Data Analytics

1. Introduction to Data Analytics

- **Definition of Data Analytics**: Understanding its role and importance.
- **Types of Data Analytics**:
  - Descriptive Analytics
  - Diagnostic Analytics
  - Predictive Analytics
  - Prescriptive Analytics
- **Data Analytics Process**: Data collection, cleaning, analysis, visualization, and interpretation.

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2. Data Collection and Types

- **Data Sources**: Structured vs unstructured data, databases, APIs, web scraping.
- **Types of Data**: Qualitative vs quantitative data.
- **Data Storage**: Databases, cloud storage, and data warehouses.

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3. Data Cleaning and Preprocessing

- **Handling Missing Data**: Techniques like imputation and removal.
- **Data Transformation**: Normalization, scaling, and encoding categorical data.
- **Outlier Detection**: Identifying and managing outliers.
- **Data Wrangling**: Cleaning data using Python libraries (e.g., Pandas).

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4. Exploratory Data Analysis (EDA)

- **Descriptive Statistics**: Mean, median, mode, variance, and standard deviation.
- **Data Visualization**: Histograms, bar charts, scatter plots, and box plots.
- **Correlation Analysis**: Pearson, Spearman correlation.
- **Identifying Trends and Patterns**: Basic pattern recognition.

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5. Statistical Analysis

- **Hypothesis Testing**: t-tests, chi-square tests.
- **Confidence Intervals**: Understanding and calculating.
- **ANOVA**: Basic analysis of variance.
- **Basic Regression**: Introduction to linear regression.

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6. Introduction to Predictive Analytics

- **Regression Analysis**: Predicting continuous values (linear regression).
- **Classification Algorithms**: Introduction to basic algorithms like logistic regression and KNN.

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7. Data Visualization

- **Importance of Visualization**: Making insights accessible.
- **Visualization Tools**: Matplotlib, Seaborn (Python libraries), Tableau, Power BI.
- **Types of Visualizations**: Line charts, pie charts, heatmaps, dashboards.
- **Interactive Visualizations**: Basic dashboard creation using tools like Tableau.

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8. Reporting and Presenting Insights

- **Data Storytelling**: Presenting results clearly.
- **Creating Reports**: Using Excel, Power BI, or Tableau for creating reports.
- **Communicating with Non-Technical Audiences**: Simplifying complex data insights.

9. Tools and Technologies

- **Excel for Data Analysis**: Pivot tables, charts, and advanced functions.
- **Python for Data Analytics**: Pandas, NumPy, Matplotlib.
- **SQL for Data Querying**: Basic SQL queries for data extraction.

10. Real-World Projects

- **Case Studies**: Example projects for analysis (e.g., sales analysis, customer segmentation).
- **Hands-on Practice**: Apply concepts learned to real datasets (e.g., Kaggle datasets).