# Power BI Assignment 1

1. **What do you mean by BI? Explain**.
   **Ans:**
   BI(Business Intelligence) is a set of processes, architectures, and technologies that convert raw data into meaningful information that drives profitable business actions. It is a suite of software and services to transform data into actionable intelligence and knowledge.
   BI tools perform data analysis and create reports, summaries, dashboards, maps, graphs, and charts to provide users with detailed intelligence about the nature of the business.

   a. BI is impotant because of
   b. Creating KPI (Key Performance Indicators) based on historic data ☐ Identify and set benchmarks for varied processes.
   c. With BI systems organizations can identify market trends and spot business problems that need to be addressed.
   d. BI helps on data visualization that enhances the data quality and thereby the quality of decision making.
   e. BI systems can be used not just by enterprises but SME (Small and Medium Enterprises)

   Types of BI tool are as follows
   - Spreadsheets: Spreadsheets like Microsoft Excel and Google Docs are some of the most widely used BI tools.
   - Reporting software: Reporting software is used to report, organize, filter, and display data.
   - Data visualization software: Data visualization software translates datasets into easy-to-read, visually appealing graphical representations to quickly gain insights.
   - Data mining tools: Data mining tools "mine" large amounts of data for patterns using things like artificial intelligence, machine learning, and statistics.
   - Online analytical processing (OLAP): OLAP tools allow users to analyze datasets from a wide variety of angles based on different business perspectives.

2. **How Power-BI helps in BI, and how does it help Analysts? Explain.**
   **Ans:**
   Power BI is a BI and data visualization tool that leverages visual analytics to empower people and organizations in making the most of their data. The engaging visualizations created in Power BI take the excel workflow to the next level and help stakeholders make sense of the massive amounts of data available.

   Power BI is made up of two components:
   - Power BI Desktop is a free desktop version that allows for data analysis and report creation and includes the Power Query Editor.
   - Power BI Service is a cloud-based version of Power BI, which has lightweight report editing functionality and is designed to share and distribute reports across the organization.

   The use of Power BI are as follows:
   1. Extract data insights with no coding skills required
      a. One of the main strengths of Power BI is its intuitive user interface that allows both technical and non-technical analysts to build data visualizations and analyses efficiently.

b. The user-friendly drag-and-drop interface makes it easy to answer complex data-related questions without the need for programming skills. This simplicity lowers the barrier for users to perform advanced analytics such as trend analyses, regressions, and statistical summaries.
2. Democratize data insights with dashboards
   a. A classic BI application most people will be familiar with is the dashboard, where data is obtained from multiple sources and presented visually in charts and graphs to give a sense of the company's processes and strategies.
   b. Power BI comes with many reporting features for users to readily create well-designed interactive dashboards. It can also connect to a wide range of data sources and can help you create powerful data models (e.g. SQL Server, Excel spreadsheets, Amazon Redshift, etc.). As a result, these dashboards can be enriched with comprehensive data from various applications across the organization.
3. Tell data stories with advanced data visualization
   a. Compelling data storytelling is more important than ever, given the burgeoning amounts of data generated in the digital age.
   b. Dashboards are great for monitoring data and telling users what is happening. However, data stories help shape the data into a step-by-step process to explain why specific trends are happening.
   c. Power BI allows users to string together a series of visualizations (including dashboards) to form a visual story to communicate data insights, provide context, and demonstrate how decisions relate to outcomes.

3. **Explain Descriptive analytics?**
   **Ans:**
   Descriptive analytics is the most basic and widely used type of analytics; it's used to produce the key performance indicators (KPIs) and metrics included in business reports and dashboards. Descriptive analytics focuses on summarizing and highlighting patterns in current and historical data, which helps companies understand what has happened to date.

