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Lab Assignment-5(JP)

Aim: Write a java program to showcase method overloading and method method Overriding.

Objectives:
1) To study method overloading.
2) To study method overriding.

Theory:
1) Method overloading and its advantages:
→ Method overloading is a feature of java in which a class has more than one method of the same name and their parameters are different.

Advantages:
i) Increases readability of program.
ii) Minimizes complexity of the code.
iii) Reduces execution time because binding is done in compilation time itself.
iv) Saves memory due to reusability.

2) Method Overriding and its Rules:
→ Method Overriding is a feature that allows a subclass

to provide a specific implementation of a method that is already provided by one of its super class.

* Rules:

i) The argument list should be exactly the same as that of overriding method.

ii) The returntype should be same.

iii) A method declared as final cannot be overriden.

iv) Constructors cannot be overriden.

Platform: open Source JP tool like Eclipse etc.

Conclusion: Thus, studied the concept of method overloading and method overriding.

* FAQ

Q1 Can we overload java main() method?
Ans yes, we can overload main () method in java but JVM only calls ~~program~~ original main method. It does not call overloaded main () method.

Q2 Can we declare overloaded methods as final?
Ans yes, we can overload a final method.

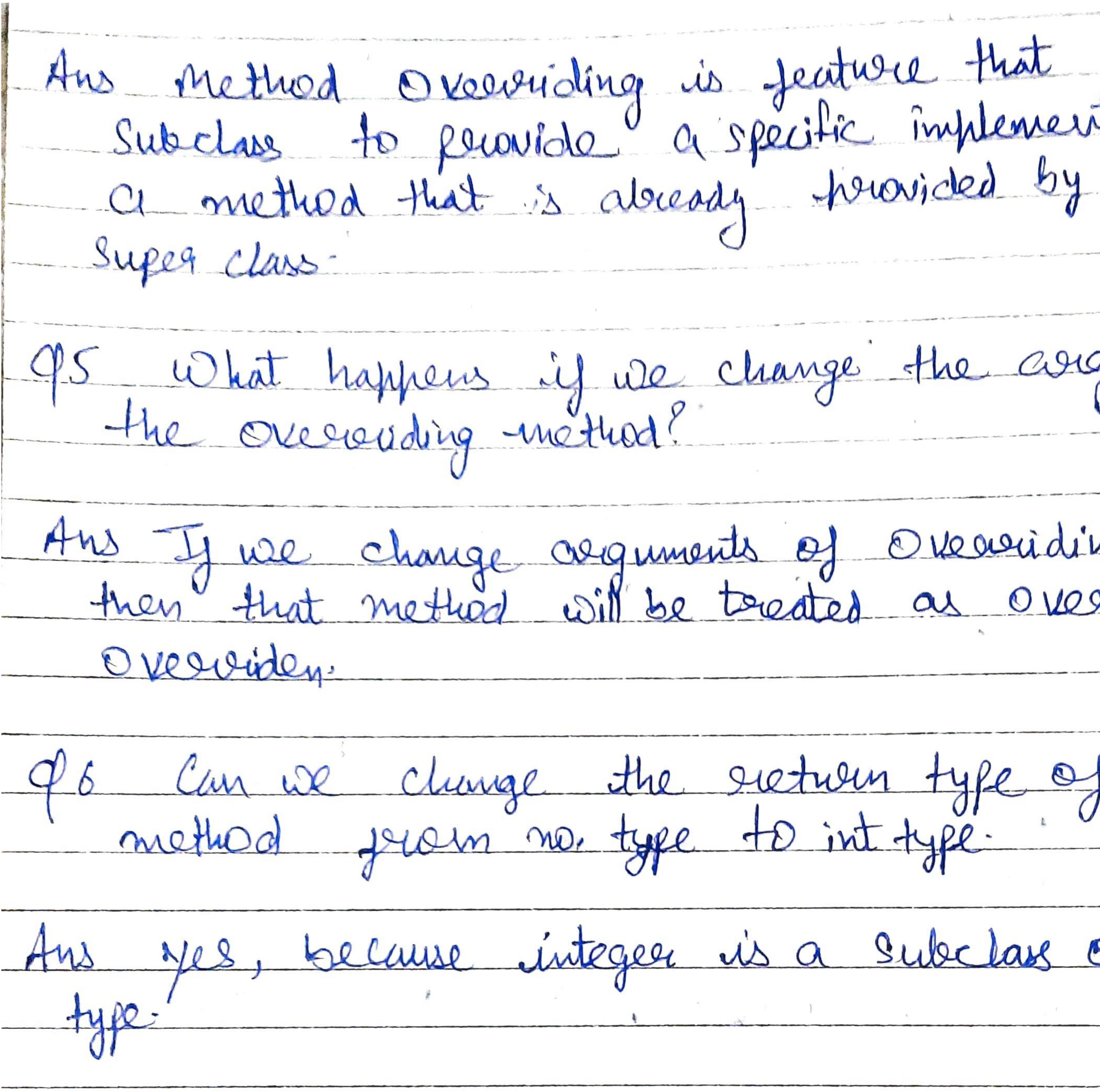
Eg

```
Class SumTest {
        public final void sum (a,b){
            Sout (a+b);
        }
        public final void sum (a,b,c) {
            sout (a+b+c);
        }
        main () {
            SumTest S : new SumTest ();
            S. Sum (10,5);
            S. sum( 10,5,2);
        }
    }
OUTPUT
  15
  17
```

