Data Analyst – Complete Content

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1. Introduction to Data Analytics

- What is Data Analytics?
- Role of a Data Analyst
- Data Analyst vs Data Scientist vs Data Engineer
- Types of Analytics
    - Descriptive
    - Diagnostic
    - Predictive
    - Prescriptive
- Data Analytics Lifecycle
- Business Understanding

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2. Statistics for Data Analysis (VERY IMPORTANT)

Descriptive Statistics

- Mean, Median, Mode
- Range, Variance, Standard Deviation
- Percentiles & Quartiles

Probability

- Probability basics
- Conditional Probability
- Bayes Theorem

Inferential Statistics

- Sampling Techniques
- Hypothesis Testing
- Confidence Intervals
- Normal Distribution
- Z-Test, T-Test, Chi-Square Test
- ANOVA (Basics)

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3. Excel for Data Analysis

Excel Basics

- Rows, Columns, Cells
- Data Types
- Formatting

Excel Functions

- Logical: `IF`, `AND`, `OR`
- Lookup: `VLOOKUP`, `HLOOKUP`, `XLOOKUP`
- Text: `LEFT`, `RIGHT`, `MID`
- Date & Time functions
- Statistical functions

Advanced Excel

- Conditional Formatting
- Pivot Tables & Pivot Charts
- Data Validation
- What-If Analysis
- Power Query
- Power Pivot
- Macros (Basics)

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4. SQL for Data Analysts (VERY IMPORTANT)

SQL Basics

- What is SQL?
- Databases & Tables
- Primary Key & Foreign Key

SQL Queries

- `SELECT`, `WHERE`
- `ORDER BY`, `LIMIT`
- `GROUP BY`, `HAVING`
- `DISTINCT`
- `CASE WHEN`

Joins

- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- FULL JOIN
- Self Join

Advanced SQL

- Subqueries
- CTE (WITH clause)
- Window Functions
  - `ROW_NUMBER()`
  - `RANK()`
  - `DENSE_RANK()`
- Indexes
- Performance tuning basics

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5. Python for Data Analysis

Python Basics

- Variables & Data Types
- Loops
- Functions
- Exception Handling

Python Libraries

- NumPy
- Pandas
- Matplotlib
- Seaborn
- SciPy (Basics)

Data Handling

- Reading CSV, Excel, JSON
- Data Cleaning
- Data Transformation
- Data Aggregation

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6. Data Cleaning & Preprocessing

- Handling Missing Values
- Removing Duplicates
- Outlier Detection
- Data Normalization
- Data Encoding
- Data Type Conversion
- Feature Engineering (Basics)

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7. Exploratory Data Analysis (EDA)

- Understanding data structure
- Summary statistics
- Univariate Analysis
- Bivariate Analysis
- Multivariate Analysis
- Correlation analysis
- Data visualization techniques

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8. Data Visualization

Visualization Principles

- Choosing the right chart
- Data storytelling

Tools

- Matplotlib
- Seaborn
- Power BI
- Tableau

Charts

- Bar Chart
- Line Chart
- Pie Chart
- Histogram
- Box Plot
- Scatter Plot
- Heat Map

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9. Business Intelligence Tools

Power BI

- Power BI Architecture
- Data Import
- Data Modeling
- DAX Basics
- Dashboards & Reports
- Power BI Service

Tableau

- Data connections
- Calculated fields
- Filters
- Dashboards
- Storytelling

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10. Machine Learning Basics for Data Analysts

- Supervised vs Unsupervised Learning
- Linear Regression
- Logistic Regression
- K-Means Clustering
- Decision Trees (Basics)
- Model Evaluation Metrics

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11. Domain Knowledge (IMPORTANT)

Business Domains

- Finance
- Banking
- Healthcare
- Retail & E-commerce
- Telecom
- Insurance

KPIs

- Revenue
- Profit Margin
- Customer Churn
- Conversion Rate
- CAC
- LTV

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12. Real-Time Data Analyst Projects

Project Examples

1. Sales Analysis Dashboard

2. Customer Churn Analysis
3. Marketing Campaign Analysis
4. Financial Performance Analysis
5. E-Commerce Product Analysis

Tools Used

- Excel
- SQL
- Python
- Power BI / Tableau

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13. Data Analyst Workflow (Real-Time)

1. Requirement Gathering
2. Data Collection
3. Data Cleaning
4. EDA
5. Analysis
6. Visualization
7. Insights & Reporting

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14. Soft Skills for Data Analysts

- Communication
- Presentation skills
- Business understanding
- Stakeholder interaction
- Storytelling with data

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15. Interview Preparation

SQL Questions

- Joins vs Subqueries
- Rank vs Dense Rank
- Group By vs Having

Python Questions

- Pandas vs NumPy
- Handling missing data

- EDA steps

Scenario-Based Questions

- Business problem solving
- KPI analysis

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16. Resume Preparation

- Data Analyst resume format
- Projects section
- Tools & technologies
- Common mistakes

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17. Certifications (Optional)

- Google Data Analytics
- Microsoft Power BI
- IBM Data Analyst
- Tableau Certification

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18. Best Practices

- Clean data before analysis
- Validate assumptions
- Document insights
- Version control
- Reproducibility

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19. Career Path

- Junior Data Analyst
- Data Analyst
- Senior Data Analyst
- Business Analyst
- Analytics Manager

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20. Tools Summary

- Excel
- SQL
- Python
- Power BI
- Tableau