PROGRAMMING LANGUAGE PYTHON: A REVIEW

Preetee K. Karmore[1], Gaurishankar L. Girhe[2]

[1] Head of Department, CSE, DBACER, Nagpur, Maharashtra, India
[2] Principal, SRPP, Nagpur, Maharashtra, India

ABSTRACT

Python is a modern, easy-to-learn, object-oriented programming language. It has a powerful set of built-in data types and easy-to-use control constructs. Since Python is an interpreted language, it is most easily reviewed by simply looking at and describing interactive sessions. It is used in vast number of applications due to the various standard libraries that come along with it and its capacity to integrate with other languages and use their features. Python can be used for scripting, web scraping, and creating data sets. It's popular in the scientific community for scientific computing; there are libraries that make it easy to share academic code projects in Python. Python is a web programming language, so it interfaces with the internet. It knows how to receive and send web requests and talk to databases. This paper describes the main features of Python programming, loops and control statements in python then discusses applications of Python programming.

Keyword : - *programming, open source, object-oriented, Real world programming.*

1. INTRODUCTION

In the mid-1980s a dutch fellow named Guido van Rossum was working on an educational project to build a language for new coders called ABC. As a result of working on this project, Van Rossum became interested in language design, and that's when he started working on Python. He made some unusual decisions, which really set Python apart from the zeitgeist at that time, and continue to make the language special today.[6] One of Van Rossum's decisions was to make indentation meaningful, which is unusual in programming languages. Critics who thought this would make the language hard to use didn't receive the idea very well, but this feature is part of the reason why Python is both readable and popular. Python syntax is very similar to English, so it's intuitive, which helps you understand what's going on. You don't have to look up what symbols mean when you use Python. The language constructs enable the user to write clear programs on both a small and large scale [5]. The most important feature in Python being it supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. Python supports a dynamic type system and automatic memory management and has a large and comprehensive standard library. Python's development is conducted largely through the Python Enhancement Proposal (PEP) process. The PEP process is the primary mechanism for proposing major new features, for collecting feedback on an issue, and for documenting the design decisions that have gone into Python. Outstanding PEPs are commented and reviewed by the Python Community. [9] The Python interpreter is easily extended with new functions and data types implemented in C or C++ (or other languages callable from C). Python is also suitable as an extension language for customizable applications.

2. FEATURES OF PYTHON PROGRAMMING
Python provides lots of features that are listed below:

2.1 Easy to code:
Python is high level programming language. Python is very easy to learn language as compared to other language like c, c#, java script, java etc. It is very easy to code in python language and anybody can learn python basic in few hours or days. It is also developer-friendly language.

2.2 Free and Open Source:

Python language is freely available at official website since, it is open-source; this means that source code is also available to the public. So you can download it as, use it as well as share it.

2.3 Object-Oriented Language:

One of the key features of python is Object-Oriented programming. Python supports object oriented language and concepts of classes, objects encapsulation etc.

2.4 GUI Programming Support:

Graphical Users interfaces can be made using a module such as PyQt5, PyQt4, wxPython or Tk in python. PyQt5 is the most popular option for creating graphical apps with Python.

2.5 High-Level Language:

Python is a high-level language. When we write programs in python, we do not need to remember the system architecture, nor do we need to manage the memory.

2.6 Extensible feature:

Python is a Extensible language. We can write our some python code into c or c++ language and also we can compile that code in c/c++ language.

2.7 Python is Portable language:

Python language is also a portable language for example, if we have python code for windows and if we want to run this code on other platform such as Linux, UNIX and Mac then we do not need to change it, we can run this code on any platform.

2.8 Python is Integrated language:

Python is also an Integrated language because we can easily integrated python with other language like c, c++ etc.

2.9 Interpreted Language:

Python is an Interpreted Language because python code is executed line by line at a time like other language c, c++, java etc there is no need to compile python code this makes it easier to debug our code. The source code of python is converted into an immediate form called byte code.

2.10 Large Standard Library

Python has a large standard library which provides rich set of module and functions so you do not have to write your own code for every single thing. There are many libraries present in python for such as regular expressions, unit-testing, web browsers etc.

2.11 Dynamically Typed Language:

Python is dynamically-typed language. That means the type (for example- int, double, long etc) for a variable is decided at run time not in advance because of this feature we don't need to specify the type of variable.

3. LOOPS AND CONTROL STATEMENTS IN PYTHON

Python programming language provides following types of loops to handle looping requirements.

3.1 While Loop

```
Syntax :
    while expression:
    statement(s)
```

In Python, all the statements indented by the same number of character spaces after a programming construct are considered to be part of a single block of code. Python uses indentation as its method of grouping statements.

