Splendor Analytics

Data Analytics Course Curriculum

Introduction to Statistics for Data Analysis

1. **Understanding the Role of Statistics in Data Analysis**

1.1. **Importance of Statistics in Data Analysis**

- Definition of statistics and its relevance in analyzing data
- Role of statistics in making data-driven decisions
- Applications of statistics in various fields such as business, science, healthcare, etc.

1.2. **Basic Concepts of Descriptive and Inferential Statistics**

- Overview of descriptive statistics: Mean, median, mode, range, variance, standard deviation
- Introduction to inferential statistics: Sampling, hypothesis testing, confidence intervals

2. **Exploratory Data Analysis (EDA)**

2.1. **Overview of Exploratory Data Analysis**

- Definition and Purpose of EDA:
- EDA as an initial approach to understanding the structure, patterns, and relationships within data.
- Importance of EDA in identifying trends, outliers, and potential insights before formal modeling.
- Goals of EDA:
- Identifying the distribution of variables.
- Detecting anomalies or outliers.
- Assessing data quality and completeness.
- Uncovering patterns and relationships between variables.
- EDA Techniques:
- Summary Statistics: Mean, median, mode, variance, standard deviation, quartiles.
- Visualization: Histograms, box plots, scatter plots, density plots, pair plots.
- Data Profiling: Missing values, unique values, data types, skewness, correlation.

2.2. **Data Visualization Techniques**

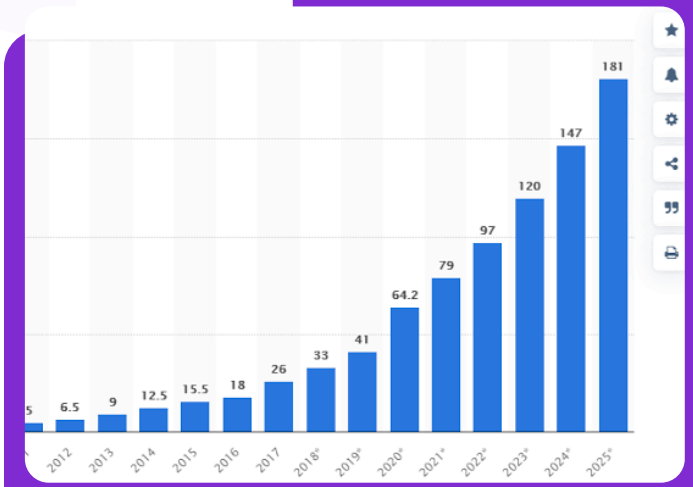
- Importance of Data Visualization:
- Enhancing understanding and communication of data patterns and insights.
- Facilitating the discovery of relationships and trends.
- Enabling decision-making based on visual evidence.
- Types of Data Visualizations:
- Univariate Visualizations: Histograms, bar plots, pie charts, box plots.
- Bivariate Visualizations: Scatter plots, stacked bar plots, violin plots.
- Multivariate Visualizations: Pair plots, heatmaps, parallel coordinates plots.
- Temporal Visualizations: Time series plots, calendar heatmaps.
- Best Practices in Data Visualization:
- Choosing appropriate visualization types based on data types and analysis goals.
- Designing visually appealing and informative plots.
- Labeling axes, adding titles, legends, and annotations.
- Ensuring clarity and accuracy in presenting data.
- Utilizing interactive visualizations for deeper exploration.

2.3. Exploring Data Distribution and Central Tendency
- Understanding Data Distribution:
- Normal distribution, skewed distribution, multimodal distribution.
- Assessing skewness and kurtosis.
- Calculating Measures of Central Tendency:
- Mean, median, mode.
- Interpretation of central tendency measures in different distributions.

2.4. Detecting Outliers and Anomalies
- Identification Techniques:
- Visualization methods (box plots, scatter plots).
- Statistical methods (z-score, IQR method).
- Domain knowledge-based approaches.
- Handling Outliers:
- Options for treatment (removal, transformation, imputation).
- Impact of outliers on analysis and modeling decisions.

