SHRI VILEPARLE KELAVANI MANDAL'S
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC ACCREDITED with "A" GRADE (CGPA : 3.18)

Object Oriented Programming using Java Laboratory (DJS22FEL22)

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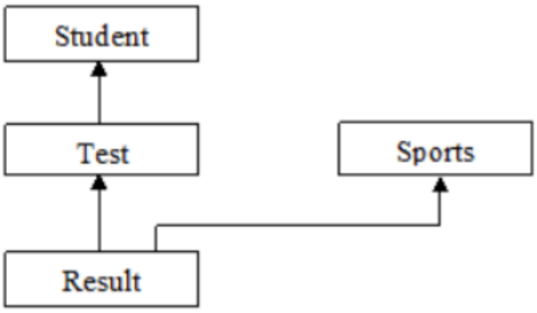
BRANCH: Information Technology
BATCH: 1

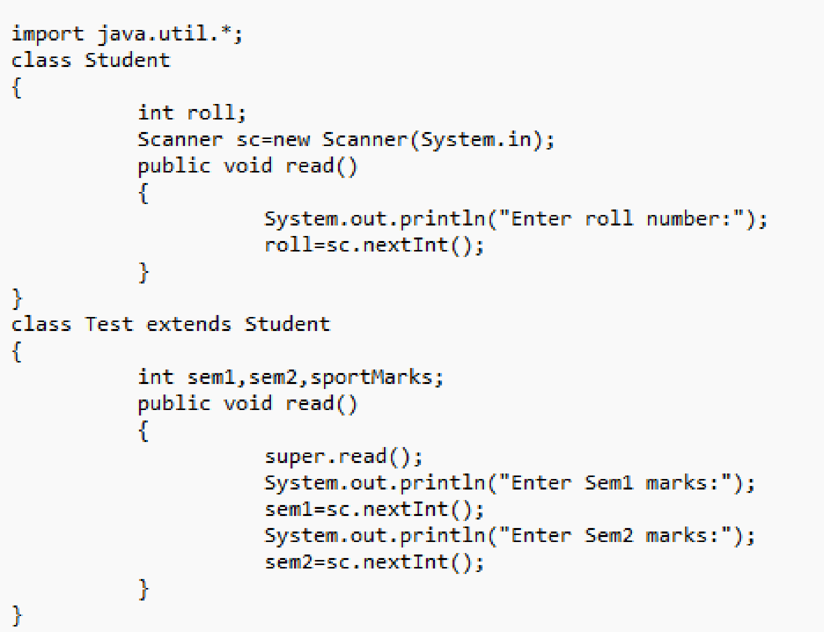
EXPERIMENT NO – 8

Aim: To implement multiple inheritance using interfaces and method overriding.

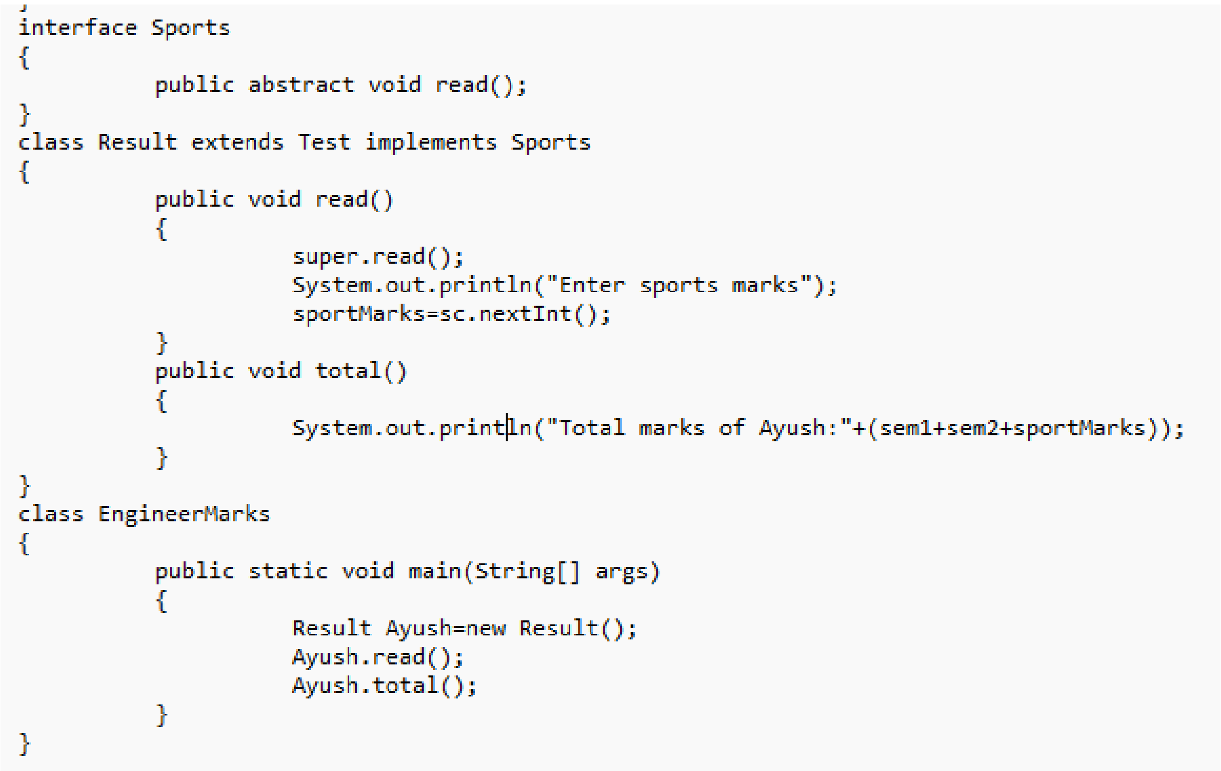
Problem Statement 1: WAP to implement three classes namely Student, Test and Result. Student class has member as rollno, and read(). Test class has members as sem1_marks and sem2_marks and read(). Result class has member as total. Create an interface named sports that has a member score (). Derive Test class from Student and Result class has multiple inheritances from Test and Sports. Total is formula based on sem1_marks, sem2_mark and score.



