

Ganeshman Singh Multiple Campus

(Tribhuvan University)
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Lab Report of OOPS IN JAVA (CACS-204)

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1. Write a Java program to class and object creation.

```
class BasicClass {  
    private String name;  
    private int value;  
  
    public BasicClass(String name, int value) {  
        this.name = name;  
        this.value = value;  
    }  
  
    public void display() {  
        System.out.println("Name: " + name + ", Value: " + value);  
    }  
  
    public static void main(String[] args) {  
        BasicClass obj = new BasicClass("Example", 42);  
        obj.display();  
    }  
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\  
Name: Example, Value: 42  
  
Process finished with exit code 0
```

2. Write a Java program to 'this' keyword usage.

```
class ThisKeywordDemo {
    private String name;
    private int age;

    public ThisKeywordDemo(String name, int age) {
        this.name = name;
        this.age = age;
    }

    public ThisKeywordDemo setName(String name) {
        this.name = name;
        return this;
    }

    public ThisKeywordDemo setAge(int age) {
        this.age = age;
        return this;
    }

    public void display() {
        System.out.println("Name: " + this.name + ", Age: " + this.age);
    }

    public static void main(String[] args) {
        ThisKeywordDemo demo = new ThisKeywordDemo("John", 25);
        demo.setName("Jane").setAge(30).display();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
Name: Jane, Age: 30
```

```
Process finished with exit code 0
```

3. Write a Java program to interface implementation.

```
interface Drawable {  
    void draw();  
}  
  
class Circle implements Drawable {  
    private double radius;  
  
    public Circle(double radius) {  
        this.radius = radius;  
    }  
  
    public void draw() {  
        System.out.println("Drawing circle of radius: " + radius);  
    }  
  
    public static void main(String[] args) {  
        Circle c = new Circle(5.0);  
        c.draw();  
    }  
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files  
Drawing circle of radius: 5.0  
  
Process finished with exit code 0
```

4. Write a Java program to student class with name, roll, marks.

```
class Student {
    private String name;
    private int roll;
    private double[] marks;

    public Student(String name, int roll, double[] marks) {
        this.name = name;
        this.roll = roll;
        this.marks = marks;
    }

    public void displayInfo() {
        System.out.println("Name: " + name);
        System.out.println("Roll: " + roll);
        double total = 0;
        for (double mark : marks) total += mark;
        System.out.println("Average: " + total / marks.length);
    }

    public static void main(String[] args) {
        Student s = new Student("Alice", 1, new double[]{80, 90, 85});
        s.displayInfo();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
Name: Alice
Roll: 1
Average: 85.0

Process finished with exit code 0
```

5. Write a Java program to car class with attributes and methods.

```
class Car {
    private String brand;
    private String model;
    private boolean isRunning;

    public Car(String brand, String model) {
        this.brand = brand;
        this.model = model;
        this.isRunning = false;
    }

    public void start() {
        isRunning = true;
        System.out.println(brand + " " + model + " started.");
    }

    public void stop() {
        isRunning = false;
        System.out.println(brand + " " + model + " stopped.");
    }

    public static void main(String[] args) {
        Car car = new Car("Toyota", "Camry");
        car.start();
        car.stop();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
Toyota Camry started.
Toyota Camry stopped.

Process finished with exit code 0
```

6. Write a Java program to array list of employees.

```
import java.util.*;

class Employee {
    String name;
    int id;

    Employee(String name, int id) {
        this.name = name;
        this.id = id;
    }

    public void display() {
        System.out.println("ID: " + id + ", Name: " + name);
    }
}

class EmployeeList {
    public static void main(String[] args) {
        ArrayList<Employee> list = new ArrayList<>();
        list.add(new Employee("John", 1));
        list.add(new Employee("Jane", 2));
        for (Employee e : list) e.display();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
ID: 1, Name: John
ID: 2, Name: Jane

Process finished with exit code 0
```

7. Write a Java program to railway ticket booking system.

```
import java.time.LocalDateTime;

class Ticket {
    String passengerName;
    String source, destination;
    LocalDateTime journeyDate;

    public Ticket(String name, String src, String dst, LocalDateTime date) {
        passengerName = name;
        source = src;
        destination = dst;
        journeyDate = date;
    }

    public void display() {
        System.out.println("Passenger: " + passengerName + ", From: " +
source + " To: " + destination);
    }
}

class RailwayBooking {
    public static void main(String[] args) {
        Ticket t = new Ticket("Alice", "NY", "LA",
LocalDateTime.now().plusDays(2));
        t.display();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
Passenger: Alice, From: NY To: LA

Process finished with exit code 0
```


8. Write a Java program to secure login using private fields.

```
class SecureLogin {  
    private String username = "admin";  
    private String password = "1234";  
  
    public boolean login(String user, String pass) {  
        return username.equals(user) && password.equals(pass);  
    }  
  
    public static void main(String[] args) {  
        SecureLogin s = new SecureLogin();  
        System.out.println("Login success: " + s.login("admin", "1234"));  
    }  
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files  
Login success: true  
  
Process finished with exit code 0
```

9. Write a Java program to animal > dog, cat, horse.

```
class Animal {
    String name;
    Animal(String name) {
        this.name = name;
    }
    void sound() {
        System.out.println(name + " makes a sound.");
    }
}
class Dog extends Animal {
    Dog(String name) { super(name); }
    void sound() {
        System.out.println(name + " barks.");
    }
}
class Cat extends Animal {
    Cat(String name) { super(name); }
    void sound() {
        System.out.println(name + " meows.");
    }
}
class Horse extends Animal {
    Horse(String name) { super(name); }
    void sound() {
        System.out.println(name + " neighs.");
    }
}
class MainAnimal {
    public static void main(String[] args) {
        Animal[] animals = {new Dog("Buddy"), new Cat("Whiskers"), new
Horse("Spirit")};
        for (Animal a : animals) a.sound();
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\P
Buddy barks.
Whiskers meows.
Spirit neighs.

Process finished with exit code 0
```

10. Write a Java program to abstract shape class.

```
abstract class Shape {
    abstract double area();
}

class Rectangle extends Shape {
    double length, width;

    Rectangle(double l, double w) {
        length = l;
        width = w;
    }

    double area() {
        return length * width;
    }
}

class MainShape {
    public static void main(String[] args) {
        Shape s = new Rectangle(5, 4);
        System.out.println("Area: " + s.area());
    }
}
```

OUTPUT

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\
Area: 20.0

Process finished with exit code 0
```