Jeevi Academy

Data Analytics

SYLLABUS

Topics Covered

Introduction to Data Analytics

1. Overview of Data Analytics and its role in decision-making
2. Key concepts: Data, Information, Insights
3. Types of Data Analytics: Descriptive, Diagnostic, Predictive, Prescriptive

Data Collection and Data Sources

1. Methods of data collection: Surveys, Web Scraping, APIs
2. Data types: Structured, Unstructured, Semi-Structured
3. Data sources: Databases, Data Warehouses, Big Data Platforms, IoT Devices
4. Data Ethics and Compliance: GDPR, CCPA

Data Cleaning and Preparation

1. Data cleaning techniques: Handling missing values, Removing duplicates, Outlier detection
2. Data transformation: Normalization, Standardization, Aggregation
3. Data integration: Combining datasets, Data merging
4. Data enrichment: Adding additional context to data

Data Analysis and Exploration

1. Exploratory Data Analysis (EDA): Summary statistics, Distribution analysis, Data visualization
2. Statistical methods: Mean, Median, Mode, Variance, Standard Deviation, Correlation, Regression
3. Techniques: Hypothesis testing, ANOVA, Chi-Square tests
4. Data profiling and quality assessment

Data Visualization

1. Principles of effective data visualization: Clarity, Accuracy, and Aesthetics
2. Tools and libraries: Matplotlib, Seaborn, Plotly, Tableau, Power BI
3. Creating visualizations: Bar charts, Line charts, Scatter plots, Heatmaps, Histograms, Dashboards
4. Interactive visualizations and storytelling with data

Introduction to Machine Learning

1. Overview of Machine Learning and its applications
2. Supervised Learning: Regression (Linear, Polynomial), Classification (Decision Trees, Random Forests, Support Vector Machines)
3. Unsupervised Learning: Clustering (K-Means, DBSCAN, Hierarchical), Dimensionality Reduction (PCA, t-SNE)
4. Model evaluation: Cross-validation, ROC-AUC, Confusion Matrix

Advanced Data Analytics Techniques

1. Time Series Analysis: Components of time series, Forecasting models (ARIMA, Exponential Smoothing)
2. Text Analytics: Natural Language Processing (NLP), Sentiment Analysis, Topic Modeling (LDA)
3. Advanced statistical methods: Bayesian Analysis, Survival Analysis
4. Anomaly Detection: Techniques and applications

Data Analytics Tools and Platforms

1. - Introduction to analytics tools: Excel, R, Python
2. Data management systems: SQL, NoSQL databases (MongoDB, Cassandra)
3. Big Data technologies: Hadoop, Spark, Hive
4. Cloud-based analytics services: AWS (Redshift, QuickSight), Google Cloud (BigQuery, Data Studio), Azure (Azure Synapse Analytics)

Practical Projects and Case Studies

1. Real-world data analytics projects: Project scoping, Data acquisition, Analysis, Visualization, Reporting
2. Industry-specific case studies: Healthcare, Finance, Retail, Marketing
3. End-to-end project implementation: Problem definition, Solution design, Data processing, Insight generation

Ethical Considerations in Data Analytics

1. Data privacy and security: Best practices, Data anonymization
2. Ethical use of data: Avoiding biases, Ensuring fairness
3. Understanding legal and regulatory requirements
4. Promoting transparency in data-driven decisions

Data Analytics Project Management

1. Project management methodologies: Agile, Scrum
2. Data project planning: Scope, Resources, Timeline
3. Collaboration tools and techniques: JIRA, Trello, Asana
4. Reporting and communication: Effectively presenting findings to stakeholders

Emerging Trends in Data Analytics

1. Artificial Intelligence and Machine Learning integration
2. Real-time Data Analytics and Stream Processing
3. Advanced Analytics with Graph Databases
4. The impact of Blockchain on data security and integrity