Python notes

Python introduction: python was introduced by Gudio Van Rossum. It was developed in the year in 1991.Python is Interpreted language.Python is used for web development and software development.Python is scripting language.Present version of python is 3.11.5.

What can Python do?:

- Python can be used on a server to create web applications.
- Python can be used alongside software to create workflows.
- Python can connect to database systems. It can also read and modify files
- Python can be used to handle big data and perform complex mathematics.

Why Python?

- Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc)
- Python has a simple syntax similar to the English language.
- Python can be treated in a procedural way, an object-oriented way or a functional way.

Features of python:

- Python is easy to understand.
- Easy to code
- Object-oriented programming language
- Easy to debug
- High-level-language
- Gui programming language
- Dynamically programming language
- Free and open source language
- Python is platform independent language

Limitations of python:

- Python is slow at run time
- High memory consumption
- Run time errors
- Simplicity
- Difficulty in using other languages
- Mobile application development

Flavours of python:

- CPython
- JPython it is java application
- Iron python is used in .net C# language
- Rubby python
- Anaconda python
- Pypy.

Applications of python:

- Web applications
- Console-based applications
- Scientific and numeric
- Image processing
- Audio and video based applications

Variables:

variables are containers to store the data. Variable names are case sensitive.

Identifier:

A name given to different python program like variables,functions,classes.

Types of variables:

- Int: it returns the integer value.
- Float: it returns the floating value.
- String: it represents in the double quotations.it is a collection of alphabets,words.
- Complex: it contains real part and imaginary part.

Difference between variable and identifier:

Identifier: identifier is used identify a entity.

Variable: it used to store the data.

Variable Names:

- A variable name must start with a letter or the underscore character
- Variable names are case sensitive.
- A variable can not start with a number
- A variable name must contain alpha numeric characters(0-9)(a-z)(A-Z).
- A variable name cannot be python keyword.

Input function: the file being read/processed by the programmer is known as input function.

Output function: we can simply use print() function to get the output.

Eval function():

We can use eval function to evaluate the expression.

Type casting: converting one data type to another data type

Operators:

What is operator.

Operators are used to perform operations on variables and values.

1.Arithemetic operators. +,-,*,%,/,//,**

2.Assignment operators. =,+=,-=,*=,%=,/=,//=,**=,&=,|=,^=,<<=,>>=

3.Comparision operators. <,>,<=,>=,==,!=

4.Logical operators. and, or, not.

5.Bit-wise operators. &,|,^,<<,>>,~

6.Membership operators. In , not in

7.Identity operators. Is, is not

Strings: strings are collection of alphabets ,and words .strings are represented by double quotations"".

Some important functions in string:

1. Slicing: it used to slice the string .that means fetching a substring
2. Count: it returns the occurance of specific character

3. Split: it is used to split the string
4. Join: it is used to join the string
5. Strip: it is used to remove the white spaces in a string
6. Lstrip : lstrip function removes the leading whitespaces on the left
7. Rstrip : rstrip removes the tariling whitespaces on the right
8. Upper :returns the upper case letters.
9. Lower: returns the lower case letters
10. Title: returns the capital letter of each word
11. Swapcase: returns if the string contains uppercase letters it turns in to lowercase and lowercase letters turns into uppercase letters.

Data structures.

1.list

2.tuple

3.set

4.dictionary

List: to store multiple values in a single variable.values are represented by square brackets.[].list is mutable. We can modify the data.

Some important functions in list :

Manipulating elements:

1. Append: to add element at the last position
2. Insert: insert the element at specific index.
3. Extend:t to add elements from one list to another list.
4. Remove. To remove specified element from the list.
5. Pop. It returns the last last element from the list.

Ordering elements:

1. Reverse: reverse the string
2. Sort: order the elements from ascending order to descending order.
3. Len: it returns the length of the list
4. Index: it returns the index of the element.
5. Min: it returns the smallest element
6. Max:it returns the largest element.

Mathematical operations:
Concatenation (+) : two add two strings.
Repetition (*) : it repeats the string.
Comparing operator (==) : compare two lists

List comprehension : to compress the code in a single line .
Syntax: list=[expression for item in list if condition]

Tuple : it is used to store the multiple values in a single variable.it is represented by parenthesis.().tuples are immutable. We can not modify the data.

Important functions in tuple:

1. Len: to return the number of elements in the tuple.
2. Count: to return the number of occurance of the given element.
3. Max: it returns the largest element from the tuple
4. Min: it returns the smallest element from the tuple
5. Sorted: to sort elements in ascending order.

Tuple Comprehension : In tuple comprehension it returns only generator object it does not return the tuple object.

Set: set is an unordered collection.set is represented by curly braces {}.set contains unique elements.sets are mutable.we can modify the data.

Important functions in set:

1. Add: to add element to the set
2. Update: to update the element to the set
3. Clear: it remove all elements from the set
4. Copy: return elements from the set.
5. Pop: it remove the random element from the se.
6. Remove: it removes the specified element.
7. Discard: it also removes the specified element.

Mathematical operations:

1. Union: combine two sets.
2. Intersection: returns the elements present in both sets
3. Difference: returns the elements present in one set1 and not in set2
4. Symmetric_ difference: returns elements present in either set1 or set2 not in both sets.

Set comprehension: compress the code into a single line.it returns the set type.

Dictionary: dictionary contains keys and values.both combination of keys and values is knowns as items.dictionaries are mutable.

Some important functions in dictionary:

1. Len: it returns the number of items from the dictionary
2. Clear: it removes all the elements from dictionary
3. Get: to get the value associated with the key
4. Pop: it removes the specific key and returns the corresponding value.
5. Pop items: it removes the keys and values from the dictionary
6. Keys: it returns all the keys associated with dict.
7. Values: it returns all the values associated with dict.
8. Copy: to create exactly duplicate dict.
9. Set default:if the key is already exist itb returns the corresponding value.
10. Items : it returns list of tuples representing key-value pairs.

Control flow statements.

Control flow: a list of statements are sequentialy executed.we can execute certain code block conditionally or repeatedly is known as control flow.

1. If : if condition is true it execute the statements
2. If else: if condition is false the else block will execute
3. If elif else : it checks the multiple conditions

Transfer statements:

1. Break : to exit out of the loop the statements after break can execute.
2. Continue : jumps the current iteration to beginning of the loop
3. Pass : we don't have any statements we use pass keyword or we don't add any methods t5o function we use pass keyword.
4. Del : to remove the elements.

Iterator statements: we want to execute group of statements at multiple times we use iterative statements.

1. While loop : while loop is used to repeatedly execute a block of statements.
2. For loop : for loop is used to iterate a sequence of items
3. Infinite loop : a program keep running infinitely with out reaching a terminate block.
4. Nested loop: we can use loop inside the loop is known as nested loop.

Functions :

Function is a block of code that executes the specific task. We can define the function by using def keyword.

There are two types of functions:
1.creating a function.
2.calling function. Calling the function by using function name.

Arguments : arguments are inputs given to the function