2.5. Assessing Data Quality and Completeness
- Checking for Missing Values:
- Frequency and pattern of missingness.
- Imputation strategies (mean, median, mode, predictive imputation).
- Assessing Data Consistency:
- Checking for duplicates, inconsistencies, and errors.
- Data validation techniques.

2.6. Uncovering Patterns and Relationships
- Correlation Analysis:
- Pearson correlation coefficient.
- Heatmaps for visualizing correlations.



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Beginner Level: Excel Course outline

1. Introduction to Excel
- Overview of Excel interface: Introduction to Excel's ribbon, tabs, and basic functions.
- Understanding workbooks, worksheets, rows, columns, and cells: Explanation of the structure of Excel files.
- Navigating Excel workbooks efficiently: Techniques for moving around workbooks using scrollbars, keyboard shortcuts, and navigation panes.

2. Basic Spreadsheet Operations
- Entering and formatting data: Methods for inputting data into cells and basic formatting options such as font styles, colors, and cell alignment.
- Using basic formulas and functions: Introduction to arithmetic operations (e.g., addition, subtraction) and functions like SUM, AVERAGE, MAX, MIN.
- Introduction to cell referencing and calculations: Understanding relative and absolute cell references, performing simple calculations within cells.

3. Managing Worksheets
- Renaming, inserting, and deleting worksheets: How to modify worksheet names and add or remove worksheets from a workbook.
- Moving and copying data between worksheets: Techniques for transferring data between different sheets within a workbook.
- Organizing data with grouping and outlining features: Using grouping and outlining to organize and collapse rows or columns for better data visibility.

4. Data Analysis Tools
- Sorting and filtering data effectively: Sorting data alphabetically or numerically, applying filters to view specific subsets of data.
- Introduction to conditional formatting for data visualization: Applying conditional formatting rules to highlight data based on specific criteria.
- Creating simple charts: Generating basic charts such as columns, line, or pie charts to visualize data trends.

5. Text and String Functions
- CONCATENATE, TEXT, LEN, LEFT, RIGHT, MID: Concatenating strings, formatting text, calculating the length of text strings, and extracting substrings.
- UPPER, LOWER, PROPER: Converting text to uppercase, lowercase, or proper case.
- FIND, SEARCH, REPLACE: Finding and replacing text within strings.
- TRIM, CLEAN, SUBSTITUTE: Removing extra spaces, non-printable characters, and substituting text within strings.

Intermediate Level:

6. Advanced Formulas and Functions
- Utilizing logical functions: Understanding IF, AND, OR functions for conditional logic.
- Working with lookup and reference functions: Exploring VLOOKUP, HLOOKUP, INDEX, MATCH functions for searching and retrieving data.
- Harnessing the power of array formulas: Using array formulas for complex calculations across ranges of data.

7. Data Management Techniques

- Implementing data validation: Setting up validation rules to control data input.
- Consolidating data from multiple sources: Combining data from different sheets or workbooks using consolidation tools.
- Analyzing data efficiently using pivot tables and pivot charts: Creating pivot tables to summarize and analyze large datasets.

8. Aggregate Functions
- SUM, AVERAGE, MAX, MIN, COUNT, COUNTA: Calculating totals, averages, maximums, minimums, and counts.
- COUNTIF, SUMIF, AVERAGEIF: Conditional counting, summing, and averaging.
- SUBTOTAL, AGGREGATE: Performing aggregate calculations while ignoring filtered or hidden rows.

9. Conditional Functions
- IF, IFERROR, AND, OR, NOT: Performing logical tests and handling errors.
- Nested IF statements: Using multiple IF statements within a single formula.
- IFS, SWITCH: Simplifying nested IF statements or multiple conditions using IFS or SWITCH functions.

Advanced Level:

10. Advanced Data Analysis
- Utilizing advanced sorting and filtering techniques: Sorting data by multiple criteria, using advanced filtering options.
- Employing subtotal and database functions for data summarization: Generating subtotals and summaries for large datasets.
- Performing what-if analysis with Goal Seek and Scenario Manager: Using these tools to analyze different scenarios and achieve desired results.