   The metrics produced by descriptive analytics are used in various ways, including:
   **Reports:** The key financial metrics included in a company's financial statements are generated by descriptive analytics. Other common reports also use descriptive analytics to highlight aspects of business performance.
   **Visualizations**: Displaying metrics in charts and other graphic representations can more efficiently communicate their impact to a wider audience.
   **Dashboards**: Executives, managers and other employees may use dashboards to track progress and manage their daily workload. Dashboards present a selection of KPIs and other important information tailored to the needs of each person.
   The information may be represented as charts or other visualizations to enable people to absorb it more quickly.
   Five Steps in Descriptive Analytics:
   a. State business metrics: The first step is to identify the metrics that you want to generate. These should reflect key business goals of each group or of the company overall. For example, a growth-oriented company might focus on measuring quarterly increases in revenue, while the company's accounts receivable group might want to track days sales outstanding and other metrics that reflect how long it takes to collect money from customers.
   b. Identify data required: Locate the data you need to produce the desired metrics. At some companies, the data may be scattered across multiple applications and files. Companies that use ERP systems may already have most or all of the data they need in their systems' databases. Some metrics may

also require data from external sources, such as industry benchmarking databases, ecommerce websites and social media platforms.

c. Extract and prepare data: If the data comes from multiple sources, extracting, combining and preparing the data for analysis is a time-consuming yet vital step to ensure accuracy. This step may involve data cleansing to eliminate inconsistencies and errors in data from different sources, as well as transforming data into a format suitable for analysis tools. Advanced forms of data analytics employ a process called data modeling to help prepare, structure and organize company information. Data modeling is a framework within information systems to define and format data.

d. Analyze data: Companies can use a variety of tools to apply descriptive analytics, from spreadsheets to business intelligence (BI) software. Descriptive analytics often involves applying basic mathematical operations to one or more variables. For example, sales managers may want to track the average revenue per sale or monthly revenue from new customers. Executives and financial specialists may seek to monitor financial metrics such as gross profit margin, which is the ratio of gross profit to sales.

e. Present data: Presenting data in compelling visual forms, such as pie charts, bar charts and line graphs, often makes it easier for stakeholders to understand. However, some people, including finance specialists, may prefer to see information presented as numbers and tables.

4. **Explain Predictive analytics?**
   **Ans:**
   The term predictive analytics refers to the use of statistics and modeling techniques to make predictions about future outcomes and performance. Predictive analytics looks at current and historical data patterns to determine if those patterns are likely to emerge again. This allows businesses and investors to adjust where they use their resources to take advantage of possible future events. Predictive analysis can also be used to improve operational efficiencies and reduce risk. Predictive models are used for all kinds of applications, including:

   a) Weather forecasts
   b) Creating video games
   c) Translating voice to text for mobile phone messaging
   d) Customer service
   e) Investment portfolio development.

   Types of Predictive Analytical Models

   **Decision Trees**
   Decision trees are the simplest models because they're easy to understand and dissect. They're also very useful when you need to make a decision in a short period of time.

   **Regression**
   This is the model that is used the most in statistical analysis. Use it when you want to determine patterns in large sets of data and when there's a linear relationship between the inputs. This method works by figuring out a formula, which represents the relationship between all the inputs found in the dataset. For example, you can use regression to figure out how price and other key factors can shape the performance of a security.

   **Neural Networks**
   Neural networks were developed as a form of predictive analytics by imitating the way the human brain works. This model can deal with complex data relationships using artificial intelligence and pattern recognition. Use it if you have several hurdles that you need to overcome like when you have too much data on hand, when you don't have the formula you need to help you find a relationship between the inputs and outputs in your dataset, or when you need to make predictions rather than come up with explanations.

