LAB1:

Develop a Java program that prints all real solutions to the quadratic equation ax2 +bx+c = 0.Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

OBSERVATION:

LAB 1

Develop a Java program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions

ALGORITHM

1) START
2) READ a, b, c (Co-efficients of the quadratic equation)
3) Calculate $d = b^2-4ac$
4) If $(d > 0)$
   - → Calculate r1 (root 1) $= \left(\frac{-b+\sqrt{d}}{2a}\right)$
   - → Calculate r2 (root 2) $= \left(\frac{-b-\sqrt{d}}{2a}\right)$
   - → Display two real and different roots (r1, r2)
5) Else If $(d == 0)$
   - → Calculate (r1)(root 1) = (root 2)(r2) $= \frac{-b}{2a}$
   - → Display real and equal roots (r1, r2)
6) Else If $(d < 0)$
   - → Display, no real solutions.
7) STOP

```
import java.util.*;
class lab1 {
  public static void main (String ss[]) {
    double r1, r2;
    Scanner s = new Scanner (System.in);
    System.out.println ("Enter the coefficients of the quadratic
                                                    equation");
    System.out.println ("Enter a");
    double a = s.nextDouble ();
    System.out.println ("Enter b");
    double b = s.nextDouble ();
    System.out.println ("Enter c");
    double c = s.nextDouble ();
    double d = (b*b)-(4*a*c);
    if (d>0)
    { System.out.println ("Roots are real and different");
      r1 = (-b+ Math.sqrt (d)) /(2*a);
      r2 = (-b - Math.sqrt (d)) /(2*a);
      System.out.println ("root 1 ="+r1+"\n root 2 ="+r2);
    }
    else if (d==0)
    {
      System.out.println ("Roots are real and equal");
       r1 = r2 = -b/(2*a);
      System.out.println ("root 1 = root 2 ="+r1);
    }
     else
     {
      System.out.println ("No real solutions");
     }
   }
}
```

SOURCE CODE:

```
import java.util.*;
class lab1 {
	public static void main(String ss[]) {
		double r1,r2;
		Scanner s=new Scanner(System.in);
		System.out.println("Enter the coefficients of the quadratic equation");
		System.out.println("Enter a");
		double a = s.nextDouble();
		System.out.println("Enter b");
		double b = s.nextDouble();
		System.out.println("Enter c");
		double c = s.nextDouble();
		double d = (b*b)-(4*a*c);
		if(d>0)
		{
			System.out.println("Roots are real and different");
			r1 = (-b + Math.sqrt(d))/(2*a);
			r2 = (-b - Math.sqrt(d))/(2*a);
			System.out.println("root1 = "+r1+"\nroot2 = "+r2);
		}
		else if(d==0)
		{
			System.out.println("Roots are real and equal");
			r1=r2= -b/(2*a);
			System.out.println("root1 = root2 = "+r1);
		}
		else
		{
			System.out.println("No real solutions");
		}
	}
}
```

OUTPUT:

CASE 1:REAL AND DIFFERENT ROOTS

```
D:\Kusum\OOJ2020>java lab1
Enter the coefficients of the quadratic equation
Enter a
1
Enter b
-5
Enter c
6
Roots are real and different
root1 = 3.0
root2 = 2.0
```

CASE 2:REAL AND EQUAL ROOTS

```
D:\Kusum\OOJ2020>java lab1
Enter the coefficients of the quadratic equation
Enter a
1
Enter b
2
Enter c
1
Roots are real and equal
root1 = root2 = -1.0
```