11. Advanced Charting Techniques
- Creating dynamic charts with named ranges and data validation: Building charts that automatically update with changes to data ranges.
- Exploring advanced chart types: Generating combo charts, sparklines, and other specialized chart types.
- Enhancing charts with trendlines and secondary axes: Adding trendlines and secondary axes to visualize trends and comparisons.

12. Data Analysis with PivotTables
- Creating and customizing pivot tables and pivot charts: Setting up pivot tables and pivot charts to summarize and analyze data.
- Enhancing interactivity with slicers, timelines, and calculated fields: Adding slicers and timelines to filter pivot table data dynamically.
- Implementing advanced pivot table techniques: Using calculated fields, grouping data, and formatting pivot tables for better analysis.

13. Data Visualization and Dashboards
- Applying design principles for effective data visualization: Designing visually appealing and informative dashboards.
- Constructing interactive dashboards with Excel: Building interactive dashboards that allow users to explore data dynamically.
- Incorporating advanced charting techniques and slicers into dashboards: Enhancing dashboards with advanced charts and slicers for filtering.

14. Excel Macros and VBA Programming
- Recording and running macros for task automation: Automating repetitive tasks by recording and executing macros.
- Introduction to Visual Basic for Applications (VBA): Understanding the basics of VBA programming language.
- Developing VBA macros to automate complex tasks and streamline workflows: Writing and debugging VBA code to customize Excel functionality.

15. Date Functions
- DATE, DATEVALUE, DAY, MONTH, YEAR: Extracting components of dates, converting text to dates.
- WEEKDAY, WEEKNUM: Determining the day of the week or week number from a given date.
- EOMONTH, WORKDAY, NETWORKDAYS: Calculating end-of-month dates, workdays, and the number of working days between two dates.
- DATEDIF: Calculating the difference between two dates in various units (e.g., years, months, days).
- TODAY, NOW: Returning the current date or date and time.

Final Assessment and Additional Topics
Excel assignment after every class.
3 solid real-world projects.
2 presentations and review.
Feedback and corrections from the facilitator.
Introduction to Financial Mathematics in Data Analytics.
Basic calculations in Data Analytics.
Career session.

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SQL

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SQL Course Outline:

Beginner Level:

1. Introduction to SQL
- Definition and purpose of SQL
- Understanding relational databases
- Overview of Database Management Systems (DBMS)
2. Basic SQL Syntax
- SELECT statement
- FROM clause
- WHERE clause
- ORDER BY clause
- GROUP BY clause
3. Data Types
- Integer
- Floating-point
- Character
- Date
- VARCHAR
- TEXT
- BOOLEAN
4. Data Definition
- CREATE statement
- ALTER statement
- DROP statement
- Indexes
5. Data Manipulation
- INSERT statement
- UPDATE statement
- DELETE statement
6. Query Filtering and Sorting
- WHERE clause for filtering data
- AND, OR conditions
- ORDER BY clause for sorting data (Ascending and Descending)
7. Data Aggregation
- SUM function
- AVG function
- COUNT function.
- MIN function
- MAX function
8. Joins and Relationships
- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- FULL OUTER JOIN
9. Subqueries
- Subqueries used in filtering data.
- Correlated subqueries
10. Views
- Creating views
- Modifying views
- Dropping views
11. Case Statements
- Using CASE statements for conditional logic
12. Data Import and Export
- Importing and exporting data (e.g., CSV, JSON)

Intermediate Level:

13. Database Design
- Understanding Entity-Relationship Diagrams (ERDs)
- Normalization techniques for efficient database design
14. Data Integrity
- Primary key constraint
- Foreign key constraint
15. Optimizations
- Query optimization techniques for improving performance.
16. Advanced Joins and Set Operations
- CROSS JOIN
- UNION, INTERSECT, EXCEPT
17. Error Handling and Debugging
- Handling errors in SQL
- Debugging techniques for troubleshooting queries
18. Minimum of 10 assignments and 4 standard real-world SQL projects
19. Feedback and corrections from the facilitator.
20. Career session.

