OOJ LAB RECORD
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1BM19CS078

LAB-1

OBSERVATION

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.

PageWork

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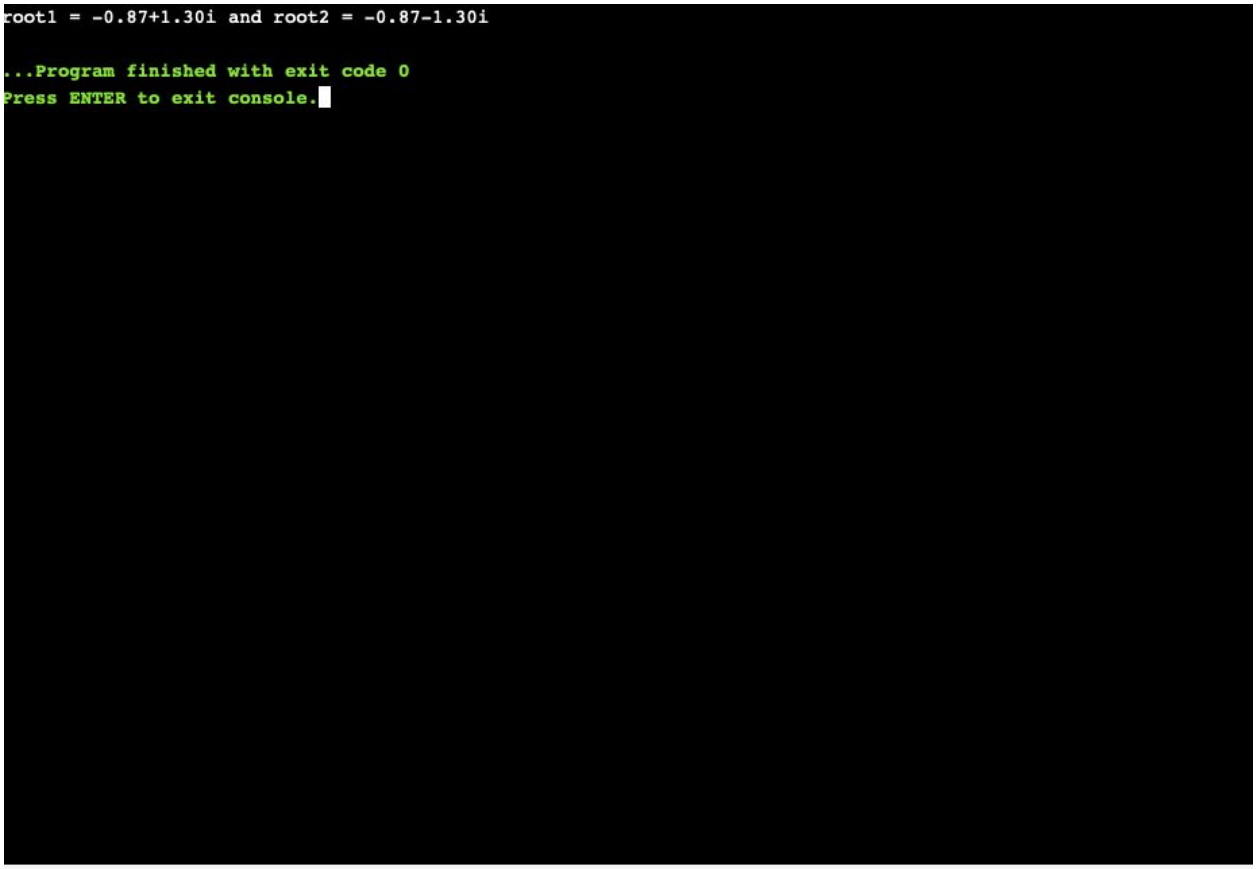
```
import java.util.Scanner
import static java.lang.Math.sqrt;
Class Quadratic {
public static void main (String [] args) {
double a, b, c, D, r1, r2, real, Imaginary;
Scanner R = new Scanner (System.in);
System.out.println ("Enter the coefficient");
a= R.next.Double ();
b= R.next Double ();
c= R.next Double ();
D= (b*b) - (4*a*c);
 if (D==0)
{
r1 = r2 = -b/(2*a);
System.out.println ("Roots are "+r1+ and r2");
}
else if (D>0)
 r1 = (-b+ Sqrt(D)) /(2*a);
r2 = (-b-Sqrt(D)) /(2*a);
System.out.print ("Roots are " +r1 and r2 ");
}
else {
System.out.println ("There are no real solutions");
 real = -b/(2*a),
 imaginary = sqrt(-D)/(2*a)
system.out.println ("Roots are "+real+ and +Imaginary);
 }
 }
```



