INSTITUTE OF ENGINEERING & MANAGEMENT

Department of Computer Science & Engineering

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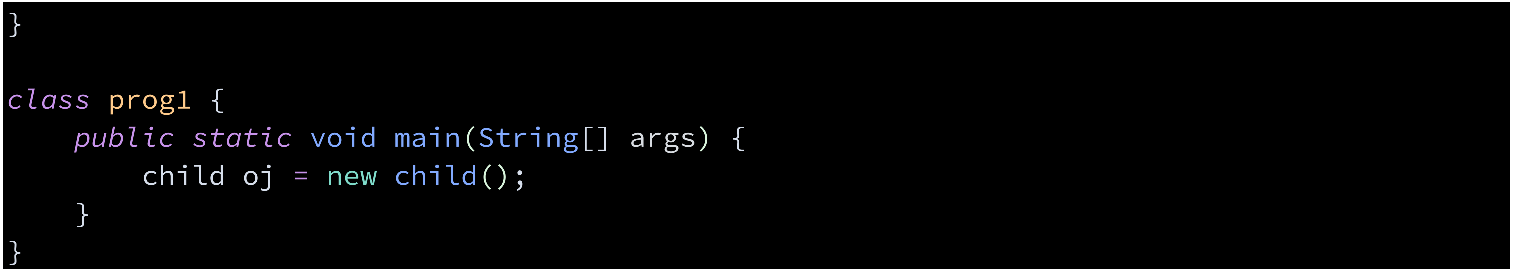
Class Roll	**: 27**
Enrollment No.	**: 12019002002039**
Subject Name	**: OOP Lab**
Assignment No.	**: Day 5**
Date	**: 01/09/2021**

1. Create a program with three classes namely Grandparent, Parent and Child with their respective default no-argument constructors. Parent and Child classes need not include super() calls in the body of their constructors. Now create an object of the Child class within the main() method.

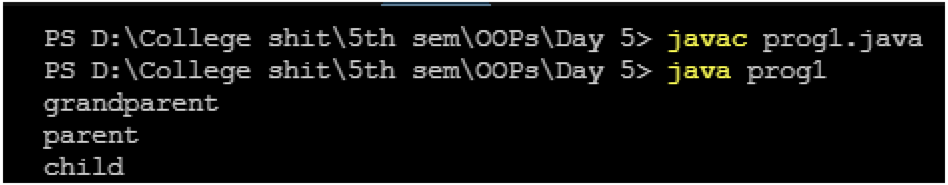
Code:

```java
class grandparent {
    grandparent() {
        System.out.println("grandparent");
    }
}

class parent extends grandparent {
    parent() {
        System.out.println("parent");
    }
}

class child extends parent {
    child() {
        System.out.println("child");
    }
```



```java
}

class prog1 {
    public static void main(String[] args) {
        child oj = new child();
    }
}
```

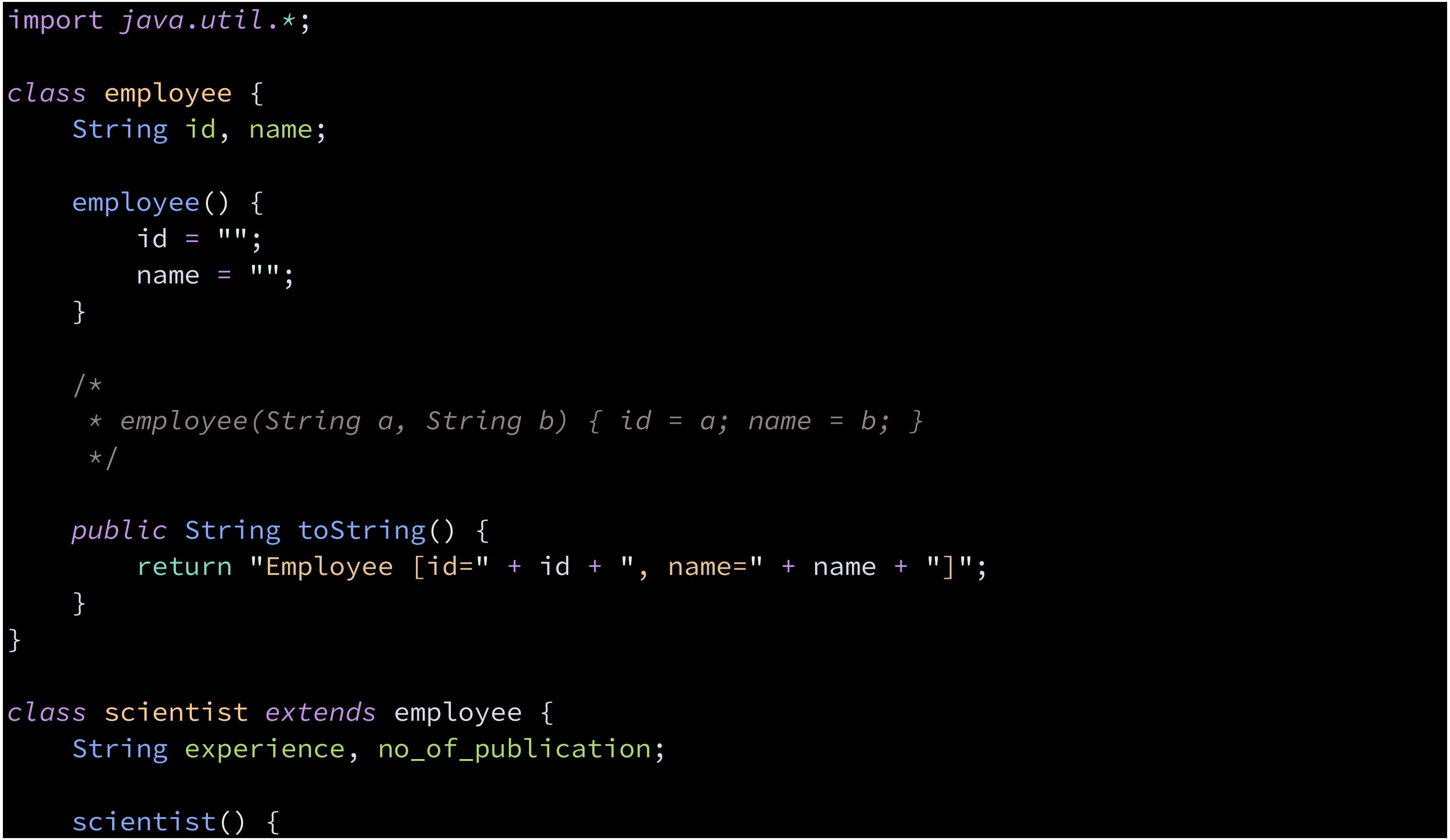
Output:



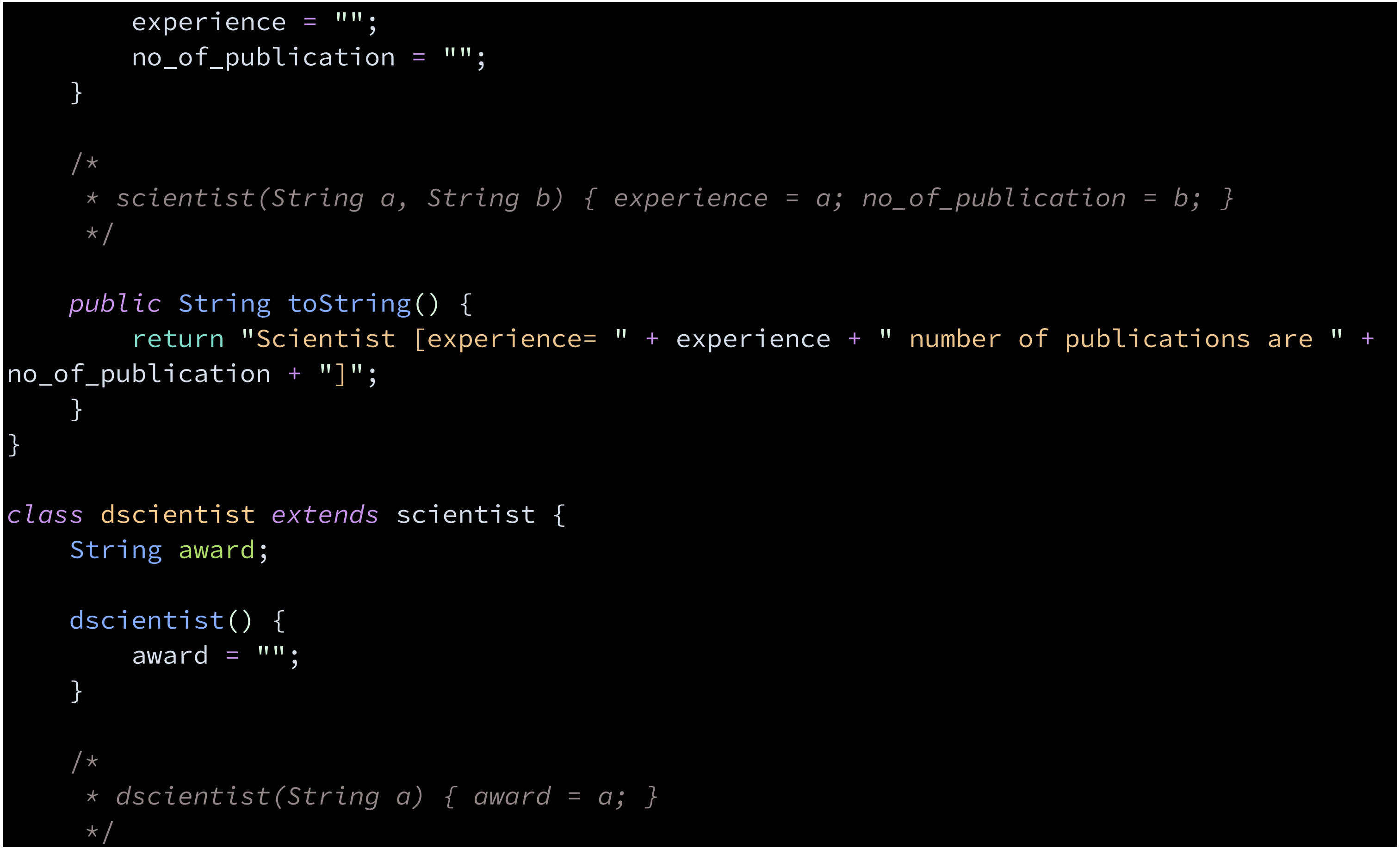
```
PS D:\College shit\5th sem\OOPs\Day 5> javac prog1.java
PS D:\College shit\5th sem\OOPs\Day 5> java prog1
grandparent
parent
child
```

2. Create a class Employee is having instance variables id and name. Create its subclass named Scientist which has instance variables experience and no_of_publication. Now create its subclass, say DScientist which has instance variable award. Put a method like public String toString(){ } in every class where you describe about the class and from main() method create object of each class and print each object.