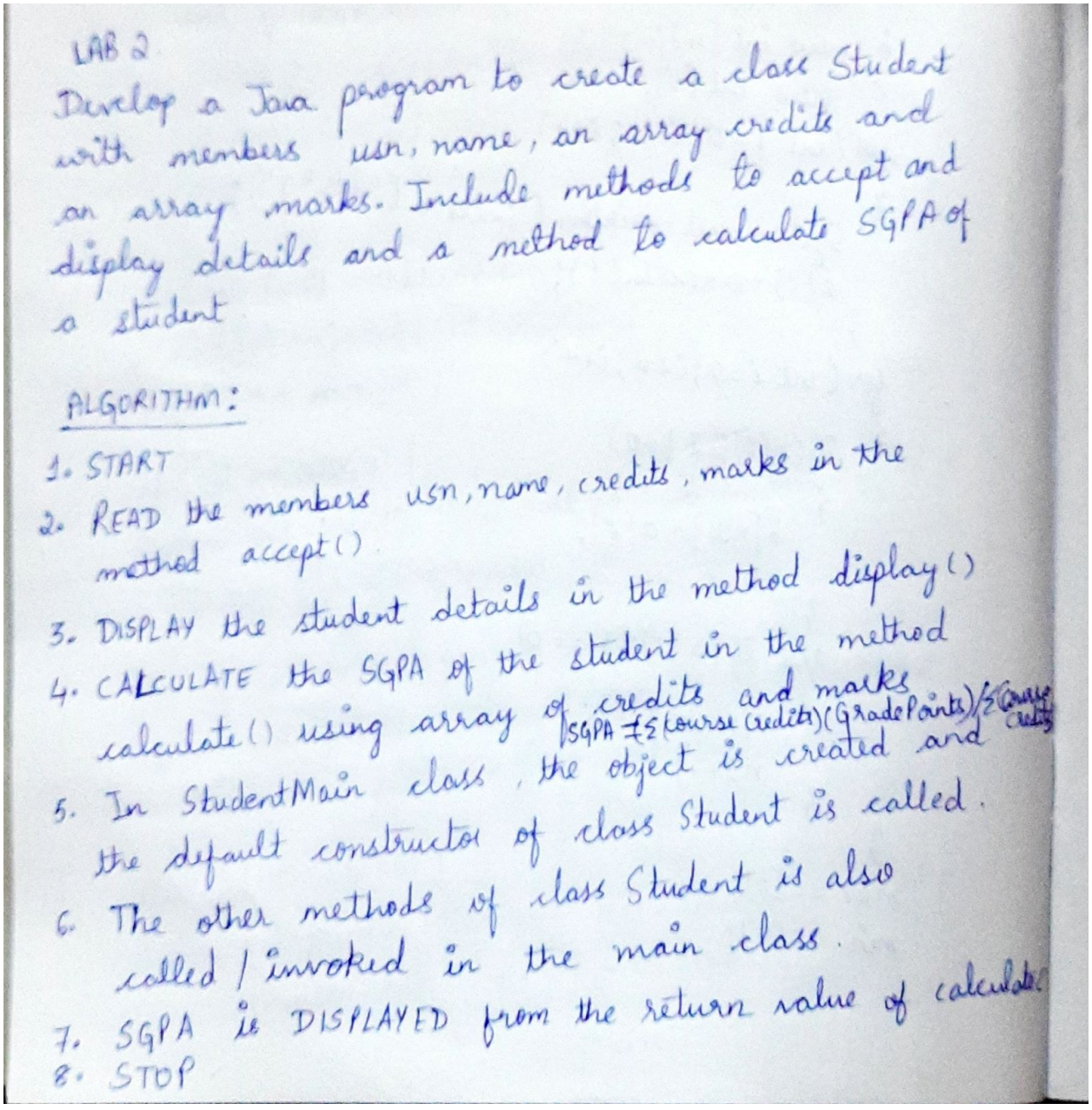
CASE 3:NO REAL SOLUTIONS

```
D:\Kusum\OOJ2020>java lab1
Enter the coefficients of the quadratic equation
Enter a
1
Enter b
2
Enter c
3
No real solutions
```

Lab 2:

Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

OBSERVATION:



LAB 2

Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student

ALGORITHM:

