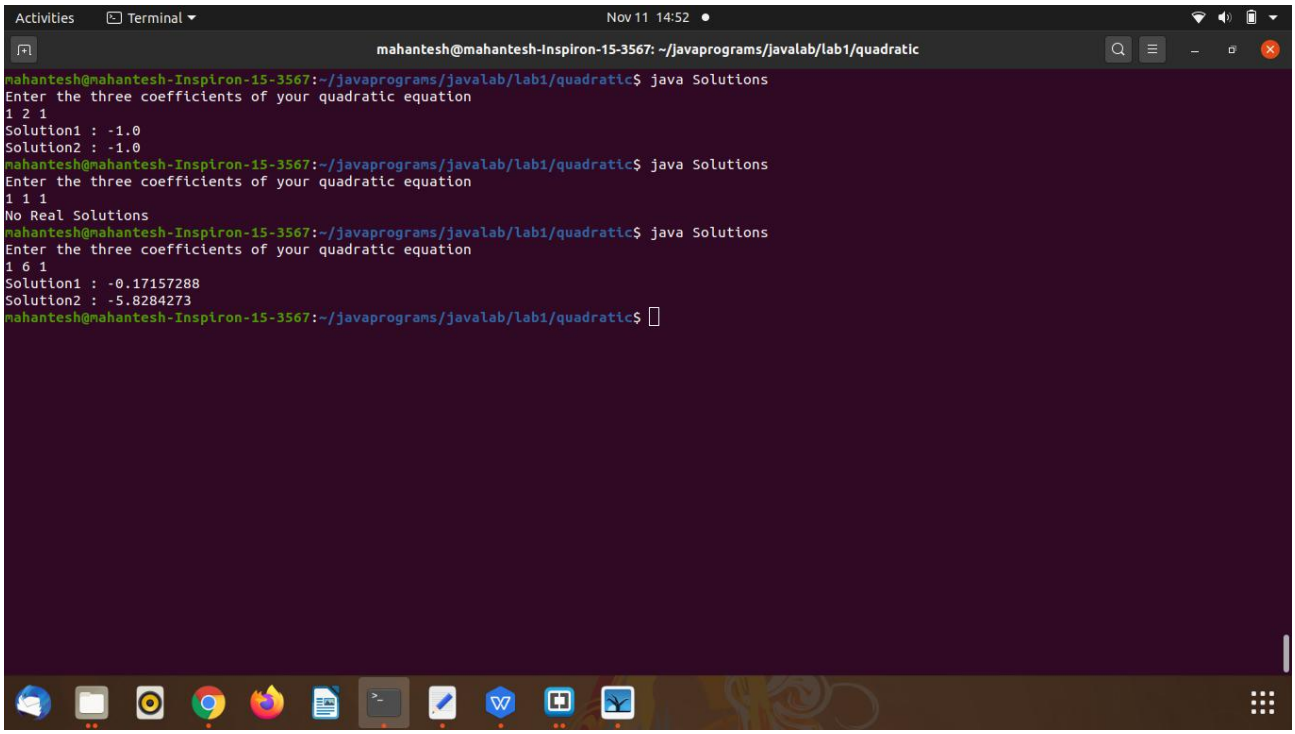
Write a program to print solutions of the quadratic equations

```
import
java.util.*;
                import java.lang.Math;
                class Solutions
                {
                public static void main(String args[])
                {
                Scanner input = new Scanner(System.in);
                float a, b, c;
                System.out.println("Enter the three coefficients of your
                quadratic equation");
                a = input.nextFloat();
                b = input.nextFloat();
                c = input.nextFloat();

                float d, sol1, sol2;

                d = b * b - 4 * a * c;

                if ( d < 0)
                {
                System.out.println("No Real Solutions");
                }
                else
                {
                sol1 = (float)(-b + Math.sqrt(d)) / (2 * a);
                sol2 = (float)(-b - Math.sqrt(d)) / (2 * a);

                System.out.println("Solution1 : " + sol1);
                System.out.println("Solution2 : " + sol2);

                }
                }
                }
```

