29/9/20

1BM19CS090
Mohammed Ibrahim Rahil.S.

Lab Program-1 :

Develop a Java prg 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 -ve, display message stating there are no real solutions.

Code:

```
import java.util.*;
class roots
{
   public static void main(String args[])
   {
      double a,b,c,x,y,d;
      System.out.println("Enter the coefficients a,b,c: ");
      Scanner s = new Scanner(System.in);
      a = s.nextFloat();
      b = s.nextFloat();
      c = s.nextFloat();
      d = (b*b)-(4*a*c);
      if (d==0)
      {
         x = -b/(2*a);
         y = x
         System.out.println("Both Roots Are Real and Equal");
         System.out.println("R1 = "+x+" And R2 = "+y);
      }
      else if (d>0)
      {
         x = (-b+Math.sqrt(d))/(2*a);
         y = (-b-Math.sqrt(d))/(2*a);
```

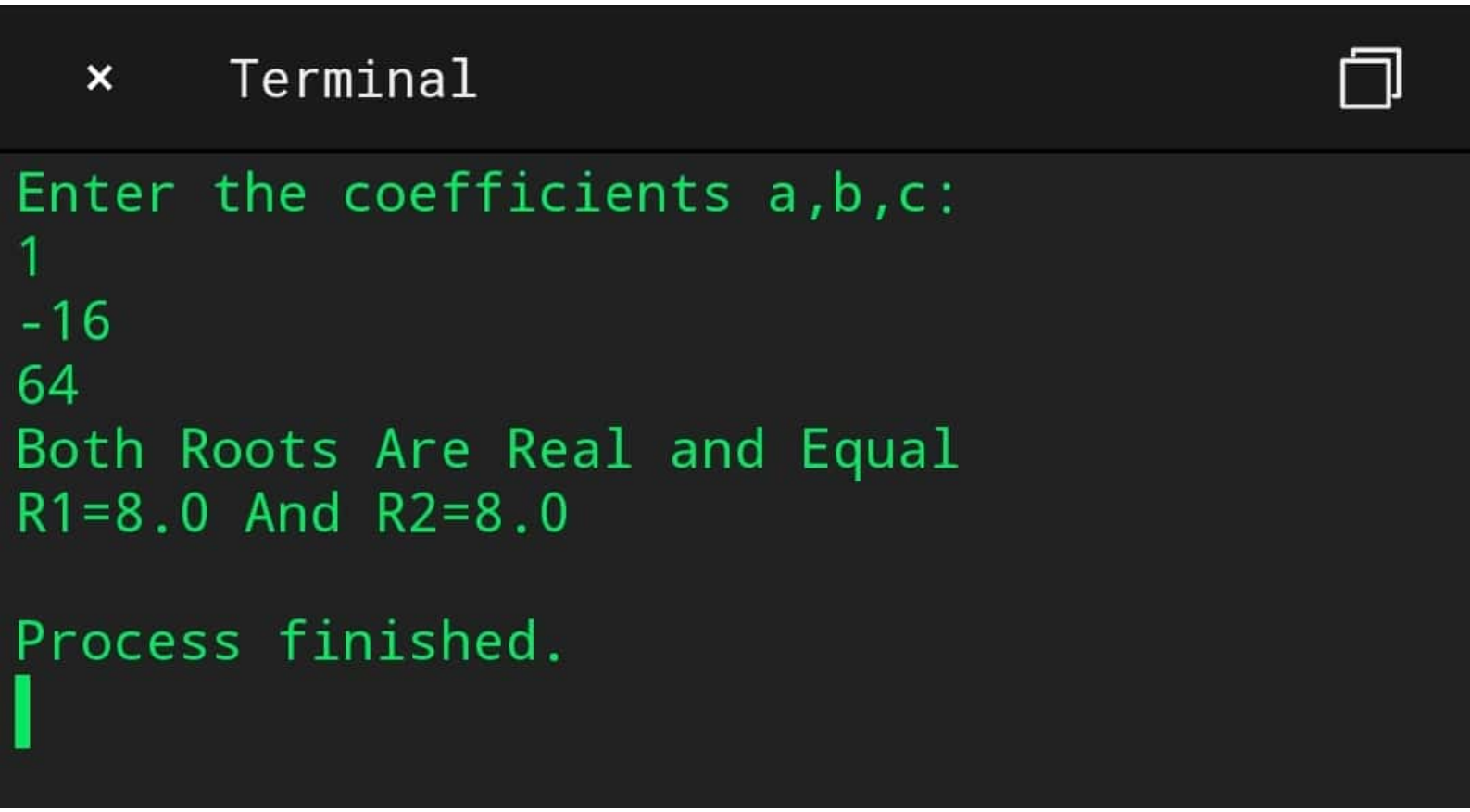
```
            System.out.println("Roots Are Real and Distinct");
            System.out.println("R1 = "+x+" And R2 = "+y);
        }
        else
        {
            System.out.println("Roots Are Imaginary. No
                                Real Solutions!");
        }
    }
}
```

