**INSTITUTE OF ENGINEERING & MANAGEMENT**

**Department of Computer Science & Engineering**



|  |  |
| --- | --- |
| **Name** | **: Saptarshi Mondal** |
| **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:

*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");

    }

}

*class* prog1 {

*public* *static* void main(String[] args) {

        child oj = new child();

    }

}

# Output:

# 

# 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() {

        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:

# 

# 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;

    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;

    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:

# 

# 4. Do the problem 3 using dynamic method dispatch.

# Code:

*class* a {

    int x = 6;

    void show() {

        System.*out*.println(x);

    }

}

*class* b *extends* a {

    int x = 7;

    void show() {

        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:

# 

# 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:

*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);

        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:

# 