Output:



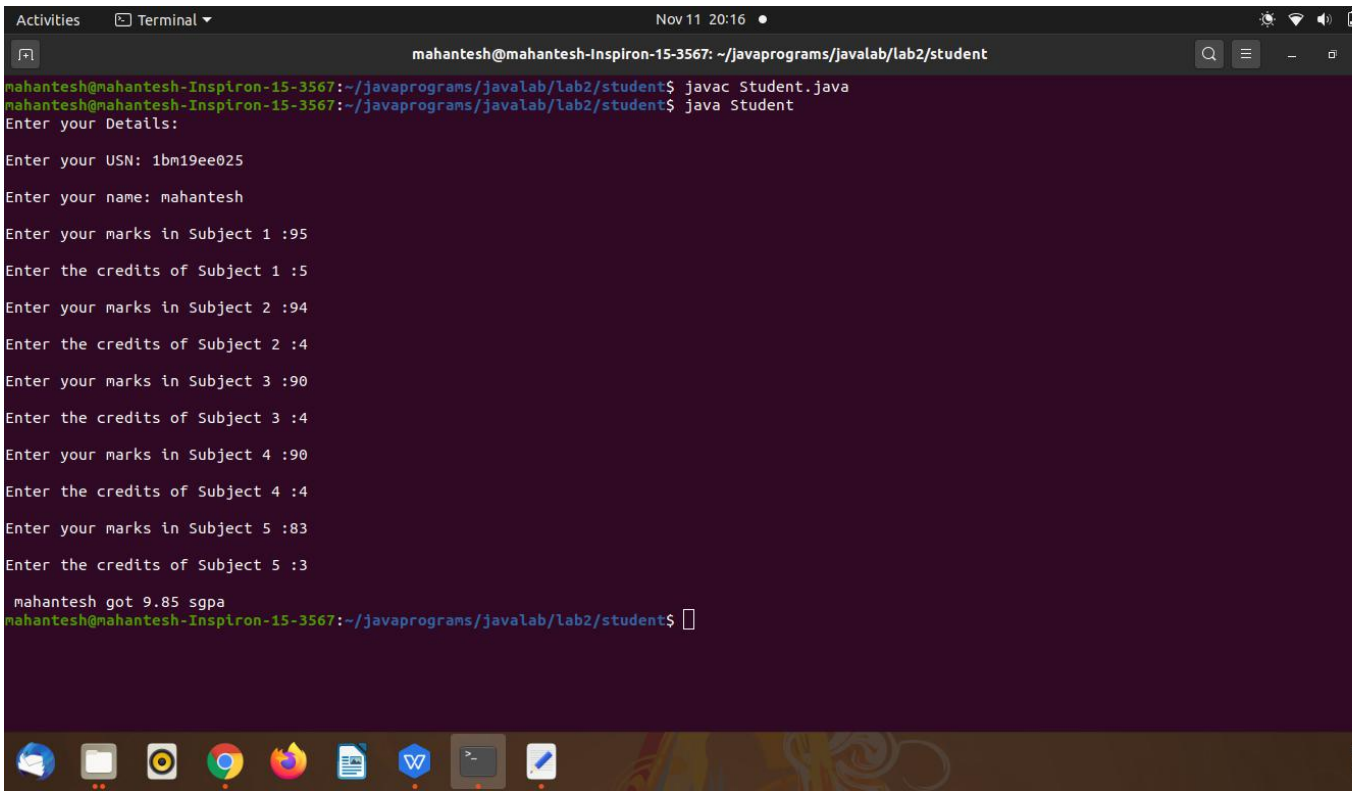
WAP to print sgpa of the student.

```
import
java.util.*;
                class Student
                {
                public static String usn;
                public static String name;
                public static int credits[];
                public static int marks[];
                public static void main(String args[])
                {
                System.out.println("Enter your Details: ");
                System.out.println();
                getdetails();
                System.out.println(name + " got " + calculatesgpa() +" sgpa");
                }
                public static void getdetails()
                {
                Scanner input = new Scanner(System.in);

                System.out.print("Enter your USN: ");

                usn = input.next();
```

```
System.out.println();
System.out.print("Enter your name: ");

name = input.next();
System.out.println();
credits = new int[5];
marks = new int [5];
for(int i = 0; i < 5; i++)
{
System.out.print("Enter your marks in Subject " + (i+1) + " :");

marks[i] = input.nextInt();
System.out.println();
System.out.print("Enter the credits of Subject " + (i+1) + " :");

credits[i] = input.nextInt();
System.out.println();
}
}
public static double calculatesgpa()
{
int c;
int sum = 0;
int sum_credits = 0;
for(int i = 0; i < 5; i++)
{
c = subjectpoints(marks[i]);
sum_credits += credits[i];
sum += c * credits[i];
}

return (double)sum / sum_credits;
}
public static int subjectpoints(int marks)
{
if(marks>=90&&marks<=100)
{
return 10;
}
else if(marks>=80&&marks<90)
{
return 9;
}
else if(marks>=70&&marks<80)
{
return 8;
}
```

```
else if(marks>=60&&marks<70)
{
return 7;
}
else if(marks>=50&&marks<60)
{
return 6;
}
else if(marks>=40&&marks<50)
{
return 5;

}
else
{
System.out.println("You Have Failed In This Subject");
return 0;
}
}
}
```