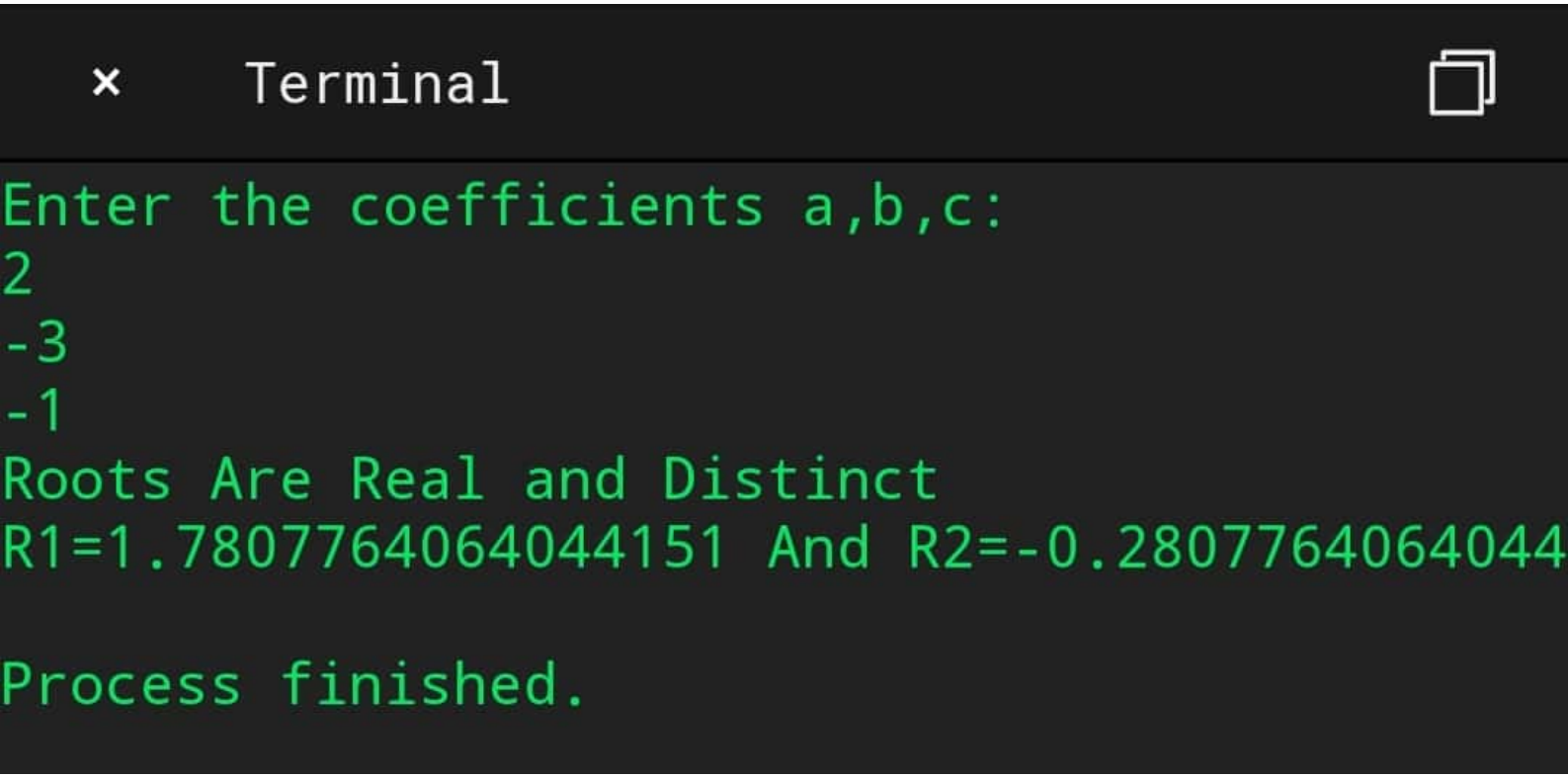
Roots.java

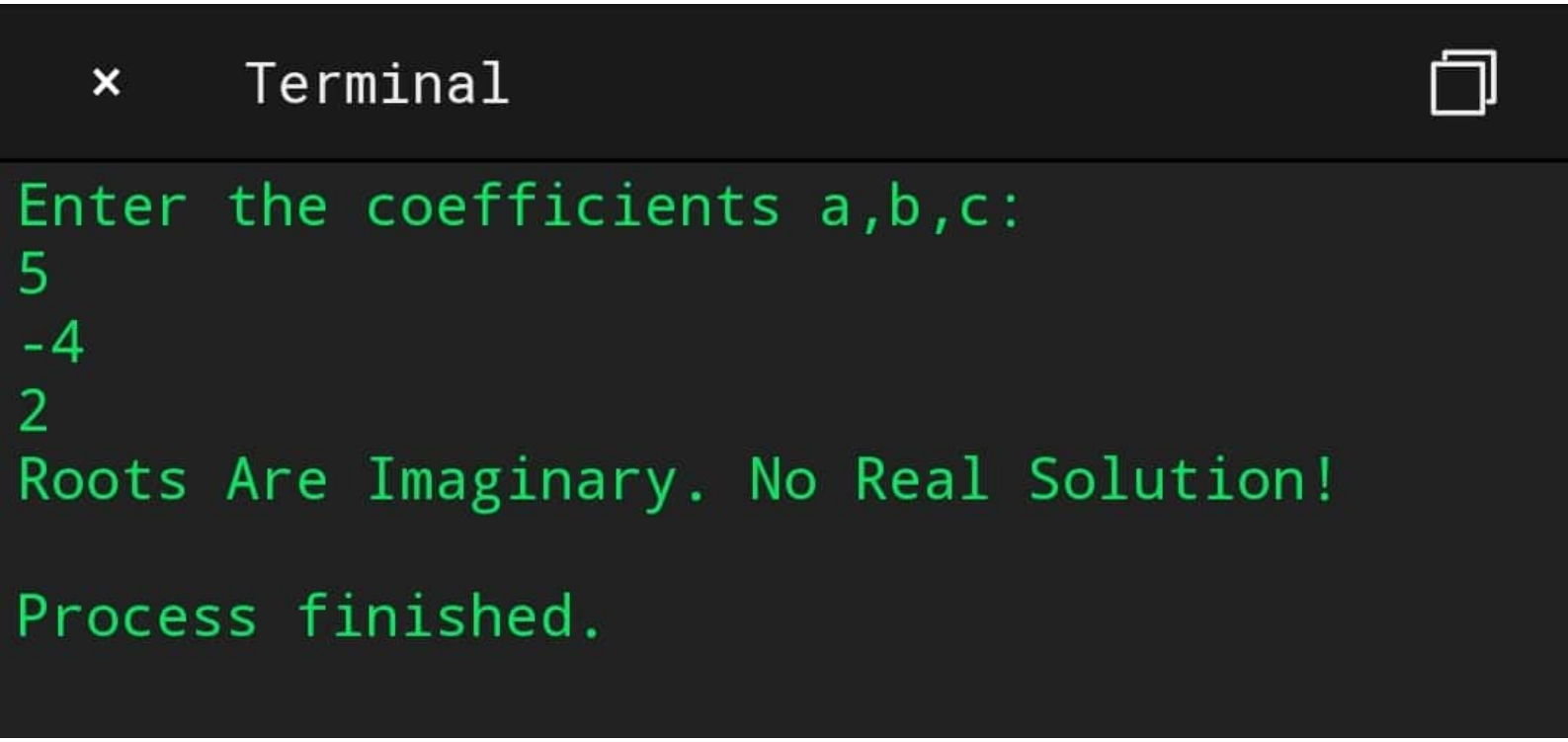
Saved

```java
import java.util.*;
class roots
 {
   public static void main(String args[])
   {
    double a,b,c,x,y,d;
    System.out.println("Enter the coefficients a,b,c:");
    Scanner s=new Scanner(System.in);
    a=s.nextFloat();
    b=s.nextFloat();
    c=s.nextFloat();
    d=(b*b)-(4*a*c);
    if(d==0)
    {
      x=-b/(2*a);
      y=x;
      System.out.println("Both Roots Are Real and Equal ");
      System.out.println("R1="+x+" And R2="+y);
    }
    else if(d>0)
    {
      x=(-b+Math.sqrt(d))/(2*a);
      y=(-b-Math.sqrt(d))/(2*a);
      System.out.println("Roots Are Real and Distinct");
      System.out.println("R1="+x+" And R2="+y);
    }
    else
    {
      System.out.println("Roots Are Imaginary. No Real Solution!");
    }
   }
}