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Power BI Course Outline:

1. Introduction to Power BI

1.1. Understanding Business Intelligence with Power BI

- Role of Power BI in modern data analytics
- Comparing Power BI with other BI tools like Tableau
- Overview of Microsoft Power Platform and Power BI products
- Transitioning from Excel to Power BI for data analysis

1.2. Power BI Desktop Essentials

- Installing and navigating Power BI Desktop
- Exploring Power BI Desktop interface components
- Connecting to data sources: Excel, SQL Server, Web, etc.
- Data import methods: Import vs. DirectQuery
- Overview of Power BI Service and mobile capabilities

1.3. Building Your First Power BI Report

- Importing and transforming data in Power BI Desktop
- Creating visualizations: Bar, line, pie charts, etc.
- Adding interactivity with slicers, filters, and drill-down paths
- Saving and publishing reports to Power BI Service
- Exploring Power BI Service features: Dashboards, data refresh, mobile access

2. Data Transformation and Modeling

2.1. Power Query Essentials

- Introduction to Power Query and Query Editor
- Data transformation tasks: Cleaning, shaping, and combining data
- Removing duplicates, handling errors, and data type conversions

2.2. Data Modeling in Power BI

- Understanding data modeling concepts and best practices
- Creating relationships between tables: One-to-one, one-to-many, many-to-many
- Working with calculated columns and measures for enhanced analysis
- Implementing data hierarchies and custom sort orders

2.3. Advanced Data Visualization Techniques

- Exploring advanced chart types: Treemap, scatter, funnel, gauge, etc.
- Customizing visuals: Formatting, colors, axes, legends, and tooltips
- Creating dynamic and interactive reports with bookmarks and buttons
- Incorporating custom visuals and third-party integrations

3. DAX Fundamentals and Advanced Calculations

3.1. Introduction to DAX

- Understanding Data Analysis Expressions (DAX) syntax and concepts
- Working with tables, columns, and rows in DAX expressions
- Introduction to row context and filter context

3.2. Basic DAX Functions

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PowerPoint Course Outline

1. Introduction to Microsoft PowerPoint
1.1. Overview of PowerPoint
- Understanding the Purpose and Functionality
- Features and Capabilities of PowerPoint

1.2. Getting Started with PowerPoint
- Launching PowerPoint Application
- Exploring PowerPoint Interface (Ribbons, Slides, Notes Pane)
- Customizing Workspace Preferences

2. Creating and Formatting Slides
2.1. Creating New Presentations
- Choosing Slide Layouts
- Adding, Deleting, and Duplicating Slides
- Using Slide Master for Consistent Design

2.2. Formatting Text and Objects
- Changing Font Styles, Sizes, and Colors
- Applying Text Alignment and Bullets
- Adjusting Object Properties (Size, Position, Fill, Outline)

3. Inserting and Editing Content
3.1. Inserting Images and Graphics
- Adding Pictures from Files and Online Sources
- Inserting Shapes, Icons, and SmartArt
- Customizing Images and Graphics

3.2. Incorporating Multimedia
- Inserting Audio and Video Clips
- Configuring Playback Options
- Adding Transitions and Animation Effects

4. Organizing and Managing Slides
4.1. Slide Navigation Techniques
- Reordering Slides
- Grouping and Ungrouping Slides
- Using Sections for Organization

4.2. Slide Show Setup
- Setting Slide Show Preferences (Timing, Transitions)
- Customizing Slide Show Controls
- Running and Presenting Slides

5. Enhancing Presentations with Visual Effects
5.1. Applying Animation Effects
- Entrance, Exit, and Emphasis Effects
- Motion Paths and Custom Animation
- Timing and Sequence Adjustment

5.2. Using Slide Transitions
- Adding Transition Effects between Slides
- Configuring Transition Properties
- Previewing and Managing Transitions