Output:

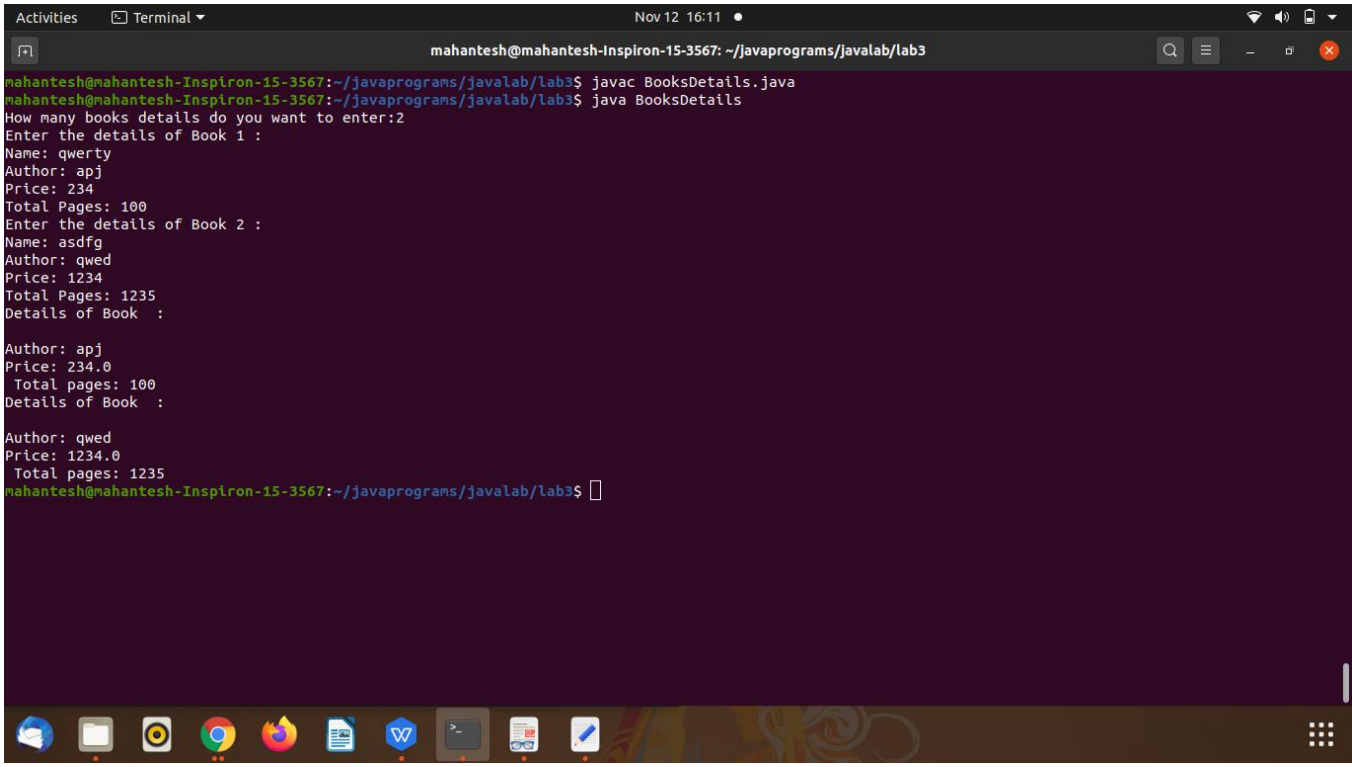


WAP TO GET AND PRINT BOOK DETAILS:

```
import
java.util.*;

                class Book
                {
                String name;
                String author;
                double price;
                int num_pages;

                Book(String name, String author, double price, int num_pages)
                {
                this.name = name;
                this.author = author;
                this.price = price;
                this.num_pages = num_pages;
                }
                public String toString()
                {
                return ("\nAuthor: "+ author +"\nPrice: "+ price +"\n Total pages:
                "+num_pages);
                }
                }

                class BooksDetails
                {
                public static void main(String args[])
                {
                String a;
                String b;
                double c;
                int d;
                System.out.print("How many books details do you want to enter:");
                int n;
                Scanner input = new Scanner(System.in);
                n = input.nextInt();
                Book book[] = new Book[n];
                for(int i = 0; i < n; i++)
                {
                System.out.println("Enter the details of Book "+ (i + 1) +" :");
                System.out.print("Name: ");
                a = input.nextLine();
                input.nextLine();
                System.out.print("Author: ");
                b = input.nextLine();
                System.out.print("Price: ");
```

```
c = input.nextInt();
System.out.print("Total Pages: ");
d = input.nextInt();
book[i] = new Book(a, b, c, d);
}

for(int i = 0; i < n; i++)
{
System.out.println("Details of Book " + book[i].name +" : ");
System.out.println(book[i]);
}
}
}
```

OUTPUT:



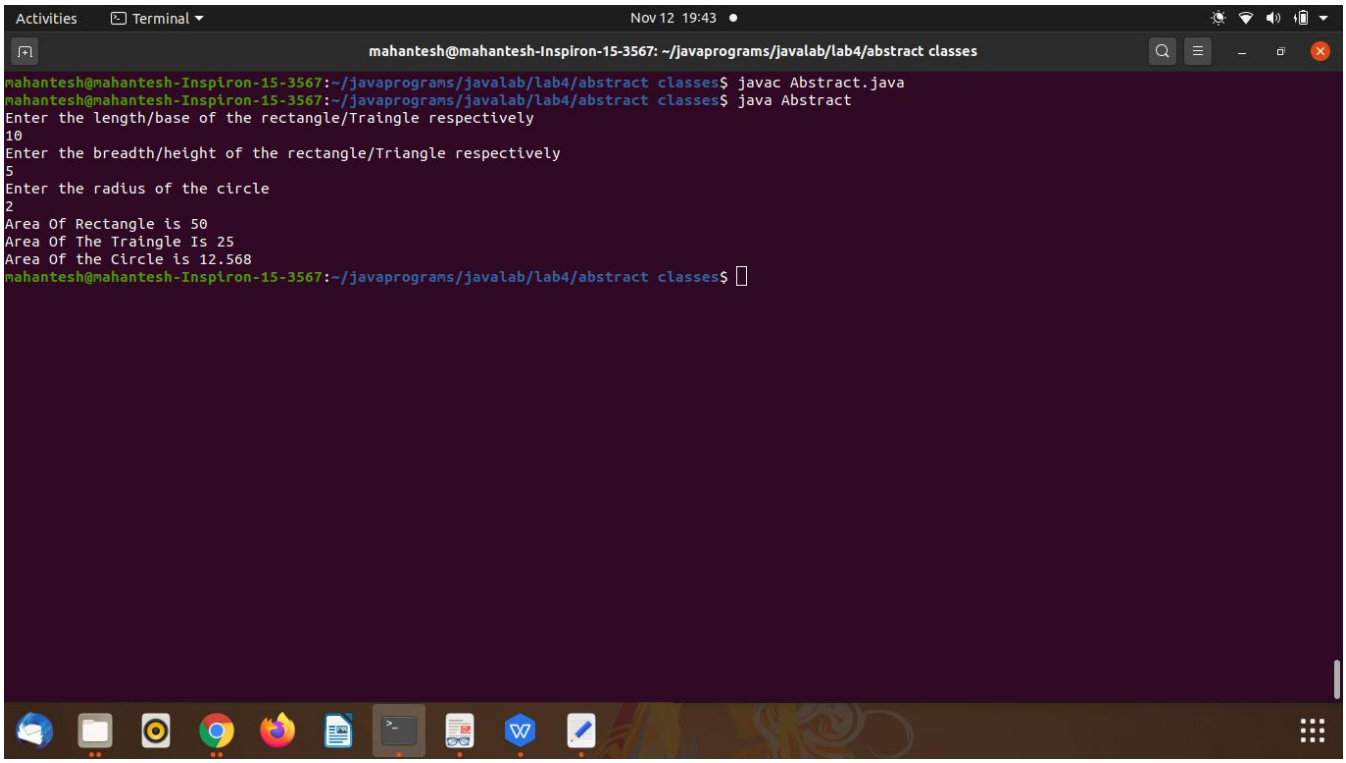
WAP TO DEMONSTRATE ABSTRACT CLASSES

ABSTRACT CLASSES PROGRAM:

```
import
java.io.*;
            import java.lang.*;
            import java.util.*;
            abstract class Shape{
            int len,wid;

            Shape(int l,int w)
            {
            len=l;
            wid=w;
            }
            abstract void printArea();
            }


            class Rectangle extends Shape
            {
            Rectangle(int a,int b)
            {
            super(a,b);
            }

            void printArea()
            {
            System.out.println("Area Of Rectangle is " + (len*wid));
            }

            }

            class Triangle extends Shape
            {
            Triangle(int a,int b)
            {
            super(a,b);
            }

            void printArea()
            {
            System.out.println("Area Of The Traingle Is " + ((len*wid)/2));
            }
            }

            class Circle extends Shape
            {
```

```
Circle(int r1,int r2)
{
super(r1,r2);
}
void printArea()
{
System.out.println("Area Of the Circle is " + (3.142*len*len));
}
}

class Abstract
{
public static void main(String[] args)
{
int l,b,rad;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the length/base of the rectangle/Traingle
respectively ");
l=sc.nextInt();
System.out.println("Enter the breadth/height of the
rectangle/Triangle respectively ");
b=sc.nextInt();
System.out.println("Enter the radius of the circle ");
rad=sc.nextInt();
Shape s;
Rectangle r=new Rectangle(l,b);
Triangle t=new Triangle(l,b);
Circle c=new Circle(rad,rad);
s=r;
s.printArea(); //prints the area of the rectangle
s=t;
s.printArea(); //prints the area of the triangle
s=c;
s.printArea(); //prints the area of the circle
}
}
```

OUTPUT:



BANK PROGRAM:

```
import
java.io.*;
            import java.lang.*;
            import java.util.*;
            abstract class account
            {
            String name;
            String acc_no;
            String type;
            double balance;

            account(String n,String a,String t,double b)
            {
```

```
name=n;
acc_no=a;
type=t;
balance=b;
}
abstract void deposit();
abstract void display();
abstract void withdraw();
abstract void fine();
abstract void inter();
}

class curr_acc extends account
{
curr_acc(String n,String a,String t,double b)
{
super(n,a,t,b);
}

void fine()
{
if(balance<1000)
{
System.out.println("You Will Be Fined 500Rs Because Minimum balance
In Your Account Must be 1000 ");
balance=balance-500;
display();
}
else
{
System.out.println("You Will Not Be Charged Any Fine Thank You ");
display();
}
}


void display()
{
System.out.println("Name Of the Account Holder is " + name);
System.out.println("Account Number of the Account Holder is " +
acc_no);
System.out.println("Type Of the Account od the Account Holder is "
+ type);
System.out.println("Balance In Your Account is " + balance);
}

void deposit()
{
```

```
double sum;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the Amount You Want To Deposit ");
sum=sc.nextDouble();
balance=balance+sum;
display();
}
void withdraw()
{
double sum;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the amount You Want To Withdraw ");
sum=sc.nextDouble();
balance=balance-sum;
if(balance>1000)
{
display();
}
else
{
