Syllabus

Python (Data Analytics)

01

Introduction to Python

- History of Python
- Why learn python?
- Python Installation
- Python Interpreter and IDE

02

Python Basic Concepts

- Data types
- Statements & Comments
- Keywords
- Variables
- Indentation
- Dynamic Typing
- User Input

03

Control Flow

- If statement
- If-else
- If–elif-else
- Nested if-else
- while loop
- for loop
- Nested for loop
- Nester while loop
- Pass,Break & continue

04

Functions

- Explore Builtin Functions
- User Defined Functions
- Defining function
- Calling a Function
- Return statement
- Function with parameter and without parameter
- Scope of variable
- Recursive & lambda Functions

05

Modules & Packages

- What is module?
- Importing & creating a module
- Reloading a module
- What is a package?
- Importing & creating a module
- Installing third party packages

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Python (Data Analytics)

06

Strings

- What is a String ?
- String Creation
- Accessing elements of a string
- Escape Sequence
- String methods
- String formatting

07

List

- What is a List ?
- List Creation
- Accessing elements of a List
- List methods
- List Comprehension
- Matrix operations using list

08

Tuple

- What is a Tuple ?
- Tuple Creation
- Accessing elements of a Tuple
- Tuple methods
- List vs Tuples

09

Dictionary

- What is a Dictionary?
- Dictionary Creation
- Accessing elements of a Dictionary
- Dictionary methods
- Dictionary Comprehension

10

Set

- What is a Set?
- Set Creation
- Accessing elements of a Set
- Set methods
- Set Comprehension

11

File Handling

- File Operations
- File modes
- Write, read,append to a file
- File positions
- Pickle Module

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Python (Data Analytics)

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Exception Handling

- What is Exception Handling?
- Exception handling techniques
- Detecting Exception (try)
- Catching exceptions (catch)
- Catching multiple exceptions
- Raising exception (raise) Finally block

13

Object Oriented Programming

- What is Object Oriented Programming?
- Class vs Object
- Method vs Functions
- Types of Methods & Attributes
- Method Overloading and Method Overriding
- Encapsulation,Polymorphism,Abstraction & Inheritance

14

Python to Database Connection

- Introduction to MySQL connector
- Connecting to the MySQL database from Python
- My SQL, Creating a table by MySQL
- Performing SQL Operations

15

Python libraries

- NumPy
- Pandas

16

Descriptive Statistics

- Measure of Central Tendency
- Measure of Dispersion
- Measure of Shape

17

Probability and Sampling

- Conditional Probability
- Bayes theorem

18

Probability Distribution

- Guassian distribution
- Binomial distribution

19

Inferential statistics

- Central limit theorem
- Confidence interval

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Python (Data Analytics)

Data Visualization

- Matplotlib and Seaborn

Hypothesis testing

- Z-test
- T-test
- Chi-square test
- Annova test
- Correlation test

Add ons

- Problem Solving Session
- Project
- Assignments on each topics
- Tips on resume and interview preparations

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SQL For Data Analytics

01

Introduction to BigQuery

- What is BigQuery ?
- BigQuery interface and UI walkthrough
- Datasets, tables, and projects

02

Data Extraction & Basic SQL Syntax

- Writing basic SELECT queries
- Specifying columns and using aliases
- Filtering data with WHERE
- Sorting results using ORDER BY
- Limiting rows with LIMIT

03

String & Data Cleaning Functions

- TRIM, UPPER, LOWER, REPLACE
- Regular expressions with REGEXP_EXTRACT, REGEXP_REPLACE
- Removing duplicates

04

Data Filtering & Conditional Logic

- Logical operators: AND, OR, NOT
- Comparison operators: =, !=, LIKE, IN, BETWEEN
- Handling NULLs: IS NULL, IS NOT NULL, IFNULL, COALESCE
- Conditional statements: CASE WHEN, IF

05

Joins & Set Operations

- Types of joins: INNER, LEFT, RIGHT, FULL OUTER, CROSS
- Join conditions and best practices
- Multi-table joins
- Set operations: UNION, INTERSECT, EXCEPT

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SQL For Data Analytics

06

Aggregation & Grouping

- Aggregate functions: SUM(), AVG(), MIN(), MAX(), COUNT()
- GROUP BY clause
- Using HAVING
- Nested aggregation