6. Collaboration and Sharing
6.1. Collaboration Features
- Working with Comments and Revisions
- Co-authoring Presentations in Real-time
- Version History and Tracking Changes

6.2. Sharing and Exporting Presentations
- Saving Presentations in Different Formats (PPTX, PDF)
- Printing Slides and Handouts
- Publishing Presentations Online (OneDrive, SharePoint)

7. Advanced PowerPoint Techniques
7.1. Customizing Slide Master
- Editing Slide Master Layouts
- Creating Custom Themes and Templates
- Applying Master Elements to Slides

7.2. Advanced Animation and Multimedia
- Layering Animation Effects
- Triggering Animation with Actions
- Embedding and Linking External Content

8. Design Principles and Best Practices
8.1. Design Principles for Effective Presentations
- Typography, Color, and Visual Hierarchy
- Slide Layout and Composition
- Audience Engagement Techniques

8.2. Best Practices for Delivering Presentations
- Storytelling and Narrative Techniques
- Engaging Audience with Interactivity
- Handling Q&A Sessions and Feedback

9. Tips for Creating Engaging Presentations
9.1. Creating Impactful Titles and Opening Slides
- Crafting Attention-grabbing Titles
- Using Visual Hooks to Capture Audience Attention
- Setting the Tone and Agenda for the Presentation

9.2. Designing Compelling Visuals and Graphics
- Choosing High-quality Images and Graphics
- Using Infographics and Data Visualizations
- Incorporating Memorable Visual Elements

10. Conclusion and Further Resources

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Python for Data Analysis Course Outline

1. Introduction to Python for Data Analysis

1.1. Overview of Python

- Introduction to Python Programming Language
- Importance of Python in Data Analysis
- Key Python Libraries for Data Analysis (e.g., NumPy, Pandas, Matplotlib)

1.2. Setting Up Python Environment

- Installing Python and Anaconda Distribution
- Introduction to Jupyter Notebooks
- Setting Up Development Environment

2. Python Basics

2.1. Python Fundamentals

- Variables, Data Types, and Operators
- Control Structures (e.g., Conditional Statements, Loops)
- Functions and Modules

2.2. Working with Data Structures

- Lists, Tuples, and Dictionaries
- Array Operations with NumPy
- Data Manipulation with Pandas DataFrames

3. Data Wrangling with Pandas

3.1. Data Loading and Inspection

- Reading Data from Different Sources (e.g., CSV, Excel, SQL)
- Inspecting DataFrames and Series
- Handling Missing Values and Duplicates

3.2. Data Cleaning and Transformation

- Data Filtering and Selection
- Data Sorting and Aggregation
- Applying Functions and Methods to Data

4. Exploratory Data Analysis (EDA)

4.1. Understanding EDA

- Importance of Exploratory Data Analysis in Data Science
- Goals and Techniques of EDA

4.2. EDA Techniques in Python

- Descriptive Statistics
- Data Visualization with Matplotlib and Seaborn
- Correlation Analysis and Heatmaps

5. Statistical Analysis with Python

5.1. Statistical Concepts

- Probability Distributions (e.g., Normal, Binomial)
- Hypothesis Testing (e.g., t-tests, chi-square tests)
- Regression Analysis

5.2. Implementation in Python

- Statistical Functions in NumPy and SciPy
- Regression Analysis with StatsModels library
- Practical Examples and Case Studies

6. Data Visualization with Matplotlib and Seaborn

6.1. Introduction to Data Visualization

- Importance of Data Visualization in Data Analysis
- Principles of Effective Visualization Design

6.2. Plotting with Matplotlib

- Basic Plots (e.g., Line Plot, Scatter Plot, Bar Plot)
- Customizing Plots (e.g., Titles, Labels, Legends)

6.3. Advanced Visualization with Seaborn

- Seaborn's High-Level Interface for Statistical Visualization
- Categorical Plots, Distribution Plots, and Pair Plots
- Plot Styling and Themes

