Assignment - 2

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1) what are the datatypes in Python? Explain the data types defined in the Python are?

1) Numbers

Number store name numeric values. Number objects are created when you assign a value to them. Numeric value can be integer, floating no. (or) even complex numbers. These values are defined as int, float and complex class in Python.

2) String

In Python, Strings are arrays of bytes representing unicode characters. A String is a collection of one or more characters put in a single quote, double quote (or) triple quote.

```
string1 = "Hello world"
print(string1)
```

o/p Hello world

3) List

Lists are just like the arrays. Lists need not be homogenous always. A single list may contain Data types like Integers, strings as well as objects.

Lists are mutable, and hence, they can be altered even after their creation.

Lists in Python can be created by just placing the sequence inside the square brackets [].

eg:- List = ["Geeks", "For", 'Geeks']

Print(List[0])

o/p :- Geeks

4) Tuple

Tuple is an ordered collection of Python objects much like a list. The sequence of values stored in a tuple can be of any type, and they are indexed by integers.

The important difference blw a List and a tuppple are that Tuple is immutable.

Also tuple are hashable whereas List are not.

eg:-

```
Tuple1 = (0, 1, 2, 3)
Tuple2 = ('Python', 'geek')
Tuple3 = (Tuple1, Tuple2)
Print(Tuple3)
```

o/p

```
((0, 1, 2, 3), ('Python', 'geek'))
```

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5) Dictionary

Dictionary in Python is an unordered collection of a data values, used to store data values like a map, which unlike other Datatypes that hold only single value as an element.

Dictionary holds key:value pair. Key-value is provided in the dictionary to make it more optimized. Each key-value pair in a Dictionary is seperated by colon :, whereas each key is sperated by 'Comma'.

eg:-

```
Dict = { 1: 'Geeks', 2: 'For', 3: 'Geeks'}
print (Dict)
```

{1: 'Geeks', 2: 'For', 3: 'Geeks'}

2) Briefly explain history of Python?

* Python laid its foundation in the late 1980's
* The implementation of Python was started in the December 1989 by Guido van Rossum at CWI in Netherland.
* In February 1991, Van Rossum Published the code to all sources.

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* In 1994, Python 1.0 was released with new features like lambda, map filter and reduce.

* Python 2.0 added new features like list, comprehensions, garbage collection system

* On December 3, 2008 Python 3.0 was released. It was designed to rectify fundamental law of the language.

* ABC programming language is said to be the predecessor of Python Language which was capable of exception handling & interfacing with Amoeba O.S

* Python is influenced by following Programming Languages
  * ABC Language
  * Modula 3

3) Explain all the operators in Python?

1) Arithmetic operators:-

These are used to perform aithmetic operation b/w two operands. It includes addition(+), Subtraction(-) multiplication (*), divide (/), remainder (%).

floor division (//) and exponent (**)

ii) Comparison operator

These are used to compare the value of the 2 operands and returns boolean true or false accordingly. The comparison operators are:

==, !=, <=, >=, >, <

iii) Assignment operator

These are used to assign the value of the right expression to the left operand.

eg:-

+=, -=, *=, %=, **=, //=

iv) Bitwise operators

The Bitwise operators perform bit by bit operation on the values of 2 operands

Binary and (&), Binary xor (^) Left shift (<<)

Binary or (|) Negation (~) Right shift (>>)

v) Logical operator

These are used primarily in the expression evaluation to make a decision. Python support and, or, not Logical operators

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vi) Membership operators

These are used to check the membership of value inside a Python. If the value is present in data structures then the resulting value is true otherwise it returns false.

* In & Not in are membership operators.

vii) Identity operator

is - It is evacuated to the True if the reference present at both side point to the same object

is not - It is evacuated to the True if the reference present at both side do not point to the same object

4) Explain the features of Python

1) Easy to learn and use :-

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

2) Expressive Language

It means that it is more understandable & readable.

3) Interpreted language

Interpreter executes the code line by line at a time. This makes debugging easy.

4) cross-platform Languages

It can run equally on different platforms such as windows, Linux, Unix etc. so we can say Python is a Portable language

5) free and open source

It is freely available at official websites source code is also available. it is open source.

6) object oriented

It supports oop language and concepts of classes and objects come into existence.

7) extensible

It implies that other Lang. such as c/c++ can be used to compile the code and thus it can be used further in our Python code.

8) GUI Programming

Graphical user interface can be developed using Python.

9) Integrated

It can be easily integrated with lang like C, C++, java etc.

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5) Justify why Python is interactive interpreter Language?

Python is an interacted interpreter Language because unlike c/c++ etc. Python is an interpreted object oriented Programming language. It is meant that each time a program is run the interpreter checks through the code for errors and then interprets the instructions into machine readable byte code. we can easily integrated Python with other languages like C, C++ etc. There is no need to compile through Python code this makes it easier to debug our code. The source code of Python is converted into an immediate form called byte code