs.

- Collaboration

Tableau allows users to share and collaborate on reports and dashboards with colleagues and integrate with other tools like Slack, Salesforce, and Google Drive.

Power BI allows users to share and collaborate on reports and dashboards with colleagues and integrate with other Microsoft tools like Excel, SharePoint, and Teams.

- Mobile Access

Power BI and Tableau provide a mobile app that allows users to access reports and dashboards from their mobile devices.

- Natural Language Processing

Power BI and Tableau includes natural language processing capabilities that allow users to ask questions in natural language and receive answers through visualizations.

- Real-time data

Power BI can connect to real-time data sources like Azure Stream Analytics and Power BI streaming datasets and display real-time data in visualizations

Tableau can connect to real-time data sources like Amazon Kinesis, Apache Kafka, and Tableau Server extracts and display real-time data in visualizations.

Key Differences between Power BI and Tableau

1. User Interface

Tableau has a more user-friendly and intuitive interface, with drag-and-drop functionality and easier-to-use visuals. Power BI can take a bit more time to learn but provides more robust functionality for advanced users.

2. Data Integration

Power BI is more tightly integrated with Microsoft products, such as Excel and SQL Server, whereas Tableau can connect to a wider range of data sources, including cloud-based databases and web services.

3. Pricing

Power BI offers a more affordable pricing structure, with a free version and lower-cost paid options. Tableau, on the other hand, can be more expensive, especially for enterprise-level solutions.

4. Customization

Tableau provides more advanced customization options for dashboards and visualizations, whereas Power BI is more limited in this regard

5. Collaboration

Power BI has more collaboration features built-in, such as co-authoring and commenting, whereas Tableau requires third-party tools to achieve similar functionality.

6. Data Integration

Power BI is tightly integrated with other Microsoft products like Excel, Azure, and Dynamics 365, while Tableau has more options for integrating with third-party applications and data sources

7. Visualization Capabilities

Tableau is known for its exceptional visualization capabilities and has more advanced charting options. In contrast, Power BI has a more user-friendly interface for creating basic charts and visualizations.

8. Data Modeling

Power BI has more robust data modeling and ETL (Extract, Transform, Load) capabilities than Tableau, making it a better choice for data manipulation and analysis

2. Distinguish between excel and Power BI

Excel

Excel is a widely used spreadsheet software developed by Microsoft, known for its versatility, user-friendliness, and extensive functionality in data analysis

Power BI

Power BI is a business analytics service by Microsoft. It provides interactive visualizations and business intelligence capabilities with an interface simple enough for end-users to create reports and dashboards

<u>Key Differences between Power BI and Excel</u>

- Purpose and Focus:

  - Power BI: Developed by Microsoft, Power BI is a business intelligence (BI) tool specifically designed for data visualization, interactive dashboards, and sharing insights. It empowers users to transform raw data into actionable visualizations.

  - Excel: Excel, also from Microsoft, is a versatile spreadsheet tool used for organizing data, performing calculations, and financial modeling. It excels in detailed analysis and handling smaller datasets.

- Data Handling:

  - Power BI: Can handle large datasets with millions of rows, offering real-time access to data.

  - Excel: Has limitations in the amount of data it can work with, making it more suitable for simpler ad hoc analysis.

- Visualization and Reporting:

  - Power BI: Provides an extensive range of dynamic and interactive visualizations. It's ideal for creating compelling reports and dashboards.

  - Excel: Offers basic charting and graphing capabilities but lacks the sophistication of Power BI's visualizations.

- Collaboration and Accessibility:

  - Power BI: Supports collaboration through its online service, allowing users to share reports and dashboards securely. It also integrates with other tools like R.

  - Excel: Collaboration features are limited, and sharing files can be cumbersome.

- Financial Modeling and Calculations:

  - Power BI: Not the primary focus, but it can handle financial calculations using DAX (Data Analysis Expressions).

  - Excel: Strong in financial modeling, complex calculations, and scenario analysis.

- Integration and Compatibility:

  - Power BI: Integrates well with other Microsoft tools and services. It complements Excel by providing advanced data modeling and visualization.

  - Excel: Familiar and widely used, it can be integrated with Power BI for enhanced analytics. Power Query and Pivot, along with DAX formulas, can optimize analytics.

- Cloud-Based Features

Once the dashboard building completes in Power BI, we can publish the report to the end-users with Microsoft's cloud-based services. But, when it comes to Excel, we need to share the large data with the dashboard via email or any online sharing tool.

3. **State and explain types of Databases**

What is database?

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS)

Types of databases

There are many different types of databases. The best database for a specific organization depends on how the organization intends to use the data.

- Relational databases

Relational database became dominant in the 1980s. Items in a relational database are organized as a set of tables with columns and rows. Relational database technology provides the most efficient and flexible way to access structured information.
Examples: Microsoft SQL Server, Oracle Database, MySQL, PostgreSQL and IBM Db2

- Object-Oriented database

Information in an object-oriented database is represented in the form of objects, as in object-oriented programming.
Examples**:** Wakanda, ObjectStore

- Distributed databases

A distributed database consists of two or more files located in different sites. The database may be stored on multiple computers, located in the same physical location, or scattered over different networks.

- Wide column databases

Wide column databases, also known as wide column stores, are schema-agnostic. Data is stored in column families, rather than in rows and columns. Highly scalable, wide column databases can handle petabytes of data, making them ideal for supporting real-time big data applications. Examples: BigTable, Apache Cassandra and Scylla

- NoSQL databases

A NoSQL or nonrelational database, allows unstructured and semi structured data to be stored and manipulated (in contrast to a relational database, which defines how all data inserted into the database must be composed). NoSQL databases grew popular as web applications became more common and more complex.
Examples**:** Apache Cassandra, MongoDB, CouchDB, and CouchBase

- Graph databases

A graph database stores data in terms of entities and the relationships between entities.
Examples**:** Datastax Enterprise Graph, Neo4J

- Open-source databases

An open-source database system is one whose source code is open source; such databases could be SQL or NoSQL databases.

- Cloud databases

A cloud database is a collection of data, either structured or unstructured, that resides on a private, public, or hybrid cloud computing platform. There are two types of cloud database models: traditional and database as a service (DBaaS). With DBaaS, administrative tasks and maintenance are performed by a service provider.
Examples**:** Microsoft Azure SQL Database, Amazon Relational Database Service, Oracle Autonomous Database.

- Multimodel database

Multimodel databases combine different types of database models into a single, integrated back end. This means they can accommodate various data types.

- Document/JSON database

Designed for storing, retrieving, and managing document-oriented information, document database is a modern way to store data in JSON format rather than rows and columns.
Examples: MongoDB, Amazon DocumentDB, Apache CouchDB

- Self-driving databases

The newest and most groundbreaking type of database, self-driving databases (also known as autonomous databases) are cloud-based and use machine learning to automate database tuning, security, backups, updates, and other routine management tasks traditionally performed by database administrators.

4. **Highlight some considerations that would inform your choice for data analysis tool**

- Scalability

Amount of dataset that I'm going to work with will determine which data analytic tool will be the best to choose and use

- Data Sharing and Collaboration

As a data analyst will I be working with the dataset all by myself or I will be collaborating and working with colleagues? Which way will I use to share my final product with others?

- Pricing

Is it a free source data analytic tool? How costly is it?

- User interface (easy to use)

How user friendly is the data analyst is? Is it easy to use and has best user interactive?