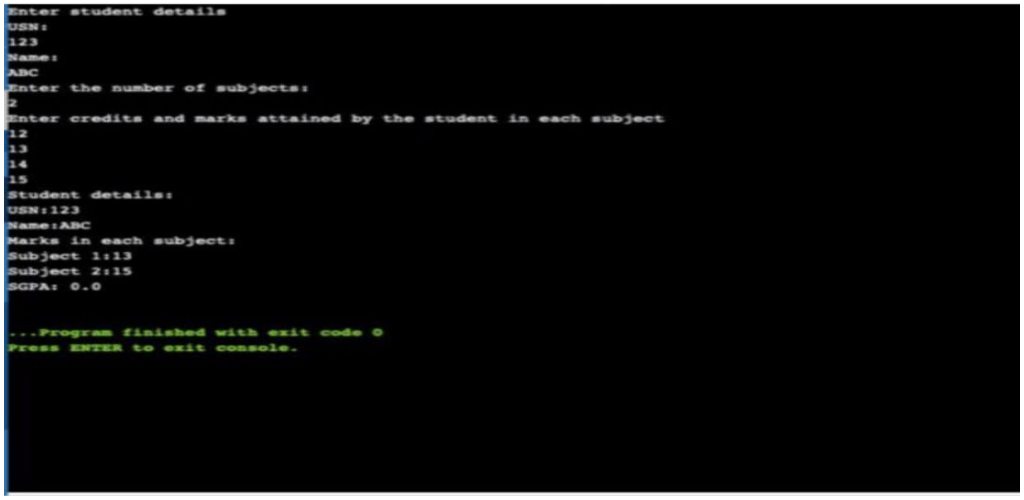
Lab Program 2:

OBSERVATION:

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.

```
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 Subject");
    Credits = new Int();
    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.next Int();
         marks[i] = s.next Int()

    void display()
    {
    System.out println("Student details
    System.out.println("USN:"+USN)
    System.out println("Name:"+name);
    System.out.println("Marks in each Subject
```

```
    {
    System.out.println("Subject "+(i+1)+": "+marks
  }
}
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
   }
   else if(marks[i]>=40 && marks[]
    {
    tcp = tcp + (4* credits
    }
   }
   return (double tcp/tc;
    }
    }

Public class main
   {
Public Static void main(String SS[]
   Student S1=new Student();
    S1.accept();
    S1.display();
    System.out.println("SGPA: "+S1.calcul
   }
   }
```



Lab Program - 3

OBSERVATION:

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.