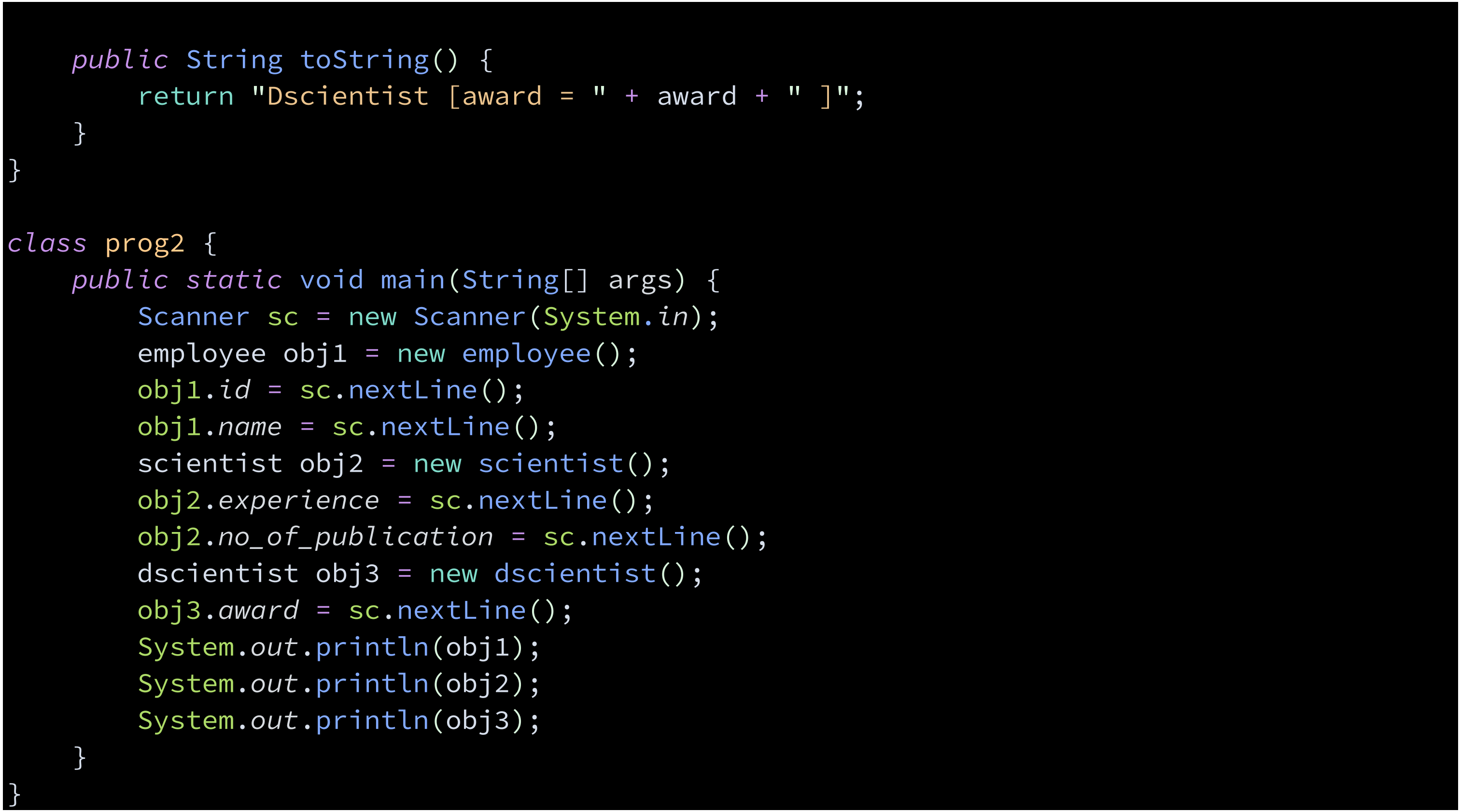
Code:



```
import java.util.*;

class employee {
    String id, name;

    employee() {
        id = "";
        name = "";
    }

    /*
     * employee(String a, String b) { id = a; name = b; }
     */

    public String toString() {
        return "Employee [id=" + id + ", name=" + name + "]";
    }
}

class scientist extends employee {
    String experience, no_of_publication;

    scientist() {
```

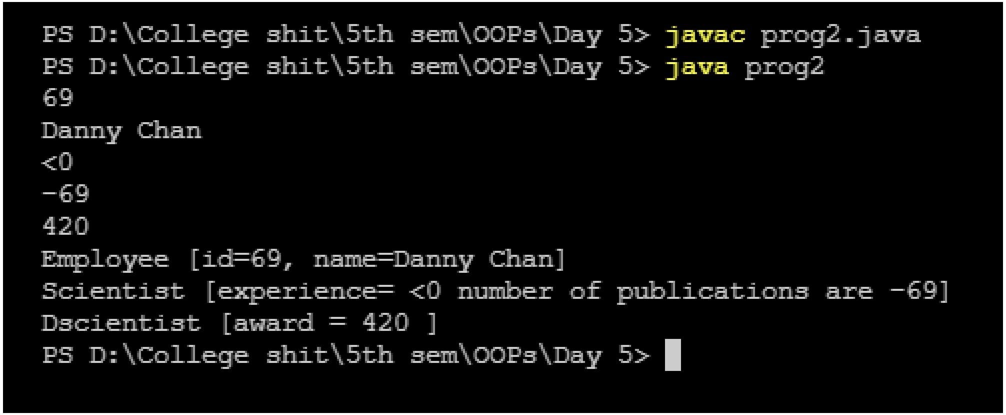


```java
        experience = "";
        no_of_publication = "";
    }

    /*
     * scientist(String a, String b) { experience = a; no_of_publication = b; }
     */

    public String toString() {
        return "Scientist [experience= " + experience + " number of publications are " +
no_of_publication + "]";
    }
}

class dscientist extends scientist {
    String award;

    dscientist() {
        award = "";
    }

    /*
     * dscientist(String a) { award = a; }
     */
```



```
    public String toString() {
        return "Dscientist [award = " + award + " ]";
    }
}

class prog2 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        employee obj1 = new employee();
        obj1.id = sc.nextLine();
        obj1.name = sc.nextLine();
        scientist obj2 = new scientist();
        obj2.experience = sc.nextLine();
        obj2.no_of_publication = sc.nextLine();
        dscientist obj3 = new dscientist();
        obj3.award = sc.nextLine();
        System.out.println(obj1);
        System.out.println(obj2);
        System.out.println(obj3);
    }
}
```

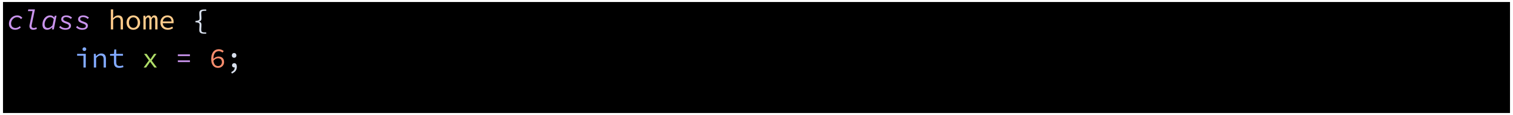
Output:



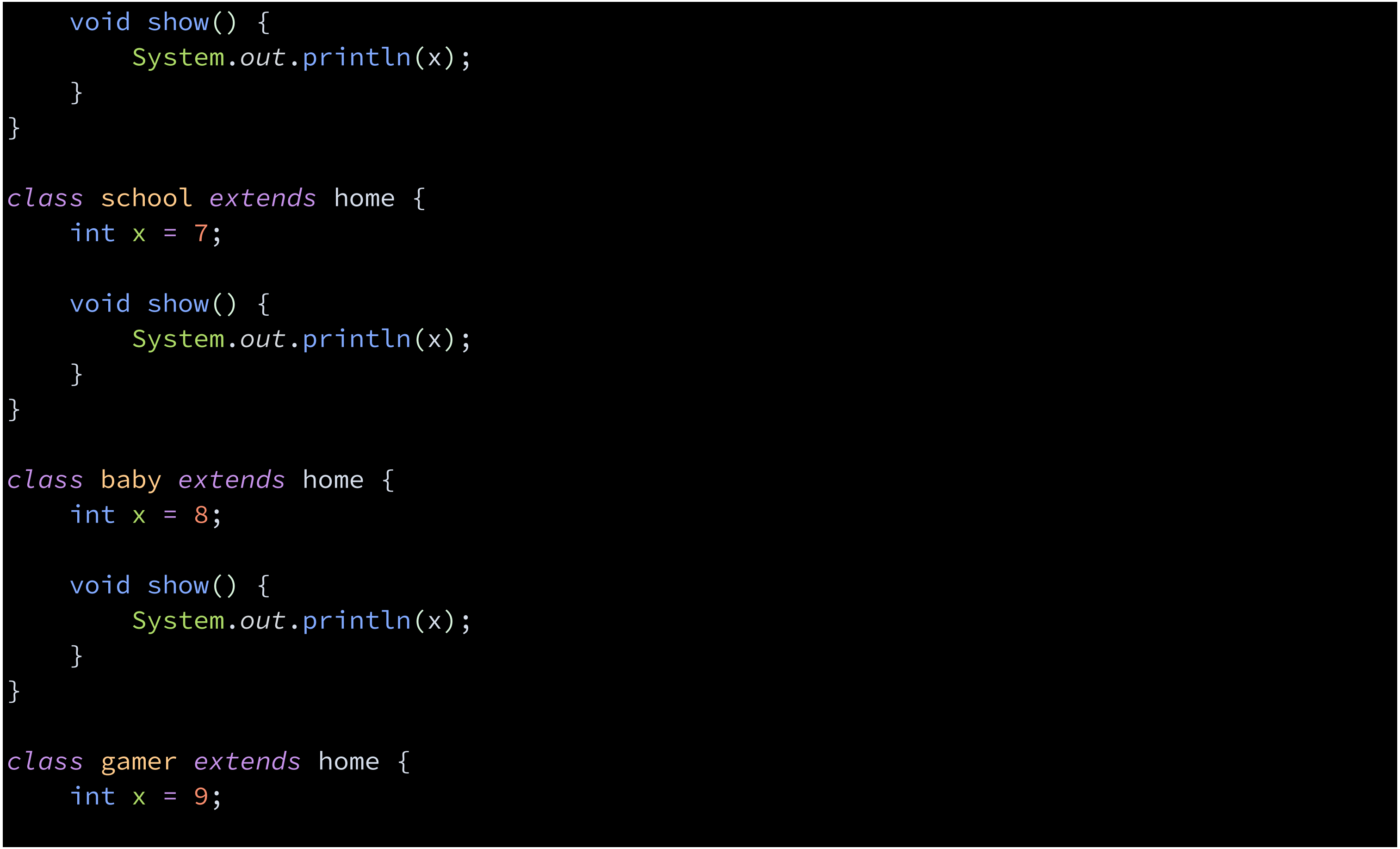
```
PS D:\College shit\5th sem\OOPs\Day 5> javac prog2.java
PS D:\College shit\5th sem\OOPs\Day 5> java prog2
69
Danny Chan
<0
-69
420
Employee [id=69, name=Danny Chan]
Scientist [experience= <0 number of publications are -69]
Dscientist [award = 420 ]
PS D:\College shit\5th sem\OOPs\Day 5>
```

3. Create a class with a method void show() and make three subclasses of it and all subclasses have this show() method overridden and call those methods using their corresponding object references.

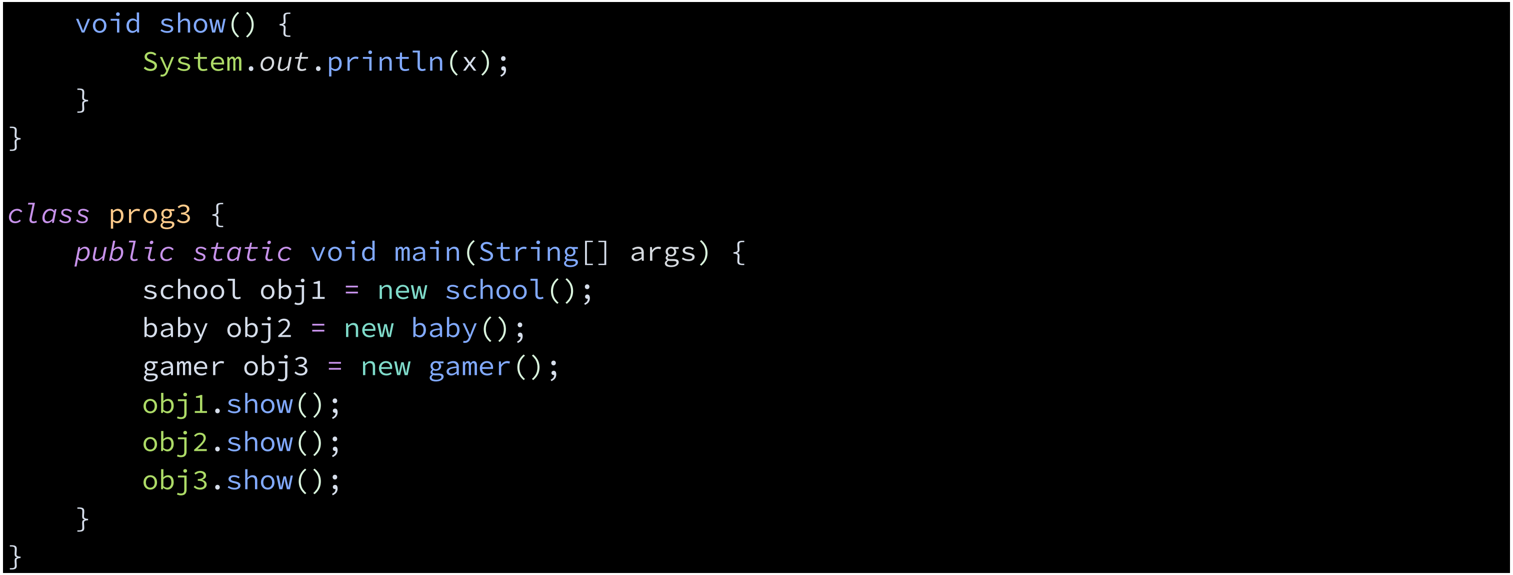
Code:



```
class home {
    int x = 6;
```