CODE

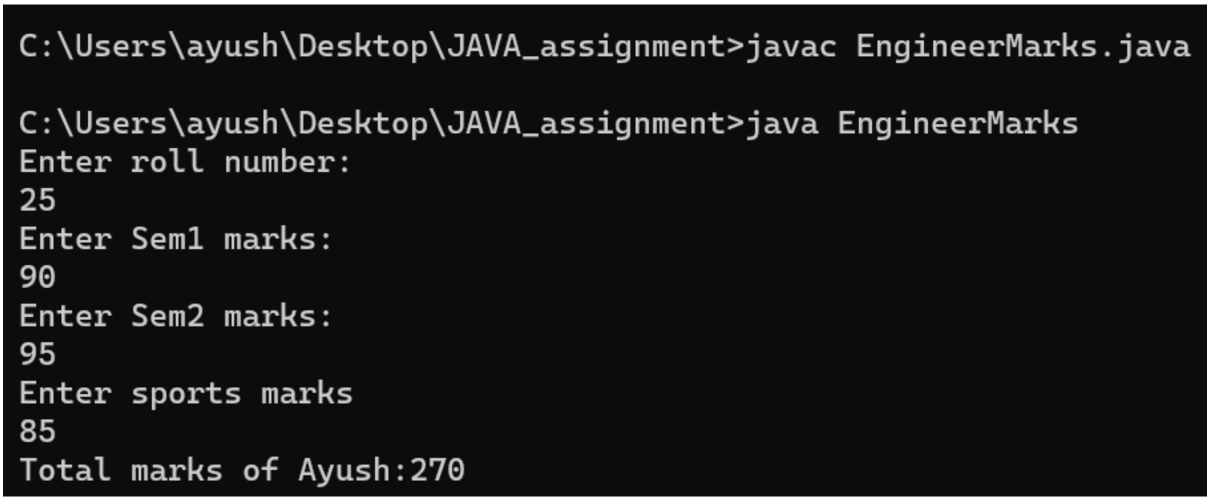


```
import java.util.*;
class Student
{
          int roll;
          Scanner sc=new Scanner(System.in);
          public void read()
          {
                    System.out.println("Enter roll number:");
                    roll=sc.nextInt();
          }
}
class Test extends Student
{
          int sem1,sem2,sportMarks;
          public void read()
          {
                    super.read();
                    System.out.println("Enter Sem1 marks:");
                    sem1=sc.nextInt();
                    System.out.println("Enter Sem2 marks:");
                    sem2=sc.nextInt();
          }
}
```



```
}
interface Sports
{
          public abstract void read();
}
class Result extends Test implements Sports
{
          public void read()
          {
                    super.read();
                    System.out.println("Enter sports marks");
                    sportMarks=sc.nextInt();
          }
          public void total()
          {
                    System.out.println("Total marks of Ayush:"+(sem1+sem2+sportMarks));
          }
}
class EngineerMarks
{
          public static void main(String[] args)
          {
                    Result Ayush=new Result();
                    Ayush.read();
                    Ayush.total();
          }
}
```

