Python - The Most Attractive & Fastest-growing Programming Language for Developers

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ABSTRACT

Python is a very suitable and easy language for both learning and real-world programming. It is a powerful and high-level object-oriented programming language and created by Guido van Rossum. It is a very good choice for those who are learning programming for the first time because of its simple syntax. It has various standard libraries so it using by a developer in vast range and its capacity to integrate with other languages and use their features attract developers too. In this paper, we describe the main characteristics and features of Python programming. We also discuss the reasons behind python being credited as the most fastest-growing high-level object orient language. We collected the contents of the research done over the articles procured from various magazines and popular websites. This paper then discusses applications of Python programming. To end with we will see a few good examples where python programming is being used.

Keyword : - *Python, programming languages, object-oriented, open-source, interoperability, Real-world. etc…*

1. INTRODUCTION

In the late 1980s, Python was conceived, while its implementation began in late 1989 by Guido van Rossum in the Netherlands atCWI (Centrum Wiskunde & Informatica). It was implemented as a successor of ABC language and capable of interfacing and exception handling with the operating system Amoeba. Author Van Rossum is Python's principal and his continuing central role in deciding the road to the development of Python. Initially, the End Of Life date (EOL, sunset date) for Python 2.7 was set in 2015, then delayed to 2020 out of concern that a large body of existing code cannot easily be forward-ported to Python 3.[4,16]. The creator of the Python language was designed to be highly extensible. It can be easily embedded in existing applications that require an application programmable interface (API). Python is a general-purpose, high-level programming language that is widely used in the real-world. The programmer or developer can write clear programs on both a small and large scale because of its readability, and its syntax allows programmers to express concepts in fewer lines of code. The most important feature in Python is supportability, it supports multiple programming paradigms, including object-oriented, imperative, and functional programming. It supports a dynamic type system and automatic memory management and It is a small core language with a comprehensive large standard library and an easily extensible interpreter. An important goal of Python languages developer is that programmers should have fun using this language. Various modules for creating a graphical user interface, connecting to relational databases, regular expressions, generating pseudorandom numbers, arithmetic calculations, etc. are included in the library. As of March 2017, Python is the fifth most popular language. [7]. A study carried out on Python found it to be more productive than conventional languages for involving string manipulation, problem-solving, and search in a dictionary called Tuple. Python has been used in

Artificial Intelligence tasks and it is making human life easier. Python is often used for Natural Language processing tasks and it like the real-world. Python has also extensive use in the Information Security Industry. Now-a-day many computer projects like Raspberry Pi single-board have started using Python as its main user-programming language. Python interpreters are available for many operating systems.

1.1 Latest reviews about python published in popular magazines and websites

As per programming Q&A sites like StackOverflow is the 5th Largest StackOverflow Community. Python has crossed 100k followers, with over 1541k Python Questions. Python questions are also the 4th most likely to be answered when compared to other popular programming languages.

4th Most-Used Language at GitHub is Python and it is also known to have an abundance of libraries that assist with data analysis and scientific computing. In addition, if you want to make simple games. PyGames is a neat game engine to build computers or mobile games..

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1.2 Reasons for Python to become The Most Attractive & Fast-growing Programming Language for Developers:

Recently in software development, Python is the 1st most demanded skill with the highest average salary offered. With the rise of AI & ML and big data, Python developers are in demand as data analysts, data scientists, especially since Python can be easily integrated into web applications to carry out tasks that require artificial intelligence machine learning. Python's status as the most attractive & fastest-growing programming language is being fuelled by a sharp uptick in its use for data analysis and data science. Stack Overflow has been established a link for new analysis, the Q&A hub that is home to the world's largest online developer community. Python Software Foundation (PSF) board director , Jacqueline Kazil predicted Python's popularity will continue to grow, as the language's utility and accessibility continue to be attractive to researchers carrying out analytics. But the share of Python developers who are visiting data science technologies like AI & ML is growing very rapidly. This suggests that Python's popularity in AI & machine learning and data science is probably the main driver of its fast growth. The overriding interest among Python developers in AI & machine learning and data science is reinforced by other data. Among the Python tagged questions, the fastest growing tag is related to NumPy, pandas a data analytics software library for Python.

