Assignment - 2

1) What the data types in python ? Explain.

Ay   The python data types are classified into five types.

1) Numeric datatype.

It Represents the data which has numeric value. Numeric value can be integer, floating or even complex numbers. These values are defined as int, float and complex class in python

* Integers :- This value is Represented by int class. It contains positive or negative whole numbers. In python there is no limit to how long an interview integer value can be.

* Float :- This value is Represented by float class. It is a real number with floating point representation. It is Specified by a Decimal point. Optionally, the character e or E followed by a positive or negative integer may be appended to specify scientific notation.

* Complex Numbers :- Complex number is represented by complex class. It is Specified as (real part) + (imaginary part).

2) Sequence Type.

In python, Sequence is the ordered collection of similar or different data types. Sequences allow to store multiple Values in an organised and efficient fashion. There are several Sequence types in python.

* 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. In python there is no character data type, a character is a String of length one. Represented by str class.

* List :- List are just like the arrays, declared in other languages. List need not be homogeneous always which makes it the most powerful tool in python. A Single list may contain Data types like integers, strings as well as objects.

Each element in the list has its definite place in the list, which allow duplicating of elements in the list, with each element having its own distinct place and Credibility. It is represented by list class

* Tuple :- It is an ordered collection of python object 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 between a list and a tuple is that tuples are immutable. Also, Tuples are hashable whereas lists are not. It is represented by tuple class.

3) Boolean.

Data type with one of the two built in values, True or False. Boolean objects that are equal to true are truthly (true) and those equal to False are falsy (False). But non - Boolean objects can be evaluated in Boolean context as well and determined to be true or false. It is denoted by the class bool.

4) Set

In python, Set is an unordered collection of data type that is iterable, mutable and has no duplicate elements. The order of elements of in a Set is undefined though it may consist of various elements. The major advantage of using a set, as opposed to a list, is that it has a highly optimised method for chealing whether a specific element is contained in the set

5) Dictionary.

Dictionary in python is an unordered collection of data values, used to store data values like a map, which unlike other Data Types that holds only single value as an element, Dictionary holds key : value pairs. key - value is provided in the dictionary to make it more optimised.

2) Briefly explain history of python

Ans   Python was conceived in the late 1980s by Guido Van
Rossum at Centrum Wiskunde & informatica in the Netherlands
as a Successor to the ABC language capable of exception
handling and interfacing with the Amoeba operating System.
Its implementation began in December 1989. Van Rossum
Shouldered sole responsibility for the project. as the lead
developer until 12 July 2018, when he announced his
"permanent vacation" from his responsibilities as python's
"Benevolent Dicator for life". a title the python community
bestowed upon him to reflect his long-Term commitment as the
project's chief decision-maker. He now Shares his leadership as a
member of a five-person Steering Council. In January 2019,
active python core developers elected Brett Cannon, Nick Coghlan,
Barry Warsaw, carol Williing and Van Rossum to a five-member
"Steering Council" to lead the project.

       python 2.0 was released on 16 October 2000 with
many major new features, including a cycle-detecling garbage
collector and support for unicode.

       python 3.0 was released on 3 December 2008. It was
major version of the language that is not completely backward
compatible. Many of its major features were backported to
python 2.6.x and 2.7.x version Series. Releases of python 3
include the utility, which automates the translation of python 2
code to python 3.

       python 2.7's end of life data was initially set at
2015 then postponed to 2020 out of concern that one large
body of existing code could not easily be forward-ported
to python 3.

3. Explain the features of python.

Au Easy to Code :-

Python is high level programming language. Python is very easy to learn languages as compared to other languages 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.

Free and Open Source.

Python language is freely available at official website and you can download it from the given download link below. Since it is open-source, this means that source code is also available to the public. So you can download it as well as share it.

Object Oriented Language.

One of the key feature of python is object oriented programming. python supports object oriented language and concepts of classes, objects encapsulation etc.

GUI Programming Support.

Graphical user 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.

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.

Extensible feature

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

python is portable language

Python language is also a portable language. for example if we have python code for window 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.

python is integrated language.

python is also an integrated language because we can early integrated python with other language like c, C++ etc.

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 immideate from called byte code.

Large Standard Library.

python has a large standard library which provides rich set of modules 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 expression, Unit-testing, web browser etc.

Dynamically Typed Language.

python is dynamically-Typed language. That means the type 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

4) Explain all the operators in python

AL **Arithmetic Operations**

Arithmetic operations are used to perform mathematical operations like addition, subtraction, multiplication & division.

Eg:- +, -, *, /, //, %, **

* Addition :- Adds two operands   A+B
- Subtraction :- Subtract two operands   A-Y
* Multiplication :- Multiplies two operands   A*B
/ Division (float):- Divides the first operand by the second x/y
// Division (float): divide the float operand by second $x//y$
% Modulus: returns the remainder when first operand is divided by the second $x\%y$
** Power: Returns first raised to power second $x**y$

Relational Operations

Relational operations compares the values. If either returns True & false according to the condition

> Greater than : True if left operand is greater than the right $x>y$
< Less than : True if left operand is less than the right $x<y$
== Equal to : True if both operands are equal $x==y$
!= Not Equals to :- True if operands are not equal $x!=y$
>= Greater than or Equal to :- True if left operand is greater $x>=y$
than or equal to the right —
<= Less than or Equal to :- True if left operand is less than or equal to the right $x<=y$.

Logical Operations :

Logical operators perform logical AND, OR & NOT.

Logical AND : True if both the operand are true   x AND y.
Logical OR : True if either of operand is true   x OR y :
Logical NOT : True if operand is false   NOT x.

Bitwise Operators:

Bitwise operators acts on bits and performs bit by bit operation.

&	Bitwise AND	$x \& y$
|	Bitwise OR	$x \| y$
~	Bitwise NOT	$\sim x$
^	Bitwise XOR	$x \wedge y$
>>	Bitwise right shift	$x >>$
<<	Bitwise left shift	$x <<$

Assignment Operators

Assignment operators are used to assign value is the variables.

= Assign value of right side of expression is left side operand. $x = y + z$

+= Add AND: add Right side operand with left side operand and then assign to left operand $a += b \cdot a = a + b$

-= Subtract AND : subtract right side operand from left operand and then assign to left operand $a -= b \cdot a = a - b$.

*= Multiple AND: multiply Right operand with left operand and then assign to left operand $a *= b \quad a = a * b$.

/= Divide AND : Divide left operand with Right operand and then assign to left operand $a /= b \quad a = a / b$

Eg:- %=, //=, **=, &=, |=, ^=, >>=, <<=.

Special Operators: There are Some special type of operators like

* Identity Operator :- It is and is not are the identity operators both are used to check if two values are located on the same part of the memory. Two variables that are equal does not simply that they are identical.

* Membership Operators : in and not in are the membership

* operators : used to test whether a value (or) variable is in a sequence.

5) Justify why python is interactive interpreted language.

Ans * python program runs directly from the source code

* Each time python programs are executed code is required

* python converts source code written by the programmer into intermediate language which is again translated into the native language / machine language that is executed. So python is an interpreted language.

* It is processed at runtime by the interpreter.

* The program need not be compiled before its execution

* It is similar to PERL and PHP

* Python is also interactive where it can prompt and interact with the interpreter directly to write the programs.

* It supports the object-oriented style of the technique which encapsulates the code within the objects.