Sathya TECHNOLOGIES TM

Python Programming Language

Python is a widely used programming language that offers several unique features and advantages compared to languages like **Java** and **C++.**

What is Python

Python is a general-purpose, dynamically typed, high-level, compiled and interpreted, garbage-collected, and purely object-oriented programming language that supports procedural, object-oriented, and functional programming.

	Python	Java
Paradigm	Object-Oriented, Procedural, Functional	Object-Oriented, Concurrent, and Class-based
Ease of Development	Concise syntax, easier for rapid development	More verbose, can be perceived as complex
Performance	Generally Slower (interpreted)	Faster (compiled to bytecode)
Memory Management	Automatic Memory Management (Garbage Collection)	Manual Memory Management (Garbage Collection)
Platform Independence	Cross-platform	Write Once, Run Anywhere (WORA)
Use Case	Data Science, AI, Web Development	Enterprise Applications, Mobile

Python Features

- **Easy to use and Read** - Python's syntax is clear and easy to read, making it an ideal language for both beginners and experienced programmers. This simplicity can lead to faster development and reduce the chances of errors.
- **Dynamically Typed** - The data types of variables are determined during run-time. We do not need to specify the data type of a variable during writing codes.
- **High-level** - High-level language means human readable code.
- **Compiled and Interpreted** - Python code first gets compiled into bytecode, and then interpreted line by line.
- **Garbage Collected** - Memory allocation and de-allocation are automatically managed. Programmers do not specifically need to manage the memory.

Python Features

- **Purely Object-Oriented** - It refers to everything as an object, including numbers and strings.
- **Cross-platform Compatibility** - Python can be easily installed on Windows, macOS, and various Linux distributions, allowing developers to create software that runs across different operating systems.
- **Rich Standard Library** - Python comes with several standard libraries that provide ready-to-use modules and functions for various tasks, ranging from **web development** and **data manipulation** to **machine learning** and **networking**.
- **Open Source** - Python is an open-source, cost-free programming language. It is utilized in several sectors and disciplines as a result.

Python History and Versions

- In the late 1980s, Guido van Rossum dreamed of developing Python. Since its release, Python started gaining popularity. According to reports, Python is now the most popular programming language among developers because of its high demands in the tech realm.
- The implementation of Python was started in December 1989 by **Guido Van Rossum** at CWI in Netherland.
- In February 1991, **Guido Van Rossum** published the code (labeled version 0.9.0) to alt.sources.
- In 1994, Python 1.0 was released with new features like lambda, map, filter, and reduce.
- Python 2.0 added new features such as list comprehensions, garbage collection systems.
- On December 3, 2008, Python 3.0 (also called "Py3K") was released. It was designed to rectify the fundamental flaw of the language.

