Python is a scripting language, means it is a interpreter based language. Interpreter will execute line by line which means every line it will converts to machine readable language and execute it if any error occurs it will stop executing and will throw the error. It is invented by Van Guido Rossum in 1989.

Variable:- It is a data name where you will save the data. Python will implicitly give the data type to data and can convert the data type automatically while executing. x is a variable also called as data name.

x=20 🡪Integer,

x=’python’🡪String(python will automatically convert data type to string)

Id(x)🡪will give you memory location address.

type(x)🡪will give the data type.

del x 🡪 It will delete the variable x and data in it.

Operators:- To do operations on data.

Arithmetic Operators:- +,-,\*,% ,/,//,\*\*

Relational Operators:- <,>,<=,>=,==,!=

Logical Operator:- and,or

Assignment Operator:- =

Short hand Operator:- +=,-=,\*=,/=,%=,//=,\*\*=

Membership Operator:- in, not in

Identity Operator:- is, is not

Slicing:- To get the values from one index value to another index value of a data. x[0:3],x[3:10:2]

Indexing:- To get the particular value of a data using its address number. X[2], x[9]

Range:- To get range of elements one by one in loop we use range. range(1,10), range(1,12,2)

Data Structures or Collections or Sequences :-

Scalar Variables, List Variables, Dictionary Variables, Tuples, Set.

Scalar Variables:- int, string, boolean, float, complex

Integer(int):- It is a number. It is a immutable object. If you want to alter the value you have to convert to string and using slicing you can change but can’t change value by using indexing. Assigning using Index or Deleting using index will not work.

String:-It means anything in double quotes(“”) or single quotes(‘’), python consider it as string. It is also a immutable object. We can’t alter the data by using indexing, but we can alter using slicing.

Float:- It is a number with float numbers. It is a immutable object. If you want to alter the value you have to convert to string and using slicing you can change but can’t change value by using indexing.

Boolean:- It is a data type which returns TRUE or FALSE value.

Decision Statements: if statement is true execute else don’t execute go to next statement.

If True: print(‘True’)

else: print(‘Not True’)

Looping Statements:-

loop:- To execute range of elements we use loop. Ex:- for i in range(1,10): print(i)

String Methods:- For suppose x is a string. X=’python’

x.lower()

x.upper()

x.capitalize()

x.title()

x.swapcase()

x.lstrip()

x.rstrip()

x.strip()

x.count()

x.split()

x.rsplit()

x.join()

x.find()

x.rfind()

x.index()

x.rindex()

x.replace()

x.ljust()

x.rjust()

x.just()

x.startswith()

x.endwith()

String Validation Functions:-

Islower()

Isupper()

Isalpha()

Isdigit()

Isalnum()

Istitle()

Isspace()

dir(x):- it gives object properties and methods.

List:- list of homogeneous or heterogeneous elements are called as List. It is a ordered list and it is a mutable object where you can add elements using index and del elements using index.

List concatenation:-

a=[100,200,300]

b=[10,20,30]

a+b=[100,200,300,10,20,30]

a\*3=[10,20,30,10,20,30,10,20,30]

List Functions:-

sum(x)

max(x)

min(x)

sorted(a)

sorted(a, reverse=True)

List Methods:-

a= [100,200,500,700,600,300]

a.append(400)

a.extend([800,900,1000])

a.insert(3,400)

a.pop(2)

a.remove()

a.sort()

a.reverse()

a.count(100)

a.index(100)

a.copy()

a.clear()

List Comprehension :-

y=[]

for i in range(1,10):

y.append(i)

print(y)

or use List Comprehension method

y=[i for i in range(1,10) if i%2==0 ]

print(y)

Dictionary:-

It is a group of key value pairs. It is mutable object. We can access values by calling key. Keys should be unique.

d = {‘te’:’hyd’, ’ap’:’amaravathi’, ’tn’:’chennai’, ’kn’:’bangalore’}

d[te]

d.get(te) 🡪 hyd

d.get(‘up’) 🡪 Error

d.get(‘up’,’lucknow’)🡪lucknow, It returns default value if key didn’t found in dictionary.

d.get(‘te’,’amaravathi’)🡪hyd,It returns te key value, if there is no key then returns default value.

