Object Oriented Programming (OOP)

The main objective of learning Object Oriented Programming is developing user defined data types (OR) building custom classes or data types.

Data types

Python data types are classified two categories

1. Predefined Data types
2. User defined Data types

Predefined data types

This existing data types or data types provided by python or third party vendors are called predefined data types.

Predefining data types are classified into two categories

1. Scalar Data Types
    a. Int
    b. Float
    c. Complex
    d. Bool
    e. NoneType
2. Collection Data Types
    a. Sequences
        i. List
        ii. Tuple
        iii. Range
        iv. String
        v. Byte
        vi. Bytearray
    b. Sets
        i. Set
        ii. Frozenset
    c. Mapping
        i. Dictionary

Scalar Data types and collections are called standard data types of python.

User defined Data Type

The data types build by programmer are called user defined data types or custom data types. These are application specific data types.

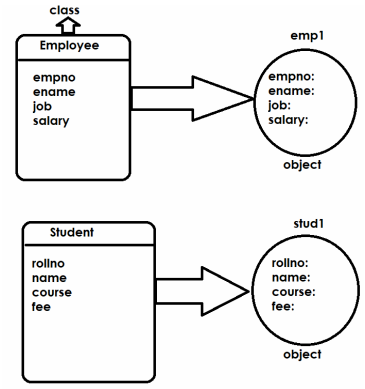
User defined data types are build by using object oriented programming concepts or principles.

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

Class

In python or in object oriented program a “class” represents data type.
Class is blueprint of object
Class define the structure of object
Class allocates memory for object or data.
Class is collection of members and these members are two types

1. Data Members (Variables)
2. Member Functions (Methods)



Data Members

The variables created within class are called data members. These variables define the properties of object.
The variables created inside class are two types

1. Instance variables
2. Class variables

Member Functions

The functions defined within class are called member functions. These member functions are called methods. These methods perform operations on data members/variables.

Member functions or methods are 3 types

1. Instance method
2. Class method
3. Static method

Syntax:
class class-name/datatype-name:
data-members
member-functions

Object
Object is an instance of a class.
In object oriented programming data is represented as objects.
These objects are created using classes.

What is SBI of an object?
Every object is having 3 characteristics

1. State
2. Behavior
3. Identity

State: Data or information given to each property or an attribute of object is called state
Behavior: An operation performed by object
Identity: Every object is identified with unique name

Syntax:
Variable/object-name=class-name()

Encapsulation

Encapsulation, in the context of programming, specifically object-oriented programming (OOP), means bundling data (variables) and the methods (functions) that operate on that data into a single unit, typically a class.

Encapsulation is process of grouping data members and member functions within single unit (class).
Binding or wrapping variables with methods with in single entity (class)

Advantage of encapsulation

1. Data Hiding
2. Binding

Data Hiding

Preventing data access from unrelated operations is called data hiding.
This allows developing secured applications.

Binding

Linking data with related operations is called binding.