7. Introduction to Machine Learning

7.1. Overview of Machine Learning

- Introduction to Supervised and Unsupervised Learning
- Types of Machine Learning Algorithms (e.g., Classification, Regression, Clustering)

7.2. Machine Learning Libraries in Python

- Introduction to Scikit-Learn
- Basics of Model Training, Evaluation, and Prediction

8. Practical Projects and Case Studies

8.1. Hands-on Data Analysis Projects

- Analyzing Real-world Datasets (e.g., Iris Dataset, Titanic Dataset)
- Building Predictive Models (e.g., Classification, Regression)

8.2. Case Studies in Data Analysis

- Exploring Data Analysis in Industry Verticals (e.g., Finance, Healthcare, Marketing)
- Solving Business Problems with Data Analytics

9. Python for Data Visualization

9.1. Interactive Data Visualization with Plotly

- Introduction to Plotly Library
- Creating Interactive Charts and Dashboards
- Deployment of Interactive Visualizations

10. Deployment and Productionization

10.1. Packaging and Deployment of Python Applications

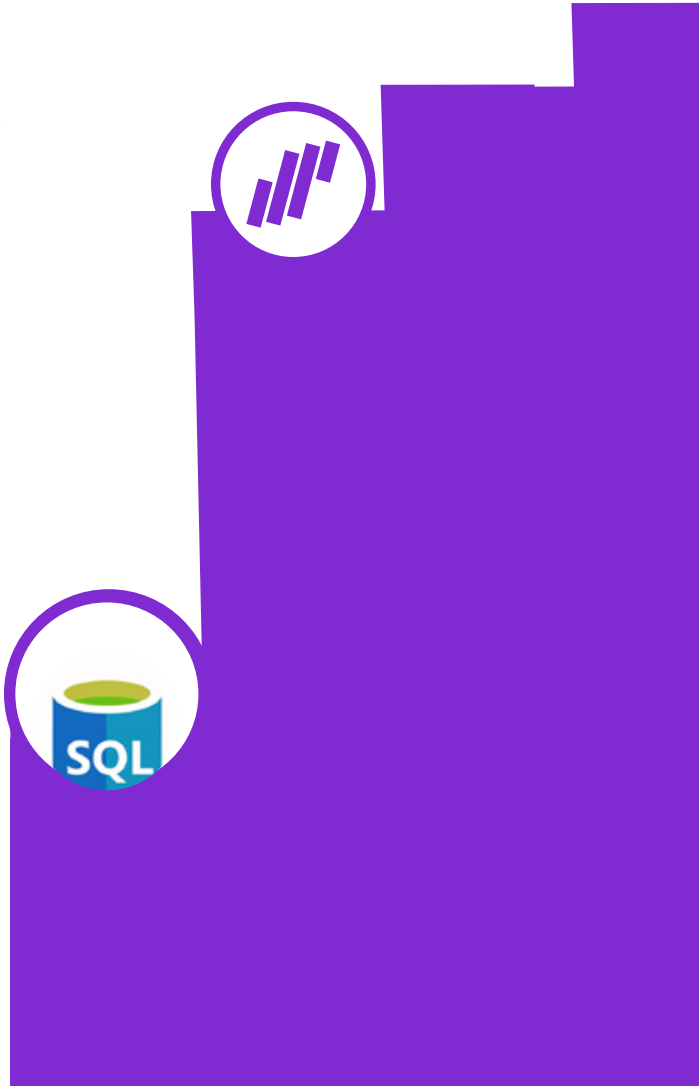
- Packaging Python Code with setuptools
- Creating Executables and Deployment Packages

10.2. Web Applications with Flask

- Building Web Applications for Data Visualization
- Integrating Flask with Python Data Analysis Libraries

11. Conclusion and Next Steps

11.1. Recap of Key Concepts and Techniques 11.2. Continuing Learning Paths in Data Analysis and Data Science 11.3. Career Opportunities in Python Data Analysis and Data Science