1. START
2. READ the members usn, name, credits, marks in the method accept()
3. DISPLAY the student details in the method display()
4. CALCULATE the SGPA of the student in the method calculate() using array of credits and marks
   SGPA = Σ(course credits)(GradePoints)/Σ(course credits)
5. In StudentMain class, the object is created and the default constructor of class Student is called.
6. The other methods of class Student is also called / invoked in the main class.
7. SGPA is DISPLAYED from the return value of calculate
8. STOP

CODE:

```
import java.util.*;
class Student {
    private String usn;
    private String name;
    private int credits[];
    private int marks[];
    private int n;

    void accept()
    {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter student details");
        System.out.println("USN:");
        usn = s.next();
        System.out.println("Name:");
        name = s.next();
        System.out.println("Enter the number of subjects:");
        n = s.nextInt();
        credits = new int[n];
        marks = new int[n];
        System.out.println("Enter credits and marks
        attained by the student in each subject");
        for(int i=0; i<n; i++)
        {
            credits[i] = s.nextInt();
            marks[i] = s.nextInt();
        }
    }
void display()
{
    System.out.println("Student details:");
    System.out.println("USN:"+usn);
    System.out.println("Name:"+name);
    System.out.println("Marks in each subject:");
```

```
for (int i = 0; i<n; i++)
 { System.out.println ("Subject "+ (i+1) +":" + marks[i]);
   }
}

double calculate()
{
   int tcp=0, tc=0;
   for (int i=0; i<n; i++)
    {
      tc = tc+ credits [i];
      if (marks [i] >=50)
      {
        tcp = tcp + (((marks [i]/10) +1) * credits [i]);
      } else if (marks[i] >=40 && marks [i]<50)
              tcp = tcp + (4* credits [i]);
   }
  return (double)tcp/tc;
  }
}

class StudentMain
{
  public static void main (String ss[]) {
    Student s1 = new Student();
      s1.accept();
      s1. display();
    System.out. println ("SGPA:" +s1. calculate ());
    }
  }
```

SOURCE CODE:

```
import java.util.*;
class Student {
        private String usn;
        private String name;
        private  int credits[];
        private int marks[];
        private int n;

        void accept()
        {
                Scanner s=new Scanner(System.in);
                System.out.println("Enter student details");
                System.out.println("USN:");
                usn=s.next();
                System.out.println("Name:");
                name=s.next();
                System.out.println("Enter the number of subjects:");
                n=s.nextInt();
                credits=new int[n];
                marks=new int[n];
                System.out.println("Enter credits and marks attained by the student in each
subject");
                for(int i=0;i<n;i++)
                {
                        credits[i]=s.nextInt();
                        marks[i]=s.nextInt();
                }
        }
        void display()
        {
                System.out.println("Student details:");
                System.out.println("USN:"+usn);
                System.out.println("Name:"+name);
                System.out.println("Marks in each subject:");
                for(int i=0;i<n;i++)
                {
                        System.out.println("Subject "+(i+1)+":"+marks[i]);
                }
        }
        double calculate()
        {
```

```
            int tcp=0,tc=0;
            for(int i=0;i<n;i++)
            {
                  tc=tc+credits[i];
                  if(marks[i]>=50)
                  {
                  tcp=tcp+(((marks[i]/10)+1)*credits[i]);
                  }
                  else if(marks[i]>=40 && marks[i]<50)
                  {
                        tcp=tcp+(4*credits[i]);
                  }
            }
            return (double)tcp/tc;
      }
}
      class StudentMain
      {

      public static void main(String ss[]) {
            Student s1=new Student();
            s1.accept();
            s1.display();
            System.out.println("SGPA: "+s1.calculate());
      }
      }
```

