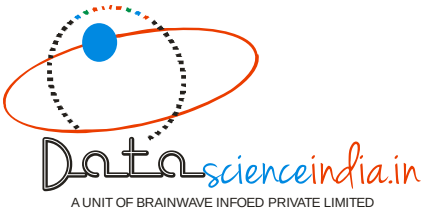
Python
for
Data Science



BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in

Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

Python Training

Python is a high level language, which is widely used for general purpose programming as it integrates with your systems more effectively. It runs on all the operating systems like Windows, Linux/Unix, and Mac OS etc. It has also been ported to the .NET and Java virtual machines. As it has an open source license, it is free to use even for commercial products. With the use of Python, programmers can program a particular function in lesser lines of codes as compared to other programming languages. Also, it enhances the readability of the code. It helps to programs both large scale and small scale programs easily and compactly.

Python supports different programming paradigms like object oriented, functional, procedural and imperative styles. It boasts of an automatic memory management and dynamic type of system. Its vast and comprehensive library lets programmers to develop any program easily. It is widely used as a scripting language but can also be used in large non scripting programs.

Why Python?

Python is an extremely popular language nowadays. Thus, to survive in this corporate world, it is important to keep oneself updated with new languages which widely aid in high level programming. It is very easy for expert programmers to pick up Python. Also, fresh programmers can easily learn python as it is:

- **Easy to learn**
- **Code is simple to write and read**
- **Modular code, thus easy to understand.**

BENEFITS OF ATTENDANCE:

Upon completion of this course, students will be able to:

- Execute Python code in a variety of environments
- Use correct Python syntax in Python programs
- Use the correct Python control flow construct
- Write Python programs using various collection data types
- Use many of the standard Python modules such as os, sys, math, and time
- Trap various errors via the Python Exception Handling model
- Use the IO model in Python to read and write disk files
- Create their own classes and use existing Python classs
- Understand and use the Object Oriented paradigm in Python programs
- Use the Python Regular Expression capabilities for data verification

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

PART-A

COURSE CONTENTS

Python Introduction

History of Python

Features of Python

Python Versions

Obtaining Python

Python versus R

Installing Python

Linux Installation
Windows Installation

Setting up PATH

Environment Variables
Choosing An Editor

Running Python

Interactive Interpreter:
Executing Python from the Command Line
Integrated Development Environment

First Python Program

INTERACTIVE MODE PROGRAMMING
SCRIPT MODE PROGRAMMING

Python Identifiers

Reserved Words

Lines and Indentation

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

Multi-Line Statements

Quotation in Python

Comments in Python

Command-Line Arguments

Python Variable Types

Naming Conventions

Standard Data Types

- **Numbers**
- **String**
- **List**
- **Tuple**
- **Dictionary**

Python Operators

Python Operators Precedence

Conditionals and Loops

- if statement else Statement
- elif (a.k.a. else-if)Statement
- while Statement
- for Statement
- break Statement
- continue Statement
- pass Statement
- else Statement…

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

String Manipulation

- Accessing Strings
- Basic Operations
- String slices
- Function and Methods

Lists

- Introduction
- Accessing list
- Operations
- Working with lists
- Function and Methods

Tuple

- Introduction
- Accessing tuples
- Operations
- Working
- Functions and Methods

Dictionaries

- Introduction
- Accessing values in dictionaries
- Working with dictionaries
- Properties
- Functions

Functions

- Defining a function
- Calling a function
- Types of functions
- Function Arguments
- Anonymous functions
- Global and local variables

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

Modules

Importing module

Creating module

Math module
Random module
Packages
Composition

Input-Output

Printing on screen
Reading data from keyboard
Opening and closing file
Reading and writing files
Functions

Exception Handling

Exception
Exception Handling
Except clause
try ? finally clause
User Defined Exceptions

GUI Programming

Introduction
Tkinter programming
Tkinter widgets

OOPs concept

Class and object
Attributes
Inheritance
Overloading
Overriding
Data hiding

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

Regular expressions

- Match function
- Search function
- Matching VS Searching
- Modifiers
- Patterns

Database

- Introduction
- Connections
- Executing queries
- Transactions
- Handling error

Python Standard Library

PART-B

Data Science

"Data science is a multifaceted discipline, which encompasses machine learning and other analytic processes, statistics and related branches of mathematics, increasingly borrows from high performance scientific computing, all in order to ultimately extract insight from data and use this new-found information to tell stories"

Data science, also known as **data-driven science**, is an interdisciplinary field about scientific methods, processes and systems to extract knowledge or insights from data in various forms, either structured or unstructured, similar to Knowledge Discovery in Databases .

