TATHASTU SCHOLAR

Task-1

Python Notes

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Topics: Study Data Types, Variables, Loops, List, Dictonaries, Functions in python.

Task: 1

Internship: Python scholar Intern.

Python definition:

Python is an open source programming language that was made to be easy-to-read and powerful. Python is a good programming language for beginners. It is a high-level language, which means a programmer can focus on what to do instead of how to do it. Writing programs in Python takes less time than in some other languages.

Syntax:

Python has a very easy-to-read syntax. Some of Python's syntax comes from C, because that is the language that Python was written in. But Python uses whitespace to delimit code: spaces or tabs are used to organize code into groups. This is different from C. In C, there is a semicolon at the end of each line and curly braces ({}) are used to group code. Using whitespace to delimit code makes Python a very easy-to-read language.

- Data types
- Variables
- Loops
- List
- Dict
- Function

Data Types:

- Numbers- Python numbers datatype contains Integers, floating point numbers and complex numbers. They are defined as int, float and complex classes in Python.
- List- list is a collection datatype which is ordered and changeable and allows duplicate items. In python lists are define with square brackets.
- Tuple- A tuple is collection of ordered and unchangeable elements. In python tuples are written with round brackets.
- Set- A set is collection of unordered elements which does not have any index and they are written with curly braces.
- Dictionaries- A dictionaries are collection of elements which are unordered, changeable and indexed. They are written with curly braces and have a key and value pair.
- Strings- String is sequence of Unicode characters. We can use single quotes or double quotes to represent strings. The computer does not understand the characters; internally, it stores manipulated character as the combination of the 0's and 1's.

Variables

A variable is a named location used to store data in the memory. It is a container that holds data that can be changed later in the program.

Variable names can be a group of both the letters and digits, but they have to begin with a letter or an underscore. It is recommended to use lowercase letters for the variable name. Var and var both are two different variables

Declaring variable and assigning values:

We don't need to declare explicitly variable in Python. When we assign any value to the variable, that variable is declared automatically.

The equal (=) operator is used to assign value to a variable.

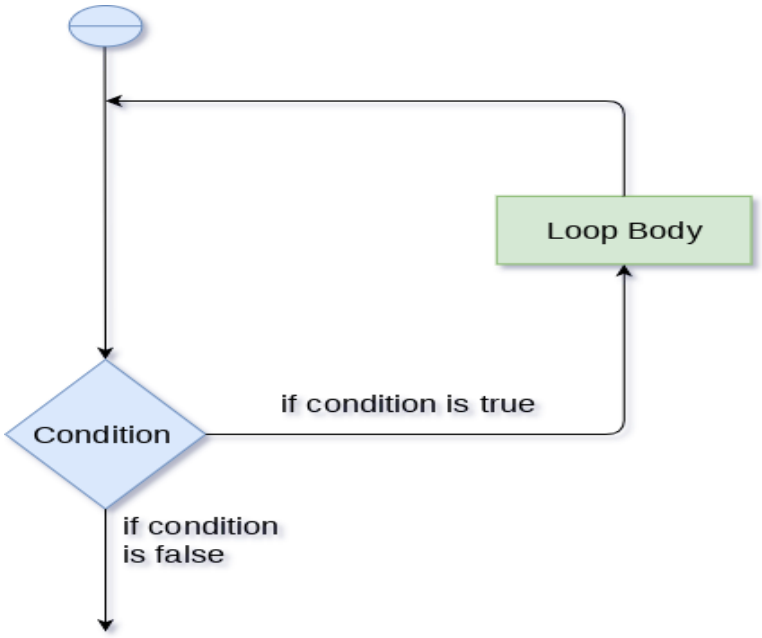
Python allows us to assign a value to multiple variables in a single statement, which is also known as multiple assignments.

We can apply multiple assignments in two ways, either by assigning a single value to multiple variables or assigning multiple values to multiple variables.

Eg: x=y=z=10

Python Loops:

The flow of the programs written in any programming language is sequential by default. The looping simplifies the complex problems into the easy ones. It enables us to alter the flow of the program so that instead of writing the same code again and again, we can repeat the same code for a finite number of times.



1. While Loop- In python while loop is used to execute a block of statements repeatedly until a given a condition is satisfied. And when the condition becomes false, the line immediately after the loop in program is executed. the statements can be a single statement or a group of statements. The expression should be any valid Python expression resulting in true or false. The true is any non-zero value and false is 0.

   The syntax of while loop:

   While expression:
   statemens

2. for in Loop- The for loop in Python is used to iterate the statements or a part of the program several times. It is frequently used to traverse the data structures like list, tuple, or dictionary.