OUTPUT:

```
D:\Kusum\OOJ2020>java StudentMain
Enter student details
USN:
1BM19CS000
Name:
Palak
Enter the number of subjects:
5
Enter credits and marks attained by the student in each subject
4 77
5 78
3 74
4 75
4 77
Student details:
USN:1BM19CS000
Name:Palak
Marks in each subject:
Subject 1:77
Subject 2:78
Subject 3:74
Subject 4:75
Subject 5:77
SGPA: 8.0
```

```
D:\Kusum\OOJ2020>java StudentMain
Enter student details
USN:
1BM19EC000
Name:
Anusha
Enter the number of subjects:
5
Enter credits and marks attained by the student in each subject
4 91
5 88
3 99
4 94
4 93
Student details:
USN:1BM19EC000
Name:Anusha
Marks in each subject:
Subject 1:91
Subject 2:88
Subject 3:99
Subject 4:94
Subject 5:93
SGPA: 9.75
```

Lab 3:

Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString( ) method that could display the complete details of the book. Develop a Java program to create n book objects.

OBSERVATION:

Week 5 - Lab 3 Program

=> Java Program to create n book objects

```
import java.util.*;
class Book {
    String name;
    String author;
    int price;
    int num_pages;
    Book()
    { }
    Book(String name, String author, int price, int num_pages)
    {
        this.name = name;
        this.author = author;
        this.price = price;
        this.num_pages = num_pages;
    }
    void accept()
    {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the name of the book");
        name = s.next();
        System.out.println("Enter the author of the book");
        author = s.next();
```

```
System.out.println("Enter the price of the book");
price = s.nextInt();
System.out.println("Enter the number of pages of the book");
num_pages = s.nextInt();
}
public String toString()
{
return("Name: "+name+"\n"+"Author: "+author+"\n"+
"Price: "+price+"\n"+"Number of pages: "+num_pages);
}
}
class BookMain{
public static void main(String ss[])
{
Scanner a = new Scanner(System.in);
Book b1 = new Book("Heights","Anne",299,345);
System.out.println("Sample input:\n"+b1);
System.out.println("Enter the number of books");
int n = a.nextInt();
Book b[] = new Book[n];
for(int i=0;i<n;i++)
{
b[i] = new Book();
System.out.println("Enter the details of "+(i+1)+"book");
b[i].accept();
}
for(int i=0;i<n;i++)
{
System.out.println("Details of book"+(i+1));
System.out.println(b[i]);
}
}
}
```

SOURCE CODE:

```
import java.util.*;
class Book {
	String name;
	String author;
	int price;
	int num_pages;
	Book()
	{}
	Book(String name,String author,int price,int num_pages)
	{
		this.name=name;
		this.author=author;
		this.price=price;
		this.num_pages=num_pages;
	}
	void accept()
	{
		Scanner s=new Scanner(System.in);
		System.out.println("Enter the name of the book");
		name=s.next();
		System.out.println("Enter the author of the book");
		author=s.next();
		System.out.println("Enter the price of the book");
		price=s.nextInt();
		System.out.println("Enter the number of pages of the book");
		num_pages=s.nextInt();
	}
	public String toString()
	{
		return ("Name: "+name + "\n" + "Author: "+author + "\n" + "Price: "+price +
"\n" +"Number of pages: "+num_pages );
	}
}
class BookMain {
	public static void main(String ss[])
	{
		Scanner a=new Scanner(System.in);
		Book b1=new Book("Heights","Anne",299,345);
		System.out.println("Sample input:\n"+b1);
		System.out.println("Enter the number of books");
		int n=a.nextInt();
		Book b[]=new Book[n];
```

```
            for(int i=0;i<n;i++)
            {
                b[i]=new Book();
                System.out.println("Enter the details of "+(i+1)+" book");
                b[i].accept();
            }
            for(int i=0;i<n;i++)
            {
                System.out.println("Details of book "+(i+1));
                System.out.println(b[i]);
            }
        }
}
```