2]

```
import java.util.Scanner;
class Book
{
private int id;
Private String title
Private int np;
Private int year;
Privati String author;
Private String Publisher;
Private double P;
 void get details ()
{
Scanner s = new Scanner (System.in).
System.out.println ("Enter ID OF Book");
  id = s.next int ();
System.out.println ("Enter the title of Book").
  title = s= next ();
System.out.println ("Enter the number of Pages of
                                book");
   np = s.nextint ();
System.out.println ("Enter Year of publishing of the
                                book").
iyear = s.nexint)
System.out.println (" Enter Author of Book ");
   author = snext ();
System.out.println (" Enter Publishes of book");
   publishu = s.next().
System.out println ("Enter prise of book");
  P = s.next Double().
  }
 void print details ()
{
```

```
b3.get details();

System.out.println("Enter the Details of the book 1");
  b1 print details().
System.out.println("Enter the Details of the book 2");
  b2 print details();
System.out println("Enter the Details of the book 3");
  b3.print details()
if (b1.price() > b2 price() && b1.price() = b3 price()
  {
  System out println("The Most Expensive book is with
          title:");
  }
else if (b2.price()>= b1 price() && b2 price() >= b3 price()
{
System.out.println("Most Expensive book is with title"
}
else
{
System.out.println("Most Expensive book is with title")
    b3 display book title();
    }
if (b1 year() == 2020)
    c++.
if (b2 year() = 2020)
    C++
if (b3 year() = 2020)
    C++