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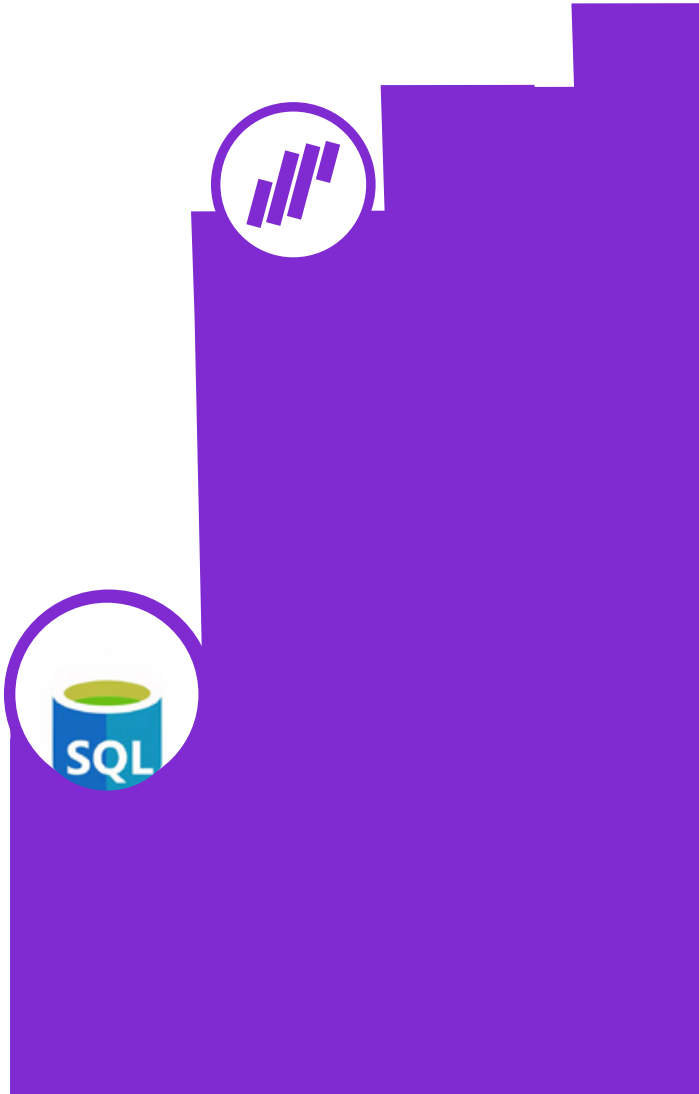
SQL Advanced Outline

1. Advanced SQL Queries: Master complex SQL queries involving subqueries, joins, window functions, and common table expressions (CTEs) to manipulate and extract data efficiently.
2. Performance Optimization: Learn techniques to optimize SQL queries for better performance, including indexing, query tuning, and understanding execution plans.
3. Data Modeling and Design: Deepen your understanding of database design principles, normalization, denormalization, and creating efficient schema structures.
4. Advanced Data Manipulation: Practice advanced data manipulation techniques such as bulk operations, conditional updates, and upserts (MERGE statements).
5. Transaction Management: Understand transaction isolation levels, concurrency control, and how to handle transactions effectively to maintain data integrity.
6. Stored Procedures and Functions: Learn to create and optimize stored procedures, user-defined functions, and triggers for automating tasks and enforcing business rules.
7. Error Handling and Debugging: Master error handling techniques, exception handling, and debugging tools to troubleshoot and resolve issues in SQL scripts and procedures.
8. Advanced Topics: Explore advanced SQL topics such as recursive queries, temporal tables, spatial data types, and working with JSON or XML data.
9. Integration with Other Technologies: Understand how SQL integrates with other technologies such as programming languages (e.g., Python, Java), data visualization tools, and data warehousing solutions.
10. Real-world Projects: Work on real-world projects or challenges to apply your SQL skills in practical scenarios, gaining hands-on experience and problem-solving abilities.



