021-345 Week 4

Assignment-01

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(1) what are the datatypes in Python ? Explain

Ans: Python have five Standard Data types
- Numbers
- String
- List
- Tuple
- Dictionary

- Numbers: A Numeric Value is any representation of data which has a numeric Value.
  Python identifies 3 types of Numbers
  Integers: +/- Whole Numbers (without fractional Part)
  float: Any real Numbers with a floating Point representation in which a fractional Component is denoted by a decimal Symbol or the Scientific notation.
  Complex: A number with a real & imaginary Component represented as x+yj.
  x & y are floats and j is -1
  (Square root of -1 Called an imaginary number)

- String: Create String Variables by enclosing Characters in quotes Python Uses Single quotes, double quotes & triple quotes to denote literal strings. only the triple quoted strings will automatically Continue

across the end of line Statement.
Strings Can be accessed as a whole String, or a Substring of the Complete Variable Using brackets []

Example:
```
Var1 = 'Hello World'
Var2 = 'Python'
Print Var1[0]
Print Var2[1:5]
```

- list: list are Very Useful Variable type in Python.
  A list Can Contain a Series of Values list Variables are declared by Using brackets following the Variable name.
  All lists in python are 0-based indexed.
  When referencing 0 member or the length of a list the number of list elements is always the number show plus one.
  Lists aren't limited to a Single dimension.
  Although Most People Can't Comprehend more than three or Four dimensions.
  You Can declare Multiple dimensions by Seperating With Commas.
  In a 2-Dimensional Array, the 1st Number is always the number of rows, the Second number is the number of Coloumns.

• Tuple: Tuples are a group of values like list and are manipulated in similar ways
But tuples, are fixed in size-once they are assigned.
In Python the fixed size is considered immutable as compared to a list that is dynamic & Mutable
Tuples are defined by Parenthesis ()
Advantages of tuples oves lists are
- Elements to a tuple. Tuples have no Append or Extend Method
- Elements Cannot be removed from a tuple
- You Can find elements in tuple, Since this doesn't Change the tuple.

• Dictionary: Dictionaries in Python are lists of Key: Value Pairs This is a very Powerful datatype to Hold a lot of velated information that Can be associated through Keys.
The Main operation of this is to Extract a Value based on the key name.
This Can also used to Sort, iterate & to Compare data.
This Can be More Complex to Understand.

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(2) Briefly Explain History of Python?

Ans:- - Python was conceived in the late 1980's by Guido Van Rossum at Centrum Wiskunde & informatica in the Netherlands

- As a successor to the ABC language, Capable of Exception Handling & interfacing with the Amoeba operating system.
- Python is a Multi-Pradigm Programming language object oriented Programming & Structured Programming are fully Supported, &
- Many of its features Support Futional Programm
- Many other Paradigms are Supported via Extensions, including design by Contract & also the logic Programming.
- Python uses dynamic typing and a Combinat of reference Counting and a Cyclic-detectin garbage Collector for Memory management
- Python is Meant to be an easily readable language.
- Its formatting is Visually unsluttered & often uses English keywords.
- Python Uses WhiteSpace indentation rather than Curly brackets / keywords
- Python Interpretes One Available for Many O.S.

- Python's name is derived from the British Comedy group Monty Python whom Python Creator Guido Van Rossum enjoyed while developing the language.
- Monty Python references Appear frequently in Python Code & Culture.
- The Prefix Py- is used to show that Something is related to Python.
- Examples of the use of this Prefix in names of Python applications or libraries include Pygame, a binding of SDL to Python

(3) Explain all the operators in Python.

Ans: There are different types of Python operators:

(a) Arithmetic operator: These are used to perform mathematical operations like +, -, * & %.

operator	Description	Syntax.
+	Addition: adds two operands	x+y
-	Subtraction: subtracts two operands	x-y
*	Multiplication: Multiplies two operands	x*y
/	Division: Divides two operand	x/y
//	Divison (floor): divides the first operand by the 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

(b) Relational operator : These operators Compares the Values, it either returns True or false according to the Condition.

operator	Description	Syntax.
>	Greater than: True if left operand is greater than the right.	x>y.
	less than: True if left operand is less than the right	
==	True if both operands are Equal	x==y
!=	True if operands are not Equal.	x!=y
>=	Greater than/ Equal to: True if left operand is greater than or Equal to the right.	x>=y
	less than/Equal to: True if left operand is less than/= to the right	

(c) logical operators: They Perform logical AND, logical OR and logical NOT operations

Operator	Description	Syntax
AND	logical AND: True if both the operands are true	x AND y
OR	logical OR: True if either of the operand is true	x OR y
NOT	logical NOT: True if the operand is false	NOT x

(d) Bitwise operator: These operators acts on bits & Performs bit by bit operations

Operator	Description	Syntax
&	Bitwise AND	x & y
|	Bitwise OR	x | y
~	Bitwise NOT	~x
^	Bitwise XOR	x ^ y
>>/<<	Bitwise Right shift	x>>
	Bitwise left shift	<<x.

(e) Special characters: These are some special type of operators like - identity operator. is and is not are the identity operators both are used to check if two values are located on the same port of the Memory. Two variables that are Equal does not implify that they are identical
is True if the operands are identical
is not True if the operands are not identica

(f) Membership operators: in and not in are the Membership operators; used to test whether a value or variables is in a Sequence
in True if value is found in the Sequence
not in True if value is not Found in the Sequence.

(4) Explain the features of Python?

Ans:- • Easy to learn & use: Python is Easy to learn & Use it is developer Friendly & High-level Programming language.

• Expressive language: it is more Expressive Means that it is More Understandable & reladable

• Interpreted language: Executes the order line at a time. This Makes debuging easy and thus Suitable for beginners

• Cross-platform language: It Can run equally on different platforms Such as windows, linux & Macintosh etc.. So we Can say that platform is a Portable language

• Free & open Source: It is freely available at official web Address. The Source Code is also Available. ∴ it is an open Source

• object-oriented language: It Supports the oop & Concepts of Classes & objects Come into existence.

- Extensible: it implies that other languages such as c/c++ can be used to compile the code & their it can be used further in our Python code.
- GUI Programming Support: Graphical user Interfac Can be developed using Python.

(5) Justify why Python is interactive interpreted language.

Ans:- Unlike c/c++, etc... Python is an interpreted OOP language, unlike 'c' language, which is a compiled Programming language. The Compiler translates the whole code in one-go rather than line-by-line. This is the reason why the c language, and all the Errors are listed during Compilation only.