

A Study on Recent Trends in Python Programming Language

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ABSTRACT: Python may be a general purpose, high-level programming language which is widely utilized in meteorology et al. . The language facilitates a rapid development cycle with its interpreted and interactive nature. attention on code readability makes the language easy to find out , and therefore the expressive syntax results in short, clear programs. Python libraries like NumPy, SciPy, and pandas provide efficient implementation of numerical operations and tasks common in science and engineering. These libraries provide a robust base from which more advanced scientific software are often built without having to stress about low-level algorithms.

KEYWORDS: Python, Numpy, Panda, SciPy, Python Programming.

I. INTRODUCTION

Python may be a general-purpose interpreted, interactive, object-oriented, and high-level programming language during this we uses English keywords frequently while the opposite languages use punctuation, and it's fewer syntactical constructions than other languages. Python is straightforward , very easy to find out syntax emphasizes readability and thus reduces the value of program maintenance. It provide increased productivity. Python is dynamically typed and garbage-collected. Python may be a rising star within the programming world for 2 main reasons: the large range of tasks it can handle combined with the very fact that it's actually a really beginner-friendly language. Python may be a programming language that allows you to work quickly and integrate the systems more efficiently. There are two major Python versions: Python 2 and Python 3. Both are quite different. Python 3 supports modern technologies like AI, machine learning, and data science. Python 3 is supported by an outsized Python developer's community. Python 2.7 will officially become unsupported beginning January 1, 2020. Python 2 continued to be maintained, with some features back ported. To further help the community transition, the EOL date was extended from 2015 to 2020, another five years.

II. PYTHON LIBRARIES AND FRAMEWORKS

A big advantage of Python is that the big choice of libraries and frameworks it offers. Python is one among the foremost popular and broadly used programming languages and has replaced many programming languages within the industry. There are tons of reasons why Python is popular among developers and one among them is that it's an amazingly large collection of libraries that users can work with. The simplicity of Python has attracted many developers to make new libraries for machine learning. due to the large collection of those libraries Python is becoming hugely popular among machine learning experts. There's a Python library for everything:

- data visualization
- machine learning
- data science
- natural language processing
- Complex data analysis

Numpy

Numpy is taken into account together of the foremost popular machine learning library in Python. Numpy is extremely interactive and straightforward to use. Makes complex mathematical implementations very simple. Makes coding is extremely easy and catching the concepts is straightforward . Widely used, hence tons of open source contribution.

SciPy

SciPy may be a machine learning library for application developers and engineers. However, you continue to get to know the difference between SciPy library and SciPy stack. SciPy library contains modules for optimization, algebra, integration, and statistics. the most feature of SciPy library is that it's developed using NumPy, and its array makes the foremost use of NumPy. additionally, SciPy provides all the efficient numerical routines like optimization, numerical integration, and lots of others using its specific sub modules. All the functions altogether sub modules of SciPy are well documented.

Pandas

Pandas may be a machine learning library in Python that gives data structures of high-level and a good sort of tools for analysis. one among the good features of this library is that the ability to translate complex operations or problems with data using one or two commands. Pandas have numerous inbuilt methods or functions for grouping the weather, combining data, and filtering, also as time-series functionality. Pandas confirm that the whole process of manipulating data are going to be easier. Support for operations like Re-indexing, Iteration, Sorting, Aggregations, Concatenations and Visualizations are among the feature highlights of Pandas. there's a spread of frameworks to settle on from, counting on your needs, such as:

- Django,
- Flask,
- Pyramid,
- Twisted,
- Falcon.

III. PYTHON 3 VS PYTHON 2

Python 3 may be a latest version. during this phrase we discuss why python 3 is best from python 2. Also we highlight the essential differences between these two versions of python and last we show the comparison between the 2. Python 3 has been broadly supported for developing a good range of GUI applications and lots of other packages are available in Python 3 as compared to Python 2. In Python 3, a print function has been used means arguments should be enclosed in parenthesis. E.g. print ("This is Python 3"). In Python 2, a print is treated as a press release. E.g. print "This is Python". In Python 3, the worth of integers division would be appropriate by default. E.g. divide 5/2 will end in 2.5. In Python 2, we'd like to supply data type as a float if the output will be available decimal otherwise only the result will be available an integer only. E.g. 5/2 give result 2. In Python 3, text and data are used. Unicode (UTF-8) may be a default encoding source for python 3 and str represented as length 1 string. In python 2, str represented because the length 8-bit string. In Python 3, Syntax changes are done to form the programming language simpler and straightforward for the developers compared to Python 2. In Python 3, for handling or catching exceptions we'd like to use "as" keyword. E.g. except Error as err (except some exception as a variable). In Python 2, we'd like to use ',' for an equivalent. E.g. except Error, err (except some exception, err). In Python 3, for raising exceptions we'd like to use as raise Error ("Message for error"). The italic syntax donated as (raise exception, (args)). In python 2, syntax used as raise Error, "message". The italic syntax donated as (raise exception, args). In Python 3, new built-in functions are included; some are removed and renamed as compared to Python 2.

