

## Assignment - 2

1. What are the data types of python? Explain.

⇒ The standard type of python:

- \* Numeric
- \* Sequence type
- \* Boolean
- \* Set
- \* dictionary

→ Numeric: - In python numeric data type represent the data which has numeric value. Numeric value can be integer, floating number (or) Even complex numbers.

These are divided into,

- Integers
- float
- complex numbers.

\* Integer: It is represented by int class. It contains positive (or) negative whole numbers.

\* Float: It is represented by float class. It is a real number with floating point representation.

It is specified by decimal point.

\* Complex numbers: - Complex numbers is represented by complex class. It is specified as (real part) + (imaginary part)j.

→ Sequence-type: Sequence is the ordered collection of similar (or) different data types. Sequences allow to solve multiple values in an organized and efficient fashion.

There are several types in python:

- String
- List
- Tuple

→ String:- Strings are arrays of bytes representing unicode characters. It is represented by str class.

→ List:- Lists are just like the arrays declared in other languages. It is represented by list class.

→ Tuple:- Tuples are created by placing sequence of values separated by 'comma' with (or) without the use of parentheses for grouping of data sequence. It is a bit tricky; there must be 'comma' to make it tuple.

→ Boolean:- Data type with one of the two built-in values, True (or) False. In python True and False should be capital 'T' and 'F'. Otherwise, it shows 'Error'. It is terminated as bool.

→ Set:- Set is an unordered collection of datatype that is iterable, mutable and has no duplicate elements. The major advantage of using a set is



as opposed to a list, is that it has highly optimized method for checking whether specific element is contained in the set.

→ Dictionary: - Dictionary can be created by placing a sequence of element within curly {} braces, separated by 'comma'. Dictionary holds a pair of values. One being the key and the other corresponding pair element being key : value. Where as keys can't be repeated and must be immutable.

Q. Briefly explain history of python.

Python was conceived in the late 1980's by GUIDO VAN ROSSUM at Centrum Wiskunde & Informatie<sup>ca</sup> (CWI) in the Netherlands as to the ABC language.

(itself inspired by SCL) capable of Exception handling and interfacing with the Amoeba operating system.

→ Python 2.0, released in 2000, introduced features like list comprehensions and a garbage collection system with reference counting.

→ Python interpreters are available for many operating systems. A global community of programmers develops and maintain cpython an open source reference implementation.

→ Python is a multi-paradigm programming language.  
object oriented programming and structured programming.

3. Explain all the operators in python.

\* Arithmetic operator:- It is used to perform mathematical operations like addition, subtraction, multiplication operations like and division.

<u>operator</u>	<u>meaning</u>	<u>Example</u>
+	adds 2 operands	$x+y$
-	Subtracts 2 operands	$x-y$
*	multiplies 2 operands	$x*y$
/	divides 1st operand by second [float]	$x/y$
//	floor division	$x//y$
**	left operand raised to the power of right	$x**y$

Comparison operators:- Comparison operators are used to compare values. It returns either 'True' (or) 'false' according to the condition.



operator

meaning

Example

$>$

Greater than

$x > y$

$<$

less than

$x < y$

$=$

equal to

$x = y$

$!=$

Not Equal to

$x != y$

$>=$

Greater than or  
Equal to

$x >= y$

$<=$

Less than or Equal to

$x <= y$

Logical operators:- Logical operators are the and, or,

not operators.

operator

meaning

Example

and

True if both the  
operands are true

$x \text{ and } y$

or

True if either of the  
operands are true

$x \text{ or } y$

not

True if operand is  
false (complements the  
operand)

$\text{not } x$

Bitwise operators:- Bitwise operators act on operands  
as if they were strings of binary digits. They  
operate bit by bit.

operator

meaning

Example

&

Bitwise AND

$x \& y$

|

Bitwise OR

$x | y$

~

Bitwise NOT

$\sim x$

^

Bitwise XOR

$x \wedge y$

>>

Bitwise right

$x >>$

shift

<<

Bitwise left

$x <<$

shift

Assignment operators: - Assignment operators are used in python to assign values to variable.

operator

meaning

Example

+=

Add AND

$x = x + y$   
 $x += y$

-=

Subtract AND

$x = x - y$   
 $x -= y$

\*=

multiply AND

$x *= y$

/=

division AND

$x = x / y$

$x /= y$

%=

modulus AND

$x = x / y$

$x \% = y$

//=

floor AND

$x = x // y$

$x // = y$

$x // y$

\*\*=

Exponent AND

$x ** = y$

$x \equiv x ** y$

$/=$

Bitwise OR

$$x /= y$$
$$x = x / y$$

$\wedge =$

Bitwise XOR

$$x \wedge y$$
$$x = x \wedge y$$

Special operators:-  $is$  and  $is\ not$  are the identity operations in python. They are used to check if two values are located on the same part of the memory.

operator

meaning

Examples

$is$

True if the operands are identical

$x\ is\ true$

$is\ not$

True if the operands are not identical

$x\ is\ not\ true$

membership operators:-

$in$  and  $not\ in$  are the membership operators in python.

operator

meaning

Example

$in$

True if value  $is$  found in the sequence

$5\ in\ x$

$not\ in$

True if value  $is\ not$  found in sequence

$5\ not\ in\ x$



4. Explain the features of python.

- \* Easy to code
- \* Free and open source
- \* object oriented language
- \* Extensible
- \* large standard library
- \* GUI programming support
- \* Integrated and Interpreted language
- \* portable language
- \* High level language
- \* Dynamically Typed language.

5. Justify why python is interactive interpreted language.

- \* python program runs directly from the source code.
- \* 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 interpreted language.
- \* python processed at runtime by the interpreter program need to compiled before its execution.