   The syntax of for loop:

   for iterating_var in sequence:
   statements(s)

List:

A list is a collection of ordered and changeable elements. In p python list are written with square brackets. The items in the list are separated with the comma (,) and enclosed with the square brackets [].

Characteristics of list:

- The lists are ordered.
- The element of the list can access by index.
- The lists are mutable types.
- A list can store the number of various elements.

List indexing and splitting:

The indexing is processed in the same way as it happens with the strings. The elements of the list can be accessed by using the slice operator []. The index starts from 0 and goes to length - 1. The first element of the list is stored at the 0th index, the second element of the list is stored at the 1st index, and so on.

List = [5,7,3,8,9]

List[0] = 5

List methods:

1. Append (): To add an item/element to the end of the list append method is used,
   Eg:- thisList =[“apple”, “cherry”, “mango”]
   thisList.append(“orange”)
   print(thisList)
   output:
   [‘apple’, ‘cherry’, ‘mango’, ‘orange’]

2. Pop(): pop method removes the specified indexed or the last item if index is not specified.
   Eg:-
   List= [“apple”, “cherry”, “mango”]
   List.pop()
   print(list)
   output: [“apple”, “cherry”]

3. Clear(): The clear() method empties the list.
   Eg:-
   Mylist= [“apple”, “cherry”, “mango”]
   Mylist.clear()
   Print(mylist)
   Output:
   []

4. Len(): len() method determines how many elements/items dose a list contain.
   Eg:-
   list= [1,4,7,8,5,3]
   print(len(list))

   output:

   6

Python Dictionary:

Python dictionary is an unordered collection of items. Each item of a dictionary has a key value pair.

- Keys must be a single element
- Value can be any type such as list, tuple, integer, etc.

Accessing dictionary values:

the values can be accessed in the dictionary by using the keys as keys are unique in the dictionary.

Properties of dictionary keys:

In the dictionary, we cannot store multiple values for the same keys. If we pass more than one value for a single key, then the value which is last assigned is considered as the value of the key.

The key cannot be any mutable object. We can use numbers, strings, or tuples as the key, but we cannot use any mutable object like the list as the key in the dictionary.

Dictionary methods:

1. Clear (): All the items can be removed at once, using the clear() method.
   Eg:-
   ```
   Dict= {1: 'apple', 2: 'cherry',  3: 'mango'}
   Dict.clear()
   ```
   Output:
   ```
   {}
   ```
2. pop(): The pop() method accepts the key as an argument and remove the associated value.
   Eg:-
   ```
   Dict= {1: 'apple', 2: 'cherry', 3: 'mango'}
   Dict.pop(3)
   ```
   Output:
   ```
   {1: 'apple', 2: 'cherry'}
   ```

Python functions:

A function can be defined as the organized block of reusable code, which can be called whenever required.

Python allows us to divide a large program into the basic building blocks known as a function. The function contains the set of programming statements enclosed by {}. A

function can be called multiple times to provide reusability and modularity to the Python program.

There are mainly two types of functions.

- **User-define functions** - The user-defined functions are those define by the user to perform the specific task.
- **Built-in functions** - The built-in functions are those functions that are pre-defined in Python.

Python provide us various inbuilt functions like range**()** or print**()**. Although, the user can create its functions, which can be called user-defined functions.

Advantages of python:

- Using functions, we can avoid rewriting the same logic/code again and again in a program.
- We can call Python functions multiple times in a program and anywhere in a program.
- We can track a large Python program easily when it is divided into multiple functions.
- Reusability is the main achievement of Python functions.
- However, Function calling is always overhead in a Python program.

Creating a function:

Python provides the **def** keyword to define the function

Syntax:

```
def my_function(parameters):
    function_block
return expression
```

Function calling:

In Python, after the function is created, we can call it from another function. A function must be defined before the function call; otherwise, the Python interpreter gives an error.

```
#function definition
def hello_world():
    print("hello world")
# function calling
hello_world()
```

Build-in functions of python

The Python built-in functions are defined as the functions whose functionality is pre-defined in Python. The python interpreter has several functions that are always present for use. These functions are known as Built-in Functions.

- abs():

  The python abs**()** function is used to return the absolute value of a number. It takes only one argument, a number whose absolute value is to be returned. The argument can be an integer and floating-point number. If the argument is a complex number, then, abs() returns its magnitude.

- all():

  The python **all()** function accepts an iterable object (such as list, dictionary, etc.). It returns true if all items in passed iterable are true. Otherwise, it returns False.