System.out.println("The Number of book Published
  in the year 2020:" + C);
```

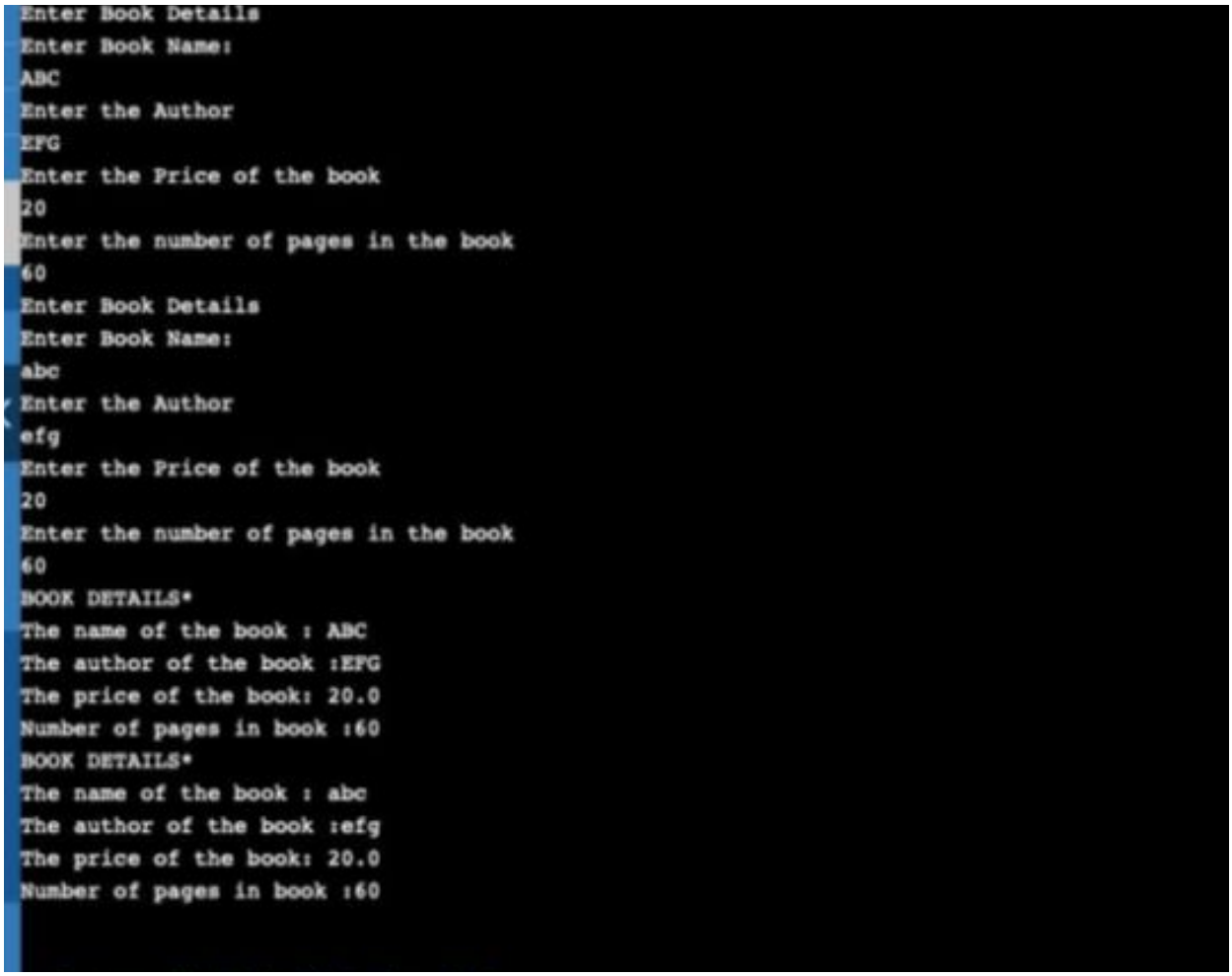
```
System.out.println (" ID of Book : " +id);
System.out.println (" The Title of book : " +title);
System.out.println (" Number of Pages of Book: " +year);
System.out.println (" year of Publisher of book
System.out.println (" Publishers of book : " +pub);
System.out.println (" Price of book ; "+p);
}
double price()
{
return p;
System.out.println (title);
}
int year
{
return year;
int pages()
{
String author
{
return author;
}
}
class book main
{
public static void main (String args[])
{
int i=0
Book b1 = new book
Book b2 = new book
Book b3 new book
b1.getdetails();
b2.getdetails();
```

```
if (b1.pages() == b2.price() && b1.price() <= b3.
    price())
{
System.out.println("The book with least number
        of Pages is Book 1");

  b1.print details();
}
else if (b2.pages() <= b1.pages() && b2.pages() <= b3.
pages())
{
System.out.println("The book with least Number
        of Pages is book 1");
b1.print details();
}
System.out.println("The book with least
Number of pages is book");
  b3.print details();
  }
System.out.println("The Enter the Author name
    whose book Details need to be Displayed");
  Scanner S1 = new Scanner(System.in);
  String author1 = S1.next();
if (author1.compareToIgnoreCase(b1.author()) ==0
    b1.details();
  else
if (author1.compareToIgnoreCase(b2.author()) == 0
    b1.printdetails

if (author2.compareToIgnoreCase(b3.author() == 0
    b2.println details();
  else
```