```







6/10/20

1BM19CS090

Mohammed Ibrahim Rahil.

Lab Program 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.

code:

```
import java.util.Scanner;
class Student
{
  private
    String usn,name;
    float cr[] = new float[5];
    float m[] = new float[5];
  public
    Scanner s = new Scanner(System.in);
    void getdet()
    {
      System.out.println("Enter Name:");
      name = s.next();
      System.out.println("Enter usn:");
      usn = s.next();
      for(int i=0; i<5; i++)
      {
        System.out.println("Enter Credits for Subject "+(i+1));
        cr[i] = s.nextFloat();
        System.out.println("Enter Marks for subject "+(i+1));
        m[i] = s.nextFloat();
      }
    }
}
```

```
public void printdet()
{
    System.out.println("Student Details are,");
    System.out.println("Name: "+name);
    System.out.println("USN:"+usn);
    for(int i=0;i<5;i++)
    {
        System.out.println("Subject "+(i+1)+" Credits: "+cr[i]);
        System.out.println("Subject "+(i+1)+" Marks: "+m[i]);
    }
}
public void scgpa()
{
    int a;
    float scg=0, tcr=0;
    for(int i=0;i<5;i++)
    {
        tcr+=cr[i];
    }
    for(int i=0;i<5;i++)
    {
        if(m[i]>=90)
        a=10;
        else if(m[i]>=80)
        a=9;
        else if(m[i]>=70)
        a=7;
        else if(m[i]>=60)
        a=6;
        else if(m[i]>=50)
        a=5;
        else
        a=4;
        scg+=((cr[i]*a)/tcr);
    }
    System.out.println("SCGP is "+scg);
}
}
```

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```
class main
{
    public static void main (String args[])
    {
        ~~float sgp;~~
        Student s1 = new Student ();
        s1.getdet();
        s1.printdet();
        s1.sgpa();
    }
}
```

scgpa.java

Saved

```
class Student
{
  private
    String usn,name;
    float cr[]=new float[5];
    float m[]=new float[5];
  public
    Scanner s=new Scanner(System.in);
    void getdet()
    {

      System.out.println("Enter Name:");
      name=s.next();
      System.out.println("Enter USN:");
      usn=s.next();
      for(int i=0;i<5;i++)
      {
        System.out.println("Enter Credits for subject "+(i+1)+":");
        cr[i]=s.nextFloat();
        System.out.println("Enter Marks for subject "+(i+1)+"(for 100):");
        m[i]=s.nextFloat();
      }
    }
    public void printdet()
    {
      System.out.println("Student Details are,");
      System.out.println ("Name:"+name);
      System.out.println ("USN:"+usn);
      for(int i=0;i<5;i++)
      {
        System.out.println("Subject "+(i+1)+" Credits:"+cr[i]);
        System.out.println("Subject "+(i+1)+" Marks:"+m[i]);
      }
    }
    public void scgpa()
    {
      int a;
      float scg=0,tcr=0;
      for(int i=0;i<5;i++)
      {
        tcr+=cr[i];
      }
      for(int i=0;i<5;i++)
      {
         if(m[i]>=90)
         a=10;
         else if(m[i]>=80)
         a=8;
         else if(m[i]>=70)
         a=7;
         else if(m[i]>=60)
         a=6;
         else if(m[i]>=50)
         a=5;
         else
         a=4;
         scg+=((cr[i]*a)/tcr);
      }
      System.out.println("SCGP is "+scg);
    }
}