OUTPUT:

```
D:\Kusum\III SEMESTER\OOJ2020>java BookMain
Sample input:
Name: Heights
Author: Anne
Price: 299
Number of pages: 345
Enter the number of books
3
Enter the details of 1 book
Enter the name of the book
Rise
Enter the author of the book
William
Enter the price of the book
300
Enter the number of pages of the book
455
Enter the details of 2 book
Enter the name of the book
Star
Enter the author of the book
John
Enter the price of the book
299
Enter the number of pages of the book
588
Enter the details of 3 book
Enter the name of the book
Oceans
Enter the author of the book
Joe
Enter the price of the book
245
Enter the number of pages of the book
366
```

```
Details of book 1
Name: Rise
Author: William
Price: 300
Number of pages: 455
Details of book 2
Name: Star
Author: John
Price: 299
Number of pages: 588
Details of book 3
Name: Oceans
Author: Joe
Price: 245
Number of pages: 366
```

LAB 4 :

Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea( ). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

OBSERVATION:

Week 8 :

Lab 4

```
import java.util.*;
abstract class Shape
{
   int a, b;
   abstract void printArea();
}
class Rectangle extends Shape
{
  void printArea()
  {
    Scanner ss = new Scanner(System.in);
    System.out.println("Enter length and breadth of the
    rectangle");
    a = ss.nextInt();
    b = ss.nextInt();
    double area;
    area = (double)a * b;
    System.out.println("The area of Rectangle is "+area);
  }
}
class Triangle extends Shape
{
  void printArea()
  {
    Scanner ss = new Scanner(System.in);
    System.out.println("Enter the base length and height of
    the triangle");
    a = ss.nextInt();
    b = ss.nextInt();
    double area;
    area = (double)0.5*a*b;
    System.out.println("The area of Triangle is "+area);
  }
}
```

```
class Circle extends Shape
{
    void printArea()
    {
      Scanner ss = new Scanner (System.in);
      System.out.println ("Enter the radius of the circle");
       a = ss.nextInt();
       double area;
        area = (double)3.14 * a * a;
        System.out.println ("The area of Circle is "+area);
    }
}
class Shapemain
{
    public static void main (String args[])
    {
      int ch;
      Scanner ss=new Scanner (System.in);
      Rectangle r = new Rectangle();
      Triangle t = new Triangle();
      Circle c = new Circle();
      while (true) {
      System.out.println ("Enter the choice of shape whose
      area has to be calculated");
      System.out.println ("1.Rectangle \n 2.Triangle \n 3.Circle \n
                                                    4.Exit");

      ch = ss.nextInt();
      switch (ch)
      {
      case 1: r.printArea();
              break;
      case 2: t.printArea();
              break;
      case 3: c.printArea();
              break;
      case 4: System.exit(0);
              break;
      default: System.out.println ("Invalid choice!");
                }}}}
```

SOURCE CODE:

```
import java.util.*;
abstract class Shape
{
int a,b;
abstract void printArea();
}

class Rectangle extends Shape
{
void printArea()
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter length and breadth of the rectangle");
a=ss.nextInt();
b=ss.nextInt();
double area;
area=(double)a*b;
System.out.println("The area of Rectangle is "+area);
}
}
class Triangle extends Shape
{
void printArea()
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter base length and height of the triangle");
a=ss.nextInt();
b=ss.nextInt();
double area;
area=(double)0.5*a*b;
System.out.println("The area of Triangle is "+area);
}
}
class Circle extends Shape
{
void printArea()
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter radius of the circle");
a=ss.nextInt();
double area;
area=(double)3.14*a*a;
System.out.println("The area of Circle is "+area);
```

```
}
}

class Shapemain
{
public static void main(String args[])
{
int ch;
Scanner ss=new Scanner(System.in);
Rectangle r=new Rectangle();
Triangle t=new Triangle();
Circle c=new Circle();
while(true){
System.out.println("Enter the choice of shape whose area has to be calculated");
System.out.println("1.Rectangle\n2.Triangle\n3.Circle\n4.Exit");
ch=ss.nextInt();
switch(ch)
{
case 1:
r.printArea();
break;
case 2:
t.printArea();
break;
case 3:
c.printArea();
break;
case 4:
System.exit(0);
break;
default:
System.out.println("Invalid choice!");
}
}
}
}
```