2. PYTHON PROGRAMMING FEATURES

Python is a dynamic, object-oriented, general-purpose, high-level programming language that uses an interpreter and can be used in a vast domain of applications, also it supports a wide variety of third-party tools which makes it much easier to use and motivates the users to continue with it. Python is very flexible, and the ability to use modules that were designed in other programming languages.

Features of Python are:

2.1 Python is powerful, simple and lovely

Python is a very high-level language that has many sources for learning like online tutorials.it supports a wide variety of third-party tools which makes it much easier to use and motivates the users. Python has a very simple and elegant syntax and it includes an internal standard library that provides all facilities. It's much easier to read and write Python programs as compared to other languages like Java, C++, C#, etc. Python allows you to focus on the exact solution rather than syntax. it makes programming fun. If you are a beginner, the great choice to start your journey with Python.
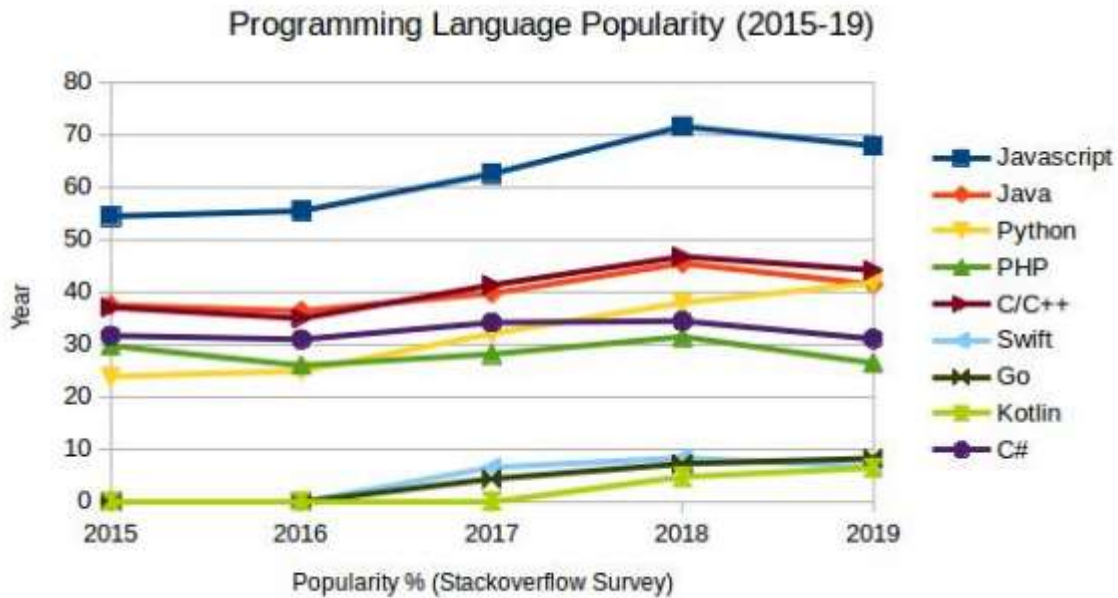
Programming Language Popularity (2015-19)

Chart -1 - Top programming language in 2020 according to state and surveys

Fig-1 Most important libraries included in python

2.2 Python is the fastest growing language

For the last five years, Python is the only language continuously on rising. It is a general-purpose, fast, powerful, simple, and high-level language, so someone wants to learn just one programming in the year 2020 and want to cover more area of software or application development then Python could be chosen.

