



Data Analytics Using Python



About Course

In the Data Analysis with Python Certification, you'll learn the fundamentals of data analysis with Python. By the end of this certification, you'll know how to read data from sources like CSVs and SQL, and how to use libraries like Numpy, Pandas, Matplotlib, and Seaborn to process and visualize data.

DATA ANALYTICS USING PYTHON

CURRICULUM

1

Python

Introduction To Python

Why Python

Application areas of python

Python implementations

Cpython

Jython

Ironpython

Pypy

Python versions

Installing python

Python interpreter architecture

Python byte code compiler

Python virtual machine(pvm)

2

Writing and Executing First Python Program

Using interactive mode

Using script mode

General text editor and command window

Idle editor and idle shell
Understanding print() function
How to compile python program explicitly

3 Python Language Fundamentals

Character set
Keywords
Comments
Variables
Literals
Operators
Reading input from console
Parsing string to int, float

4 Python Conditional Statements

If statement
If else statement
If elif statement
If elif else statement
Nested if statement

5 Looping Statements

While loop

For loop
Nested loops
Pass, break and continue keywords

6 Standard Data Types

Int, float, complex, bool, nonetype
Str, list, tuple, range
Dict, set, frozenset

7 String Handling

What is string
String representations
Unicode string
String functions, methods
String indexing and slicing
String formatting

8 Python List

Creating and accessing lists
Indexing and slicing lists
List methods
Nested lists
List comprehension

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Python Tuple

Creating tuple

Accessing tuple

Immutability of tuple

10

Python Set

How to create a set

Iteration over sets

Python set methods

Python frozenset

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Python Dictionary

Creating a dictionary

Dictionary methods

Accessing values from dictionary

Updating dictionary

Iterating dictionary

Dictionary comprehension

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Python Functions

Defining a function

Calling a function

Types of functions
Function arguments
Positional arguments, keyword arguments
Default arguments, non-default arguments
Arbitrary arguments, keyword arbitrary arguments
Function return statement
Nested function
Function as argument
Function as return statement
Decorator function
Closure
Map(), filter(), reduce(), any() functions
Anonymous or lambda function

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Modules & Packages

Why modules
Script v/s module
Importing module
Standard v/s third party modules
Why packages
Understanding pip utility

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File I/O

Introduction to file handling

File modes

Functions and methods related to file handling

Understanding with block

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SQL Regular Expressions(Regex)

Need of regular expressions

Re module

Functions /methods related to regex

Meta characters & special sequences

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Introduction to Database

Database Concepts

What is Database Package?

Understanding Data Storage

Relational Database (RDBMS) Concept

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SQL

iSQL basics

DML, DDL & DQL

DDL: create, alter, drop

SQL constraints:

Not null, unique,

Primary & foreign key, composite key

Check, default

DML: insert, update, delete and merge

DQL : select

Select distinct

SQL where

SQL operators

SQL like

SQL order by

SQL aliases

SQL views

SQL joins

Inner join

Left (outer) join

Right (outer) join

Full (outer) join

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SQL (Structured Query Language)

Mysql functions

String functions

Char_length

Concat

Lower

Reverse

Upper

Numeric functions

Max, min, sum
Avg, count, abs
Date functions
Curdate
Curtime
Now

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Numpy Package

Difference between list and numpy array
Vector and matrix operations
Array indexing and slicing

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Introduction to pandas

Labeled and structured data
Series and dataframe objects

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Pandas Package

How to load datasets
From excel
From csv
From html table

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Accessing data from Data Frame

`at & iat`
`loc & iloc`
`head() & tail()`

23 Exploratory Data Analysis (EDA)

`describe()`
`groupby()`
`crosstab()`
`boolean slicing / query()`

24 Data Manipulation & Cleaning

`Map(), apply()`
Combining data frames
Adding/removing rows & columns
Sorting data
Handling missing values
Handling duplication
Handling data error

25 Data Visualization using matplotlib and seaborn packages

IScatter plot, lineplot, bar plot
Histogram, pie chart,

**Jointplot, pairplot, heatmap
Outlier detection using boxplot**

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Array:

**Dynamic Array, Array Function, Month Names,
Size of an Array**

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Function and Sub:

**User Defined Function, Custom Average Function,
Volatile Functions, ByRef and ByVal.**

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Application Object:

**Status Bar, Read Data from Text File, Write
Data to Text File.**

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ActiveX Controls:

**Text Box, List Box, Combo Box, Check Box, Option
Buttons, Spin Button, Loan Calculator**

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User form:

**User form and Ranges, Currency Converter,
Progress Indicator, Multiple List Box Selections,
Multicolumn Combo Box, Dependent Combo Boxes,
Loop through Controls, Controls Collection,**

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Tableau

- Tableau - Home
- Tableau - overview
- Tableau - environment setup
- Tableau - get started
- Tableau - navigation
- Tableau - design flow
- Tableau - file types
- Tableau - data types
- Tableau - show me
- Tableau - data terminology

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Tableau - Data Sources

- Tableau - custom data view
- Tableau - data sources
- Tableau - extracting data
- Tableau - fields operations
- Tableau - editing metadata
- Tableau - data joining
- Tableau - data blending

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Tableau – Work Sheet

- Tableau - add worksheets
- Tableau - rename worksheet

Tableau - save & delete worksheet
Tableau - reorder worksheet
Tableau - paged workbook

34 Tableau - Calculation

Tableau - operators
Tableau - functions
Tableau - numeric calculations
Tableau - string calculations
Tableau - date calculations
Tableau - table calculations
Tableau - lod expressions

35 Tableau - Sorting & Filter

Tableau - basic sorting
Tableau - basic filters
Tableau - quick filters
Tableau - context filters
Tableau - condition filters
Tableau - top filters
Tableau - filter operations

36 Tableau - Charts

Tableau - bar chart

Tableau - line chart
Tableau - pie chart
Tableau - crosstab
Tableau - scatter plot
Tableau - bubble chart
Tableau - bullet graph
Tableau - box plot
Tableau - tree map
Tableau - bump chart
Tableau - gantt chart
Tableau - histogram
Tableau - motion charts
Tableau - waterfall charts
Tableau - dashboard

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Projects

One project using python & sql
One dashboard using tableau

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Data Analysis – Visualization using Python

Introduction exploratory data analysis
Descriptive statistics, Frequency Tables, and summarization
Univariate Analysis (Distribution of data & Graphical Analysis)

Bivariate Analysis(Cross Tabs, Distributions & Relationships, Graphical Analysis)
Creating Graphs- Bar/pie/line chart/histogram / boxplot/ scatter/ density etc)
Important Packages for Exploratory Analysis (NumPy Arrays, Matplotlib, seaborn, Pandas etc)

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Importing and Exporting Data using Pandas

Importing Data from various sources (CSV, txt, excel, access, etc)

Database Input (Connecting to the database)

Viewing Data objects – subsetting, methods

Exporting Data to various formats

Important python functions: Pandas

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Statistics Essential for Data Analytics

Introduction

Sample or Population Data?

The Fundamentals of Descriptive Statistics

Measures of Central Tendency, Asymmetry, and Variability

Practical Example: Descriptive Statistics

Distributions

Estimators and Estimates

Confidence Intervals: Advanced Topics

Practical Example: Inferential Statistics
Hypothesis Testing: Introduction
Hypothesis Testing: Let's Start Testing!
Practical Example: Hypothesis Testing
The Fundamentals of Regression Analysis
Subtleties of Regression Analysis
Assumptions for Linear Regression Analysis
Dealing with Categorical Data
Practical Example: Regression Analysis

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Data Analytics with Python

Course Introduction
Data Analytics Overview
Statistical Computing
Mathematical Computing Using NumPy
Data Manipulation with Pandas
Data visualization with Python
Intro to Model Building

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R Programming for Data Science

R Basics
Data Structures in R
R Programming Fundamentals
Working with Data in R
Strings and Dates in R

Data Analyst Capstone



www.softcrayons.com



(+91) 854 501 2345



@softcrayons



info@softcrayons.com



693, Sector 14-A, Vasundhara,
Ghaziabad (U.P.), 201012