VEGAAHI
IT PVT LTD

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Power BI

tableau SOFTWARE

X Excel

Data Analysis
Course Curriculum

Duration: 3 Months

Module 1 : Python Programming

Python Introduction and Setting Up the Environment

- ✓ Introduction to programming
- ✓ R or Python?
- ✓ Why Python for Data Science?
- ✓ Different job roles with Python
- ✓ Different Python IDEs
- ✓ Downloading and setting up the Python environment

Hands-On - Installing Python - IDLE

Python Basic Syntax and Data Types

- ☑ Python input and output operations.
- ☑ Comments
- ☑ Variables, rules for naming variables
- ☑ Basic Data Types in Python
- ☑ Typecasting in python

Hands-On - Using comments, variables,data types, and typecasting in python program

Operators in Python

- ☑ Arithmetic operators
- ☑ Assignment operators
- ☑ Comparison operators
- ☑ Logical operators
- ☑ Identity operators
- ☑ Membership Operators
- ☑ Bitwise Operators

Hands-On - Working with different data types in a program

Strings in Python

- ☑ Creating strings
- ☑ String formatting
- ☑ Indexing
- ☑ Slicing
- ☑ String methods

Hands-On - Performing string operations

Lists

- ☑ Creating lists
- ☑ Properties of lists
- ☑ List indexing
- ☑ List slicing
- ☑ List of lists
- ☑ List Methods
- ☑ Adding, Updating & removing elements from lists

Hands-On - Slicing, Indexing, and using methods on lists

Tuples

- ☑ Syntax to create tuples
- ☑ Tuple properties
- ☑ Indexing on tuples
- ☑ Slicing on tuples
- ☑ Tuple methods

Hands-On - Working with Tuples

Sets

- ☑ The syntax for creating sets
- ☑ Updating sets
- ☑ Set operations and methods
- ☑ Difference between sets, lists, and tuples

Hands-On - Performing set operations in a program

Dictionaries

- ☑ The syntax for creating Dictionaries
- ☑ Storing data in dictionaries
- ☑ Dictionaries keys and values
- ☑ Accessing the elements of dictionaries
- ☑ Dictionary methods

Hands-On - Creating dictionaries and using dictionaries methods

Python Conditional Statements

- ☑ Setting logic with conditional statements
- ☑ If statements
- ☑ If -else statements
- ☑ If-elif-else statements

Hands-On - Setting logic in programs using conditional statements

[] Loops in Python

- ☑ Iterating with python loops
- ☑ while loop
- ☑ for loop
- ☑ range
- ☑ break
- ☑ continue
- ☑ pass
- ☑ enumerate
- ☑ zip
- ☑ assert

Hands-On - Iterating with loops in python

Getting Started with HackerRank use cases and working on them

- ☑ Solving Level by Level Challenges
- ☑ Assignments to acquire Bronze and Silver Level badges

{} List and Dictionaries comprehension

- ☑ Why List comprehension
- ☑ The syntax for list comprehension
- ☑ The syntax for dict comprehension

Hands-On - Using List and Dictionary comprehension

[] Functions

☑ What are Functions	☑ Modularity and code reusability
☑ Creating functions	☑ Calling functions
☑ Passing Arguments	☑ Positional Arguments
☑ Keyword Arguments	☑ Variable-length arguments (*args)
☑ Variable Keyword length arguments (**kargs)	☑ Return keyword in python
☑ Passing function as an argument	☑ Passing function in return
☑ Global and local variables	☑ Recursion

Anonymous Functions

- ☑ Lambda
- ☑ Lambda with filter
- ☑ Lambda with map
- ☑ Lambda with reduce

Hands-On - Working with lambda, filter, map, and reduce in python

Generators

- ☑ Creating and using generators

Hands-On - Creating and using generators

Modules

- ☑ Creating modules
- ☑ Importing functions from a different module
- ☑ Importing Variables from different modules
- ☑ Python built-in modules

Hands-On - Creating and importing Modules

Exceptions and Error handling

- ☑ Syntax errors
- ☑ Logical errors
- ☑ Handling errors using try, except and finally

Hands-On - Handling Errors with try and except

Classes and Objects (OOPS)