class main
{
  public static void main(String args[])
  {
    float scgp;
    Scanner n=new Scanner(System.in);
    Student s1=new Student();
    s1.getdet();
    s1.printdet();
    s1.scgpa();
  }
}
```

```
Terminal
Enter Name:
rahil
Enter USN:
1BM19CS090
Enter Credits for subject 1:
5
Enter Marks for subject 1(for 100):
87
Enter Credits for subject 2:
4
Enter Marks for subject 2(for 100):
91
Enter Credits for subject 3:
4
Enter Marks for subject 3(for 100):
81
Enter Credits for subject 4:
4
Enter Marks for subject 4(for 100):
76
Enter Credits for subject 5:
3
Enter Marks for subject 5(for 100):
71
Student Details are,
Name:rahil
USN:1BM19CS090
Subject 1 Credits:5.0
Subject 1 Marks:87.0
Subject 2 Credits:4.0
Subject 2 Marks:91.0
Subject 3 Credits:4.0
Subject 3 Marks:81.0
Subject 4 Credits:4.0
Subject 4 Marks:76.0
Subject 5 Credits:3.0
Subject 5 Marks:71.0
SCGP is 8.05

Process finished.
```

Lab 3. Program: 13/10/19

1BM19CS090

Mohammed Ibrahim Ra

Q) 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 toString() method that could display the complete details of the book. Develop a Java prg. to create n book objects.

code:

```
import java.util.Scanner;
class Book
{
    private
    String name, auth;
    float price, num_pages;
    public
    Scanner s= new Scanner (System.in);
    Book()
    {
        name = "xyz";
        auth = "abc";
        price =0;
        num_pages = 0;
    }
    void getdet()
    {
        System.out.print("Enter Book Name: ");
        name = s.next();
        System.out.print("Enter Author Name: ");
        auth = s.next();
        System.out.print("Enter Price: ");
        price = s.nextFloat();
```

```
        System.out.print("Enter No. of pages: ");
        num_pages = s.nextFloat();
    }
    public String toString()
    {
        return("Book Name: "+name+"\nAuthor Name="
                +auth+"\nprice="+price+"\nNo. of Pages="
                +num_pages);
    }
}
class BookMain
{
    public static void main(String args[])
    {
        int n;
        Scanner s=new Scanner(System.in);
        System.out.println("Enter No. of Books:");
        n=s.nextInt();
        Book b[]=new Book[n];
        for(int i=0;i<n;i++)
        {
            b[i]=new Book();
            System.out.println("Book No-"+(i+1));
            b[i].getdet();
        }
        for(int i=0;i<n;i++)
        {
            System.out.println("\nDetails of Book "+(i+1)+":");
            System.out.println(b[i]);
        }
}
```

BookInfo.java

Saved

```java
import java.util.Scanner;
class Book
{
  private
  String name,auth;
  float price,num_pages;
  public
  Scanner s=new Scanner(System.in);
  Book()
  {
    name="xyz";
    auth="abc";
    price=0;
    num_pages=0;
  }
  void getdet()
  {
    System.out.print("Enter Book Name:");
    name=s.next();
    System.out.print("Enter Author Name:");
    auth=s.next();
    System.out.print("Enter Price:");
    price=s.nextFloat();
    System.out.print("Enter No. of pages:");
    num_pages=s.nextFloat();
  }
  public String toString()
  {
    return("Book Name="+name+"\nAuthor Name="+auth+"\nprice="+price+"\nNo. of Pages="+num_pages);
  }
}
class BookMain
{
  public static void main(String args[])
  {
    int n;
    Scanner s=new Scanner(System.in);
    System.out.println("Enter No. of Books:");
    n=s.nextInt();
    Book b[]=new Book[n];
    for(int i=0;i<n;i++)
    {
      b[i]=new Book();
      System.out.println("Book No-"+(i+1));
      b[i].getdet();
    }
    for(int i=0;i<n;i++)
    {
      System.out.println("\nDetails of Book "+(i+1)+",");
      System.out.println(b[i]);
    }
  }
}
```

