**Assignment 1**

**1.**What do you mean by BI? Explain.

Answer:- Business intelligence (BI) is a technology-driven process for analyzing data and delivering actionable information that helps executives, managers and workers make informed business decisions. As part of the BI process, organizations collect data from internal IT systems and external sources, prepare it for analysis, run queries against the data and create data visualizations, [BI dashboard](https://www.techtarget.com/searchbusinessanalytics/definition/business-intelligence-dashboard) and reports to make the analytics results available to business users for operational decision-making and strategic planning.

2. How Power-BI helps in BI, and how does it help Analysts? Explain

Answer:- Power Bi is business intelligence tools that lets you visualize your data and share insights across your organization, or embed them in your app or website.” The solution comprises several products and services, and value and versatility comes from leveraging the individual elements, and taking advantage of how they work together.

Help of Power Bi

1. Power BI enables anyone to visualize and analyze data with greater speed, efficiency, and understanding. It connects users to a broad range of live data through built-in dashboards, provides interactive reports, and enables to create visualizations with ease.
2. Power Bi helps to gather more information from existing information with the help of DAX
3. Analyst use some custom visuals through which they can make interactive dashboard
4. With Power BI we create dashboards and reports on data sources, bundle them, and share them with our colleagues as packaged solutions. Plus we can schedule automatic data refresh for the whole content pack

3.Explain Descriptive analytics?

Answer:- **Descriptive analytics** is the process of using current and historical data to identify trends and relationships. It’s sometimes called the simplest form of data analysis because it describes trends and relationships but doesn’t dig deeper.

The practice of descriptive analytics produces business metrics, reports, and KPIs (Key Performance Indicators) to help businesses track their performance and different trends. As a result, companies understand what's happened thus far and, when combined with the other types of business analytics, get an idea of why things happened, what things may occur, and how to prepare for future events.

* The company’s current performance: Descriptive analytics helps businesses keep track of critical metrics involving individuals, groups and teams, and the company as a whole. For instance, descriptive analytics can show how a specific sales rep is doing this quarter or which of the rep’s products sells the most.
* The business’s historical trends: Descriptive analytics gathers information over long periods, and that accumulated information can be used to track the company's progress by comparing the metrics for different periods. For example, the corporate bean counters can track sales or expenses by comparing the results of various quarters, calculating revenue growth by percentages, and rendering the results on easy-to-read charts.
* The company’s strong and weak points: Descriptive analytics gives professionals the tools to compare the performances of various business groups using metrics like employee-generated revenue or expenses as a percentage of revenue. It will also compare these results with known industry averages or published results from other businesses. These comparisons help companies see where they’re doing well and where they need to improve.
* How Does Descriptive Analytics Work?

Descriptive analytics breaks down into five steps, including:

1. State the Business Metrics

For starters, the business must identify the metrics that it wants to generate based on the essential business goals of each group within the company or the company's overall goals. For instance, a company emphasizing growth may emphasize measuring quarterly revenue increases. At the same time, the company's accounts receivable department might monitor great days' sales and other metrics that show how much time it takes to collect money from their customers.

2. Identify the Data Required

Next, the company must find the data needed to generate the desired metrics. This task is a potential challenge since the relevant data may be scattered across many files and applications. However, companies that employ an Enterprise Resource Planning (ERP) system may have an easier time because they will already have most or all the needed data in their systems' databases. Furthermore, some metrics may also need data from external sources, like e-commerce websites, industry benchmarking databases, or social media platforms.

3. Extract and Prepare the Data

Extracting, combining, and preparing the relevant data for analysis is potentially time-consuming if the needed analysis data originates from multiple sources. However, this is a crucial step to ensure accuracy. Furthermore, this may involve data cleansing to eliminate inconsistencies and mistakes in the data, a reasonable effort considering the information coming from an eclectic group of sources and rendering data into a suitable format for analysis tools. Advanced data analytics types use a process known as data modeling, a framework residing within information systems to help prepare, arrange, and organize the company's information. Data modeling defines and formats complex data, turning it into a usable, actionable resource.