PageWork

System.out.println("The Given Author's book is not found");

output:

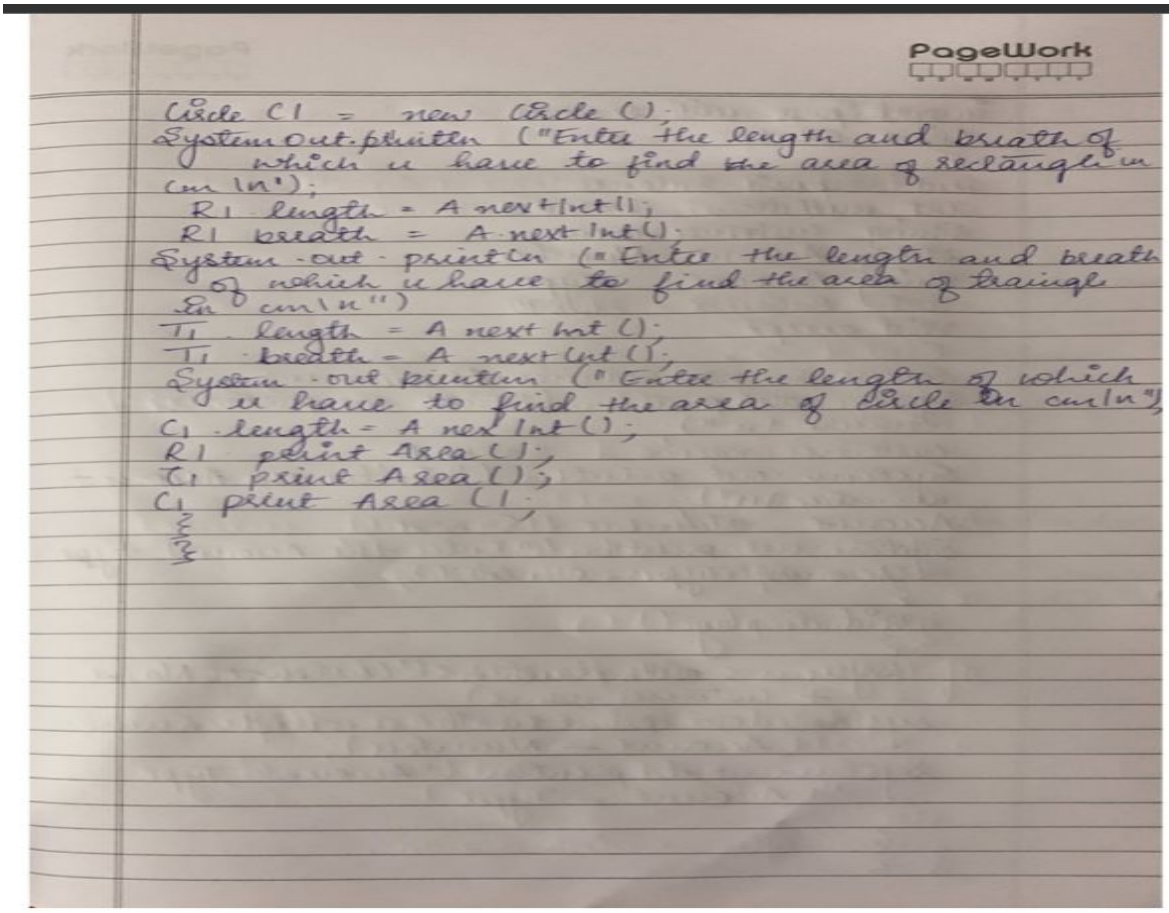


Lab-4

Observation:

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.

```
import java.util.Scanner
abstract class Shape
{
int length, breath
void printArea()
{}
}
class Rectangle extends Shape
{
double areaR
void printArea(){
areaR = (length * breath);
System.out.println("The area of rectangle is
+ "areaR+" (cm^2)");
}
}
class Triangle extends Shape
{
double areaC;
void printArea(){
areaC = (3.14) * (length * length);
System.out.println("The area of circle
" +areaC + "(cm^2)");
}
}
class Main
{
public static void main (String args[])
{
Scanner A = new Scanner (System.in)
Rectangle R1 = new Rectangle
TriangleTi = new Triangle
```



```
Circle C1 = new Circle();
System.out.println("Enter the length and breath of
    which u have to find the area of rectangle in
cm\n");
  R1.length = A.nextInt();
  R1.breadth = A.nextInt();
System.out.println("Enter the length and breath
    of which u have to find the area of triangle
in cm\n");
  T1.length = A.nextInt();
  T1.breadth = A.nextInt();
System.out.println("Enter the length of which
    u have to find the area of circle in cm\n");
  C1.length = A.nextInt();
  R1.printArea();
  T1.printArea();
  C1.printArea();
}
}
```

```
Enter the length and breadth of which u have to find the area of rectangle in cm

20
5
Enter the length and breadth of which u have to find the area of triangle in cm

10
5
Enter the length of which u have to find the area of circle in cm

30
The area of rectangle is 100.0 cm^2
The area of Triangle is 25.0cm^2
The area of circle is 2826.0cm^2
```