OUTPUT



```
C:\Users\ayush\Desktop\JAVA_assignment>javac EngineerMarks.java

C:\Users\ayush\Desktop\JAVA_assignment>java EngineerMarks
Enter roll number:
25
Enter Sem1 marks:
90
Enter Sem2 marks:
95
Enter sports marks
85
Total marks of Ayush:270
```

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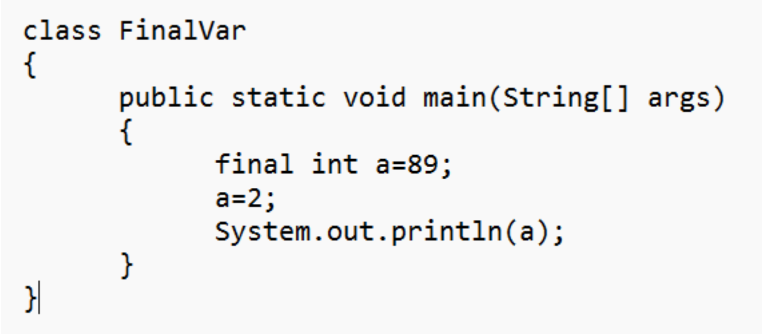
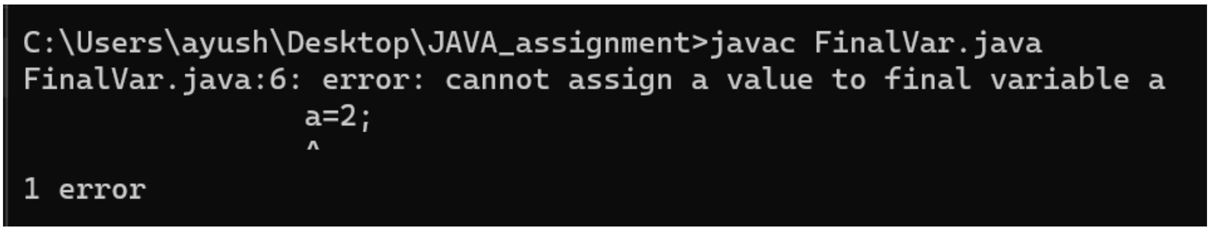
Problem Statement 2:

Demonstrate that a variable is constant, method cannot be overridden, class cannot be inherited using final keyword

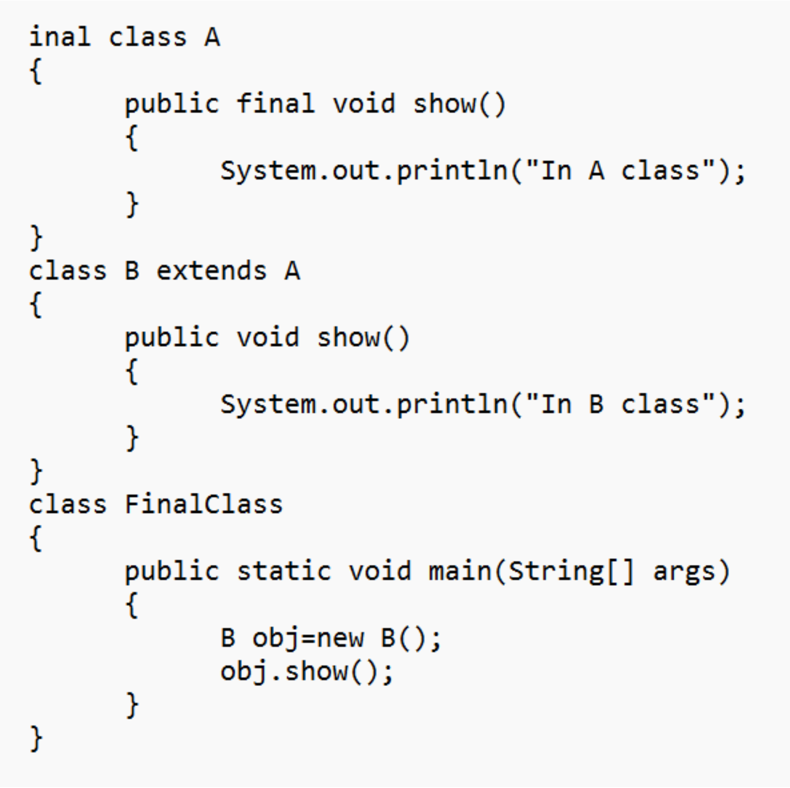
CODE:



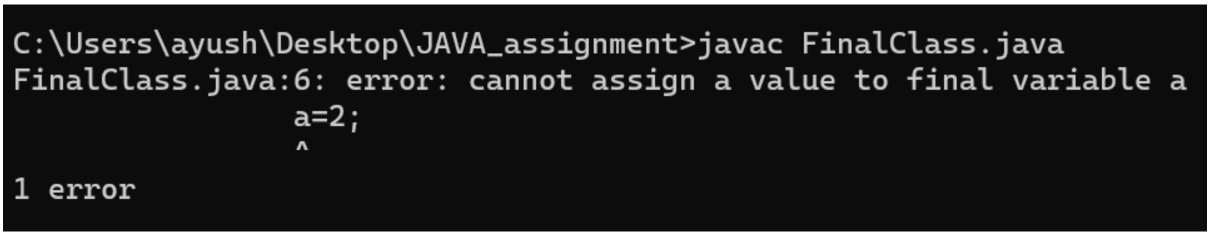
```
class FinalVar
{
	public static void main(String[] args)
	{
		final int a=89;
		a=2;
		System.out.println(a);
	}
}
```



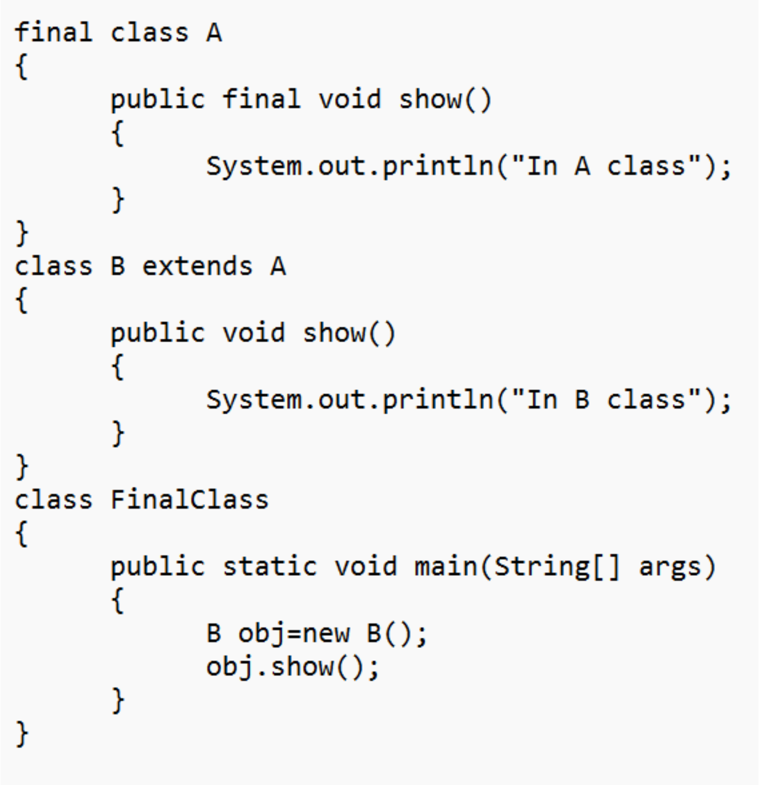
```
C:\Users\ayush\Desktop\JAVA_assignment>javac FinalVar.java
FinalVar.java:6: error: cannot assign a value to final variable a
                a=2;
                ^
1 error
```