OUTPUT:

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab4.java

D:\Kusum\III SEMESTER\OOJ2020>java Shapemain
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
1
Enter length and breadth of the rectangle
2
3
The area of Rectangle is 6.0
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
2
Enter base length and height of the triangle
1
2
The area of Triangle is 1.0
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
3
Enter radius of the circle
2
The area of Circle is 12.56
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
5
Invalid choice!
```

```
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
4

D:\Kusum\III SEMESTER\OOJ2020>
```

LAB 5:

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks: •Accept deposit from customer and update the balance. • Display the balance. • Compute and deposit interest • Permit withdrawal and update the balance • Check for the minimum balance,impose penalty if necessary and update the balance

OBSERVATION:

Lab 5:

```
import java.util.Scanner;
abstract class Account {
    String cName, accType;
    long accNo;
    double bal;
    final double minBal = 1000.0;
Account (String cName, long accNo, double bal, String
                                                accType){

    this.accNo = accNo;
    this.cName = cName;
    this.bal = bal;
    this.accType = accType;

  }
abstract void addBal (double amt);
abstract void dispBal ();
abstract void withBal (double amt);

}
class Curr_acct extends Account {
    Curr_acct (String cName, long accNo, double bal) {
      super (cName, accNo, bal, "Current");
      System.out.println("Name: " + cName + "\t accNo :" +
      accNo + "\t bal : " + bal + "\t type : " + accType);

  }
void addBal(double amt) {
    this.bal += amt;

  }
void dispBal() {
    System.out.println("Your balance is :" + this.bal);
  }
void checkBal() {
    if (this.bal < minBal) {
      System.out.println("Insufficient balance, penalty
                                                imposed");
      this.bal -= this.bal * 0.02; } }
```

```
    void withBal (double amt) {
        this.bal -= amt;
        checkBal();
    }
}
class Sav_acct extends Account {
    Sav_acct (String cName, long accNo, double bal) {
        super (cName, accNo, bal, "Savings");
        System.out.println ("Name : " + cName + "\t accNo: " + accNo +
        "\tbal:" + bal + "\t type:" + accType);
    }
    void addBal (double amt) {
        this.bal += amt;
        addIntr();
    }
    void addIntr() {
        this.bal += this.bal * 0.07;
    }
    void dispBal () {
        System.out.println ("Your balance is : " + this.bal);
    }
    void withBal (double amt) {
        this.bal -= amt;
    }
}
class Bank {
    public static void main (String[] args) {
        Scanner sc = new Scanner (System.in);
        Double amt;
        System.out.println ("Enter your details : ");
        System.out.println ("Name : ");
        String x = sc.next();
```

```
System.out.println("Account Number : ");
long y = sc.nextLong();
for(;;)
{
System.out.println("Type of account : \n1. Current account
\n2. Savings account \n3. Exit");
int t = sc.nextInt();
if(t==1) {
System.out.println("The current account provides
cheque book facility but no interest.");
Curr_acct c = new Curr_acct(x, y, 50000);
for(;;)
{
  System.out.println("1: Deposit \n2: Display Balance \n
  3: Withdraw \n4: Exit");
  int ch = sc.nextInt();
  switch(ch) {
  case 1:
    System.out.println("Enter the amount to be added:");
    amt = sc.nextDouble();
    c.addBal(amt);
    break;
  case 2: c.dispBal();
          break;

  case 3:
      System.out.println("Enter the amount to be
                          withdrawn:");

      amt = sc.nextDouble();
      c.withBal(amt);
      break;
  case 4: System.exit(0);
  default: System.out.println("Invalid choice! Try again");
  }
}
}
```