`

LAB-5

OBSERVATION: 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

```
import java.util.Scanner
Class Bank
{
int deposit balance
int withdraw_balance
String customer name
String Account_Number
String Account_Type
int Balance = 270890
void accept
{
Scanner S = new Scanner (System.in)
System.out.println ("Enter the customer
name \n").
customer name = S.next ().
System.out.println ("Enter the Account
number \n").
Account_Number = S.next ().
System.out.println ("Enter the Account type
Account Type = S.next ();
{
void display ()
{
System.out.println ("Customer Name
+ customer name).
System.out.println ("Account number
+ Account_Number);
System.out.println ("Account Type
"+ Account_Type).
}
}
```

```
class curr_acct extends Bank {
int updated_balance,
int After_cwithdrawn
int updated_lost_cbalance

int cdepo_ba() {

updated_balance = Balance + deposit_balance
return updated_balance
int cwith = (( updated_balance
After_cwithdrawn = (updated_balance) -
return After_cwithdrawn;
}
int minimum ()
{
if (After_cwithdrawn < (2000))
{
updated_lost_cbalance = ((After_cwithdraw
- (200));
System.out.println ("you have minimum
balance below 2000 so u have to lost 200
");
return updated_lost_cbalance
}
else
return After_cwithdrawn;
}
}
class Sav_acct extends Bank {
int supdated_balance
int after_swithdrawn;
int updated_lost_sbalance;
```

```
int compound_interest;
int sdepo_ba() {

Supdated_balance = Balance + deposit_balance
return Supdated_balance;
}
int interest()
{
double r=0.08
int n=12;
int t=5;
compound_interest_(int)
((Supdated_balance)*(Math.pow(1+(r)
,(n*t))));
return compound_interest;
}
int swith_bal) {
After_swithdrawn ((compound_interest
-(withdrawn_balance)).
return After_swithdrawn;
}
int minimum()
{
if ((After_swithdrawn) <= (1000))
{
updated_lost_sbalance = ((After_swith
)-(100));
return updated_lost_sbalance;
}
else
return After_swithdrawn;
}
```

PageWork

```
}
Class Transaction
public static void main (String args[]) {
Scanner r = new Scanner (System.in);
Curr_acct CA = new Curr_acct();
CA.accept();
System.out.println("Enter the money u want to deposit in current account (in rupees)");
CA.deposit_balance = r.nextInt();
CA.display();
System.out.println("After your deposition of "+CA.deposit_balance+"\n Now your total balance is RS_"+CA.cdepo_bal());
System.out.println("Enter the money you want to withdraw _ balance = r.nextInt();
System.out.println("After your withdrawal of "+CA.wthdraw_balance+" "+CA.cwith_bal());
System.out.println("After checking if u have minimum balance are not your updated total balance is RS-"+CA.minimum());
Sav_acct SA = new Sav_acct();
SA.accept();
System.out.println("Enter the money u want to deposit in Saving account");
SA.display();
System.out.println("After your withdrawal of RS"+SA.withdraw_balance+"\n Now your total balance is RS-"+SA.swith_bal());

System.out.println("After checking if u have minimum balance
```

Page

```
are not your updated total balance is RS."+SA.minimum());
}
}
```

```
C:\Program Files\Java\jdk1.8.0_261\bin>javac Transaction.java

C:\Program Files\Java\jdk1.8.0_261\bin>java Transactions
Enter the customer name

lakshmi
Enter the Account Number

2356CNR678
Enter the Account type

personal
Enter the money u want to deposit in current account in rupees
890
CUSTOMER  NAME : lakshmi
ACCOUNT NUMBER : 2356CNR678
ACCOUNT TYPE : personal
After your deposition of 890
Now your total balance is RS-28780
Enter the money you want to withdraw in rupees
28000
After your withdrawal of 28000
Now your total balance is RS-780
you have minimum balance below 2000 so u have lost 1000 rs
After checking if u have minimum balance are not your updated total balance is RS-580
Enter the customer name

lakshmi
Enter the Account Number

123CNR9086
Enter the Account type

business
Enter the money u want to deposit in Saving account
456
CUSTOMER  NAME : lakshmi
ACCOUNT NUMBER : 123CNR9086
ACCOUNT TYPE : business
After your deposition of 456
Now your total balance is RS-28346
After interest ur updated balance is RS-42231
Enter the money you want to withdraw in Saving account
42000
After your withdrawal of RS-42000
Now your total balance is RS-231
After checking if u have minimum balance are not your updated total balance is RS-131

C:\Program Files\Java\jdk1.8.0_261\bin>
```