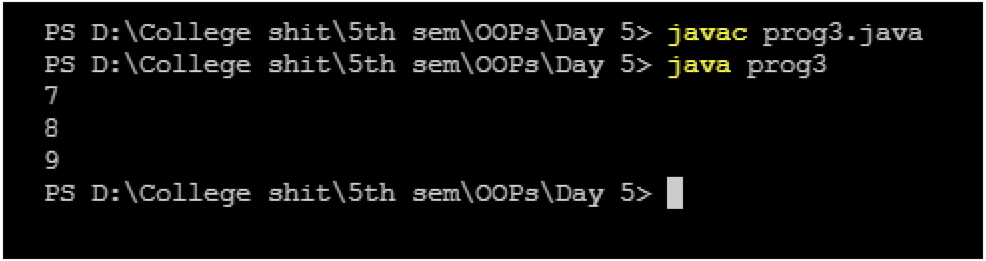


```java
    void show() {
        System.out.println(x);
    }
}

class school extends home {
    int x = 7;

    void show() {
        System.out.println(x);
    }
}

class baby extends home {
    int x = 8;

    void show() {
        System.out.println(x);
    }
}

class gamer extends home {
    int x = 9;
```



```java
    void show() {
        System.out.println(x);
    }
}

class prog3 {
    public static void main(String[] args) {
        school obj1 = new school();
        baby obj2 = new baby();
        gamer obj3 = new gamer();
        obj1.show();
        obj2.show();
        obj3.show();
    }
}
```

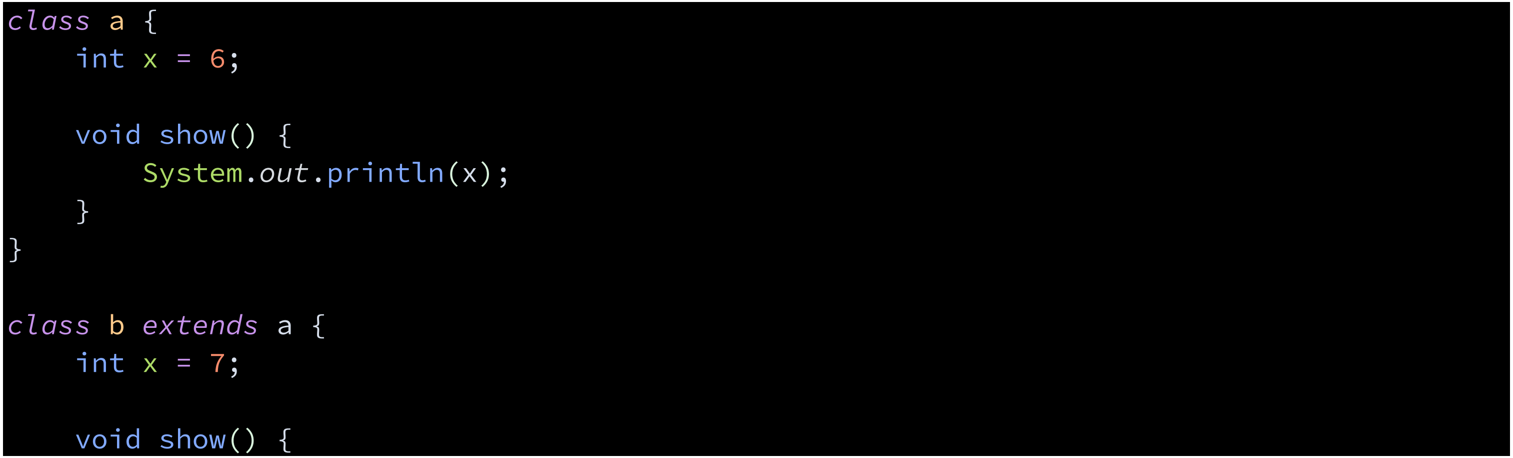
Output:



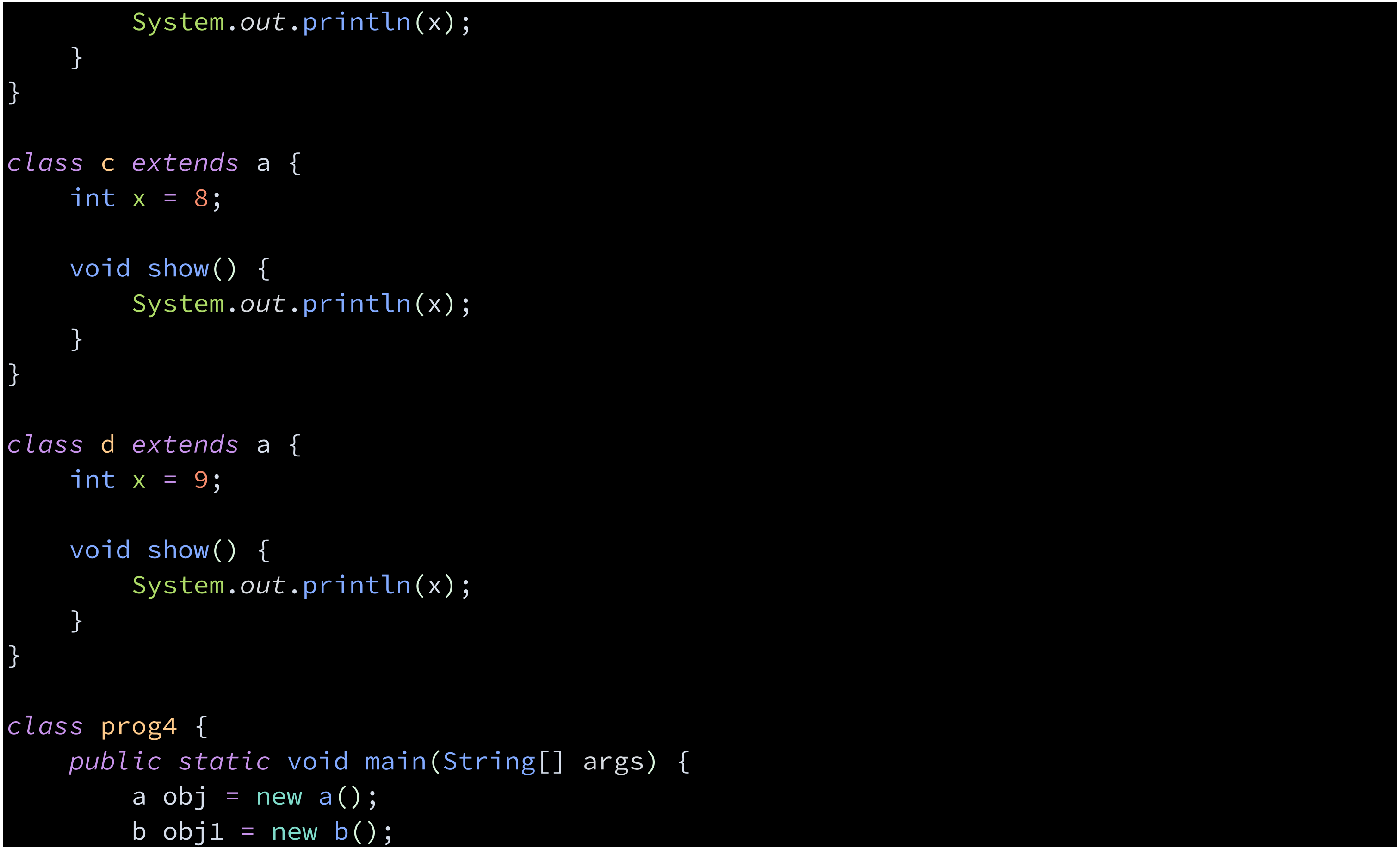
```
PS D:\College shit\5th sem\OOPs\Day 5> javac prog3.java
PS D:\College shit\5th sem\OOPs\Day 5> java prog3
7
8
9
PS D:\College shit\5th sem\OOPs\Day 5> 
```

4. Do the problem 3 using dynamic method dispatch.

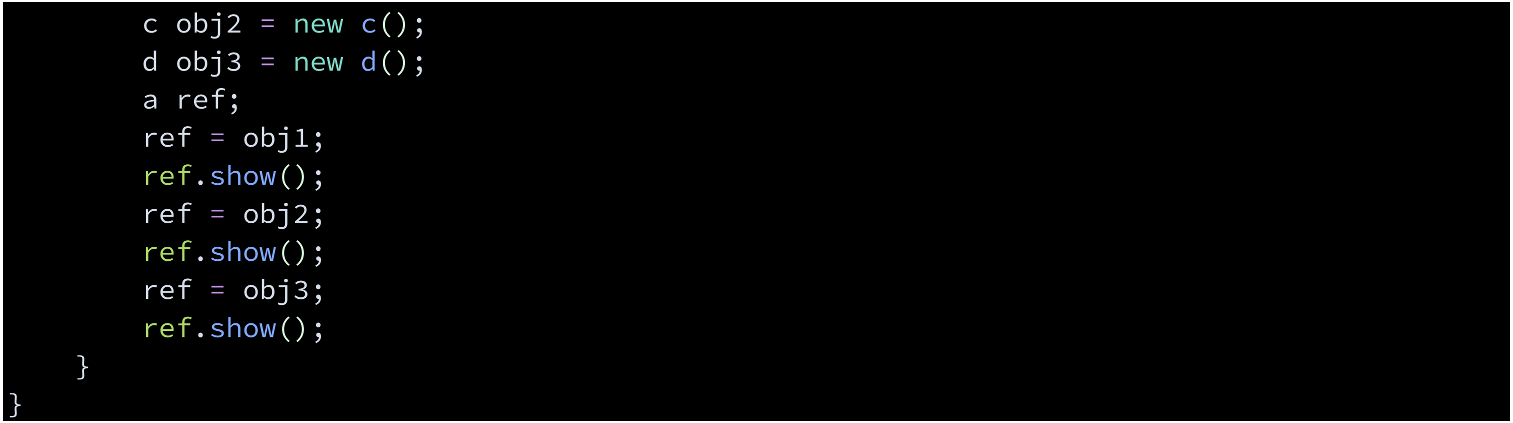
Code:



```java
class a {
    int x = 6;

    void show() {
        System.out.println(x);
    }
}

class b extends a {
    int x = 7;

    void show() {
```

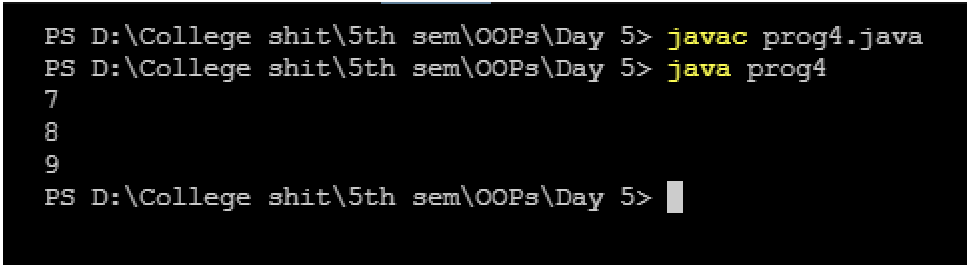


```java
        System.out.println(x);
    }
}

class c extends a {
    int x = 8;

    void show() {
        System.out.println(x);
    }
}

class d extends a {
    int x = 9;

    void show() {
        System.out.println(x);
    }
}

class prog4 {
    public static void main(String[] args) {
        a obj = new a();
        b obj1 = new b();
```



```
        c obj2 = new c();
        d obj3 = new d();
        a ref;
        ref = obj1;
        ref.show();
        ref = obj2;
        ref.show();
        ref = obj3;
        ref.show();
    }
}
```

