

Splufic Python Training

Welcome to the instructor-led Training for week one day one

Our Aim

- Teach learners to design, develop and test software components and systems in a workplace environment, working as a team member, while contributing to the workflow for the finished product and leading to employment in a range of sectors.

What is Python?

Python is a very versatile programming language. In this Python training course, you'll learn how to program in Python.

Python also has a rich library making it possible to build sophisticated applications using relatively simple-looking code. For these reasons, Python has become a popular application development language and also the preferred “first” programming language.

Main Features

- Python is a general-purpose language that was specifically designed to make programs very readable.
- Easy to code (read and write)
- Easy for code documentation
- It is free and open source
- It is an object oriented language
- It is a high level language
- Has support for Graphical User Interface GUI
- Developed in the late 1980s by Dutch programmer Guido van Rossum.

What Can Python Do?

- Web Development
- Scientific and Numeric Computing
- Function Decorators Allow Enhanced Functionality
- Machine Learning (ML)
- Embedded Systems Development
- Desktop Application Development
- Browser Web Application Automation

Learning Goals?

- write high-quality and efficient python code
- Understand how to write tests for your Python code
- apply for real-time programming positions
- solve 15+ real-world problems.
- make yourself marketable for entry-intermediate level programming positions
- contribute to open source projects
- Gain extensive knowledge of Git/Github

Contents (at a glance):

- Functions/Modules
- Arrays, Lists, Dictionaries and Sets
- Strings, Lists and Tuples
- Flow control
- File Input/Output
- exceptions handling
- Object Oriented Programming and Design (OOPD)
- Python Standard Library (time and date)
- Web Design (flask)
- GUI Development (tkinter)
- version control with Git/GitHub

What is computer Science?

- Computer science is the study of computation and information.
- Computation is any type of calculation that includes both arithmetic and non-arithmetic steps and which follows a well defined model
- Information is processed data

Application Areas Of Computer Science

Activity	Computer Application
Defense	Image processing software for target detection and tracking
Driving	GPS-based navigation software with traffic views on smartphones and dedicated navigation hardware
Education	Simulation software for performing dangerous or expensive biology laboratory experiments virtually
Farming	Satellite-based farm management software that keeps track of soil properties and computes crop forecasts
Films	3D computer graphics software for creating computer-generated imagery for movies
Media	On-demand, real-time video streaming of television shows, movies, and video clips
Medicine	Patient record management software to facilitate sharing between specialists
Physics	Computational grid systems for crunching data obtained from particle accelerators
Political activism	Social network technologies that enable real-time communication and information sharing
Shopping	Recommender system that suggests products that may be of interest to a shopper
Space exploration	Mars exploration rovers that analyze the soil to find evidence of water

Tools Used in Developing Applications

- Logic and Mathematics
- Computers
- Software, IDEs and Compilers
- Test editors: sublime text

Definition of Basic Terms

- Computational Thinking
- Model
- Algorithm
- Data

Computational Thinking

Computational thinking is a term used to describe the intellectual approach through which natural or artificial processes or tasks are understood and described as computational processes. This skill is probably the most important one you will develop in your training as a computer scientist.

Think like a computer!

Model

- In general, a model is an informative representation of an object, person or system.
- It contains data or information about itself or the environment that has an input, and an output
- In describing a model, there must be clear definition of its data in terms of
 - shape (1D, 2D or 3D),
 - size,

Data

- a piece of information.
- This information may be in the form of text documents, images, audio clips, software programs, or other types of data.
- It may also mean something given
- It has a type and it varies (variables)
- It has shape and size

Algorithm

- Is a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
- It determines the behaviour and operation of models
- We start the development of the algorithm by clearly specifying the input data (i.e., the information we start with) and the output data (i.e., the information we desire to obtain)

Data Types

- The data type refers to the range of values data (variables) can have (e.g., integer, non-integer number, sequence of characters, or list of other values) and also to the operations that can be performed on the data.

Python Syntax

- A set of rules which defines how a Python program will be written
- each line in a Python script is a statement
- It is case sensitive
- Comments Are Marked by #
- End-of-Line Terminates a Statement
- Use '\n' to write multiline statements
- Indentation: Whitespace Matters!
- To write two separate executable statements in a single line, you should use a semicolon ;

Error

- There is an error in a Python program is when a certain statement is not in accordance with the prescribed usage.

Syntax Error

- The most common reason of an error in a Python program is when a certain statement is not in accordance with the prescribed usage. Such an error is called a syntax error. The Python interpreter immediately reports it, usually along with the reason.

Semantic Error

- It is user generated
- It occurs when you make a mistake in the input data

Error Debugging

- It is the process of removing error from python programs

Questions?

Assignment

- Read about computer science at https://en.wikipedia.org/wiki/Computer_science
- Read chapters one and two of the course textbook