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Course: FYMCA

Division: B

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ADVANCE JAVA ASSIGNMENT 4

1)Demonstrate use of super keyword using program.

```
class Animal {
    // overridden method
    public void display() {
        System.out.println("I am an animal");
    }
}

class Dog extends Animal {
    // overriding method
    @Override
    public void display() {
        System.out.println("I am a dog");
    }

    public void printMessage() {
        // this calls overriding method
        display();
        // this calls overridden method
        super.display();
    }
}

class question1 {
    public static void main(String[] args) {
        Dog dog1 = new Dog();
        dog1.printMessage();
```

```
    }
}
```

Output:

```
I am a dog
I am an animal
```

2) Demonstrate Abstract class and interface.

```
abstract class Shape {
    public abstract double getArea();
}

interface Drawable {
    public void draw();
}

class Circle extends Shape implements Drawable {
    private double radius;

    public Circle(double radius) {
        this.radius = radius;
    }

    public double getArea() {
        return Math.PI * radius * radius;
    }

    public void draw() {
        System.out.println("Drawing a circle with radius " +
radius);
    }
}

public class question2 {
    public static void main(String[] args) {
        Circle c = new Circle(5);
        System.out.println("Area of circle: " + c.getArea());
        c.draw();
    }
}
```

Output:

```
Area of circle: 78.53981633974483
Drawing a circle with radius 5.0
```

3) Implement Method overriding and overloading.

```
class Parent {
    public void display() {
        System.out.println("Parent display method");
    }
}

class Child extends Parent {
    @Override
    public void display() {
        System.out.println("Child display method");
    }
}

class Overload {
    public void display(int num) {
        System.out.println("display(int) method: " + num);
    }

    public void display(String message) {
        System.out.println("display(String) method: " + message);
    }

    public void display(double num) {
        System.out.println("display(double) method: " + num);
    }
}

public class question3 {
    public static void main(String[] args) {
        Parent p = new Child();
        p.display();
        Child c = new Child();
        c.display();
        Overload o = new Overload();
        o.display(5);
        o.display("Hello, World!");
        o.display(3.14);
```

```
    }
}
```

Output:

```
Child display method
Child display method
display(int) method: 5
display(String) method: Hello, World!
display(double) method: 3.14
```

4)Create a package cal_data. Write down functions for mathematical functions like area,square,cube etc.

```
package cal_data;

public class MathFunctions {
    public static double squareArea(double side) {
        return side * side;
    }

    public static double rectangleArea(double length, double
width) {
        return length * width;
    }

    public static double triangleArea(double base, double height)
{
        return 0.5 * base * height;
    }

    public static double square(double num) {
        return num * num;
    }

    public static double cube(double num) {
        return num * num * num;
    }
}
```

5) Use Above package and use all methods in it.

```
import cal_data.MathFunctions;

public class question5 {
    public static void main(String[] args) {
        MathFunctions mf = new MathFunctions();
        double squareArea = mf.squareArea(5);
        System.out.println("Square area: " + squareArea);
        double rectangleArea = mf.rectangleArea(5, 7);
        System.out.println("Rectangle area: " + rectangleArea);
        double triangleArea = mf.triangleArea(5, 7);
        System.out.println("Triangle area: " + triangleArea);
        double square = mf.square(5);
        System.out.println("Square: " + square);
        double cube = mf.cube(5);
        System.out.println("Cube: " + cube);
    }
}
```

Output:

```
Square area: 25.0
Rectangle area: 35.0
Triangle area: 17.5
Square: 25.0
Cube: 125.0
```