Output:

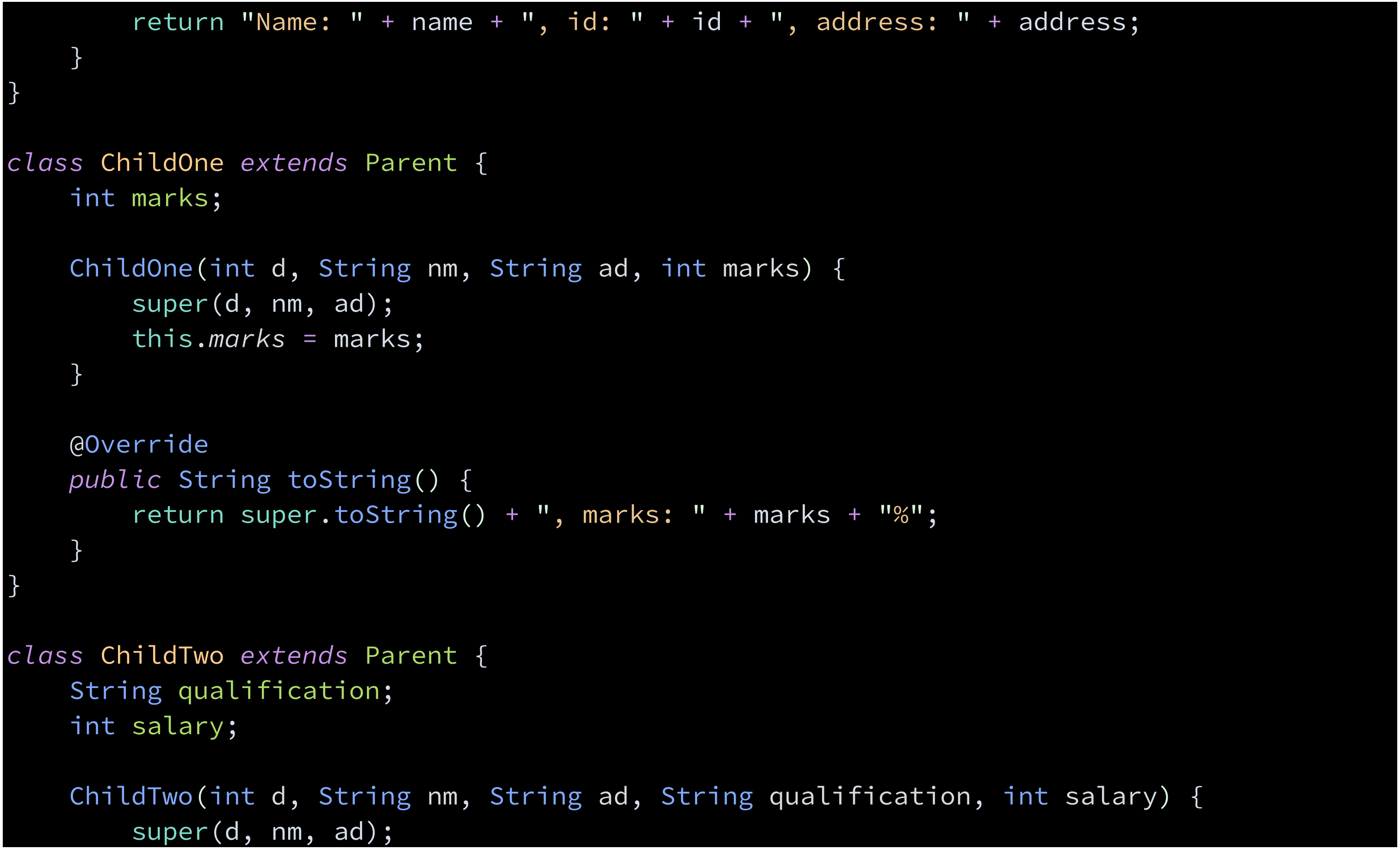


```
PS D:\College shit\5th sem\OOPs\Day 5> javac prog4.java
PS D:\College shit\5th sem\OOPs\Day 5> java prog4
7
8
9
PS D:\College shit\5th sem\OOPs\Day 5>
```

