



## **PYTHON: FUTURE PROGRAMMING LANGUAGE**

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### **Abstract**

Abstract- Python is free and open source and runs on all major operating systems. It is an applicable language for fast literacy and real-world programming. Python is a high-level programming language created by Guido van Rossum. This paper discusses the causes behind why it's the growing programming language in recent times supported by exploration done worldwide. This paper also features significant information and tools concerning the Python programming language.

**Keywords:** Python programming, Real-time programming, Effective and fast programming

### **I. Introduction**

In this paper, we're showing the array of impressive features and tools at our disposal. Python is an interpreted, high-level, general-purpose programming language with numerous, standard libraries and fluently extensible interpreter. Code and reducing the line of code reading is the central aspect. Modular programming using functions can be performed using this language. It also allows branching and looping. The most important feature of Python is to support multiple programming paradigms including imperative, object-oriented, and functional programming or procedural. Python is dynamically typed i.e., the type for the value is decided at runtime, not in advance. By default, the automatic memory management feature is enabled. It means that the system manages memory, eliminating the need for manual intervention. Python interpreters are available for numerous operating systems.

### **II. Latest Articles About Python**

#### **2.1 Largest Stack Overflow Community**

Stack Overflow is a programming-related Q&A site. Python has 100K+ followers, and millions of questions. The questions related to Python are answered in less time when compared to other popular programming languages.

#### **2.2 Community Meet-ups**

At meet-ups and conferences, we can connect and learn from developers. Meet-ups offer learning to those who come together. Python is the second largest community among all programming languages.

#### **2.3 4th Most-Used Language at GitHub**

The libraries which are used for data analysis and scientific computing are in Python. Also, PyGames is a neat game engine to build games with if we want to make simple games.

#### **2.4 Career Opportunities**

On job portals, Python is the most demanded skill and also with the higher-than-average salary offered. With the introduction of Hadoop, the demand for Python developers has increased since it is a skill that goes hand in hand with the data science and Machine Learning field.

### **III. Reasons for python becoming the fastest-growing programming language:**

Python is the fastest-growing programming language. It is used for data science and related fields. The Q&A hub, Stack Overflow, has established a new connection through analysis.

Python Software Foundation predicted Python will continue to develop, as the language's access and usage continue to be attractive to researchers for analytics. However, the number of Python coders who are data scientists is growing very rapidly. This suggests that Python's popularity in data science and machine learning is probably the important driver of its fast growth."

The interest of Python developers in data science is increasing. Among the Python-tagged questions, the fastest-growing tag is pandas, a data analytics software library for Python. Just introduced in 2011, it accounts for almost 1% of Stack Overflow question views.



With the help of Python-related questions, it is analyzed that most customers are from industry, academic, etc followed by manufacturing and software industries.

#### **IV. Characteristics of python**

Python is a very well-designed language used for real-world programming. Python is an object-oriented, high level and general-purpose language that uses an interpreter. Python is designed to be easy to use and understand. Python is a very user-friendly language. Python has replaced Java as the most popular introductory language, and it has gained popularity for being a beginner-friendly language. This language is very flexible i.e. it is a dynamically typed language. Python is also more forgiving of errors, so we'll be able to compile and run our program until we hit the problematic part. Python is a neat, clean, flexible, and simple programming language. This language can support various styles of programming like structural and object-oriented. Python is very flexible, because of its ability to use modules and components that are designed with the help of other programming languages. For example, we can write a program in C or Java and import it to Python as a module.

However, this language also has drawbacks, some of which are as:

##### **4.1 Not Easy to Maintain**

Because Python is a dynamically typed language. The Python applications are growing higher and more complex, this may be difficult to maintain as errors will become difficult to track down and fix, so it will take experience and insight to know how to design the code or write unit tests to ease maintainability.

##### **4.2 Slow**

Python is also slower because it is too flexible and dynamically typed language. The machine would need to do a lot of referencing to make sure what the definition of something is, and it slows its performance downwards.

#### **V. FEATURES OF PYTHON**

##### **5.1 Simple**

It is a very high-level interpreted language. Python supports a wide variety of third-party tools, making it easy to use and motivating consumers to continue with it. Python has a simple and elegant syntax. Python programs are very simple to read and write programs compared to other languages like C#, Java, and C, etc. Python syntax makes it easy to make coding fun and allows us to focus on the solution rather than syntax. If you are a novice coder, it will be a great choice to start your journey with Python.

##### **5.2 Portable**

Python apps are used on different operating systems such as Windows 10, Linux, UNIX, iOS, Mac OS, etc. We can move Python apps from one platform to another, and run it without any changes. Python runs flexibly on almost all platforms like Windows, Mac OS X, iOS, Linux, etc.

##### **5.3 Open source**

Even though all rights of this programming language are reserved for the Python organization, as it is open source and there is no limitation in using, changing, and distributing. We can freely use and distribute Python, for personal or commercial use. We can also make changes to Python's source code. In each iteration, Python is improving constantly.

##### **5.4 Supports other technologies**

It supports .Net, etc objects.

