PYTHON ASSIGNMENT - II

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1) what are the datatypes in python? Explain?

A) Every value in python has a datatype. Since everything is an object in python programming, data types are actually classes & variables are instance of these classes.

There are various data types in python. five of the important datatypes are listed below.

* Numeric

A numeric value is any representation of data which has a numeric value. python identifies 3 types of numbers

* Integer: It includes positive & negative whole numbers.
* float: It includes any real number with a floating point representation in which a fractional component
* Complex number: It includes the combination of a real number & imaginary component represented as x+yj; where x & y are real numbers & value of j is -1:

* Boolean

Data with one of two built-in values True or False. Note this 'T' & 'F' are of upper case. true & false are not valid & python will throw an error for them.

* Sequence type
A sequence is an ordered collection of similar or different data types. Python has the following built in sequence data types.

* String: A string value is a collection of one or more characters put in the square bracket

* List: A list object is an ordered collection of one or more data items, not necessarily of the same type, put in square bracket.

* Tuple: A tuple object is an ordered collection of one or more data items, not necessarily of the same type put in parenthesis.

* Dictionary:
A dictionary object is an unordered collection of data in a key: value pair form. A collection of such pair is enclosed in curly brackets.
Ex: {1: "Steve", 2: "Bill", 3: "Ram", 4: "Farah"}

2) Briefly explain history of python
A) Python is an interpreted, high level, general purpose programming language. Created by Guido Van Rossum & first released in 1991. Python's design philosophy emphasizes code readability with its notable use of significant white space.
Its language constructs & object-oriented approach aim to help programmers write clear, logical code for small & large-scale project.

Python is dynamically typed & garbage collection. It supports multiple programming paradigms, including structured, object oriented & functional programming.

Python is often described as a "batteries included" language due to its comprehensive standard library. Python was conceived in the late 1980's as a successor to the ABC language.

Python 2.0, released in 2000, introduced features like list comprehensions & a garbage collection systems with reference counting.

Python 3.0, released in 2008, was a major revision of the language which is not completely backward compatible & many of the Python 2 codes doesn't run unmodified on Python 3.

The Python 2 language was officially discontinued in 2020 & Python 2.7.18 is the last Python 2.7 released & therefore, the last Python 2 released.

No more security patches & other improvements will be released for it. With Python 2's end-of-life, only Python 3.5.x & later are supported.

Python interpreters are available for many operating systems. A global community of programmers develops & maintains CPython, an open source reference implementation.

A non profit organization, the python software Foundation, manages & direct the resource for python & Cpython developments.

3) Explain all the operators in python

A) operators are the symbols that perform mathematical operations b/w two operands

1) Arithmetic operators:

operator	Description	syntax
+	Addition	a+b
-	Subtraction	a-b
*	multiplication	a*b
/	Division	a/b
//	floor division	a//b
%	modulus	a%b
**	power	a**b

2) Relational operator:

operator	Description	syntax
>	Greater than	a>b
<	less than	a<b
>=	Greater than or equal to	a>=b
<=	Less than or equal to	a<=b
==	Equal to	a==b
!=	Not equal to	a!=b

3) Logical operators:

operator	Description	syntax
and	Logical AND	a and b
or	Logical OR	a or b
not	Logical Not	not a

4) Bitwise operators:

operator	Description	Syntax
&	Bitwise AND	a&b
|	Bitwise OR	a|b
~	Bitwise NOT	~a
^	Bitwise XOR	a^b
>>	Bitwise right shift	a>>
<<	Bitwise left shift	a<<

Special operators:

is - True if the operands are identical

is not - True if the operands are not identical.

6) Membership operators:

in - True if value is found in sequence

not in - True if value is not found in sequence.

4) Explain the features of python.

A) 1) Easy to learn & use

Python is easy to learn & use. It is developer friendly & high level programming language.

2) Expressive language

Python is expressive language since it is more understandable & readable.

3) Interepted language

The interepter executes the code line by line at a time. This makes debugging easy & thus suitable for beginners.

4) Cross-platform language

Python can run equally on different platform like windows, Linux, Unix etc. So we can say that it is portable language.

5) Free & open source

This language is freely available at official web address. The source-code is also available so, it is open source.

6) object oriented language

This language supports the concept of classes & object came into existance.

7) Extensible

It implies that other language such as C/C++ can be used to compile the code & thus it can be further used in our python code.

8) Large standard library
Python has a large & broad library & provides rich set of module & functions for rapid application development.

9) GUI Programming support
Graphical user interfaces can be developed using python

10) Integrated.
It can be easily integrated with languages like C, C++, java etc.

5) Justify why python is interactive interpreted language.

A) Python is interpreted language since interpreter executes the code line by line at a time. This makes debugging easier. And converts machine readable byte codes. And if any error is encountered it stops the translation until the error is fixed.

Python is interactive. when a python statement is entered, & is followed by the return key, if appropriate, the results will be printed on screen immediately in next line. It is used in a similar way as the Unix command line or the terminal & is helpful for the debugging purpose.