Data science is a "concept to unify statistics, data analysis and their related methods" in order to "understand and analyze actual phenomena" with data. It employs techniques and theories drawn from many fields within the broad areas of mathematics, statistics, information science, and computer science, in particular from the subdomains of machine learning, classification, cluster analysis, data mining, databases, and visualization.

Libraries for Data Science

NumPy

Numerical Python code name: - NumPy, is a Python library for numerical calculations and scientific computations. NumPy provides numerous features which can be used by Python enthusiasts and programmers to work with high-performing arrays and matrices. NumPy arrays provide vectorization of mathematical operations, which gives it a performance boost over Python's looping constructs.pandas Series and DataFrame objects rely primarily on NumPy arrays for all the mathematical calculations like slicing elements and performing vector operations.

SciPy

Scientific Python code name, SciPy-It is an assortment of mathematical functions and algorithms which are built on top of Python's extension **NumPy. SciPy** provides various high-level commands and classes for manipulating and visualizing data. SciPy is useful for data-processing and prototyping of systems. SciPy contains modules for optimization, linear algebra, integration, interpolation, special functions, FFT, signal and image processing and other tasks common in science and engineering. SciPy provides other advantages for building scientific applications and many specialized sophisticated applications that are backed by powerful and fast growing Python community.

Matplotlib

This open source project was developed to handle different types of data generated from multiple sources in the epilepsy. matplotlib is a 2D graphical Python library. However, it also supports 3D graphics. With increasing demand for Python in many folds in the recent years, growth of matplotlib has given tough competition to giants like **MATLAB** and **Mathematica.**

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in
Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com

Pandas

Pandas is a library written for the Python programming language for data manipulation and analysis. In particular, it offers data structures and operations for manipulating numerical tables and time series. Pandas Python is one of those libraries for data analysis, that contains high-level data structures and tools to help data scientists or data analysts manipulate data in a very simple and easy way. **Pandas** adds data structures and tools that are designed for practical data analysis in finance, statistics, social sciences, and engineering. Pandas works well with incomplete, messy, and unlabeled data and provides tools for shaping, merging, reshaping, and slicing datasets.

NLTK

NLTK is a set of libraries designed for **Natural Language Processing (NLP).** NLTK's basic functions allow you to tag text, identify named entities, and display parse trees, which are like sentence diagrams that reveal parts of speech and dependencies.

Overviw of Machine Learning

Participants in this course will take away:

Data science has become the central approach to tackling data-heavy problems in both business and academia. In this course, students learn how data science is done in the wild, with a focus on data acquisition, cleaning, and aggregation, exploratory data analysis and visualization, feature engineering, and model creation and validation. Students use the Python scientific stack to work through real-world examples that illustrate these concepts. Concurrently, students learn some of the statistical and mathematical foundations that power the data-scientific approach to problem solving.

- Hands-on experience setting up an integrated analysis environment for doing data science with Python.
- An understanding of how to use the Python standard library to write programs, access the various data science tools, and document and automate analytic processes.
- Orientation to some of the most powerful and popular Python libraries for data science including Pandas (data preparation, analysis, and modeling;

time series analysis), scipy.stats (statistics) and Matplotlib(data visualization).

- **Working knowledge of the Python tools ideally suited for data science tasks, including:**
  - **Accessing data (e.g., text files, databases)**
  - **Cleansing and normalizing data**
  - **Exploring data (e.g., simple statistics, correlation matrices, visualization)**
  - **Modeling data**
- **Learn practically through over case studies**
- **We will award you with a certificate after working on real-world projects post the course.**

Learning Methodology:

It is totally practical based on projects from the highly expert trainers.

Career Options:

After completion of the advanced Python course you may get a quick pick from the industry as Python has a great scope and opportunities.

- **Assignment/Notes**
- **Projects**
- **Online/Offline Test**

Datascienceindia.in
A UNIT OF BRAINWAVE INFOED PRIVATE LIMITED

BRAINWAVE
INFOED PRIVATE LIMITED
www.brainwaveindia.in

Address: 28, New Trimurty Complex, Hiran Magri, Sector-4, Udaipur-313002, Rajasthan
Phone No: 0294 2464395, Mobile:+91 9828919909,Email: brainwaveudaipur@gmail.com