System.out.println("You Cannot Withdraw This Much Amount ");
fine();
}
}

void inter()
{
System.out.println("Your Account Type Is Not Elgible For Any
Interest ");

}
}

class sav_acc extends account
{
sav_acc(String n,String a,String t,double b)
{
super(n,a,t,b);
}
void display()
{
System.out.println("Name Of the Account Holder is " + name);
System.out.println();
System.out.println("Account Number of the Account Holder is " +
acc_no);
System.out.println();
System.out.println("Type Of the Account of the Account Holder is "
```

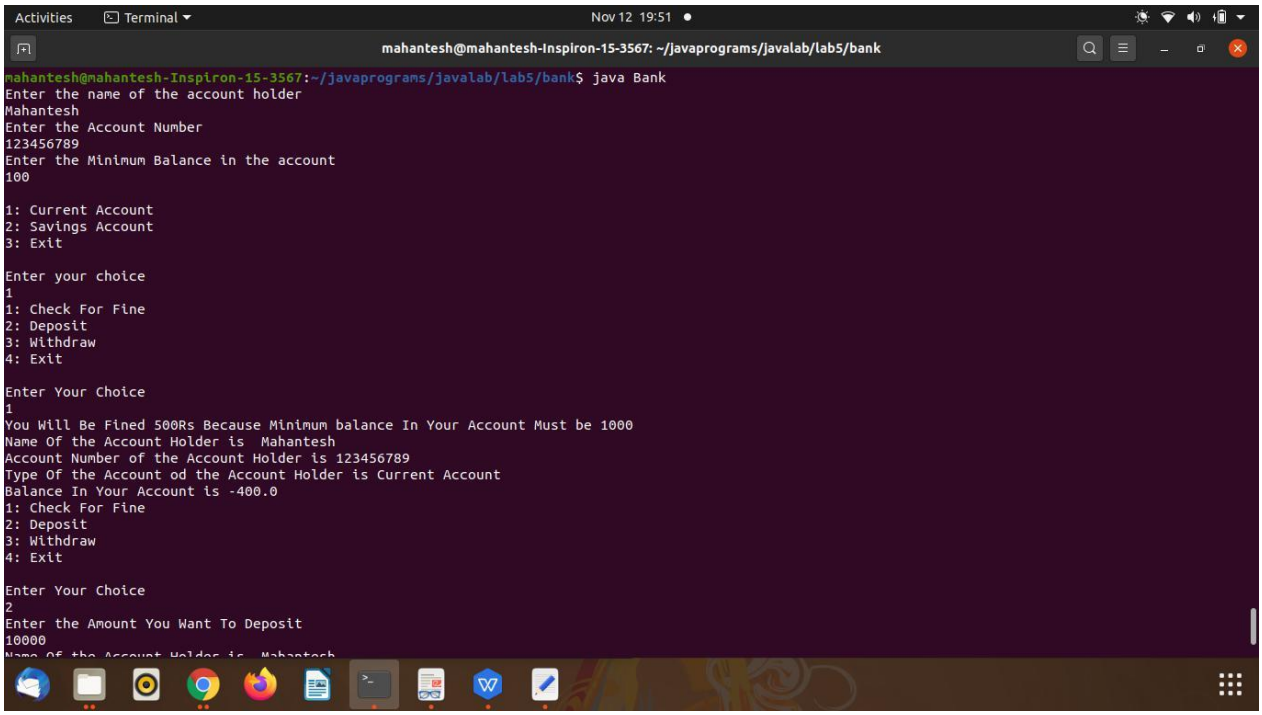
```
+ type);
System.out.println();
System.out.println("Balance In Your Account is " + balance);
System.out.println();
}
void withdraw()
{
double sum;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the amount You Want To Withdraw ");
System.out.println();
sum=sc.nextDouble();
balance=balance-sum;
display();
}

void deposit()
{
int sum;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the principal amount you want to submit
");
sum=sc.nextInt();
balance+=sum;
display();

}

void inter()
{

double r,t;
double interest;
double amount;
double power;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the Rate of interest ");
r=sc.nextDouble();
System.out.println("Enter the Year of time Account has to be elapsed
");
t=sc.nextDouble();

power=Math.pow((1+((r)/(100))),t);
System.out.println(power);
amount=balance*power;
System.out.println(amount);
interest=amount-balance;
System.out.println("Interest Accumalted In Your Account is " +
```