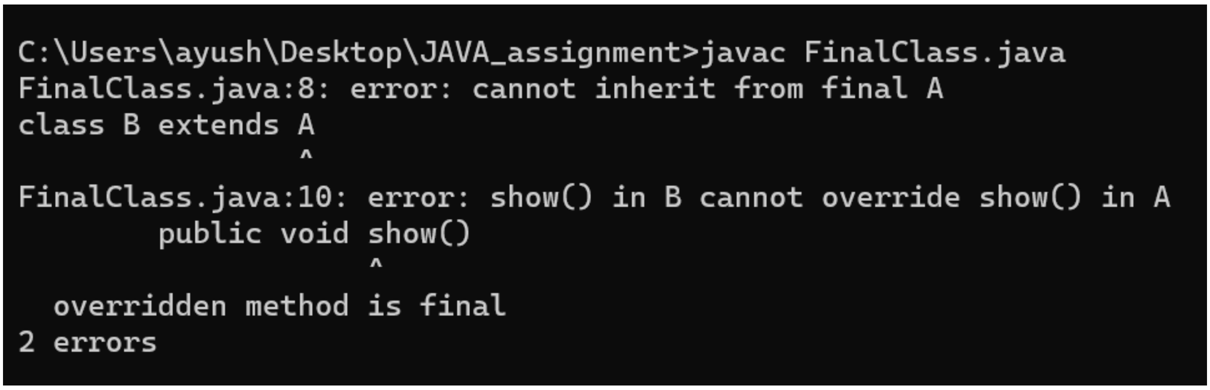
```
inal class A
{
	public final void show()
	{
		System.out.println("In A class");
	}
}
class B extends A
{
	public void show()
	{
		System.out.println("In B class");
	}
}
class FinalClass
{
	public static void main(String[] args)
	{
		B obj=new B();
		obj.show();
	}
}
```



```
C:\Users\ayush\Desktop\JAVA_assignment>javac FinalClass.java
FinalClass.java:6: error: cannot assign a value to final variable a
                a=2;
                ^
1 error
```



```
final class A
{
        public final void show()
        {
                System.out.println("In A class");
        }
}
class B extends A
{
        public void show()
        {
                System.out.println("In B class");
        }
}
class FinalClass
{
        public static void main(String[] args)
        {
                B obj=new B();
                obj.show();
        }
}
```

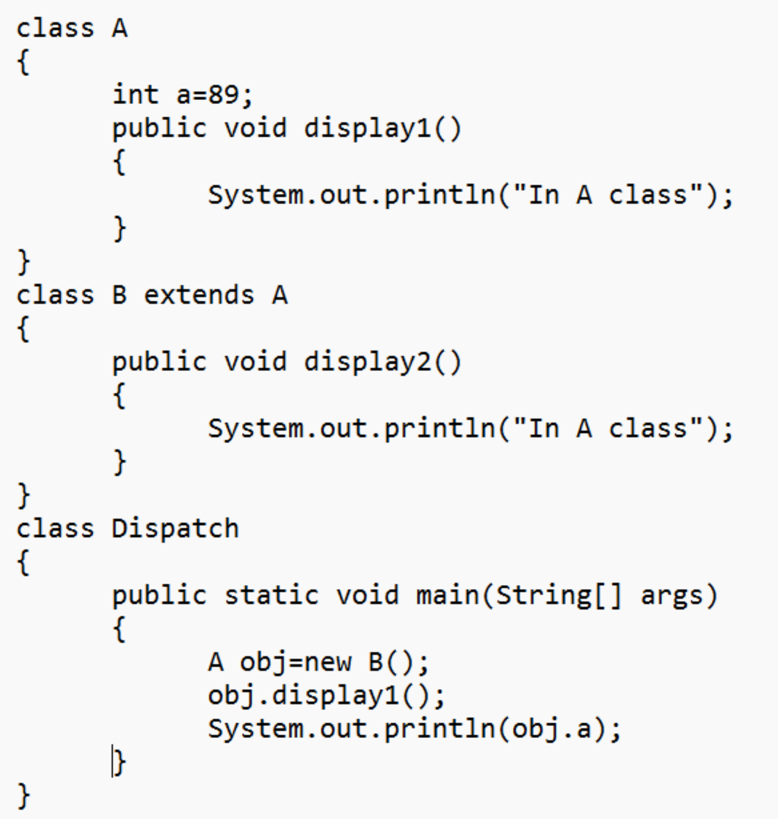


```
C:\Users\ayush\Desktop\JAVA_assignment>javac FinalClass.java
FinalClass.java:8: error: cannot inherit from final A
class B extends A
                ^
FinalClass.java:10: error: show() in B cannot override show() in A
        public void show()
                    ^
  overridden method is final
2 errors
```

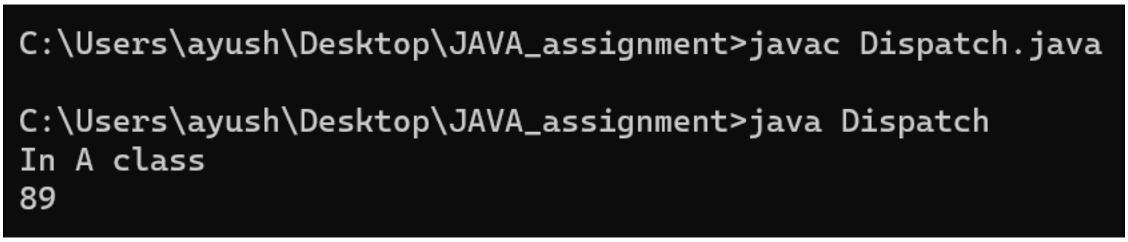
Problem Statement 3:

Demonstrate using a suitable example that a base class reference variable can point to a child class object using the concept of dynamic method dispatch.