```
Terminal
Enter No. of Books:
2
Book No-1
Enter Book Name:Famous
Enter Author Name:Gyllenhaal
Enter Price:699
Enter No. of pages:436
Book No-2
Enter Book Name:North
Enter Author Name:Trippier
Enter Price:899
Enter No. of pages:1232

Details of Book 1,
Book Name=Famous
Author Name=Gyllenhaal
price=699.0
No. of Pages=436.0

Details of Book 2,
Book Name=North
Author Name=Trippier
price=899.0
No. of Pages=1232.0

Process finished.
```

Lab 4 Program: 3/11/20

1BM19CS090
Mohammed Ibrahim Rahil S

code:

```
import java.util.Scanner;
abstract class Shape{
    float a, b;
    abstract void printArea();
    Scanner ss=new Scanner(System.in);
}
class Rectangle extends Shape{
    void printArea(){
        System.out.print("Enter Length: ");
        a = ss.nextFloat();
        System.out.print("Enter Breadth: ");
        b = ss.nextFloat();
        System.out.print("Area of Rectangle is " +(a*b)+"\n");
    }
}
class Triangle extends Shape{
    void printArea(){
        System.out.print("Enter Base Length: ");
        a = ss.nextFloat();
        System.out.print("Enter Height: ");
        b = ss.nextFloat();
        System.out.print("Area of Triangle is " +(0.5*(a*b))
                +"\n");
    }
}
class Circle extends Shape{
    void printArea(){
        System.out.print("Enter Radius: ");
        a = ss.nextFloat();
        System.out.print("Area of Circle is "+(3.14*a*a)
                +"\n");
    }
}
```

```
class AreaMain {
    public static void main (String args[]) {
        int i;
        Scanner ss = new Scanner (System.in);
        do {
            System.out.print ("\n1. Rectangle \n2. Triangle \n3. Circle
                               \n4. Exit \n Enter Your choice: ");
            i = ss.nextInt();
            if (i==1) {
                Rectangle r = new Rectangle();
                r.printArea(); }
            else if (i==2) {
                Triangle t = new Triangle();
                t.printArea();
            }
            else if (i==3) {
                Circle c=new Circle();
                c.printArea();
            }
            else if (i==4)
                break;
            else
                System.out.println ("Enter Valid Choice!!");
        } while (i>0);
    }
}
```

ShapeArea.java

Saved

```java
import java.util.Scanner;
abstract class Shape{
    float a,b;
    abstract void printArea();
    Scanner ss=new Scanner(System.in);
}

class Rectangle extends Shape{
    void printArea(){
        System.out.print("Enter Length:");
        a=ss.nextFloat();
        System.out.print("Enter Breadth:");
        b=ss.nextFloat();
        System.out.print("Area of Rectangle is "+(a*b)+"\n");
    }
}
class Triangle extends Shape{
    void printArea(){
       System.out.print("Enter Base Length:");
        a=ss.nextFloat();
        System.out.print("Enter Height:");
        b=ss.nextFloat();
        System.out.print("Area of Triangle is "+(0.5*(a*b))+"\n");
    }
}
class Circle extends Shape{
    void printArea(){
        System.out.print("Enter Radius:");
        a=ss.nextFloat();
        System.out.print("Area of Circle is "+(3.14*a*a)+"\n");
    }
}
class AreaMain{
    public static void main(String args[]){
        int i;
        Scanner ss=new Scanner(System.in);
        do{
            System.out.print("\n1.Rectangle\n2.Triangle\n3.Circle\n4.Exit\nEnter Your Choice:");
            i=ss.nextInt();
            if(i==1){
                Rectangle r=new Rectangle();
                r.printArea();
            }
            else if(i==2){
                Triangle t=new Triangle();
                t.printArea();
            }
            else if(i==3){
                Circle c=new Circle();
                c.printArea();
            }
            else if(i==4)
                 break;
            else{
                System.out.println("Enter Valid Choice!!");
           }
        }while(i>0);
    }
}
```