IV. COMPARISON

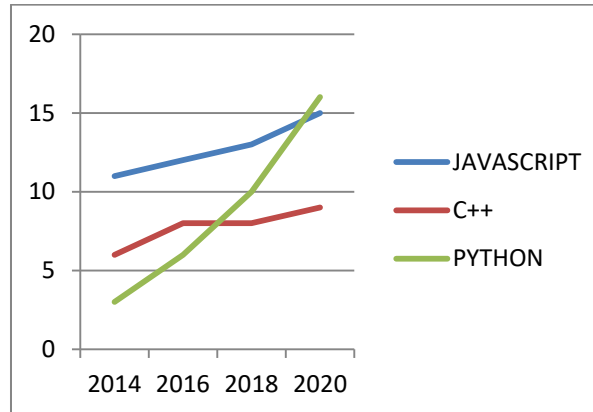
Python Vs C++

Python and C++ are the programming languages used for general purpose but both Python and C++ languages differ from one another in some ways. C++ is originated from C language with multiple paradigms and supply the feature of compilation. Python may be a general purpose and one among the high-level programming languages. A variable are often used directly without its declaration while writing code in python. In C++, a single program needs to get compiled on every operating system on which the code is to be run. Python provides the power to 'write once, run anywhere' that permits it to run on all the operating systems which have Python installed. C++ is prone to memory leak as it does not provide garbage collection and uses pointers to a large extent. Python has inbuilt garbage collection and dynamic memory allocation process that enables efficient memory management.

Python Vs Javascript

Python has mutable and immutable data types like set (mutable) and list (Immutable). Whereas Java-Script has no concept of mutable and immutable. Python has built-in hash tables, called dictionaries, sets, etc which can be used in the hash with keys and values. Whereas Java-Script has no built-in hash table support. Python uses indentation whereas

java-script uses curly brackets. Python calls itself as A battery included language because it comes with a good range of modules Whereas Java-Script comes with only a few modules like date, math, regexp, JSON and it has the functionality available through the host environment like a web browser or some other environment.



V. WHY PYTHON IS POPULAR

The reason behind the very much popularity of python programming language across the world is the features it provides. Let's have a look at the features of python language. Python Supports Multiple Programming Paradigms. Python is a multi-programming language including features such as object-oriented, imperative, procedural, functional, reflective etc. Python has Large or big Set Of Library and Tools. Python has very extensive standard libraries and tools that enhance the overall functionality of python language and also helps python programmers to easily write codes. Python has a Vast Community Support. That is makes python a favorable choice for development purposes. If you are having problems while writing a python program, you can post directly to python community and will get the response with the solution of your problem. we will also find many new ideas regarding python technology and change in the versions. Python is Designed or developed for Better Code Readability. Python provides a much better code readability as compared to another programming language. For example, it uses whitespace indentation in place of curly brackets for delimiting the block of codes. Python Contains Fewer Lines Of Codes. Codes are written in python programming language complete in fewer lines thus reducing the efforts of programmers.

VI. FUTURE TECHNOLOGIES ON PYTHON

Generally, we've seen that python programming language is extensively used for web development, application development, system administration, developing games etc. Let's dive into the technologies which use python as a core element for research, production and further developments.

(1) Artificial Intelligence (AI)

Python programming language is undoubtedly dominating the opposite languages when future technologies like AI (AI) comes into the play. There are many python frameworks, libraries, and tools that are specifically developed to direct AI to scale back human efforts with increased accuracy and efficiency for various development purposes. it's only the synthetic Intelligence that has made it possible to develop speech recognition system, autonomous cars, interpreting data like images, videos etc.

We have shown below a number of the python libraries and tools utilized in various AI branches.

- **Machine Learning-** PyML, PyBrain, scikit-learn, MDP Toolkit, GraphLab Create, MIPy etc.
- **General AI-** pyDatalog, AIMA, EasyAI, SimpleAI etc.
- **Neural Networks-** PyAnn, pyrenn, ffnet, neurolab etc.
- **Natural Language & Text Processing-** Quepy, NLTK, gensim

(2) Big Data

The future scope of python programming language also can be predicted by the way it's helped big data technology to grow. Python has been successfully contributing in analyzing an outsized number of knowledge sets across computer clusters through its high-performance toolkits and libraries.

Let's have a glance at the python libraries and toolkits used for Data analysis and handling other big data issues.

- Pandas
- Scikit-Learn
- NumPy
- SciPy
- GraphLab Create
- IPython
- Bokeh
- Agate
- PySpark
- Dask

(3) Networking

Networking is another field during which python features a brighter scope within the future. Python programming language is employed to read, write and configure routers and switches and perform other networking automation tasks during a cost-effective and secure manner. For these purposes, there are many libraries and tools that are built on the highest of the python language. Here we've listed a number of these python libraries and tools especially employed by network engineers for network automation.

- Ansible
- Netmiko
- NAPALM(Network Automation and Programmability Abstraction Layer with Multivendor Support)
- Pyeapi
- Junos PyEZ
- PySNMP
- Paramiko SSH

VII. WEBSITES DEVELOPED USING PYTHON

As you already know that python programming language is employed for web development, so here are a number of the world's hottest websites that are created using python.

- Youtube
- Quora
- Instagram
- Pinterest
- Spotify
- Flipkart
- Slack
- Uber
- Cloudera
- Zenefits

VIII. FUTURE SCOPE

Python has been voted as most favorite programming language beating C, C++ and java programming. Python programming is open source programming language and wont to develop almost all kinds of application. Python is getting used worldwide as a good range of application development and system development programming language . Big brands and program giants are using python programming to form their task easier. Google, Yahoo, Quora, Facebook are using python programming to unravel their complex programming problems. Python programming is flexible , robust and comprehensive. Python is high-level programming language and straightforward to find out also because it reduces the coding effort compare to other programming languages. Python programming is employed to write down test scripts and tests mobile devices performance. it's one among the foremost versatile languages lately . Python programmers are most demandable within the IT industry lately and obtain paid more compared to a different language programmer.



IX. CONCLUSION

In this paper, We introduced that python features a popular programming language nowadays. The paper discussed about the python libraries and framework. They show the comparison of python with other programming languages. They tell about the longer term technologies on python. So, we conclude that python programming is straightforward and fastest growing language which has excellent future.

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