# Nepathya College
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**Object Oriented Programming in Java**
**Lab 3**

**Objective:** To learn concepts of object oriented paradigm in Java.
**Descriptions:**

- **Refer theory from the slides.**

**Program**
**Note: The program should be well formatted i.e. proper use of indentation, comment, description of program and functions etc.**

**1. Complete the following a program in Java to create a class Box with instance variables length, width, and height. Create at least 2 objects from the class Box and calculate volume of each box object.**

```
class Box{
….....................................
}
//This class declares an object of type Box.
public class boxdemo {
        public static void main(String[] args) {
                Box box1 = new Box();
                ….....................................
                double vol;

                // assign values to box1's instance variables
                box1.width = 100;

                // compute volume of second box
                vol = box2.width * box2.height * box2.length;

        }
}
```

**Output**

```
Volume of box1 is 30000.0
Volume of box2 is 162.0
```

**2. Write a program in Java to create a class Box with instance variables length, width, and height, add method volume that returns some value. Create at least 2 objects from the class Box and calculate volume of each box object.**

**Output**

```
Volume of first box is 30000.0
Volume of second box is 162.0
```

**3. Write a program in Java to create a class Box with instance variables length, width, and height, add method volume that returns some value, Also add a method setDimension() that takes parameters. Create at least 2 objects from the class Box and calculate volume of each box object.**

**Output**

```
Volume of first box is 30000.0
Volume of second box is 162.0
```

**4. Complete the following program that demonstrate the concept of constructor**

```
class Box{
        double width;
        double height;
        double length;
        // use default constructor here
}
public class boxdemo{
        public static void main(String[] args){
                Box box1 = new Box();

                double vol;
                vol = box2.volume();
        }
}
```

**Output**

```
Constructing Box
Constructing Box
Volume of first box 1000.0
Volume of first box 1000.0
```

**5. Complete the following program that demonstrate the concept of parameterized constructor.**

```
class Box{
        int length;
        int width;
        int height;

        //use parameterized constructor here
}
public class constructor1{
        public static void main(String[] args){
                Box box1 = new Box(10, 20, 30);
                int vol;

                vol = box2.volume();
        }
}
```

**Output**

```
The volume of first box is 6000
The volume of first box is 120
```

**6. Use keyword "this" in the above program and illustrate the demonstration.**

**7. Make class "Rectangle" with attributes length and breadth. The class contains methods computeArea and displayArea. Write a program with main method that creates two objects of Rectangle class and find their areas and display area of larger rectangle.**

**Output**

```
Area of larger rectangle is 1500
```

**8. Modify the above program by entering the variable values from the keyboard.**

**9. Create a class Addition and define a method namely sum with three overloaded forms. The first with two integer parameters, second with three integer parameters and third form with two parameter of integer and double to find the sum. Define another class namely MethOverDemo that contains main() method to test class Overload.**

**Output**

```
First method: 30
Second method: 60
Third method: 30.0
```

**10. Complete the following program that demonstrate the concept of constructor overloading.**

```
class Box
{
        double width, height, depth;
        // constructor used when all dimensions // specified
        Box(double w, double h, double d)
        {
                width = w;
                height = h;
                depth = d;
        }

        // compute and return volume
        double volume()
        {
                return width * height * depth;
        }
}
public class methodoverloading
{
        public static void main(String args[])
        {
                // create boxes using the various  constructors
                Box mybox1 = new Box(10, 20, 15);

                double vol;

                // get volume of first box
                vol = mybox1.volume();
                System.out.println(" Volume of with 3 parameters is " + vol);
        }
}
```

**Output**

```
Volume of with 3 parameters is 3000.0
Volume of with no parameters is 0.0
Volume of cube is 343.0
```

**11. Complete the following program that demonstrate the concept of object passing.**

```
class Area{
        int length, breadth;
        int area(){
                return length * breadth;
        }
}
public class Passingobject {
        public static void main(String[] args) {
                Area A1 = new Area(10, 20);
                Area A2 = new Area(A1);
        }
}
```

**Output**

```
The area of A1 is: 200
The area of A2 is: 200
```