##### **5.5 Extensible and Embeddable**

Suppose an app requires high performance. We can easily combine pieces of C/C++ or Java with Python code. It will give our app high performance as well as scripting capability which other languages might not provide out of the box.

##### **5.6 A high-level, interpreted language**

Unlike Java/C++, we don't have to worry about daunting tasks like memory management, garbage collection, and so on. Likely, when we run a Python program, it automatically converts our code to the



code your computer understands. We don't need to worry about any low-level operations.

### **5.7 Large standard libraries to solve common tasks**

Python has several standard libraries which makes the life of a coder much easier since we don't have to write all the coding ourselves. For example, if We need to connect the SQL database on a Web server, we can use the SQLdb library using import SQLdb. Standard libraries in Python are well-tested and used by thousands of people. So, we can be very sure that it won't break your apps.

### **5.8 Object-oriented**

Everything in Python is an object. Object-oriented programming (OOP) helps us to solve a much complex problem easily. With OOP, we can divide these tough problems into smaller sets by creating objects.

### **5.9 Python is a multi-paradigm coding language**

Object-Oriented coding and structured coding are fully supported. Python uses the dynamic method and a combination of reference counting and a cycle-detecting garbage collector for memory management. Python has important features i.e. dynamic resolution of the name (delay binding), which binds variable names and methods during code execution. It is very highly extensible. Python is added to existing applications that need a programmable interface. Python's greatest strength is its very big standard library, providing tools that suit many tasks. For Internet-based apps, a variety of widely used formats and protocols, such as MIME and HTTP, are fully supported. Modules for creating and connecting to relational databases, pseudo and random number generators, arithmetic, and unit testing are also included.

### **5.10 Python is used to write a wide variety of programs**

Python is a well-designed code language that is used for real-world programming. The program types that are written by Python are categorized below:

#### **5.11 System programming:**

Python's Internal interfaces support working with services of OS and hence help make it a suitable coding language for system programming. The std library of Python can support the different types of platforms and OS. It contains some very important tools to work with system resources such as environmental variables, files, sockets, pipes, processes, multiple treats, command lines, standard stream interfaces, shell coding, etc.

#### **5.12 Graphical User Interface (GUI):**

Tkinter and wxPython are the basic interfaces for designing Graphical UIs in Python. Tkinter is a standard object-oriented interface that is distributed with a Python interpreter by default. It provides essential tools for designing Graphical UI.

#### **5.13 Network and Internet programming:**

Various modules are in the Python standard library that provide many tools for network programmers to work, such as client-server and socket programming, FTP, Telnet, email functions, RPC, SOAP, etc.

#### **5.14 Components integrity:**

Python can make an integrated connection between its core code and other part of the application. Swing and SIP tools can import the compiled code of other code languages for use in Python.

#### **5.15 Database programming:**

Python supports databases like Oracle, Informix, MySQL, PostgreSQL, SQLite, etc. Pickle is a standard module that can store and recover objects in the files. Also, ZODB is a purely object-oriented tool for working with the database. From Python 2.6, SQLite is considered a standard part of Python.

#### **5.16 Other programming applications:**

Python dominates an extensive extent of coding areas. For example, the tool used for game coding is PyGame and the tool used for image processing is PIL. For robot-related programming, PyRo exists. A complete package for AI, network simulation, and shell programming was published under the title NLTK. Almost in all areas, we can find sufficient modules that help us to get to our target. There are different tools available for Python users according to their needs. This excellent feature makes Python



suitable for any type of programming. A large amount of usage of Python by popular websites and applications is the best evidence for this matter.

### **Python Users:**

Almost all organizations are using this tool for different functions. Some of them are:

- Social media like YouTube is an extensive user of Python.
- The BitTorrent peer-to-peer file-sharing system uTorrent is written in Python.
- Google uses Python as a customization tool for its popular GIS mapping products.
- For complex scientific programming it is used.
- MediaTek uses Python for hardware coding and testing.
- The National Security Agency uses Python for cryptography and intelligence-related programs.
- One Laptop Per Child project builds its UI and activity model in Python.

## **VI. FUTURE OF PYTHON**

According to the technical indexes, Python is the most popular programming language. With the rise of jQuery and Node.js, Python's usage as the language for backend web development has increased, especially since it has a fragmented MVC ecosystem. However, with big data becoming more and more popular, Python has become a skill that is more in demand than it has ever been, especially since it is integrated into almost all web apps. Python is actively worked on with a quick update cycle, pushing out new iterations every year to ensure it remains relevant. It has skyrocketed to the 1st place when compared to other languages based on the interest search volume.

## **VII. Conclusion**

In this paper, we briefly introduced the Python programming language as an appropriate choice for learning coding and real-world programming. This paper discussed the properties, features, and types of code offered by Python. According to these features, we found Python as a faster, power-packed, portable, simple, and open-source coding language that supports other technologies also. This paper has discussed the latest applications of Python by some of the popular organizations. The paper shows the reasons why Python language is the fastest-growing coding language based on the information obtained from popular and trusted internet blogs and websites.

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