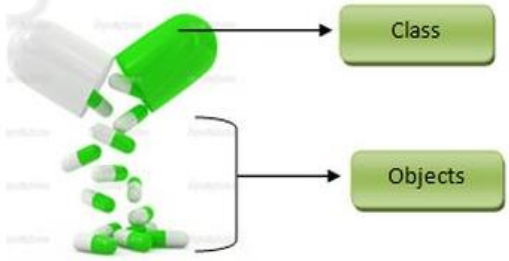
Classes and Objects

- A user-defined prototype for an object that defines a set of attributes that characterize any object of the class.
- The attributes are data members (class variables and instance variables) and method accessed via dot notation.
- A class is a collection of objects
- An object is an instance of a class which has its own state and behavior.
- In Python ,a class is defined by using a keyword class like a function begins with the keyword **def.**

- **<u>Structure of a class</u>**
- --variables
- --functions/methods
- --constructors



- ```
  class A:
      print("Hello")

  obj=A()   #creating object
  ```

- ```
  class A:
      def msg(self):
          print("Hello")

  obj=A()
  obj.msg()
  ```

What is self?

- The self parameter is a reference to the class instance itself, and is used to access variables that belongs to the class.
- It does not have to be named self , you can call it whatever you like, but it has to be the first parameter of any function in the class:

- ```
  class A:
      def msg(abc):
          print("Hello")

  obj=A()
  obj.msg()
  ```


Python Constructors

- A constructor is a special type of method (function) which is used to initialize the instance members of the class.
- Constructor can be parameterized and non-parameterized as well.
- Constructor definition executes when we create object of the class.
  ```

- Constructors also verify that there are enough resources for the object to perform any start-up task.

Creating a Constructor

- A constructor is a class function that begins with double underscore (_).
- The name of the constructor is always the same __init__().
- While creating an object, a constructor can accept arguments if necessary.
- When we create a class without a constructor, Python automatically creates a default constructor that doesn't do anything.
- Every class must have a constructor, even if it simply relies on the default constructor.
- In Python, Constructors can be parameterized and non-parameterized as well.
- The parameterized constructors are used to set custom value for instance variables that can be used further in the application.
- There are two types of constructor:

  a) Default constructor or Non Parameterized Constructor

  b) Parameterized constructor

Default Constructor

By default in python a default constructor is always present

- ```
  class Student:
      # default constructor
      def __init__(self):
          print("This is non parametrized constructor")

  Student()
  ```
  ```

Parameterized Constructor

A constructor with parameters is known as Parameterized Constructor.

```
  def show(self,name):
     print("Hello",name)


student = Student()
student.show("abc")
```

Note :-You cannot have more than one constructor in a class.

Task to be done

1.Create a class rectangle and create parameterized constructor with length and breadth. Also calculate the area and perimeter.

2.Create a class Student and ask values for roll no, name and marks from user in a default constructor ,write a function to display data. Create atleast three objects and call the functions respectively.

3.Write a program to create a class Employee with empId ,name and salary.

--Create a Parameterized Constructor for Employee

--Create at least three objects fro Employee class

--Write a function Display the Employee details.

---Calculate the highest salary of employee using reference variable