Table -1: Python is the fastest growing language (In %)

Language	Origin	2015	2016	2017	2018	2019	Main Purpose
Javascript	1995	0.544	0.554	0.625	0.715	0.678	Web development, Dynamic contents, Client and Server side
Java	1995	0.374	0.363	0.397	0.454	0.411	Enterprise Application
Bash/Shell	1971/79	–	–	–	0.404	0.366	Automation and system admin
Python	1991	0.238	0.249	0.32	0.379	0.417	General purpose
PHP	1995	0.297	0.259	0.281	0.314	0.264	Web development, Server-side
C++	1980/83	0.206	0.194	0.223	0.246	0.235	General purpose
C	1972	0.164	0.155	0.19	0.221	0.206	General Purpose, Low-level programming
Ruby	1995	0.08	0.089	0.091	0.103	0.084	Web development
R	1993	–	–	0.045	0.06	0.058	Statistical Computing
Objective-C	1986	0.078	0.065	0.064	0.073	0.048	General purpose

2.3 Python Data Structures & Uses.

Python is rich with sets, lists, dictionaries, tuples, strings, and many other types built-in. We could even add Skippy, Numbly, SciPy, panda, etc. and leverage their benefits. Python has a large, Extensible, and well equipped standard library. It provides tools suited too many tasks. Python is a complete and amazing programming solution with the greatest advantages namely
1. It is completely free and open-source even for commercial use.
2. It runs natively on Mac, Windows, OS, Linux, UNIX, and other, it does the standard library.
3. It fits quick scripting and large development projects like google web search system.
4. it uses for scientific programming tasks.
5. It uses for hardware testing purposes like Intel, Hewlett-Packard, Seagate, Cisco, Qualcomm, and IBM using Python for testing.

3. APPLICATIONS and USERS OF PYTHON PROGRAMMING

Python is a very well designed language and the best choice for real-world programming. Python can be used to write a wide variety of programs and applications most common applications and program types that can be written by Python are categorized below:

3.1 System Programming

Python is suitable for system programming because it provides internal interfaces for working with the services of the operating system. These interfaces provide some functions such as directories or file operations, parallel processing, etc. It contains multiple tools for working worth system resources such as files, sockets, environmental variables, pipe, processes, command line, standard stream interfaces, multiple threads, shell programming, etc. [17]

3.2 Graphical User Interface

Tkinter and GxPython are the basic object oriented interfaces for designing GUIs or that provides essential tools for designing GUI in Python. Tkinter is a standard object-oriented interface Generated GUIs give a similar look on different platforms.

3.3 Component integrity

Python is capable to make an integrated connection between its codes and other components. Swing and SIP tools can import the compiled codes of other languages to using in Python.

3.4 Network and internet programming

Various modules are included in the Python standard library that provides many tools for network programmers, such as: socket programming, FTP, Telnet, client-server connection, email functions, RPC, SOAP, etc. Some third-party tools like mod-Python allow servers like Apache to run python, too.

3.5 Other Programming applications

I.   PyGame is a tool for Gaming Programming
II.   PIL for image processing
III. PyRo is used for Robotic Programming
IV.   NLTK is a package for AI (artificial intelligence), shell programming and network simulation.
V.   SciPy is used for scientific programming tasks.

Fig-2 Python application types diagram

4. CONCLUSIONS

We have seen how Python is fast-growing with its powerful features and it causes more popularity among users. Also, we introduced various features of the Python programming language as a suitable choice for learning and real-world programming. We have seen its applications and demand in the market and growth of career. The paper has discussed the features, types of programming support offered by python rich libraries. It is a very vast language so that it is using to develop various applications. A few of the topics in which Python's application can be researched are Information Security, Artificial Intelligence, Machine learning, and Big Data Analytics, Data Science, etc.

5. ACKNOWLEDGEMENT

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BIOGRAPHY

I'm from a middle-class family of Bihar. Nobody comes in this world, without the support of family and friends, I always respect them. My mother and father is real god for me. They always blessing their child in every condition.

Everybody has an ambition in life. Aim or ambition is the inner aspiration of man. No man can do anything in the world without aim.

I always follow these two lines 'DO YOUR WORK AND LITTLE MORE' & 'NEVER GIVE UP'.

I am a technofreak, I have a strong interest in Technologies and their architecture developments.