Q3 Can an Overloaded method be overrided?

Ans yes, we can override a method which is overloaded. This is because Overloading is resolved at compile time & overriding at runtime. So, overloaded method is a completely different method in the eyes of Compiler.

Q4 What is method Overriding?



Ans Method Overriding is feature that Subclass to provide a specific implemen a method that is already provided by Super class.

Q5 What happens if we change the arg the overriding method?

Ans If we change arguments of Overridi then that method will be treated as over Overriden.

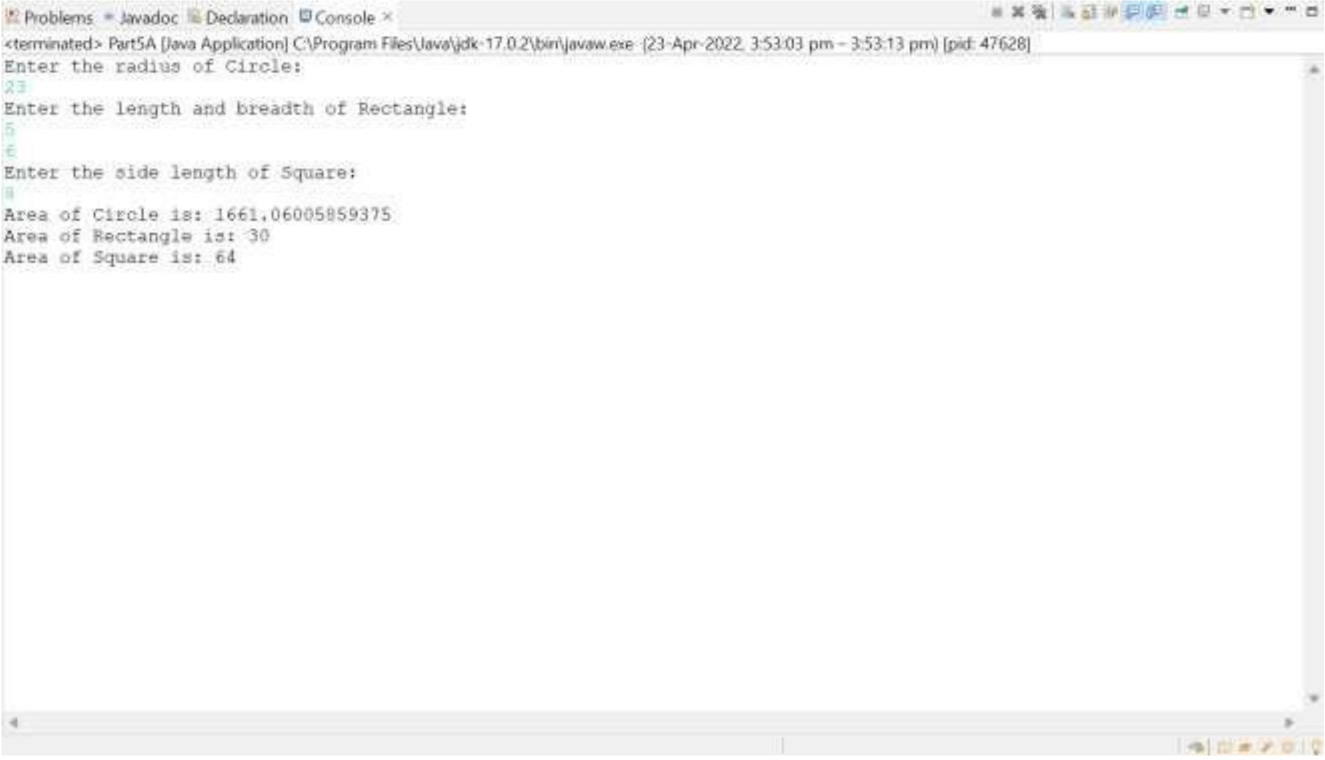
Q6 Can we change the return type of method from no. type to int type.

