Assignment

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1) What the data types in python? Explain

→ Data types are the classificotion or categorization of data items

→ It represents the kind of value that tells what operations can be Performed on a particular data.

→ Following are the standard or built-in data type of Python:

- Numeric
- Sequence type
- Boolean
- set
- Dictionary

→ Numeric: In Python numeric data type represents the data which has numeric value.

→ Numeric value can be integer, floating number or even complex numbers.

Ex: 1, 30.27, 2+i

1) int :- This value contains Positive or negative whole numbers

→ In Python there is no limit to how long an integer value can be. Ex:- 0, 1, 2

2) float :- It is specified by a decimal point Ex:- 20.35

3) complex :- It is specified by realpart + imaginary part

Ex:- -2+3j

Sequence type

→ In Python sequence is the ordered collection of similar or different data types

→ sequences allows to store multiple values in an organized & efficient fashion

There are several sequence types in Python

1. String
2. List
3. Tuple

1. String: 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.
→ It is represented by "str" class.

2) List:
→ Lists are just like an arrays, declared in other languages
→ Lists need not be homogeneous.
→ A single list may contain int, strings, & objects.
→ Lists are mutable, they can be altered even after their creation.
→ It is represented by 'list' class.

3) 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 & they are indexed by integeres.
→ Dff blw Tuple & list is tuple is immutable & Tuples are hashable whereas lists are not
→ It is represented by 'tuple' class.

Boolean:-
→ Data type with one of the two built-in-values, true or False.
→ Boolean objects that are equal to true are truthy (true), & those equal to false are falsy

→ Non Boolean objects can be evaluated in Boolean context as well & determined to be true or False.
→ It is denoted by the class bool

Set

→ In Python, set is an unordered collection of datatype that is iterable, mutable & has no duplicate elements
→ The order of elements in a set is undefined though it may consist of various elements.
→ The main advantage of using a set, as opposed to a list is that has highly optimized method for checking whether a specific element is contained in the set

Dictionary

→ Dictionary in python is an unordered collection of data values, used to store data values like map, which is unlike of other Data types.
→ 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 a colon:, whereas each key is seperated by a 'comma'.

2) Briefly Explain history of Python?

→ Python is a Widely used general-purpose, high-level Programming language
→ It Was intially designed by Guido Van Rossum in 1991 & devoloped by Python software Foundation.
→ It Was mainly developed for emphasis on code readability, & its synlax allows programmers to express concepts in fewer lines of code.

→ The Programming language which Python is said to have succeeded in ABC Programming language, which had the interfacing with the Amoeba operating system & had the feature of exception handling

→ It had taken some issues with ABC but lifted most of features

→ He had taken the syntax of ABC & some of its good features

→ The inspiration for the name came from BBC's TV show - "Monty Python's flying circus", as he was a big fan of TV show

→ Also he wanted a short, unique & slightly mysterious name for his invention & hence named it "Python".

→ Python has been an inspiration for many other coding languages such as Ruby, cobra, Boo, Groovy, julia, swift Go etc.

3) Explain all operators in Python.

(i) Arithmetic operators Arithmetic operators are used to Perform mathematical operations like addition, subtraction multiplication etc.

Operator	Description	syntax
+	Adds two operands	x + y
-	Subtract	x - y
*	multiplication	x * y
/	Division (float)	x / y
//	floor Division, it does not include decimal part	x // y
%	Modulus	x % y
**	Power	x ** y

2. Relational operators: Relational operators compare the values. It either returns true or false according to the condition.

Operator	Syntax	Description
>	x > y	Greater than
==	x == y	equal to
!=	x != y	Not equal to - true if operands are not equal
>=	x >= y	greater than or equal to

3. Logical operators: Logical operators Perform Logical AND and Logical OR and Logical NOT operations.

operator	Description	syntax.
and	Logical AND	x and y
or	Logical OR	x or y
not	Logical NOT	not x.

4. Bitwise operator: Bitwise operator acts on bits & performs bit by bit operation.

Operator	Description	syntax
&	Bitwise AND	x & y
|	Bitwise OR	x | y
~	Bitwise NOT	~x
^	Bitwise XOR	x ^ y
>>	Bitwise right Shift	x >>

5. Assignment operators: Assignment operators are used to assign values to variables.

operator	syntax	Description
=	x = y+z	Assign
+=	a += b a = a+b	Add AND
-=	a -= b a = a-b	Subtract AND
*=	a *= b a = a*b	Multiply AND
/=	a /= b a = a/b	Divide AND
%=	a %= b a = a%b	Modules AND
//=	a //= b a = a//b	Divide (floor) AND
**=	a **= b a = a**b	Exponent (raise Power)
&=	a &= b a = a&b	AND on operands.
|=	a |= b a = a|b	OR on operands
^=	a ^= b a = a^b	XOR on operands
>>=	a >>= b a = a>>b	Performs Bitwise right shift on operands

6. special operators: They are some operators like.

Identify operators - is & is not are the identify operators both are used to check if two values are located on the same part of memory

(4) Explain features of python?

→ Python is a dynamic, high level, Free open source & interpreted Programming Language

→ It supports OOP as well as POP.

→ It is a dynamic typed Language.

Features of Python:

1. Easy to code:

→ Python is high level Programming language. Python is very easy to learn compared to C, C#, Java etc.

→ It is very easy to code in Python language & anybody can learn Python basic in few hours or days.

→ It is also devoloper friendly language.

2. Free & open source:

→ Python language is freely available at Website. Since it is open-source, it means that source code is also available to the public.

→ So you can download it as use it as well as share it

3. object oriented language:

→ One of the key features of Python is object oriented programming

→ Python supports OOP & concept of class & objects

Programming support.

→ Graphical user interfaces can be made using modules.

→ PyQt is most popular option for creating graphical apps with Python.

5. High-level language.

Python is highlevel language. When we write Pgm, we do not need to remember the system architecture, nor do we need to manage the memory

6. Extensible Feature:

Python is a Extensible language We can write our code in to c or c++ & also we can compile that code in c/c++

7. Python is Portable language

Python language is also an Portable language for ex: if We have Python code for windows, if we don't want to run in Linux, unix & Mac. then We don't need to change it, We can run this code On any platform

8. Python is integrated language:

→ We can easily integated Pynthon with other languages like c, c++ etc.

9. Interpreted language:

→ Python code is executed line by line at a time like other languages like c, c++, java 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 immediate form called byte code.

10. Large standard Library:

→ It has rich set of module & functions so you don't have to write your own code for every single thing.

→ They are many libraries present in Python such as regular expressions, web browsers.

11. Dynamically typed language

→ (For example - int, double, long) for a variable is decided at runtime not in advance because of this feature we donot need to specify the type of variable.

(5) Justify Why Python is interactive lang interpreted Language?

Python is an interacted interpreted language because unlike c/c++ etc, Python is an interpreted object oriented Programming Language.

→ By interpreted it is meant that each time a program is run the interpreter checks through the code for errors & then interprets the instruction into machine readable bytecode

→ We can easily integrated python with other languages like c, c++ 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 immediate form called byte code.