```
else if (t==2) {
System.out.println (" The savings account provides compound interest and withdrawal facilities but no chequebook facility ");
Sav_acct s= new Sav_acct (x, y, 5000);
for (;;) {
System.out.println ("1: Deposit \n2: Display Balance \n3: Withdraw \n4: exit");
int ch = sc.nextInt ();
switch (ch) {
case 1:
System.out.println ("Enter the amount to be added:");
amt = sc.nextDouble();
s.addBal (amt);
break;
case 2:
   s.dispBal ();
   break;
case 3:
System.out.println ("Enter the amount to be withdrawn:");
amt = sc.nextDouble ();
 s.withBal (amt);
  break;
case 4: System.exit (0);
default :System.out.println ("Invalid choice! Try again");
  }
}
else if (t==3)
  System.exit (0);
else
System.out.println ("Invalid choice ! Try again");
  }
}
```

SOURCE CODE:

```
import java.util.Scanner;

abstract class Account {
   String cName, accType;
   long accNo;
   double bal;
   final double minBal = 1000.0;

   Account(String cName, long accNo, double bal, String accType) {
      this.accNo = accNo;
      this.cName = cName;
      this.bal = bal;
      this.accType = accType;
   }

   abstract void addBal(double amt);

   abstract void dispBal();

   abstract void withBal(double amt);
}

class Curr_acct extends Account {
   Curr_acct(String cName, long accNo, double bal) {
      super(cName, accNo, bal, "Current");
      System.out.println("Name: "+cName+"\taccno: "+accNo+"\tbal: "+bal+"\ttype: "+accType);
   }

   void addBal(double amt){
      this.bal  += amt;

   }

   void dispBal(){
      System.out.println("Your balance is: " + this.bal);
   }
         void checkBal() {
      if (this.bal < minBal) {
                           System.out.println("Insufficient balance, penalty imposed");
         this.bal -= this.bal * 0.02;
      }
```

```
}

    void withBal(double amt){
        this.bal -= amt;
        checkBal();
    }

}

class Sav_acct extends Account {
    Sav_acct(String cName, long accNo, double bal) {
        super(cName, accNo, bal, "Savings");
        System.out.println("name: " + cName + "\taccno: " + accNo + "\tbal: " + bal + "\ttype: " +
accType);
    }

    void addBal(double amt){
        this.bal  += amt;
        addIntr();
    }

    void addIntr() {
        this.bal += this.bal * 0.07;
    }

    void dispBal(){
        System.out.println("Your balance is: " + this.bal);
    }


    void withBal(double amt){
        this.bal -= amt;

    }



    }


class Bank {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        Double amt;
```

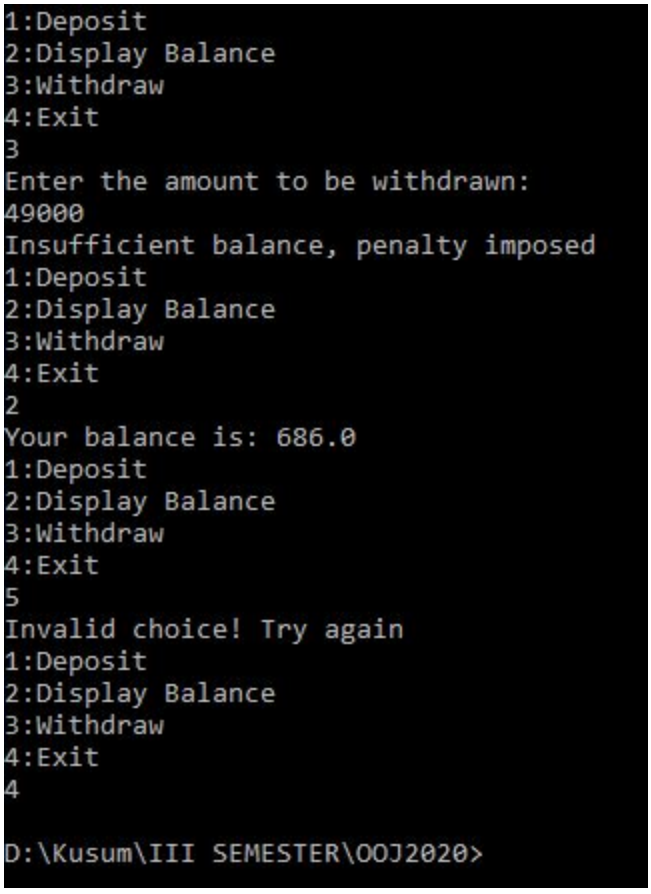
```
                System.out.println("Enter your details:");
                System.out.println("Name:");
                String x=sc.next();
                System.out.println("Account Number:");
                long y=sc.nextLong();
                for(;;)
                {
                System.out.println("Type of account:\n1.Current account\n2.Savings
account\n3.Exit");
                int t=sc.nextInt();


