**Introduction**

* **Python is a general purpose high level programming language.**
* **Python was developed by Guido Van Rossam in 1989 while working at National**
* **Research Institute at Netherlands.**
* **But officially Python was made available to public in 1991. The official Date of Birth for**
* **Python is : Feb 20th 1991.**

Name of Python:

**The name Python was selected from the TV Show**

**"The Complete**

**Monty**

**Python's**

**Circus", which was broadcasted in BBC from 1969 to 1974.**

**Guido developed Python language by taking almost all programming features from different languages**

**1. Functional Programming Features from C**

**2. Object Oriented Programming Features from C++**

**3. Scripting Language Features from Perl and Shell Script**

**4. Modular Programming Features from Modula-3**

**Most of syntax in Python Derived from C and ABC languages. Where we can use Python:**

**We can use everywhere. The most common important application areas are**

**1. For developing Desktop Applications-skype,adobephotoshop**

**2. For developing web Applications**

**3. For developing database Applications**

**4. For Network Programming**

**5. For developing games**

**6. For Data Analysis Applications**

**7. For Machine Learning**

**8. For developing Artificial Intelligence Applications**

**9. For IOT**

**...**

**Note:**

**Internally Google and Youtube use Python coding**

**NASA and Nework Stock Exchange Applications developed by Python.**

**Top Software companies like Google, Microsoft, IBM, Yahoo using Python.**

**Features of Python:**

**1. Simple and easy to learn:**

**Python is a simple programming language. When we read Python program,we can feel like reading english statements.**

**The syntaxes are very simple and only 30+ kerywords are available.**

**When compared with other languages, we can write programs with very less number of lines. Hence more readability and simplicity.**

**We can reduce development and cost of the project.**

**2. Freeware and Open Source:**

**We can use Python software without any licence and it is freeware.**

**Its source code is open,so that we can we can customize based on our requirement. Eg: Jython is customized version of Python to work with Java Applications.**

**3. High Level Programming language:**

**Python is high level programming language and hence it is programmer friendly language. Being a programmer we are not required to concentrate low level activities like memory management and security etc..**

**4. Platform Independent:**

**Once we write a Python program,it can run on any platform without rewriting once again. Internally PVM is responsible to convert into machine understandable form.**

**5. Portability:**

**Python programs are portable. ie we can migrate from one platform to another platform very easily. Python programs will provide same results on any paltform.**

**6. Dynamically Typed:**

**In Python we are not required to declare type for variables. Whenever we are assigning**

**the value, based on value, type will be allocated automatically.Hence Python is considered as dynamically typed language.**

**But Java, C etc are Statically Typed Languages b'z we have to provide type at the beginning only.**

**This dynamic typing nature will provide more flexibility to the programmer.**

**7. Both Procedure Oriented and Object Oriented:**

**Python language supports both Procedure oriented (like C, pascal etc) and object oriented**

**(like C++,Java) features. Hence we can get benefits of both like security and reusability etc**

**8. Interpreted:**

**We are not required to compile Python programs explcitly. Internally Python interpreter will take care that compilation.**

**If compilation fails interpreter raised syntax errors. Once compilation success then PVM (Python Virtual Machine) is responsible to execute.**

**9. Extensible:**

**We can use other language programs in Python. The main advantages of this approach are:**

**1. We can use already existing legacy non-Python code**

**2. We can improve performance of the application**

**10. Embedded:**

**We can use Python programs in any other language programs. i.e we can embedd Python programs anywhere.**

**11. Extensive Library:**

**Python has a rich inbuilt library.**

**Being a programmer we can use this library directly and we are not responsible to implement the functionality.**

**etc...**

**Limitations of Python:**

**1. Performance wise not up to the mark b'z it is interpreted language.**

**2. Not using for mobile Applications**

**Flavors of Python:**

**1.CPython:**

**It is the standard flavor of Python. It can be used to work with C lanugage Applications**

**2. Jython or JPython:**

**It is for Java Applications. It can run on JVM**

**3. IronPython:**

**It is for C#.Net platform**

**4.PyPy:**

**The main advantage of PyPy is performance will be improved because JIT compiler is available inside PVM.**

**5.RubyPython**

**For Ruby Platforms**

**6. AnacondaPython**

**It is specially designed for handling large volume of data processing.**

**...**

**Python Versions:**

**Python 1.0V introduced in Jan 1994**

**Python 2.0V introduced in October 2000**

**Python 3.0V introduced in December 2008**

**Note: Python 3 won't provide backward compatibility to Python2**

**i.e there is no guarantee that Python2 programs will run in Python3. Current versions**

**Python 3.6.1 Python 2.7.13**

**Identifiers**

**A name in Python program is called identifier.**

**It can be class name or function name or module name or variable name. a = 10**

**Rules to define identifiers in Python:**

**1. The only allowed characters in Python are**

* **alphabet symbols(either lower case or upper case)**
* **digits(0 to 9)**
* **underscore symbol(\_)**

**By mistake if we are using any other symbol like $ then we will get syntax error.**

* **cash = 10** √
* **ca$h =20** 

**2. Identifier should not starts with digit**

* **123total** 
* **total123** √

**3. Identifiers are case sensitive. Of course Python language is case sensitive language.**

* **total=10**
* **TOTAL=999**
* **print(total) #10**
* **print(TOTAL) #999**

**Identifier:**

**1. Alphabet Symbols (Either Upper case OR Lower case)**

**2. If Identifier is start with Underscore (\_) then it indicates it is private.**

**3. Identifier should not start with Digits.**

**4. Identifiers are case sensitive.**

**5. We cannot use reserved words as identifiers**

**Eg: def=10** 

**6. There is no length limit for Python identifiers. But not recommended to use too lengthy identifiers.**

**7. Dollor ($) Symbol is not allowed in Python.**

**Q. Which of the following are valid Python identifiers?**

**1) 123total** 

**2) total123** √

**3) java2share** √

**4) ca$h** 

**5) \_abc\_abc\_** √

**6) def** 

**7) if** 

**Note:**

**1. If identifier starts with \_ symbol then it indicates that it is private**

**2. If identifier starts with (two under score symbols) indicating that strongly private identifier.**

**3.If the identifier starts and ends with two underscore symbols then the identifier is language defined special name,which is also known as magic methods.**

**Eg: add**

**Reserved Words**

**In Python some words are reserved to represent some meaning or functionality. Such type of words are called Reserved words.**

**There are 33 reserved words available in Python.**

* **True ,False ,None**
* **and, or , not ,is**
* **if ,elif ,else**
* **while ,for ,break ,continue ,return ,in ,yield**
* **try ,except ,finally ,raise ,assert**
* **import ,from ,as ,class ,def ,pass ,global ,nonlocal ,lambda ,del ,with**

**Note:**

**1. All Reserved words in Python contain only alphabet symbols.**

**2. Except the following 3 reserved words, all contain only lower case alphabet symbols.**

 **True**

 **False**

 **None**

**Eg: a= true** 

**a=True** √

**>>> import keyword**

**>>> keyword.kwlist**

**['False', 'None', 'True', 'and', 'as', 'assert', 'break', 'class', 'continue', 'def', 'del', 'elif', 'else',**

**'except', 'finally', 'for', 'from', 'global', 'if', 'import', 'in', 'is', 'lambda', 'nonlocal', 'not', 'or',**

**'pass', 'raise', 'return', 'try', 'while', 'with', 'yield']**