CODE:



```
class A
{
      int a=89;
      public void display1()
      {
            System.out.println("In A class");
      }
}
class B extends A
{
      public void display2()
      {
            System.out.println("In A class");
      }
}
class Dispatch
{
      public static void main(String[] args)
      {
            A obj=new B();
            obj.display1();
            System.out.println(obj.a);
      }
}
```



```
C:\Users\ayush\Desktop\JAVA_assignment>javac Dispatch.java

C:\Users\ayush\Desktop\JAVA_assignment>java Dispatch
In A class
89
```

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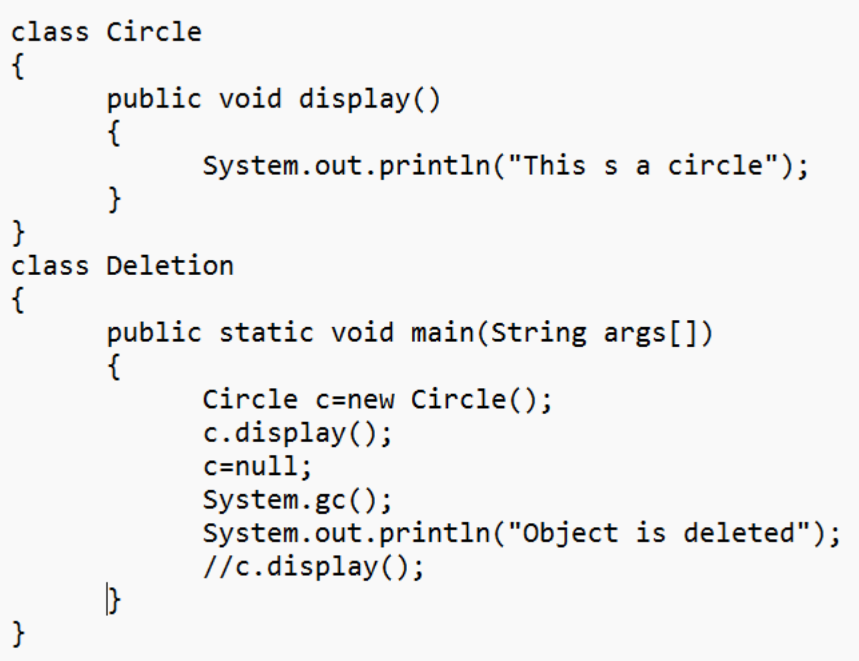
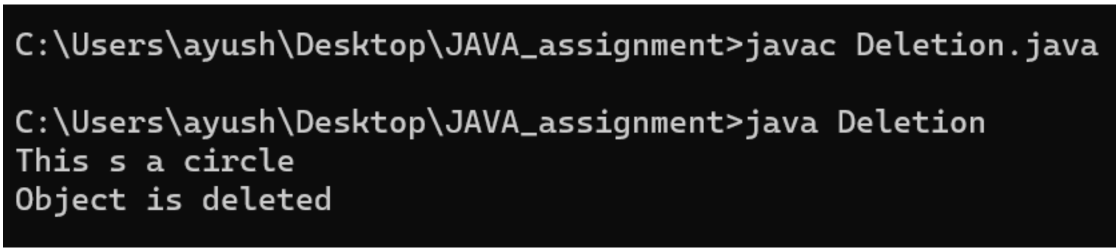
Problem Statement 4:

WAP to create an object of a class, delete the same object by calling System. gc () and display a message that the “object has been deleted”.

CODE:



```
class Circle
{
	public void display()
	{
		System.out.println("This s a circle");
	}
}
class Deletion
{
	public static void main(String args[])
	{
		Circle c=new Circle();
		c.display();
		c=null;
		System.gc();
		System.out.println("Object is deleted");
		//c.display();
	}
}
```



```
C:\Users\ayush\Desktop\JAVA_assignment>javac Deletion.java

C:\Users\ayush\Desktop\JAVA_assignment>java Deletion
This s a circle
Object is deleted
```