      if(t==1){
                        System.out.println("The current account provides cheque book facility but
no interest.");
                Curr_acct c = new Curr_acct(x, y, 50000);
      for(;;)
                        {
         System.out.println("1:Deposit\n2:Display Balance\n3:Withdraw\n4:Exit");
         int ch = sc.nextInt();

         switch (ch) {
            case 1:
               System.out.println("Enter the amount to be added:");
               amt = sc.nextDouble();
               c.addBal(amt);
               break;

            case 2:
               c.dispBal();
               break;

            case 3:
               System.out.println("Enter the amount to be withdrawn:");
               amt = sc.nextDouble();
               c.withBal(amt);
               break;
                                case 4:System.exit(0);
                        default:System.out.println("Invalid choice! Try again");
         }
                        }

                }
```

```
      else if(t==2){
                              System.out.println("The savings account provides compound interest and
withdrawal facilities but no cheque book facility.");
                    Sav_acct s = new Sav_acct(x, y, 5000);
      for(;;) {
         System.out.println("1:Deposit\n2:Display Balance\n3:Withdraw\n4:Exit");
         int ch = sc.nextInt();
         switch (ch) {
            case 1:
               System.out.println("Enter the amount to be added:");
               amt = sc.nextDouble();
               s.addBal(amt);
               break;

            case 2:
               s.dispBal();
               break;

            case 3:
               System.out.println("Enter the amount to be withdrawn:");
               amt = sc.nextDouble();
               s.withBal(amt);
               break;
            case 4:System.exit(0);
                        default:System.out.println("Invalid choice! Try again");
         }
      }
                    }
                    else if(t==3)
                              System.exit(0);
                    else
                              System.out.println("Invalid choice! Try again");


                    }
                    }
   }
```

OUTPUT:

CASE 1:Current Account(With deposit, display, withdraw, Penalty, Exit)

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
38216481
Type of account:
1.Current account
2.Savings account
3.Exit
1
The current account provides cheque book facility but no interest.
Name: Kusum     accno: 38216481 bal: 50000.0    type: Current
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
200
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 50200.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
500
```



CASE 2:Savings account(Deposit,Compound interest,Display,withdraw,Invalid choice,Exit)

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
12487183
Type of account:
1.Current account
2.Savings account
3.Exit
2
The savings account provides compound interest and withdrawal facilities but no cheque book facility.
name: Kusum     accno: 12487183 bal: 5000.0     type: Savings
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
300
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 5671.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
500
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 5171.0
```

```
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
7
Invalid choice! Try again
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4

D:\Kusum\III SEMESTER\OOJ2020>
```

Case 3:Invalid choice and exit

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
491493257
Type of account:
1.Current account
2.Savings account
3.Exit
6
Invalid choice! Try again
Type of account:
1.Current account
2.Savings account
3.Exit
3

D:\Kusum\III SEMESTER\OOJ2020>
```