Object Oriented Programming (OOP)
Python is an object oriented programming language
Object oriented is not language; it is a programming paradigm which defines set of rules and regulations for organizing of data and instructions.
Python is multi paradigm programming language, it not only support object oriented programming it also support other programming paradigms
EG: Procedural Oriented Programming (POP)

Drawbacks of procedural oriented programming

1. In procedural oriented programming data can be declared as local or global
2. Global data does not have security from other functions or unrelated functions
3. if this global data is access by unrelated functions it leads to logical errors
4. In a large program it is difficult to identify which function is accessing global data (OR) debugging application is complex

Advantage of OOP

1. Reusability
2. Modularity
3. Readability
4. Extensibility
5. Security
6. Efficiency

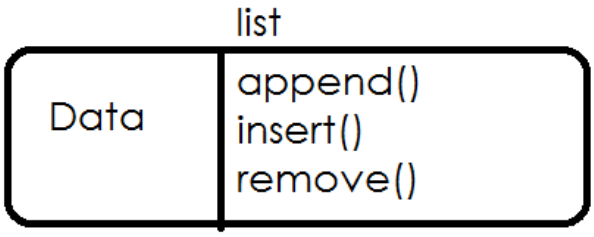
All the features of achieved using the following OOP concepts

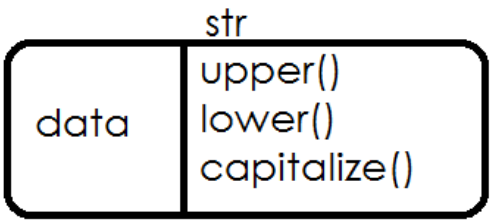
1. Encapsulation
2. Polymorphism
3. Inheritance
4. Class
5. Object
6. Abstraction

Encapsulation
Encapsulation is a process of grouping data and instructions which operates on that data within single entity
Binding data with related operations

Advantage

1. **Data Hiding**
   Preventing data access from unrelated operations
   This allows developing secured applications
2. **Binding**
   Linking data with related operations
   Debugging application becomes easy





class

class is a building block of an object oriented programming
In object oriented application development data is represented as objects.
Object is an implementation of class
Class is data type
Class is encapsulated with properties and behavior of object
Class is a blueprint of object
Class defines the structure of object
Class is a collection of attributes/variables/fields and methods/functions
Class allocates memory for object
These classes are two types.

1. Predefined classes
2. User defined classes

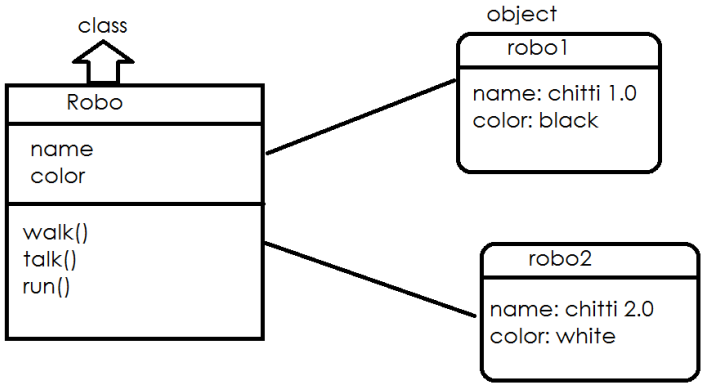
Predefined classes: the existing classes are called predefined classes or the classes provided by python
Ex: int class, float class, complex class, list class, str class, tuple class,…
User defined classes: the classes or data types build by programmer are called user defined classes
Eg: student, Marks, Player, Employee, Product,….

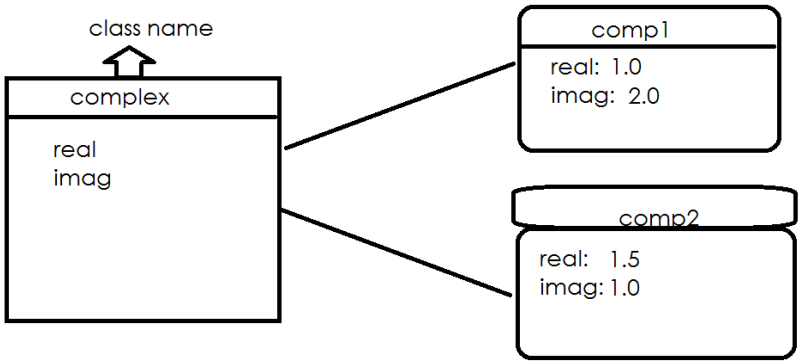
Object

Object is an instance of class
Object is an implementation of class
In object oriented application development data is represented as objects.
Every object is having two characteristics

1. Properties
2. Behavior

Properties define the state of the object
Behavior define functionality of the object
To create an object we required class





Syntax of class
class **<class-name>/<data-type-name>:**
variables/properties/fields/data member
methods/member functions

The variables declared inside the class are two types.
1. Instance variables/object level variables
2. Class level variables

The methods defined inside class are three types
1. Instance methods/object level methods
2. Class level methods

3. Static methods

A method is function, which is a member of class. A method written inside class to perform operation on data.

Building a class is nothing but creating user defined data type.