3.2 For in Loop

In Python, there is no C style for loop, i.e., for (i=0; i<n; i++). There is "for in" loop which is similar to for each loop in other languages.
Syntax:

> for iterator_var in sequence:
>> statements(s)

It can be used to iterate over iterators and a range.

3.3 Nested Loops

Python programming language allows to use one loop inside another loop. Following section shows few examples to illustrate the concept.
Syntax:

for iterator_var in sequence:
for iterator_var in sequence:
    statements(s)
    statements(s)

The syntax for a nested while loop statement in Python programming language is as follows:

while expression:
while expression:
    statement(s)
    statement(s)

A final note on loop nesting is that we can put any type of loop inside of any other type of loop. For example a for loop can be inside a while loop or vice versa.

3.4 Loop Control Statements

Loop control statements change execution from its normal sequence. When execution leaves a scope, all automatic objects that were created in that scope are destroyed. Python supports the following control statements.

3.4.1   Continue Statement

It returns the control to the beginning of the loop.

3.4.2   Break Statement

It brings control out of the loop

3.4.3   Pass Statement

We use pass statement to write empty loops. Pass is also used for empty control statement, function and classes.

4. PYTHON APPLICATIONS

Python is known for its general purpose nature that makes it applicable in almost each domain of software development. Python as a whole can be used in any sphere of development.

4.1 Web Applications:

We can use Python to develop web applications. It provides libraries to handle internet protocols such as HTML and XML, JSON, Email processing, request, beautifulSoup, Feedparser etc. It also provides Frameworks such as Django, Pyramid, Flask etc to design and delelop web based applications. Some important developments are: PythonWikiEngines, Pocoo, PythonBlogSoftware etc.

4.2 Desktop GUI Applications

Python provides Tk GUI library to develop user interface in python based application. Some other useful toolkits wxWidgets, Kivy, pyqt that are useable on several platforms. The Kivy is popular for writing multitouch applications.

4.3 Software Development

Python is helpful for software development process. It works as a support language and can be used for build control and management, testing etc.

4.4 Scientific and Numeric

Python is popular and widely used in scientific and numeric computing. Some useful library and package are SciPy, Pandas, IPython etc. SciPy is group of packages of engineering, science and mathematics.

4.5 Business Applications

Python is used to build Business applications like ERP and e-commerce systems. Triton is a high level application platform.

4.6 Console Based Application

We can use Python to develop console based applications. For example: IPython.

4.7 Audio or Video based Applications

Python is awesome to perform multiple tasks and can be used to develop multimedia applications. Some of real applications are: TimPlayer, cplay etc.

4.8 3D CAD Applications

To create CAD application Fandango is a real application which provides full features of CAD.

4.9 Enterprise Applications

Python can be used to create applications which can be used within an Enterprise or an Organization. Some real time applications are: OpenErp, Tryton, Picalo etc.

4.10 Applications for Images

Using Python several applications can be developed for image. Applications developed are: VPython, Gogh, imgSeek etc.

5. CONCLUSIONS

We have seen various features of Python Programming. We have seen its loops and control statements. Also discussed applications of Python Programming in different area. It is a very vast language and has got various facets which can be researched upon. Few of the topics in which Python's application can be researched are Information Security, Artificial Intelligence, and Big Data Analytics etc.

6. REFERENCES

[1]. G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955.
[2].Kalyani Adawadkar, "Python Programming-Applications and Future", International Journal of Advance Engineering and Research Development, April -2017.
[3].K.R. Srinath, "Python – The Fastest Growing Programming Language", International Research Journal of Engineering and Technology (IRJET), Volume: 04 Issue: 12 | Dec-2017.
[4].Van Rossum, Guido (20 January 2009). "A Brief Timeline of Python". The History of Python. Google. Retrieved 20 January 2009.
[5]. Kuhlman, Dave. "A Python Book: Beginning Python, Advanced Python, and Python Exercises".
[6]. https://www.coursereport.com/blog/what-is-python-programming.
[7]. "Python for Artificial Intelligence". Wiki.python.org. 19 July 2012. Archived from the original on 1 November 2012. Retrieved 3 December 2012.
[8]. "The RedMonk Programming Language Rankings: January 2011 – tecosystems". Redmonk.com.
[9]. Warsaw, Barry; Hylton, Jeremy; Goodger, David (13 June 2000). "PEP 1 – PEP Purpose and Guidelines". Python Enhancement Proposals. Python Software Foundation. Retrieved 19 April 2011.
[10]. "PEP 466 -- Network Security Enhancements for Python 2.7.x". python.org. Retrieved 9 January 2017.