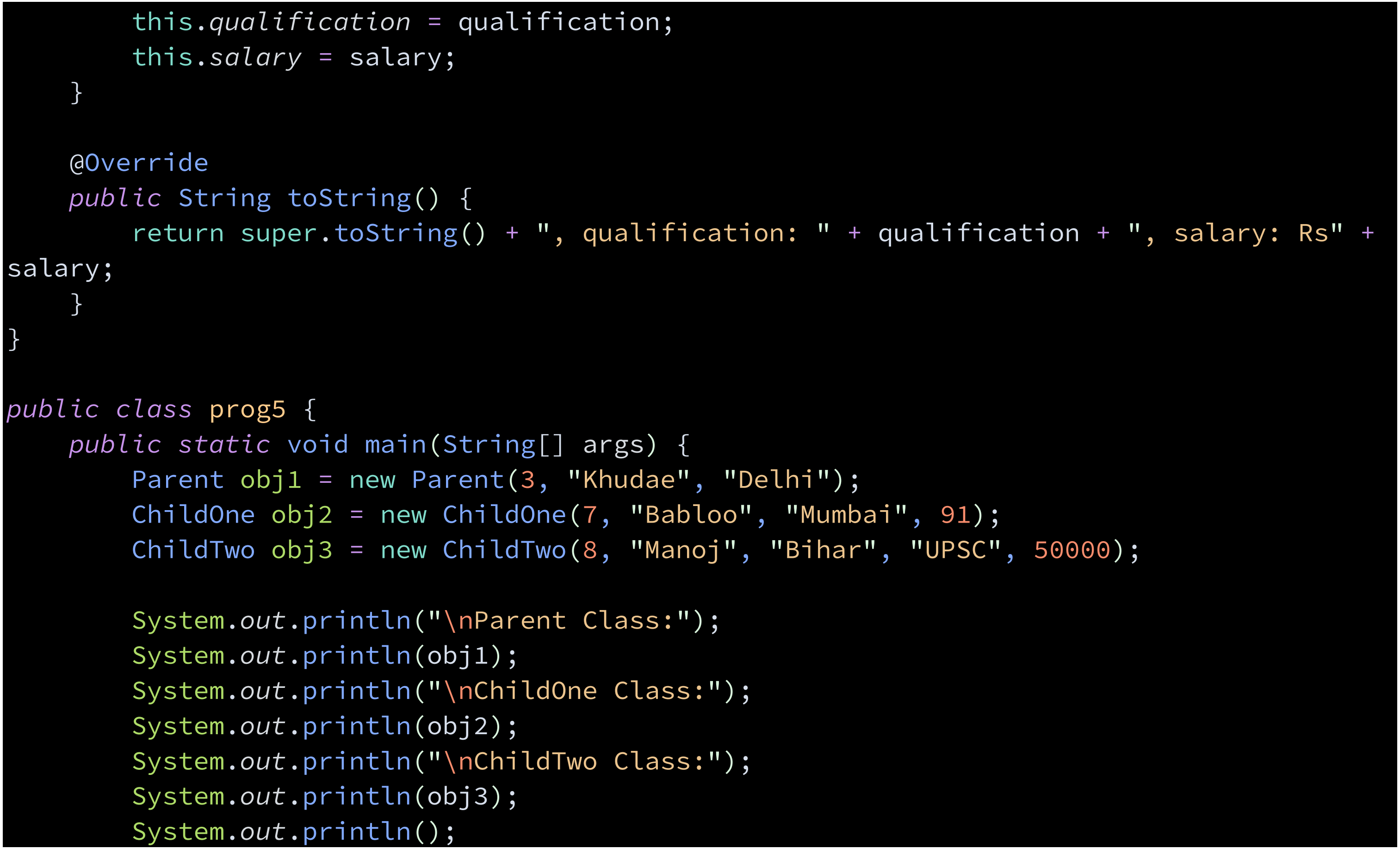
5. Create a class Parent having instance variables id, name, and address. Create a class ChildOne having instance variables id, name, address, and marks. Also create another class ChildTwo with instance variables id, name, address, qualification, and salary. Within each class define your own method to display values of these variables. Design the program using super call with proper parameter and use object of each class from main() to display their properties.

Code:

```java
class Parent {
    int id;
    String name, address;

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

    @Override
    public String toString() {
```

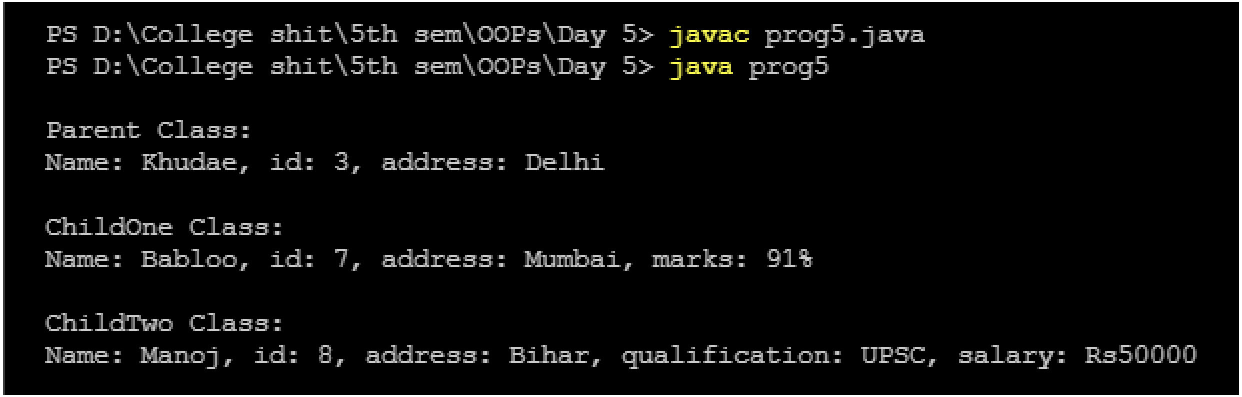


```
        return "Name: " + name + ", id: " + id + ", address: " + address;
    }
}

class ChildOne extends Parent {
    int marks;

    ChildOne(int d, String nm, String ad, int marks) {
        super(d, nm, ad);
        this.marks = marks;
    }

    @Override
    public String toString() {
        return super.toString() + ", marks: " + marks + "%";
    }
}

class ChildTwo extends Parent {
    String qualification;
    int salary;

    ChildTwo(int d, String nm, String ad, String qualification, int salary) {
        super(d, nm, ad);
```



```java
        this.qualification = qualification;
        this.salary = salary;
    }

    @Override
    public String toString() {
        return super.toString() + ", qualification: " + qualification + ", salary: Rs" +
salary;
    }
}

public class prog5 {
    public static void main(String[] args) {
        Parent obj1 = new Parent(3, "Khudae", "Delhi");
        ChildOne obj2 = new ChildOne(7, "Babloo", "Mumbai", 91);
        ChildTwo obj3 = new ChildTwo(8, "Manoj", "Bihar", "UPSC", 50000);

        System.out.println("\nParent Class:");
        System.out.println(obj1);
        System.out.println("\nChildOne Class:");
        System.out.println(obj2);
        System.out.println("\nChildTwo Class:");
        System.out.println(obj3);
        System.out.println();
    }
}
```

Output:



```
PS D:\College shit\5th sem\OOPs\Day 5> javac prog5.java
PS D:\College shit\5th sem\OOPs\Day 5> java prog5

Parent Class:
Name: Khudae, id: 3, address: Delhi

ChildOne Class:
Name: Babloo, id: 7, address: Mumbai, marks: 91%

ChildTwo Class:
Name: Manoj, id: 8, address: Bihar, qualification: UPSC, salary: Rs50000
```