07

Subqueries & CTEs

- Using subqueries in SELECT, FROM, and WHERE clauses
- Common Table Expressions (CTE) with WITH

08

Window Functions

- Introduction to window functions vs. aggregates
- Key functions: ROW_NUMBER(), RANK(), DENSE_RANK(), LAG(), LEAD(), NTILE()
- Partitioning and ordering data with OVER()
- Running totals, moving averages

09

Date & Time Functions

- Working with DATE, DATETIME, TIMESTAMP types
- Functions: CURRENT_DATE, DATE_DIFF, DATE_TRUNC, FORMAT_DATE

10

Case Study

- Real-world dataset
- Tasks involving joins, window functions, aggregations, and date logic
- Students write and present analytical queries and insights

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PowerBI & Advanced Excel

01

Get or connect to data

- Identify and connect to data sources or a shared semantic model
- Change data source settings, including credentials and privacy levels
- Choose between Direct Query and Import
- Create and modify parameters

02

Profile and clean the data

- Evaluate data, including data statistics and column properties
- Resolve inconsistencies, unexpected or null values, and data quality issues
- Resolve data import errors

03

Transform and load the data

- Select appropriate column data types
- Create and transform columns
- Group and aggregate rows
- Pivot, unpivot, and transpose data
- Convert semi-structured data to a table
- Create fact tables and dimension tables
- Identify when to use reference or duplicate queries and the resulting impact
- Merge and append queries
- Identify and create appropriate keys for relationships
- Configure data loading for queries

04

Design and implement a data model

- Configure table and column properties
- Implement role-playing dimensions
- Define a relationship's cardinality and cross-filter direction
- Create a common date table
- Identify use cases for calculated columns and calculated tables

05

Create single aggregation measures

- Use the CALCULATE function
- Implement time intelligence measures
- Use basic statistical functions
- Create semi-additive measures
- Create a measure by using quick measures
- Create calculated tables or columns
- Create calculation groups

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PowerBI & Advanced Excel

06

07

08

09

10

Optimize model performance

- Improve performance by identifying and removing unnecessary rows and columns
- Identify poorly performing measures, relationships, and visuals by using Performance Analyzer and DAX query view
- Improve performance by reducing granularity

Create reports

- Select an appropriate visual
- Format and configure visuals
- Apply and customize a theme
- Apply conditional formatting
- Apply slicing and filtering
- Configure the report page
- Choose when to use a paginated report
- Create visual calculations by using DAX
-

Enhance reports for usability and storytelling

- Configure bookmarks
- Create custom tooltips
- Edit and configure interactions between visuals
- Configure navigation for a report
- Apply sorting to visuals
- Configure sync slicers
- Group and layer visuals by using the Selection pane
- Configure drill through navigation
- Configure export settings
- Design reports for mobile devices
- Enable personalized visuals in a report
- Design and configure Power BI reports for accessibility
- Configure automatic page refresh

Identify patterns and trends

- Use the Analyze feature in Power BI
- Use grouping, binning, and clustering
- Use AI visuals
- Use reference lines, error bars, and forecasting
- Detect outliers and anomalies

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PowerBI & Advanced Excel

11

Data Gateways

- Introduction to Data Gateways
- How Data Gateways work
- Connect to an on premise Data Source by using a Data Gateway
- Download Data Gateway
- Installing a Data Gateway
- Manage Data Gateway
- Add and Remove Administrators
- Add Data Source, Add or Remove Users to a Data Source
- Refresh On Premise Data
- Configuring Automatic Refresh using Schedules

12

Create and manage workspaces and assets

- Create and configure a workspace
- Configure and update a workspace app
- Publish, import, or update items in a workspace
- Create dashboards
- Choose a distribution method
- Configure subscriptions and data alerts
- Promote or certify Power BI content
- Identify when a gateway is required
- Configure a semantic model scheduled refresh

13

Secure and govern Power BI items

- Assign workspace roles
- Configure item-level access
- Configure access to semantic models
- Implement row-level security roles
- Configure row-level security group membership
- Apply sensitivity labels