Dictionary Methods:-

d.keys() 🡪 it returns list of keys in d dictionary

d.values() 🡪 it returns list of values in d dictionary

d.items() 🡪 it returns list of keys and values [(key:value),(key:value)] in d dictionary

d.get(key) 🡪 it returns the value of the key in the d dictionary

d.pop(key) 🡪 it returns and delete given key value pair in d dictionary

d.popitem() 🡪 it returns and delete last key:value pair in d dictionary

d.update(dict) 🡪 it appends new dictionary to d dictionary

c=d.copy() 🡪 python copies d dictionary to c variable

d.clear() 🡪 python clears all key value pairs in d dictionary.

Dictionary Comprehension:-

y={}

for i in range(1,10):

y[i]=i\*i

print(y)

or simply use Dictionary Comprehension

y={i:i\*i for i in range(1,10) }

Tuple:- It is same as list but Tuple is a immutable object. Item assignment or item deletion or appending element is not supported in Tuple. It is also a ordered list.

x=(10,20,30)

x=(10,)

If you want to alter the tuple, first we need to change it to list and we can use list methods on that variable.

Without changing tuple data type to list data type we cant alter the elements in that tuple.

Ex:- x[2]=40 or del x[2] 🡪 throw errors in tuple. But will work in list

Set:- It is also a collection of elements. It is mutable object but not support indexing or item assignment and item deletion.It is a unordered list and contains unique elements. It allows us to do mathematical operations like union, intersection, minus and symmetric difference.

a=set() 🡪 declaring a empty set

a={100,200,300}

Set methods:-

a.add(400) 🡪 To add element 400 in the set

a.pop() 🡪 it will return and delete first element

a.remove(200) 🡪 it will delete given element if not found throws error

a.discard(200) 🡪 it will delete given element if not found doesn’t throw error.

a.copy() 🡪 Python will copy a set

a.clear() 🡪 python will clear all elements in the set.

a={10,20,30,40,60} b={40,50,60}

union(|):- a | b :- {10,20,30,40,50,60}

intersection(&):- a&b:- {40,60}

minus(-):- a-b:- {10,20,30}

symmetric difference:- a^b:-{ 10,20,30,50}

frozen set:- it is same as set but immutable. We cannot add delete an element in frozen set.

a= frozenset([10,20,30])

Files:-

fileobject = open(filename,mode)

modes:-read,write,append

read mode(r):-

fileobject = open(filename,’r’)🡪python open file and place the pointer at beginning of the file, If file not there, python throws error.

x=fileobject.read()🡪 python will open the file and copy the data into x variable.

X=fileobject.read(n)🡪python will open the file and copy up to n bits in the file and save in x variable.

x=fileobject.readlines()🡪python will open and return the data in the form of list

fileobject.close()

write mode(w):-

fileobject=open(filename,’w’)🡪python opens the file in write mode, if file exists it will erase all the data in the file and points at the beginning of the file. if file doesn’t exist it will create new file and place pointer at starting of the file.

fileobject.write(‘Hello world\n’) 🡪python opens the file and write the the i/p data.

Append mode(a):-

fileobject=open(filename,’a’):- python opens the file if file exists and place the pointer at ending of the file. if file doesn’t exist it will create new file with that name and place pointer art the beginning of the file.

fileobject.append(‘Hello appended\n’)

with open(filename,’w’) as fileobject:

fileobject.write(‘fdjvbjhfd\n’)

By this context manager even if we forgot to close the file python automatically will close the file.

fileobject.tell():- python will tell you at what byte the pointer is located.

fileobject.seek(10,0)🡪pointer will be at the 10th byte from starting point.

Fileobject.seek(0,0)🡪pointer will be at the starting byte.

Fileobject.seek(0,2)🡪pointer will be at the end of the file.

Attributes:-

x= open(‘al.txt’,’w’)

x.closed🡪 returns false because file is not closed.

x.mode 🡪 returns write mode because we opened the file in