- ☑ Creating classes & Objects
- ☑ Understanding __init__ constructor method
- ☑ Different types of methods
- ☑ Class methods
- ☑ Inheritance
- ☑ Overriding parent methods
- ☑ Understanding Types of inheritance
- ☑ Multiple Inheritance
- ☑ Polymorphism
- ☑ Attributes and methods
- ☑ Class and instance attributes
- ☑ Instance methods
- ☑ Static methods
- ☑ Creating child and parent class
- ☑ The super() function
- ☑ Single inheritance
- ☑ Multilevel Inheritance
- ☑ Operator overloading

Hands-On - Creating classes, objects. Creating methods and attributes. Working with different methods. Using inheritance and polymorphism.

Date and Time

- ☑ time module
- ☑ datetime module
- ☑ time delta
- ☑ formatting date and time
- ☑ strftime()
- ☑ strptime()

Hands-On - working with date and time

Regex

- ☑ Understanding the use of regex
- ☑ re.search()
- ☑ re.compile()
- ☑ re.find()
- ☑ re.split()
- ☑ re.sub()
- ☑ Meta characters and their use

Hands-On - Using regular expression to search patterns

Files

- ☑ Opening file
- ☑ Opening different file types
- ☑ Read,write,close files
- ☑ Opening files in different modes

Hands-On - Reading, Writing, Appending, opening, and closing files.

APIs the Unsung Hero of the Connected World

- ☑ Introduction to APIs
- ☑ Accessing Public APIs

Hands-On – Accessing Public Weather APIs and People in Space API

Python for Web Development - Flask

- ☑ Introduction to Python Web Framework Flask
- ☑ Installing Flask
- ☑ Working on GET, POST, PUT, METHODS using Python Flask Framework
- ☑ Working on Templates, render_template function

Hands-On Projects

- ☑ Web Scraping- Dynamic Website with multiple pages along with Data Analysis
- ☑ Sending Automated Emails
- ☑ Building a Virtual Assistant with Frontend Interface

Module 2 : Data Analysis

Packages

- ☑ Creating packages
- ☑ Importing modules from the package
- ☑ Different ways of importing modules and packages
- ☑ Working on Numpy, Pandas, and Matplotlib

Hands-On - Creating and importing

</> Web Scraping

- ☑ Introduction to web scraping: Tools, libraries, and ethical considerations
- ☑ Scraping data from websites using libraries like BeautifulSoup and requests: HTML parsing, locating elements, and extracting data
- ☑ Handling different types of data on websites: Tables, forms, etc.
- ☑ Storing scraped data in appropriate formats: CSV, JSON, or databases

Hands-On - Working on Scraping Data from Static Dynamic Websites

⚙ Exploratory data analysis (EDA) using Pandas and NumPy

- ☑ Introduction to Pandas, a Python library for data manipulation and analysis.
- ☑ Overview of NumPy, a fundamental package for scientific computing with Python.
- ☑ Explanation of key data structures in Pandas: Series and DataFrame.
- ☑ Hands-on exploration of data using Pandas to summarize, filter, and transform data.
- ☑ Data cleaning techniques, handling missing values, and dealing with outliers.
- ☑ Statistical analysis of data using NumPy functions

{ } Data Visualization using Matplotlib, Seaborn, and Plotly

- ☑ Introduction to data visualization and its importance in data analysis.
- ☑ Overview of Matplotlib, a popular plotting library in Python.
- ☑ Exploring different types of plots: line plots, scatter plots, bar plots, histogram, etc.
- ☑ Customizing plots with labels, titles, colors, and styles.
- ☑ Introduction to Seaborn, a Python data visualization library based on Matplotlib.
- ☑ Advanced plotting techniques with Seaborn: heatmaps, pair plots, and categorical plots.
- ☑ Introduction to Plotly, an interactive plotting library for creating web-based visualizations.
- ☑ Creating interactive and dynamic visualizations with Plotly.