```
Terminal

1.Rectangle
2.Triangle
3.Circle
4.Exit
Enter Your Choice:1
Enter Length:2
Enter Breadth:2.2
Area of Rectangle is 4.4

1.Rectangle
2.Triangle
3.Circle
4.Exit
Enter Your Choice:2
Enter Base Length:34
Enter Height:11
Area of Triangle is 187.0

1.Rectangle
2.Triangle
3.Circle
4.Exit
Enter Your Choice:3
Enter Radius:23
Area of Circle is 1661.06

1.Rectangle
2.Triangle
3.Circle
4.Exit
Enter Your Choice:4

Process finished.
```

3/11/20

1BM19CS090

Lab 5 Program:

Mohammed Ibrahim Rafi

code:

```
import java.util.Scanner;
class Account{
    String cn;
    char t;
    int ano;
    float bal = 0, wit = 0;
    Scanner ss = new Scanner(System.in);
    void dep(){
        System.out.print("Enter Amount to be Deposited: ");
        bal = ss.nextFloat();
        System.out.print("Balance = " + bal);
    }
    void withd(){
        System.out.print("Enter Amount to be withdrawn: ");
        wit = ss.nextFloat();
        bal -= wit;
        System.out.print("Balance = " + bal);
    }
    void bal(){
        System.out.print("Balance = " + bal);
    }
}
class sav_acct extends Account{
    void interest(){
        float per; double in; int yr;
        System.out.print("Enter Rate of Interest (%) and
                          years Invested: ");
        per = ss.nextFloat();
        yr = ss.nextInt();
        in = bal * Math.pow((1 + (per/100)), yr);
        System.out.print("Deposit Interest = " + in);
    }
}
```

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```
class curr_acct extends Account {
    void pen(){
        if (bal <= 2000)
        {
            bal -= 100;
            System.out.print("\n Penalty of Rs. 100 levied");
            System.out.print("\n Balance = " +bal);
        }
        else
            System.out.print("\n Minimum Balance Maintained");
    }
}
class BankMain
{
    public static void main(String args[])
    {
        Scanner ss = new Scanner(System.in);
        System.out.println("***** Bank *****");
        Account A = new Account();
        System.out.print("Enter Name:");
        A.cn = ss.next();
        System.out.print("Enter Account No:");
        A.ano = ss.nextInt();
        System.out.print("Enter S for Saving or
                          C for Current :");
        A.t = ss.next().charAt(0);
        int i;
        if (A.t == 'S' || A.t == 's') {
            sav_acct sav = new sav_acct();
            do {
                System.out.print("\n\n1. Deposit\n2. Withdraw
                                  \n3. View Balance
                                  \n4. View Deposit Interest
                                  \n5. Exit
                                  \n Enter Choice:");
                i = ss.nextInt();
```

```
        if (i==1)
            sav.dep();
        else if (i==2)
            sav.withd();
        else if (i==3)
            sav.bal();
        else if (i==4)
            sav.interest();
        else if (i==5)
            break;
        else
            System.out.print("Enter Valid choice!!");
    } while (i>0);
}
if (A.t == 'C' || A.t == 'c'){
    curr_accl cur = new curr_accl();
    do{
        System.out.print("\n1.Deposit\n2. Widthdraw\n3 View Balan
                \n4.Exit\n Enter choice:");
        i = ss.nextInt();
        if (i==1)
            cur.dep();
        else if (i==2){
            cur.withd();
            cur.pen();
        }
        else if (i==3)
            cur.bal();
        else if (i==4)
            break;
        else
            System.out.print("Enter Valid Choice!!");
    }
}
}
```