4. Analyze the Data

Companies have various tools at their disposal to apply descriptive analytics, ranging from business intelligence (BI) software to spreadsheets such as ones found in Excel. Descriptive analytics usually involves using fundamental mathematical operations to one or more of the variables. For instance, a sales manager might like to monitor the average sales revenue or the monthly revenue from either established or recently acquired customers.

5. Present the Data

Once business analysts have gone through the necessary steps, all that's left is presenting the data. First, however, the information must be presented so that everyone can understand it, from stakeholders to finance specialists. Stakeholders usually appreciate seeing the report in compelling visual forms, like bar charts, pie charts, or line graphs. Visible data is easier to grasp. Finance specialists on the other hand, may want the information presented through numbers and tables.

4.Explain Predictive analytics?

Answer:- Predictive analytics is the use of historical data, statistical algorithms, predictive modeling, and big data machine learning techniques to help organizations predict future outcomes more accurately, plan for unknown events, and discover opportunities in future activities.

Frequently, [supervised machine learning techniques](https://www.mathworks.com/discovery/supervised-learning.html) are used to predict a future value (How long can this machine run before requiring maintenance?) or to estimate a probability (How likely is this customer to default on a loan?).

Predictive analytics starts with a business goal: to use data to reduce waste, save time, or cut costs. The process harnesses heterogeneous, often massive, data sets into models that can generate clear, actionable outcomes to support achieving that goal, such as less material waste, less stocked inventory, and manufactured product that meets specifications.

### Step-by-Step Workflow for Predicting Energy Loads

Typically, the workflow for a predictive analytics application follows these basic steps:

1. **Import data from varied sources, such as web archives, databases, and spreadsheets.**  
   Data sources include energy load data in a CSV file and national weather data showing temperature and dew point.
2. **Clean the data by removing outliers and combining data sources.**  
   Identify data spikes, missing data, or anomalous points to remove from the data. Then aggregate different data sources together – in this case, creating a single table including energy load, temperature, and dew point.
3. **Develop an accurate predictive model based on the aggregated data using statistics, curve fitting tools, or machine learning.**  
   Energy forecasting is a complex process with many variables, so you might choose to use neural networks to build and train a predictive model. Iterate through your training data set to try different approaches. When the training is complete, you can try the model against new data to see how well it performs.
4. **Integrate the model into a load forecasting system in a production environment.**  
   Once you find a model that accurately forecasts the load, you can move it into your production system, making the analytics available to software programs or devices, including web apps, servers, or mobile devices.

5.Explain perspective analytics?( I think this is prescriptive analytics)

Answer:-Prescriptive analytics is a type of data analytics—the use of technology to help businesses make better decisions through the analysis of raw data. Specifically, prescriptive analytics factors information about possible situations or scenarios, available resources, past performance, and current performance, and suggests a course of action or strategy.

Prescriptive analytics relies on artificial intelligence techniques, such as machine learning—the ability of a computer program, without additional human input, to understand and advance from the data it acquires, adapting all the while. Machine learning makes it possible to process a tremendous amount of data available today. As new or additional data becomes available, computer programs adjust automatically to make use of it, in a process that is much faster and more comprehensive than human capabilities could manage.

Prescriptive analytics works with another type of data analytics, predictive analytics, which involves the use of statistics and modeling to determine future performance, based on current and historical data. However, it goes further: Using the predictive analytics' estimation of what is likely to happen, it recommends what future course to take.

6.Write five real-life questions that PowerBi can solve

1.With unstructured and unorganised data power bi helps to give meaningful insight.

2.It helps to protect the analytics data

3. Excessive Time Spent Preparing for Presentations

4. Using natural language technology and Power Bi Question & Answer feature provides a more natural experience to locate and better understand your BI.

5. Using Power BI reduces the possibility of error by allowing reports to be run in seconds using only the most current data