Classes and Objects

By

Dr M. Senthilkumar

Assistant Professor

Department of Computer Science

Government Arts and Science College, Avinashi - 641654

What is a Class?

- ✓ Class is a User-defined Data type
- ✓ Class contains Data Members and Member Functions

- ✓ Data Members are Optional
- ✓ Member Functions are Optional
- ✓ Class can be Empty

- ✓ Java Program contains One or More Classes

What is a Class?

- ✓ Class may extend another Class
- ✓ Class may implement an Interface

- ✓ Class is a Template for creating Objects
- ✓ Class is the Original Copy
- ✓ Objects are Instances of a class
- ✓ Memory is allocated for Objects

What is a Class?

- ✓ The variables defined within a class but outside methods are called Instance variables/ Member variables
- ✓ The variables defined within the methods of a class are called Local variables

- ✓ Memory for Instance Variables are allocated within the method frame of Heap Area

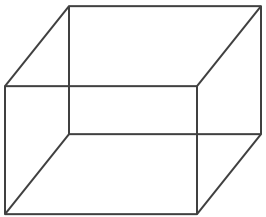
- ✓ Memory for Local Variables are allocated within the method frame of Local Area

Structure of a Class

```
class classname
{
        type instance-variable 1;

        type instance-variable 2;

        …
        ...
        type instance-variable N;

        ret_type methodname 1 (parameter-list)
        {
                // body of method
        }

        ret_type methodname 2 (parameter-list)
        {
                // body of method
        }

        ret_type methodname N (parameter-list)
        {
                // body of method
        }
}
```

Example 1

```
class Box
{
        double width;
        double height;
        double depth;
}
```



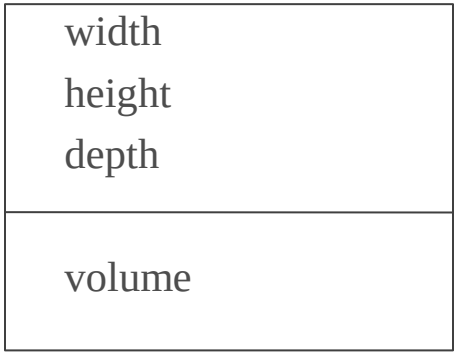
```
class BoxVol
{
        public static void main(String args[])
        {
                Box B1 = new Box();
                double Vol;
                B1.width = 3.0;
                B1.height = 4.0;
                B1.depth = 5.0;
                Vol = B1.width * B1.height * B1.depth;
                System.out.println("Volume is = " + Vol);

        }
}
```

width
height
depth

Example 2

```
class Box
{
    double width;
    double height;
    double depth;
    void volume()
    {
        System.out.print("Volume of the Box is = ");
        System.out.println(width * height * depth);
    }
}
```

```
class BoxVol
{
    public static void main(String args[])
    {
        Box B1 = new Box( );
        B1.width = 3.0;
        B1.height = 4.0;
        B1.depth = 5.0;
        B1.volume( );
    }
}
```



Example 3

```
class Box
{
   double width;
   double height;
   double depth;
  void getData(double x, double y, double Z)
   {
            width = y;
            height = y;
            depth = z;
    }
    double volume( )
   {
            double V = width  * height * depth;
            return (V);
   }
}
```

```
class BoxVol
{
      public static void main(String args[])
      {
            double Vol;
            Box B1 = new Box( );
            B1.getData(3.0, 4.0, 5.0);
            Vol = B1.volume( );
            System.out.println("Box Volume = " + Vol);
       }
}
```

width height Depth
getData( ) volume( )

Example 4

```
class Rectangle
{
        double length;
        double width;
        void getData(double x, double y)
        {
                length = x;
                width = y;
        }
        double computeArea( )
        {
                double area = length * width ;
                retrun (area);
        }
}
```

```
class RectArea
{
      public static void main(String args[])
      {
            double Area;
            Rectangle R = new Rectangle();
            R.getData(15.0, 10.0)
            Area = R.computeArea()
            System.out.println("Area= " + Area);
       }
}
```

Thank you