Ans yes, because integer is a subclass o type.

<u>Code:</u>

```
//Assignment 5 Part A
package sample;

import java.util.Scanner;

class Area{
        int length, breadth, side, areaSquare, areaRectangle;
        float pi = 3.14f; float
        radius; double areaCircle;
        Area(){
                radius=0;
                length=0;
                breadth=0;
                side=0;
        }
        void input(float r) {radius = r;
        }

        void input(int l, int b) {length = l;
                breadth = b;
        }

        void input(int s) {
                side = s;
        }

        void AreaCircle() {
                areaCircle = pi*radius*radius;
                System.out.println("Area of Circle is: "+areaCircle);
        }

        void AreaSquare() {
                areaSquare = side*side;
                System.out.println("Area of Square is: "+areaSquare);
        }

        void AreaRectangle() {
                areaRectangle = length*breadth;
                System.out.println("Area of Rectangle is: "+areaRectangle);
        }
}

public class Part5A {

        public static void main(String[] args) { Scanner sc = new
                Scanner(System.in);
                System.out.println("Enter the radius of Circle: ");
                float r = sc.nextFloat();
                System.out.println("Enter the length and breadth of Rectangle:
");
                int l = sc.nextInt();
                int b = sc.nextInt();


            System.out.println("Enter the side length of Square: ");
            int s = sc.nextInt();

                        Area circle = new
                        Area(); Area rectangle
                        = new Area();Area
                        square = new Area();

                        circle.input(r)
                        ;
                        rectangle.input
                        (l,b);
                        square.input(s)
                        ;

                        circle.AreaCircle();
                        rectangle.AreaRectan
                        gle();
                        square.AreaSquare();
                }

        }
```

Output:



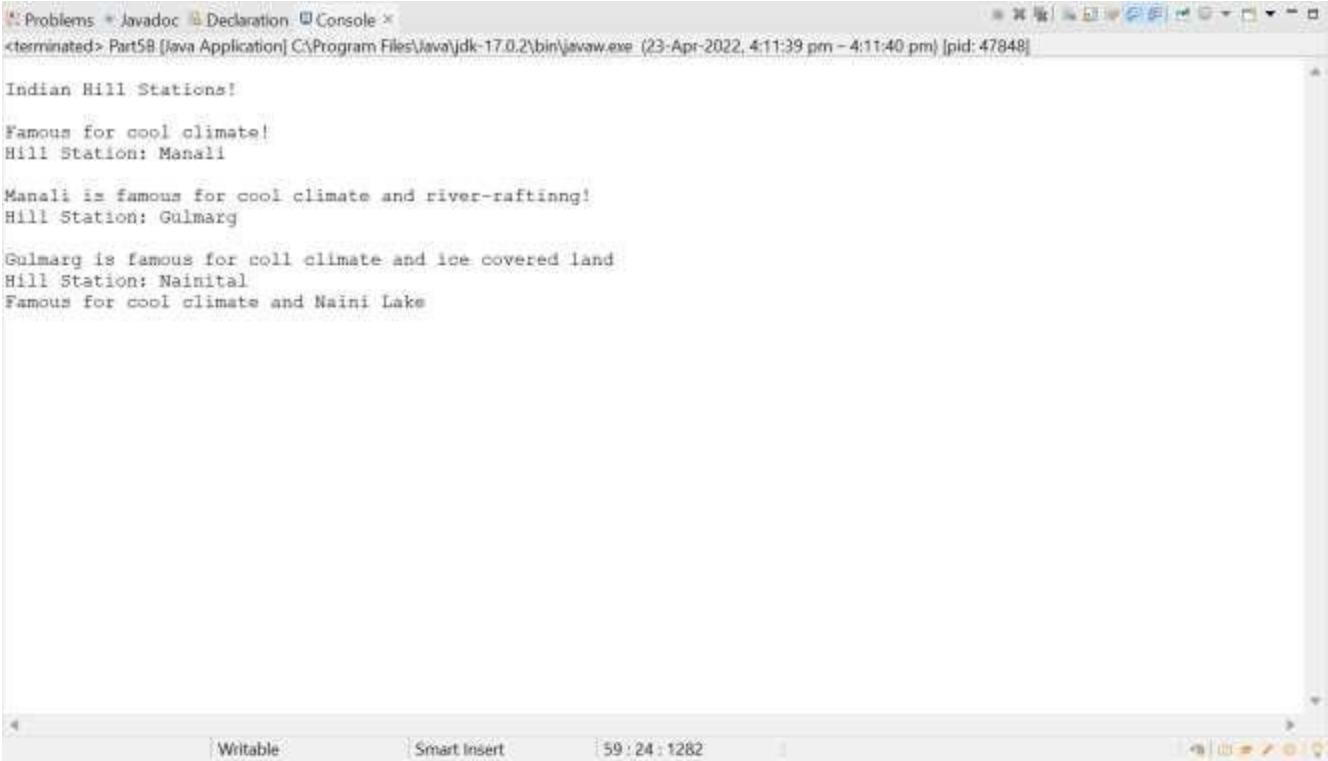
<terminated> Part5A [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (23-Apr-2022, 3:53:03 pm – 3:53:13 pm) [pid: 47628]

```
Enter the radius of Circle:
23
Enter the length and breadth of Rectangle:
5
6
Enter the side length of Square:
8
Area of Circle is: 1661.06005859375
Area of Rectangle is: 30
Area of Square is: 64
```

```
//Assignment 5 Part Bpackage
sample; class hillstation{
        void location() {
                System.out.println("\nIndian Hill Stations!");
        }

        void famousfor() {
                System.out.println("\nFamous for cool climate!");
        }
}

class manali extends hillstation{
        void location() {
                System.out.println("Hill Station: Manali");
        }
        void famousfor() {
                System.out.println("\nManali is famous for cool climate and
river-raftinng!");
        }
}

class gulmarg extends hillstation{
        void location() {
                System.out.println("Hill Station: Gulmarg");
        }
        void famousfor() {
                System.out.println("\nGulmarg is famous for coll climate and
ice covered land");
        }
}

class nainital extends hillstation{
        void location() {
                System.out.println("Hill Station: Nainital");
        }
        void famousfor() {
                System.out.println("Famous for cool climate and Naini Lake");
        }
}

public class Part5B {

        public static void main(String[] args) {
                hillstation h = new hillstation();
                hillstation m = new manali();
                hillstation g = new gulmarg();
                hillstation n = new nainital();
                hillstation h1;
                h1 = h;
                h1.location();
                h1.famousfor();
                h1 = m;
                h1.location();
                h1.famousfor();
                h1 = g;
                h1.location();
                h1.famousfor();
                h1 = n;
                h1.location();
                h1.famousfor();
```

```
            }
    }
```

Output:



```
<terminated> Part58 [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe  (23-Apr-2022, 4:11:39 pm – 4:11:40 pm) [pid: 47848]

Indian Hill Stations!

Famous for cool climate!
Hill Station: Manali

Manali is famous for cool climate and river-raftinng!
Hill Station: Gulmarg

Gulmarg is famous for coll climate and ice covered land
Hill Station: Nainital
Famous for cool climate and Naini Lake
```