Bank.java

Saved

```java
import java.util.Scanner;
class Account{
  String cn;
  char t;
  int ano;
  float bal=0,wit=0;
  Scanner ss=new Scanner(System.in);
  void dep(){
    System.out.print("Enter Amount to be Deposited:");
    bal=ss.nextFloat();
    System.out.print("Balance = "+bal);
  }
  void withd(){
    System.out.print("Enter Amount to be Withdrawn:");
    wit=ss.nextFloat();
    bal-=wit;
    System.out.print("Balance = "+bal);
  }
  void bal(){
    System.out.print("Balance = "+bal);
  }
}
class sav_acct extends Account{
  void interest(){
    float per;double in;int yr;
    System.out.print("Enter Rate of Interest(%) and years Invested:");
    per=ss.nextFloat();
    yr=ss.nextInt();
    in=bal*Math.pow((1+(per/100)),yr);
    System.out.print("Deposit Interest = "+in);
  }
}
class curr_acct extends Account{
  void pen(){
    if(bal<=2000)
    {
      bal-=100;
      System.out.print("\nPenalty of rs.100 levied");
      System.out.print("\nBalance = "+bal);
    }
    else
    {
      System.out.print("\nMinimum Balance Maintained");
    }
  }
}
 class BankMain
 {
   public static void main(String args[])
   {
    Scanner ss=new Scanner(System.in);
    System.out.println("*****Bank*****");
    Account A=new Account();
    System.out.print("Enter Name:");
    A.cn=ss.next();
    System.out.print("Enter Account No:");
    A.ano=ss.nextInt();
    System.out.print("Enter S for Savings or C for Current:");
    A.t=ss.next().charAt(0);
    int i;
    if(A.t=='S'||A.t=='s'){
      sav_acct sav=new sav_acct();
      do{
        System.out.print("\n\n1.Deposit\n2.Widthdraw\n3.View Balance\n4.View Deposit Interest\n5.Exit\nEnter Cho
        i=ss.nextInt();
        if(i==1){
          sav.dep();
        }
        else if(i==2){
          sav.withd();
        }
        else if(i==3){
          sav.bal();
        }
        else if(i==4){
          sav.interest();
        }
        else if(i==5){
          break;
        }
        else{
          System.out.print("Enter Valid Choice!!");
        }
      }while(i>0);
    }
    if(A.t == 'C'||A.t=='c'){
      curr_acct cur=new curr_acct();
      do{
        System.out.print("\n1.Deposit\n2.Widthdraw\n3.View Balance\n4.Exit\nEnter Choice:");
        i=ss.nextInt();
        if(i==1){
          cur.dep();
        }
        else if(i==2){
           cur.withd();
           cur.pen();
        }
        else if(i==3){
          cur.bal();
        }
        else if(i==4){
          break;
        }
        else{
          System.out.print("Enter Valid Choice!!");
        }
      }while(i>0);
    }
  }
```

```
×   Terminal

*****Bank*****
Enter Name:Ahmed
Enter Account No:123456
Enter S for Savings or C for Current:S


1.Deposit
2.Widthdraw
3.View Balance
4.View Deposit Interest
5.Exit
Enter Choice:1
Enter Amount to be Deposited:5000
Balance = 5000.0

1.Deposit
2.Widthdraw
3.View Balance
4.View Deposit Interest
5.Exit
Enter Choice:2
Enter Amount to be Withdrawn:600
Balance = 4400.0

1.Deposit
2.Widthdraw
3.View Balance
4.View Deposit Interest
5.Exit
Enter Choice:3
Balance = 4400.0

1.Deposit
2.Widthdraw
3.View Balance
4.View Deposit Interest
5.Exit
Enter Choice:4
Enter Rate of Interest(%) and years Invested:4 2
Deposit Interest = 4759.039650878913

1.Deposit
2.Widthdraw
3.View Balance
4.View Deposit Interest
5.Exit
Enter Choice:5

Process finished.
```

```
Terminal

1.Deposit
2.Widthdraw
3.View Balance
4.Exit
Enter Choice:1
Enter Amount to be Deposited:3000
Balance = 3000.0

1.Deposit
2.Widthdraw
3.View Balance
4.Exit
Enter Choice:2
Enter Amount to be Withdrawn:1200
Balance = 1800.0
Penalty of rs.100 levied
Balance = 1700.0

1.Deposit
2.Widthdraw
3.View Balance
4.Exit
Enter Choice:3
Balance = 1700.0

1.Deposit
2.Widthdraw
3.View Balance
4.Exit
Enter Choice:5
Enter Valid Choice!!

1.Deposit
2.Widthdraw
3.View Balance
4.Exit
Enter Choice:4

Process finished.
```