5. **Explain perspective analytics?**
   **Ans:**

Prescriptive analytics is a type of data analytics that attempts to answer the question "What do we need to do to achieve this?" It involves the use of technology to help businesses make better decisions through the analysis of raw data. Prescriptive analytics specifically factors information about possible situations or scenarios, available resources, past performance, and current performance, and suggests a course of action or strategy. It can be used to make decisions on any time horizon, from immediate to long-term. It is the opposite of descriptive analytics, which examines decisions and outcomes after the fact. Advantages and Disadvantages of Prescriptive

Analytics Advantages
- Prescriptive analytics can cut through the clutter of immediate uncertainty and changing conditions. It can help prevent fraud, limit risk, increase efficiency, meet business goals, and create more loyal customers. When used effectively, it can help organizations make decisions based on highly analyzed facts rather than jump to under-informed conclusions based on instinct.
- Prescriptive analytics can simulate the probability of various outcomes and show the probability of each, helping organizations to better understand the level of risk and uncertainty they face than they could be relying on averages. Organizations that use it can gain a better understanding of the likelihood of worst-case scenarios and plan accordingly.

Disadvantages
- Prescriptive analytics is not foolproof. It is only effective if organizations know what questions to ask and how to react to the answers. As such, it's only effective if its inputs are valid. If the input assumptions are invalid, the output results will not be accurate.
- This form of data analytics is only suitable for short-term solutions. This means businesses shouldn't use prescriptive analytics to make any long-term ones. That's because it becomes more unreliable if more time is needed.
- Not all prescriptive analytics providers are made the same. So it's important for businesses to carefully consider the technology and who provides it. Some may provide real, concrete results while others make the promise of big data and fail to deliver

6. **Write five real-life questions that PowerBi can solve.**
   **Ans:**
   a) Business Intelligence solutions: Access to the data is limited
      Business intelligence reports are usually based on huge datasets. So imagine that you have no BI software implemented, only loads of data to analyze. Will you share it with, for instance, your business partners? We doubt so — they won't waste their time on trying to understand an enormous dataset. But business intelligence can solve the problem of limited access to the data. By turning loads of information into a clear and short report, it allows easy and fast sharing. You can provide anyone with such a report: your business partners, managers, executives, members of the technical department, etc. Anyone can get access and check the report using their smartphone, at any time.
   b) Performance management is far from perfection
      Use your imagination one more time — imagine that a year ago you released an innovative product. The product itself has prospects, and everything seems to be fine. But even after a year, you haven't reached the desired result, and the sales are pretty low. Something is going wrong, and the reason may arise from poor performance management. With business intelligence software, you can gain a much deeper understanding of your company's performance and potential opportunities.
   c) Business Intelligence solutions: Creating multiple systems takes too much time
      Making decisions usually involves analyzing data from multiple resources. Without business intelligence solutions, you will have to get data from each of them, then combine everything together and, finally, move to the reporting stage. And only then you will be able to start the decision-making process. Creating multiple systems takes too much time and effort, but there is a way to save these

precious resources, and spend them on something more important. Business intelligence solutions allow building a centralized data warehouse, while creating reports becomes extremely fast and easy.

d) Only tech teams can develop custom reports

A lot of traditional tools that allow analyzing data and reporting are too complicated, so usually only tech teams are able to use them properly. And this is not the only problem in this case — every time you need a report, you will have to delegate this task to your tech department. This means another waste of time. Instead, business intelligence tools are much easier to use. Many of them are equipped with manuals, videos, and even live training to help your team members to understand how they work. We have already mentioned our article about tools, remember? You will definitely find there something suitable for you and your team. And things can get even easier in case you decide to create a personalized business intelligence solutions. It will perfectly fit your requirements, so it will be even more simple for your workers to work with it.

e) Business Intelligence solutions: Day-to-day operations are not organized

Dealing with numerous types of data in your everyday operations can easily turn into a chaotic disaster. Just imagine: sales and performance metrics are in different reports, financial data is in separate spreadsheets, and so on. If you have to deal with such a disorder every day, you can easily get lost and miss important pieces of data. Thanks to business intelligence solutions, you can develop a central location, where all the data will be organized.

Therefore, every member of your team will experience no problems when monitoring key performance indicators, analyzing the data, and sharing the reports. Understanding these reports will also be very easy — the format of business intelligence reports is very user-friendly.