Hands-on: Instagram Reach Analysis

Database Access

- ☑ Introduction to databases.
- ☑ Why SQL?
- ☑ Execution of an SQL statement.
- ☑ Installing MySQL
- ☑ Load data.
- ☑ Use, Describe, Show table.
- ☑ Select.
- ☑ Limit, Offset.
- ☑ Order By.
- ☑ Distinct.
- ☑ Where, Comparison Operators, NULL.
- ☑ Logic Operators.
- ☑ Aggregate Functions: COUNT, MIN, MAX, AVG, SUM.
- ☑ Group By.
- ☑ Having.
- ☑ Order of Keywords.
- ☑ Join and Natural Join.
- ☑ Inner, Left, Right, and Outer Joins.
- ☑ Sub Queries/Nested Queries/Inner Queries.
- ☑ DML: INSERT
- ☑ DML: UPDATE, DELETE
- ☑ DML: CREATE,TABLE
- ☑ DDL: ALTER, ADD, MODIFY, DROP
- ☑ DDL: DROP TABLE, TRUNCATE, DELETE
- ☑ Data Control Language: GRANT, REVOKE

Hands-on - Working on SQL Queries

MS Excel

- ✔ Excel Introduction
- ✔ Workbook Window
- ✔ Create & Open Workbooks
- ✔ MS Excel Online
- ✔ Excel vs Google Sheets
- ✔ Office Button
- ✔ Ribbon and Tabs
- ✔ Features of Tabs
- ✔ Quick Access Toolbar
- ✔ Mini Toolbar
- ✔ Title, Help, Zoom, View

Excel Worksheet

- ✔ Worksheet, Row, Column
- ✔ Moving on Worksheet
- ✔ Enter Data
- ✔ Select Data
- ✔ Delete Data
- ✔ Move Data
- ✔ Copy Paste Data
- ✔ Spell Check
- ✔ Insert Symbols

Excel Calculation

- ✔ Addition
- ✔ Sigma Addition
- ✔ Subtraction
- ✔ Calculate Average
- ✔ Sigma Average

[] Excel Fill Handle

- [x] Fill Handle
- [x] Fill Handle with Text
- [x] Text with Numbers
- [x] Fill Handle with Dates

{◯} Excel Formula

- [x] Create Formula open link
- [x] Fill Handle in Formula
- [x] Relative Referencing
- [x] Absolute Referencing
- [x] Instruction for Typing

{} Quick Excel Functions

- [x] Excel IF
- [x] If Function
- [x] If with Calculations
- [x] Excel COUNTIF
- [x] Advanced If
- [x] WHAT IF Analysis

{◯} Excel Charts and visualizations

- [x] Introduction to Excel Charts
- [x] Dynamic Advanced Charts
- [x] Pivot Table with Dashboard
- [x] Advanced Pivot Table Tips & Tricks

</> Excel Advanced

- [x] Excel Macros
- [x] Excel sumif
- [x] Excel vlookup
- [x] Excel ISNA
- [x] Find & Remove Duplicates
- [x] Create drop-down List
- [x] Merge cells in Excel

Tableau

- ✅ Building bar charts and line charts
- ✅ Creating pie charts and scatter plots
- ✅ Designing basic maps and geographic visualizations
- ✅ Using filters to subset data
- ✅ Sorting data by different criteria
- ✅ Applying quick filters for interactive exploration
- ✅ Adding labels, tooltips, and colors to visualizations
- ✅ Formatting axes and gridlines
- ✅ Customizing visual elements for better presentation
- ✅ Combining multiple visualizations into a dashboard
- ✅ Adding interactivity with filters and actions
- ✅ Arranging and organizing dashboard elements
- ✅ Publishing dashboards to Tableau Public or Tableau Server
- ✅ Embedding dashboards in websites or presentations
- ✅ Presenting and sharing dashboards effectively

Power BI

- ✅ Overview of Power BI and its features
- ✅ Understanding the Power BI interface
- ✅ Connecting to data sources
- ✅ Importing and transforming data
- ✅ Creating bar charts and line charts
- ✅ Designing pie charts and scatter plots
- ✅ Building basic tables and matrices
- ✅ Using filters and slicers to subset data
- ✅ Adding interactivity to visualizations
- ✅ Sorting and formatting data
- ✅ Building interactive dashboards with multiple visualizations
- ✅ Adding filters and slicers for user interactivity
- ✅ Formatting and organizing dashboard elements
- ✅ Publishing reports to the Power BI Service
- ✅ Sharing reports and dashboards with others
- ✅ Configuring security and access controls

Hands-on: Instagram Reach Analysis