

# **Day71 Intro. To Data Analytics**

By: Loga Aswin

- Data analytics tools are software or applications designed to collect, process, analyze, and visualize data to extract meaningful insights and make informed decisions.
- These tools leverage various techniques, algorithms, and statistical methods to interpret large volumes of data efficiently.
- They play a crucial role in transforming raw data into actionable insights for businesses, researchers, and various industries.

## **Types of Data Analysis:**

### **1. Descriptive Analytics Tools:**

These tools summarize and describe past data to understand what happened.

- Time-Series Analysis Tools: Software like MATLAB or R packages (e.g., 'forecast') enable analyzing data collected at successive intervals to identify patterns and trends over time.
- Data Aggregation Tools: Platforms like Splunk or Elastic Stack (ELK) help aggregate and summarize large volumes of data for reporting and visualization.

### **2. Diagnostic Analytics Tools:**

They dig deeper to determine why something happened by analyzing historical data.

- Root Cause Analysis Tools: Applications like JMP or Minitab assist in identifying the underlying causes of specific outcomes or issues by analyzing historical data and relationships.

- **Event Correlation Tools:** Systems like Nagios or Zabbix correlate events from various sources to pinpoint issues affecting system performance.

### **3. Predictive Analytics Tools:**

These tools forecast future trends and outcomes based on patterns in historical data.

- **Machine Learning Platforms:** Libraries such as Scikit-learn, TensorFlow, and Keras provide algorithms and frameworks to build predictive models based on historical data.
- **Time-Series Forecasting Tools:** Tools like Prophet by Facebook or ARIMA models in R are specialized for forecasting future values based on time-series data.

### **4. Prescriptive Analytics Tools:**

They suggest actions to optimize outcomes by considering various scenarios.

- **Optimization Software:** Tools like IBM CPLEX or Gurobi enable optimization modeling to prescribe the best course of action based on defined constraints and objectives.
- **Simulation Tools:** Applications like AnyLogic or Simul8 facilitate creating simulations to predict outcomes under different scenarios and suggest optimal decisions.

### **Data Analytics Tools:**

- 1. Programming Languages:** Python, R, and SQL are extensively used for data manipulation, analysis, and querying databases.
- 2. Statistical Tools:** Packages like SPSS, SAS, and STATA are used for statistical analysis and modeling.

3. **Business Intelligence (BI) Tools:** Examples include Tableau, Power BI, and QlikView for data visualization and creating interactive dashboards.
4. **Big Data Tools:** Hadoop, Spark, and Apache Flink are used for handling and analyzing large-scale datasets.
5. **Machine Learning Tools:** TensorFlow, Scikit-learn, and PyTorch are popular for implementing machine learning algorithms.