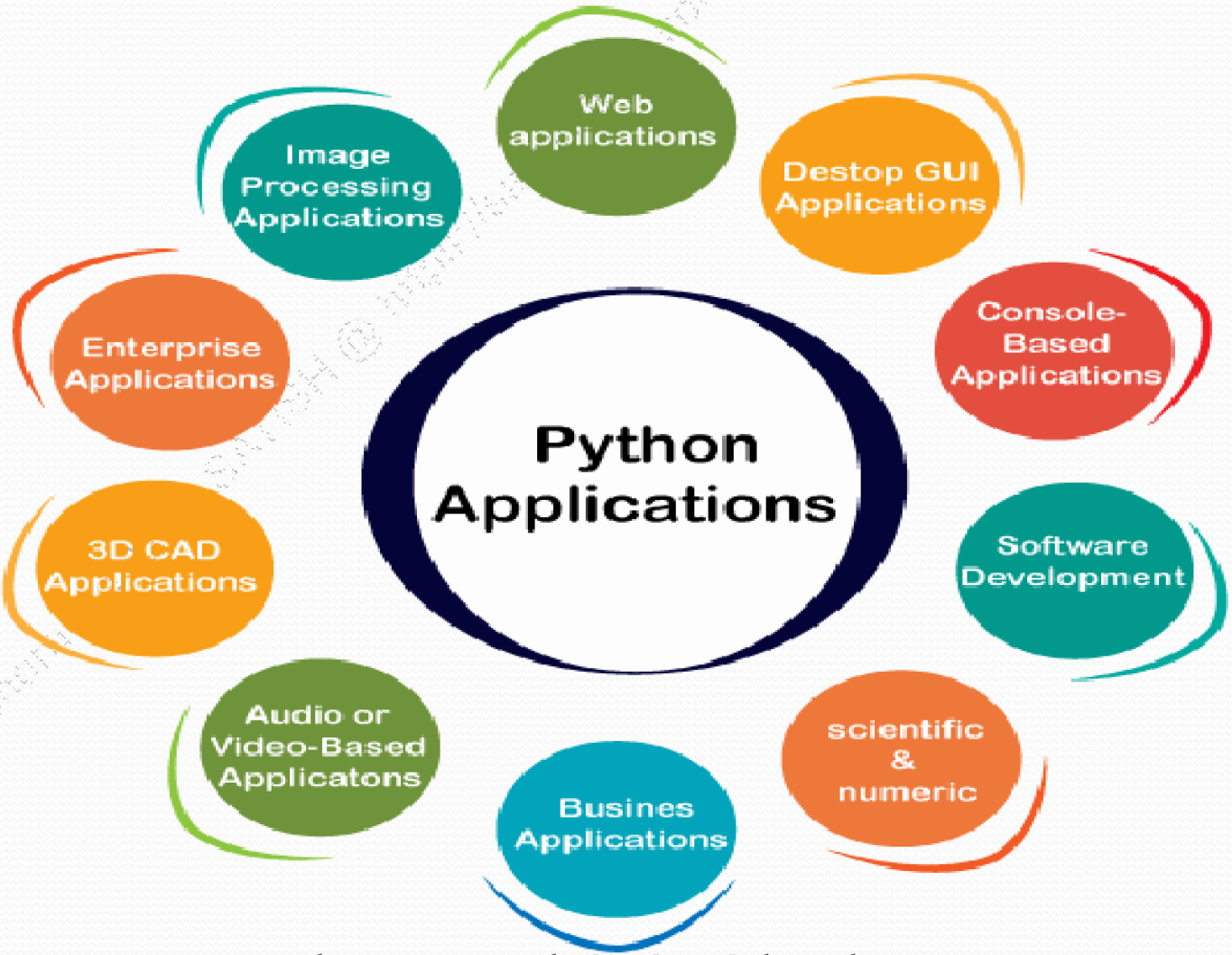
Usage of Python

Python is a general purpose, open source, high-level programming language and also provides number of libraries and frameworks.Python has gained popularity because of its simplicity, easy syntax and user-friendly environment. The usage of Python as follows.

- Desktop Applications
- Web Applications
- Data Science
- Artificial Intelligence
- Machine Learning
- Scientific Computing
- Robotics
- Internet of Things (IoT)
- Gaming
- Mobile Apps
- Data Analysis and Preprocessing

Python Applications

- Python is known for its general-purpose nature that makes it applicable in almost every domain of software development. Python makes its presence in every emerging field. It is the fastest-growing programming language and can develop any application.



Python Roadmap

Step 1: Learn the Basics- Syntax, Variables, Data Types, Conditionals,

Step 2: Loops, Functions, Built-in Functions

Step 3: Data Structures- Lists, Tuples, Sets, Dictionaries

Step 4: OOP- Classes, Inheritance, Objects

Step 5: Advance Topics 1- RegEx, Decorators, Lambda

Step 6: Advanced Topics 2- Modules, Iterators,

Step 7: Learn Python Libraries

Step 8: Learn Version Control Systems

Step 9: Build Python Apps