**DESCRIPTIVE ANALYSIS**

Descriptive analysis is the foundation of data analysis, focusing on summarizing and describing historical data to provide a clear picture of what has happened over a specific period. This type of analysis uses various statistical measures such as mean, median, mode, and standard deviation to summarize data. It often involves visual tools like charts, graphs, and tables to make the data more understandable. The purpose of descriptive analysis is to provide a comprehensive overview of past events and trends. Some techniques of descriptive analysis includes data aggregation, data mining, and data visualization.

**Applications of Descriptive Analysis includes:**

1. Business: Annual revenue reports, customer satisfaction surveys, and sales performance summaries.
2. Health-care: Patient demographics, disease incidence rates, and treatment outcomes.
3. Education: Student performance reports, enrollment statistics, and graduation rates.

**DIAGNOSTIC ANALYSIS:**

Diagnostic analysis goes a step further by examining the data to understand the reasons behind past outcomes. It seeks to answer the question, “Why did it happen?” This type of analysis involves identifying patterns, correlations, and anomalies in the data to uncover the root causes of specific events or trends. It’s purpose is to identify the underlying causes of past performance or events. Certain techniques in diagnostic analysis includes drill-down, data discovery, data mining, and correlations.

**Applications of Diagnostic Analysis:**

1. Business: Analyzing the reasons for a drop in sales, customer churn analysis, and identifying factors contributing to employee turnover.
2. Health-care: Investigating the causes of an outbreak, understanding patient readmission rates, and analyzing treatment effectiveness.
3. Education: Identifying factors affecting student performance, understanding dropout rates, and analyzing the impact of teaching methods.

**PREDICTIVE ANALYSIS**

Predictive analysis uses historical data to forecast future outcomes. It answers the question, “What is likely to happen?” by employing statistical models, machine learning algorithms, and data mining techniques. This type of analysis helps organizations anticipate future trends and make proactive decisions. It’s purpose is to predict future events and trends based on historical data. Techniques of Predictive analysis Includes regression analysis, time series analysis, machine learning, and neural networks.

**Applications of Predictive analysis:**

1. Business: Sales forecasting, risk assessment, and customer behavior prediction.
2. Health-care: Predicting disease outbreaks, patient admission rates, and treatment success probabilities.
3. Education: Forecasting enrollment numbers, predicting student success, and identifying at-risk students.

**PRESCRIPTIVE ANALYSIS**

Prescriptive analysis is the most advanced type of data analysis, focusing on recommending actions to achieve desired outcomes. It answers the question, “What should we do?” by suggesting optimal decisions and strategies based on the insights gained from predictive analysis. This type of analysis often uses optimization algorithms and simulation techniques. It’s purpose is to provide actionable recommendations to achieve specific goals. some techniques of prescriptive analysis Includes optimization, simulation, decision analysis, and machine learning.

**Applications of prescriptive analysis:**

1. Business: Optimizing marketing strategies, supply chain management, and resource allocation.
2. Health-care: Recommending treatment plans, optimizing hospital operations, and improving patient care pathways.
3. Education: Personalizing learning plans, optimizing resource allocation, and improving curriculum design.