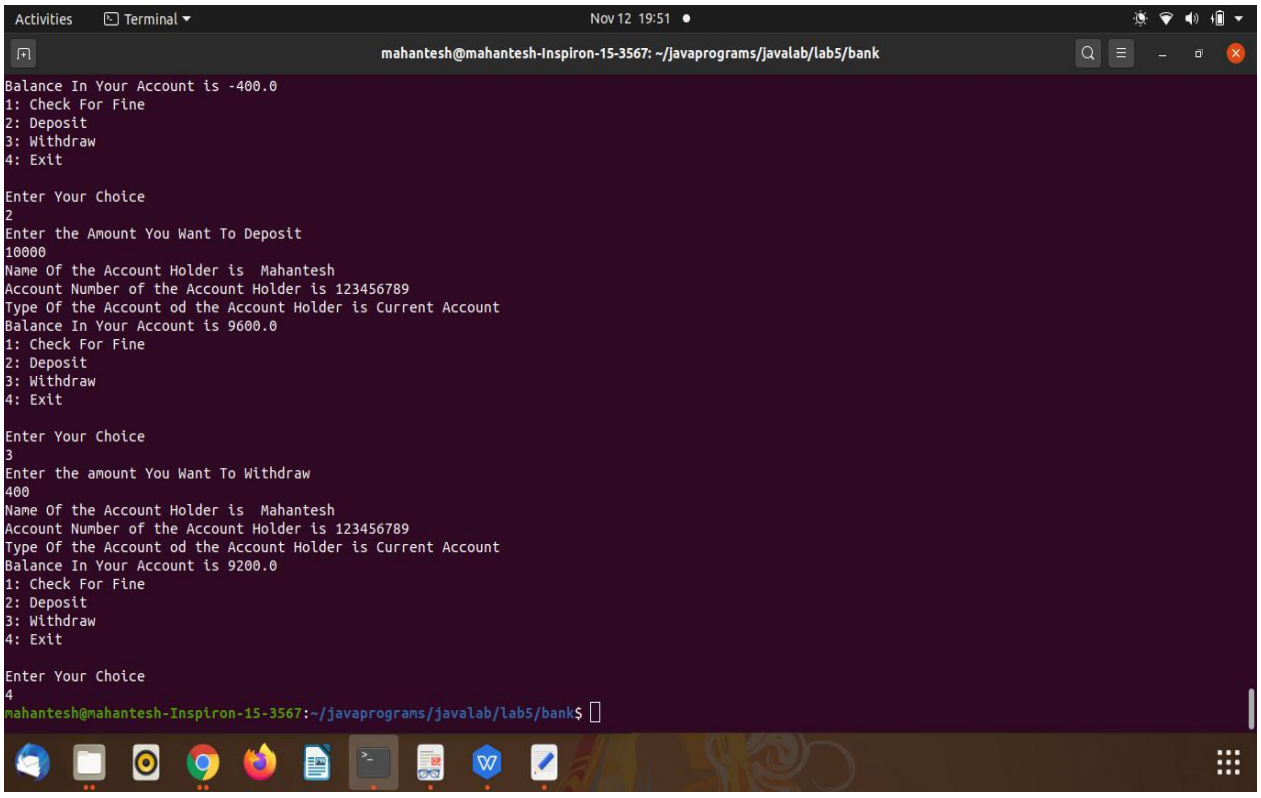
```
interest);
display();
System.out.println();
}

void fine()
{
System.out.println("You Have No Restriction On Your Minimum Balance
Thank You! ");
System.out.println();
}

}

class Bank
{

public static void main(String[] args)
{
account a;
Scanner sc=new Scanner(System.in);
String name,acc_num,typ;
int option;
double bal;
System.out.println("Enter the name of the account holder ");
name=sc.next();
System.out.println("Enter the Account Number ");
acc_num=sc.next();
typ="Current Account";
System.out.println("Enter the Minimum Balance in the account ");
bal=sc.nextDouble();
System.out.println();
System.out.println("1: Current Account ");
System.out.println("2: Savings Account ");
System.out.println("3: Exit");
System.out.println();
System.out.println("Enter your choice ");
option=sc.nextInt();

switch(option)
{
case 1:
curr_acc c=new curr_acc(name,acc_num,typ,bal);
a=c;
int counter;
do
{
System.out.println("1: Check For Fine ");
```

```
System.out.println("2: Deposit ");
System.out.println("3: Withdraw ");
System.out.println("4: Exit");
System.out.println();
System.out.println("Enter Your Choice ");
counter=sc.nextInt();
switch(counter)
{
case 1:
a.fine();
break;

case 2:
a.deposit();
break;

case 3:
a.withdraw();
break;

case 4:
System.exit(0);
break;

}
}while(counter!=4);

break;


case 2:
sav_acc s=new sav_acc(name,acc_num,typ,bal);
a=s;
int cnr;
do
{

System.out.println("1: Deposit ");
System.out.println("2: Withdraw ");
System.out.println("3: Interest");
System.out.println("4: Exit");
System.out.println();
System.out.println("Enter Your Choice ");
cnr=sc.nextInt();
switch(cnr)
{
case 1:
a.deposit();
break;
```

```
case 2:
a.withdraw();
break;

case 3:
a.inter();

case 4:
System.exit(0);
break;

}
}while(cnr!=5);
break;


case 3:
System.exit(0);
break;
}
}
}
```

