

BISHOP GEORGE SCHOOL & COLLEGE
Worksheet No.8 (2021-2022)
Class – 10th
Subject – Computer Applications
Chapter 7 – Class as a User Defined Types

Class : A class is a set of similar object. It has data members and methods.

Defining a class :

Syntax :

```
class <Classname>
{
    Data members;
    -----
    -----
    Method( )
    {
        -----
        -----
    }
}
```

In above syntax:

class : It is a keyword, used to define a class.

Classname: It is referred as tag. It is a user defined type. (A class name should be valid identifier).

Data members: The variables, which are declared within class are called data members or instance variable.

Methods : Operation on data member is called method or member function, it is defined within class.

Example:

```
class sum //class name is sum
{
    int a, b, c; // data members are a, b, c
    void Add( ) // method is void Add
    {
        c= a + b;
        System.out.println( "sum="+c);
    }
}
```

[Sum of a and b is being calculating and storing result into c and value of c is being printed inside method Add()]

Member VariableDeclaration :The class contains member variables and member methods for its objects. In Java, member variables are classified into two categories.

- (i) **Instance Variable :** The variables that are declared inside a class but not within a method are called Instance variable. Each object has its own copy of instance variables.
- (ii) **Static Variable:** Variables that have static modifier (keyword) in their declaration are called static (class) variables. All the objects of the class share the same copy of a variable.

Example:- class Student

```

{
    static String school_name;    //Static variable
    static String class_name;    //Static variable
    String name;                 //Instance variable
    int roll_no;                 //Instance variable
    int age;                      //Instance variable
}

```

Object: object is uniquely identifiable entity, used to access members of a class (Data members and Methods).

Creating object of a class: An object is created in two steps:

1. Creating an object:

Syntax: [Classname objectname;]

In above syntax,

Classname: is a class, object of which is to be created

objectname: is user defined name, should be a valid identifier.

Example: **sum obj;** // obj is object of class sum

2. Instantiating and initializing an object:

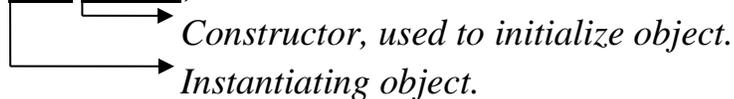
Syntax: [objectname =new Classname();]

In above Syntax,

new: is keyword is used to instantiate an object, it allocates memory for object.

Classname(): Object is being initialized. It is also called constructor.

Example: **obj = new sum();** // Instantiation and initialization



Creation, instantiation and initialization of object can be done on same line also:

Syntax: `Classname objectname =new Classname();`

Example: `sum obj = new sum();`

- Constructor, used to initialize object.
- Instantiating object.
- Creating object obj of class sum.

Accessing or calling member of a class: To access members of a class period (.) operator is used with object name.

Syntax: `Objectname.datamember / method();`

Example: `obj.a=10;`
`obj.b= 12;`
`obj.sum();`

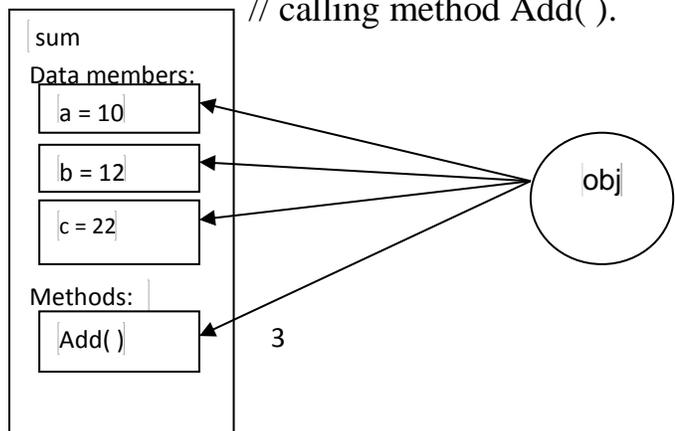
A program as example of class and object:

```
class sum //class name is sum
{
    int a, b, c; // data members are a, b, c
    void Add() // method is void Add
    {
        c= a + b;
        System.out.println( "sum="+c);
    }
}
```

`Sum of a and b is being calculating and storing result into c and value of c is being printed inside method Add()`

```
class call //class of main( ) method
{
    public static void main(String args[]) //main( ) method
    {
        sum obj = new sum( ); // creating, instantiating and initializing object.
        obj.a=10; // calling data member a and assigning 10 to a.
        obj.b= 12; // calling data member b and assigning 12 to b.
        obj.Add( ); // calling method Add( ).
    }
}
```

Output:



sum = 22

Note:

- Object of a class is created inside main() method.
- Members of a class are called through the object of that class inside main() method.

EXERCISE

1. Answer the following the questions:

- (a) What is the significance of class in Java?
- (b) How does a class form the basis of all computation?
- (c) State the class declaration rules.
- (d) What is the purpose of the new operator?
- (e) Mention any two attributes required for a class declaration.
- (f) State one difference between an instance variables and static variables.
- (g) Name the keyword that distinguishes between instance variables and class variables.
- (h) Write two differences between Primitive and Composite Data types.