14

Introduction to Advanced Excel

- Navigating the Excel interface (cells, ranges, ribbons, sheets)
- Data types: text, numbers, dates
- Absolute vs. relative references
- Basic formulas: SUM, AVERAGE, COUNT, MIN, MAX
- Logical formulas: IF, AND, OR, IFERROR
- Lookup functions:
- VLOOKUP / HLOOKUP
- XLOOKUP

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PowerBI & Advanced Excel

15

Dynamic Arrays and Pivot table

- What are dynamic arrays?
- SEQUENCE, SORT, SORTBY, FILTER, UNIQUE
- Creating Pivot Tables and Pivot Charts
- Row, Column, Values, and Filter areas
- Grouping data (dates, numbers)
- Calculated fields in PivotTables
- Slicers for filtering

16

Statistical Functions and Macros

- Descriptive stats: MEDIAN, MODE
- Percentile analysis: PERCENTILE, QUARTILE, RANK
- Correlation: CORREL

17

Project

Syllabus

Tableau

01

Connect to data sources

- Identify data source
- Determine live connection vs. extract
- Connect to extracts
- Connect to files
- Connect to relational databases
- Connect to published data sources from a Tableau Server or Tableau Cloud site
- Replace the connected data source with another data source for an existing chart or sheet

02

Prepare data for analysis

- Assess data quality (completeness, consistency, accuracy)
- Perform cleaning operations
- Organize data fields into folders
- Use multiple data sources (establish relationships, create joins, union tables)
- Prepare data by using Data Interpreter, pivot, and split
- Create extract and data source filters

03

Customize fields

- Change default field properties (types, sorting, etc.)
- Rename columns
- Choose when to convert between discrete and continuous
- Choose when to convert between dimension and measure
- Create aliases

04

Create calculated fields

- Write date calculations
- Write string functions
- Write logical and Boolean expressions
- Write number functions
- Write type conversion functions
- Write aggregate functions
- Write basic spatial calculations

05

Create table calculations

- Moving average and window average
- Percent of total
- Running total
- Difference and percent of difference
- Percentile
- Index
- Ranking
- Apply quick table calculations
- Customize table calculations

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Tableau

06

Create and use filters

- Apply filters to dimensions and measures
- Configure filter settings including Top N, Bottom N, include, exclude, wildcard, and conditional
- Add filters to context
- Apply filters to multiple sheets and data sources

07

Create parameters to enable interactivity

- In calculations
- With filters
- With reference lines
- Set parameters to dynamically refresh

08

Structure the data

- Sets
- Bins
- Hierarchies
- Groups

09

Map data geographically

- Create symbol maps
- Create density maps
- Create choropleth maps (filled maps)
- Create mark layers

10

Summarize, model, and customize data by using the Analytics pane

- Totals and subtotals
- Reference lines
- Reference bands
- Average lines
- Trend lines
- Distribution bands
- Forecast by using default settings
- Customize a data forecasting model

11

Create Level of Detail (LOD) calculations

- Write FIXED LOD calculations
- Write INCLUDE LOD calculations
- Write EXCLUDE LOD calculations
- Write nested LOD calculations

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Tableau

12

Create charts

- Create basic charts from scratch (bar, line, pie, highlight table, scatter plot, histogram, tree map, bubbles, data tables, Gantt, box plots, area, dual axis, combo)
- Sort data (including custom sort)

13

Create dashboards and stories

- Combine sheets into a dashboard by using containers and layout options
- Add objects (containers, images, text)
- Create stories using story points

14

Add interactivity to dashboards

- Use filter in a dashboard
- Add filter, URL, and highlight actions
- Create interactivity using dynamic zone visibility
- Add navigation buttons
- Create interactivity using set and parameter actions
- Create show/hide buttons for dashboard objects

15

Format workbooks, worksheets, and dashboards

- Apply color, font, shapes, styling
- Add custom shapes and color palettes
- Add annotations
- Customize tooltips
- Apply padding
- Format gridlines, row-level and column-level bands, and shading
- Create a responsive design for specific device layouts

16

Publish Content

- Publish a workbook
- Publish a data source from Desktop or Prep
- Export content
- Publish a flow

17

Schedule data updates

- Schedule data extract refreshes

18

Manage published workbooks

- Create alerts
- Create subscriptions
- Create and save custom views
- Understand user roles and permissions
- Customize and distribute a published workbook