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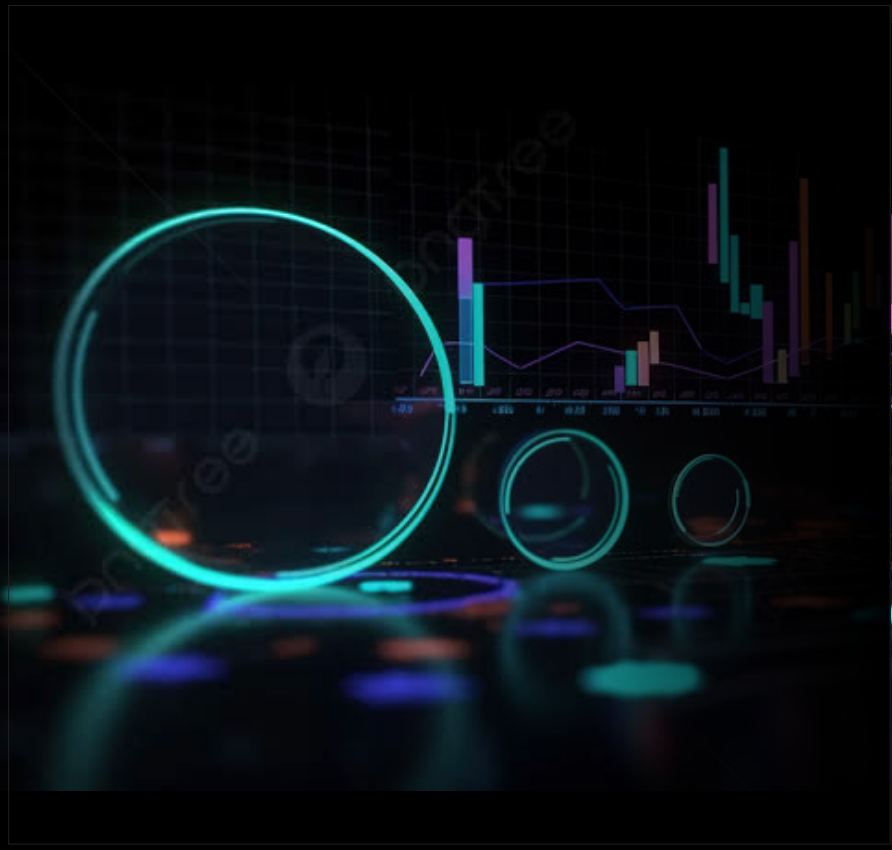
Prices & Duration



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Price

SA PROGRAM PACKAGES

A. HR Analytics
Class Duration- 1 Month
Prices
Virtual- 100k
Physical- 120k

B. Supply Chain Management and Logistics
Program Duration- 1 Month
Prices
Virtual- 100k
Physical- 120k

C. Microsoft Excel
Program Duration- 1 Month
Prices
Virtual- 50k
Physical- 60k

D. SQL
Program Duration- 1 month
Prices
Virtual- 80k
Physical- 95k

E. Microsoft Power BI
Program Duration- 80k
Prices
Virtual- 80k
Physical- 95k

F. Business Intelligence
Program Duration- Two Months
Timing-
Prices
Virtual- 150k
Physical- 180k

G. Full Stack Data Analyst (PowerPoint, Statistics, Excel, SQL, Power Bi, Python, Story Telling)
Program Duration- 4 Months
Prices
Virtual- 250k
Physical- 275k

H. Data Analysis Beginner (PowerPoint, Statistics, Excel, SQL and PowerPoint BI)
Program Duration- 3 Months
Prices
Virtual- 165k
Physical- 195k

I. Data Analysis Intermediate (Power Point, Statistics, Excel, SQL, Power BI, Python)
Program Duration- 3 Months
Prices
Virtual- 200k
Physical- 240k

COMBO PACKAGES

A. Excel and SQL
Program Duration - 2 Months
Prices
Virtual- 120k
Physical- 145k

B. Excel and Power BI
Program Duration- 2 Months
Prices
Virtual- 120k
Physical- 145k

C. SQL and Power BI
Price- 130k
Program Duration- 2 Months
Prices
Virtual- 130k
Physical- 155k

Thank You