

Python: The Programming Language of Future

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Abstract- Python is a suitable language for fast learning and real-world programming. Python is a powerful high-level programming language created by a programmer named Guido van Rossum. In the review paper, we first introduce you to the python programming characteristics. This paper also discusses the reasons behind python being awarded as the fastest-growing programming language in recent times supported by research done worldwide. This paper also features important information and tools with reference to the python programming language.

Index terms- Python programming, Real-time programming, Efficient and fast programming

INTRODUCTION

In this review paper, we are going to introduce the features and tools of Python. Python is a general-purpose programming language that is highly used in the current times. Code and reducing the line of code reading is an important aspect of it. The language constructs help enable the user to write clear programs on all scales be it small or large. The most important feature in Python being; it supports multiple programming paradigms including imperative, object-oriented, and functional programming or procedural. Python is dynamically typed. Automatic memory management is enabled by default. Python interpreters are available for many operating systems.

LATEST ARTICLES ABOUT PYTHON PUBLISHED IN POPULAR SOURCES

Largest Stack Overflow Community:

Stack Overflow is programming related Q&A site you will no doubt become intimate with as a coding beginner. Python has 100K+ followers, and millions of questions. Python-related questions are likely to be answered in less time when compared to other popular programming languages.

Community Meet-ups:

At meet-ups and conferences, you can connect and learn from developers. Meetups offer learning to those who come together. Thus, if programming languages are to be considered, Python is the 2nd largest community.

4th Most-Used Language at GitHub:

Python is known to have an abundance of libraries that assist with data analysis and scientific computing. Also, PyGames is a neat game engine to build games with if you want to make simple games.

Career Opportunities:

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

Reasons for Python becoming the fastest-growing programming language:

Python has a status of being the fastest-growing programming language and is fuelled by a sharp upside in its use for data science and related fields. The connect has been established by a new analysis on Stack Overflow, the Q&A hub.

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

The overriding of interest among Python developers in data science is reinforced by other data. Among the Python-tagged questions, the fastest growing tag

is related to pandas, a data analytics software library for Python. Just introduced in 2011, it now accounts for almost 1% of Stack Overflow question views.

By analysis of customers by industry, Stack Overflow described that those engaged in Python-related questions are most commonly involved in academia, followed by manufacturing and software industries.

CHARACTERISTICS OF PYTHON

Python is a very well-designed language that can be used for real-world programming. Python is also a very high-level, dynamic, object-oriented, general-purpose programming language that uses interpreter and which can be used in a vast domain of applications. Python was designed to be easy to understand and use. Python is a very user-friendly language. Python has much more gained popularity for being a beginner-friendly language, and it has replaced Java as the most popular introductory language. As normally a dynamically typed language, Python is really very flexible. Furthermore, Python is also more forgiving of errors, so you'll still be able to compile and run your program until you hit the problematic part. Python is a flexible, neat, clean, simple programming language. This language can support various styles of programming including structural and object-oriented. Other styles can be used, too. Python is very flexible, because of its ability to use modules and components that were designed with help in other programming languages. For example, you can write a program in C or Java and import it to python as a module. Then add else to it (for instance design a GUI for it).

However, there are also some drawbacks with python:

Not Easy to Maintain:

Because Python is a dynamically typed language, the same thing can very easily mean something different depending upon the context. As the Python applications are growing larger and more complex, this may get difficult to maintain as errors will become difficult to track down and fix, so it will take experience and also the insight to know how to design your code or write unit tests to ease maintainability.

Slow:

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

FEATURES OF PYTHON

Simple:

It is a very high-level language that has too many sources for learning. Python supports a wide variety of third-party tools which make it much easier to use and motivate the consumers to continue with. Python has a very simple and elegant having syntax. It's much simpler to read and write Python programs compared to other languages like C#, Java, C. Python makes coding fun and allows us to focus on the solution rather than syntax. If you are a novice coder, it's a great choice to start your journey with Python.

Portable:

Python apps can be used on different operating systems such as Windows 10, Linux, UNIX, iOS, Mac OS, etc. You can move Python apps from one platform to another, and run it without any changes.

It runs flexibly on almost all platforms including Windows, Mac OS X, iOS, and Linux.

Open source:

Even though all rights of this programming language are reserved for the Python organization, but as it is open source and there is no limitation in using, changing, and distributing. You can freely use and distribute Python, be it for personal or commercial use. Not only can you use and distribute software that is written in it, but you can also even make changes to the Python's own source code. Python has a large community constantly which is improving it in each iteration.

Supports other technologies:

It can support .Net, etc objects.

Extensible and Embeddable:

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

A high-level, interpreted language:

Unlike Java/C++, you don't have to worry about daunting tasks like memory management, garbage collection, and so on. Likely, when you run a Python program, it automatically converts your code to the code your computer understands. You don't need to worry about any low-level operations.

Large standard libraries to solve common tasks:

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

Object-oriented:

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

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. An important feature of Python is the dynamic resolution of the name (delay binding), which binds methods and variable names during code execution. Python was designed to be very high extensible. Python can also be added to existing applications that need a programmable interface. Python has a very big standard library, commonly cited as one of Python's greatest strengths, providing tools suited to many tasks. For Internet-based apps, a big number of standard formats and protocols (such as MIME and HTTP) are supported. Modules for creating and connecting to the relational databases, pseudo and random number generators, arithmetic, and doing unit testing are also included.

Python can be used to write a wide variety of programs:

Python is a well-designed code language that can be used for real-world programming. The extremely

common program types that can be written by Python are categorized below:

System programming:

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

Graphical User Interface (GUI):

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

Network and internet programming:

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

Components integrity:

Python is able to make an integrated connection between its core code and other parts of the application. Tools like Swing and SIP can import the compiled code of other code languages for use in Python.

Database programming:

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

Other programming applications:

Python dominates a wide extent of coding areas. For example, PyGame is a tool for game coding and PIL is used for image processing. 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, you can find sufficient modules that can help you get to your target. There are different tools available for Python users with different needs. This excellent feature makes Python suitable for any kind of programming. A large amount of usage of Python by popular websites and applications is the best evidence for this matter.

Python Users:

Many organizations have used and been using this tool for different functions. Some of them are enlisted:

- 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.
- NASA and others use Python for complex scientific programming tasks.
- MediaTek use Python for hardware coding and test.
- National Security Agency uses Python for cryptography and intelligence-related programs.
- One Laptop Per Child project builds its UI and activity model in Python.

FUTURE OF PYTHON

According to the technical indexes, Python is the most popular programming language out of many ones. With the rise of jQuery and more recently Node.js, Python's usage as the main 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 it can be integrated into almost all web apps. Python is actively worked on with a quick update cycle, pushing out new iterations every year or so to make sure it remains relevant. In terms of search volume for interest in learning Python, it has skyrocketed to the 1st place when compared to others.

CONCLUSION

In this paper, we briefly introduced the Python programming language as a suitable choice for learning coding and real-world programming. The paper has discussed the properties, features, types of code support 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 flexibly. Then, various types of programs that can be written by Python were investigated. The paper has also discussed the latest applications of python by some of the popular organizations. The paper referenced 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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