OUTPUT:


Activities
Terminal
Nov 12 19:51
mahantesh@mahantesh-Inspiron-15-3567: ~/javaprograms/javalab/lab5/bank
mahantesh@mahantesh-Inspiron-15-3567:~/javaprograms/javalab/lab5/bank$ java Bank
Enter the name of the account holder
Mahantesh
Enter the Account Number
123456789
Enter the Minimum Balance in the account
100
1: Current Account
2: Savings Account
3: Exit
Enter your choice
1
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
Enter Your Choice
1
You Will Be Fined 500Rs Because Minimum balance In Your Account Must be 1000
Name Of the Account Holder is Mahantesh
Account Number of the Account Holder is 123456789
Type Of the Account od the Account Holder is Current Account
Balance In Your Account is -400.0
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
Enter Your Choice
2
Enter the Amount You Want To Deposit
10000


Activities
Terminal
Nov 12 19:51
mahantesh@mahantesh-Inspiron-15-3567: ~/javaprograms/javalab/lab5/bank
Balance In Your Account is -400.0
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
Enter Your Choice
2
Enter the Amount You Want To Deposit
10000
Name Of the Account Holder is Mahantesh
Account Number of the Account Holder is 123456789
Type Of the Account od the Account Holder is Current Account
Balance In Your Account is 9600.0
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
Enter Your Choice
3
Enter the amount You Want To Withdraw
400
Name Of the Account Holder is Mahantesh
Account Number of the Account Holder is 123456789
Type Of the Account od the Account Holder is Current Account
Balance In Your Account is 9200.0
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
Enter Your Choice
4
mahantesh@mahantesh-Inspiron-15-3567:~/javaprograms/javalab/lab5/bank$