Program 1

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.

Code:

```
import java.util.Scanner;
class quadraticequation
 public static void main(String args[])
   Scanner S = new Scanner(System.in);
   System.out.println("Enter the values of a b and
  c"); double a,b,c,d,r1,r2; a=S.nextFloat();
  if(a==0)
     System.out.println("invalid input");
   else
   b=S.nextFloat();
  c=S.nextFloat(); d=(b*b)-
  (4*a*c);
   if(d>0)
      r1=(-b+Math.pow(d,0.5))/(2*a); r2=(-b-
     Math.pow(d,0.5)/(2*a);
        System.out.println(" Roots are Real and Distinct and The values are: " + r1 + "and" +
r2);
   }
        else if(d==0)
         {
        r1=-b/(2*a);
          System.out.println("Roots are Equal and the values are " + r1);
   else
       {
```

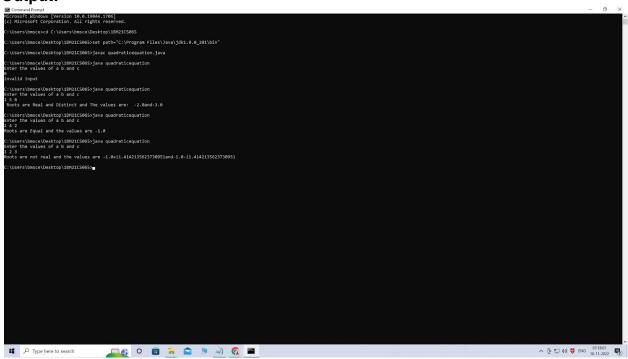
```
r1=-b/(2*a);
r2=(Math.sqrt(Math.abs(d)))/(2*a);
System.out.println("Roots are not real and the values are " + r1 + "+i" +Math.abs(r2)+
"and" + r1+ "-i" +Math.abs(r2));
}
}
}
```

Observation:

```
18/11/22
                                                                system out Println ( Roote are equal and value
                 PROGRAM - 1
                                                                                                is "+ r1);
                QUADRATIC EQUATIONS
                                                                  Jelse &
                                                                  Ator 11 = 6/(2*a);
                                                                      12 = (Math. Sqrt (math. abs (d)))/(2*a);
 import java util Scannor
import java . Util scanner
                                                                 System . out Println ("Roorls are not real good the
class quadratic equation
                                                                     valus are " + + 1 + "+i" + Maths abs(12) + "and" + m
                                                                          -i" + Maths abs (re)); } } } }
                                                                 output
  Public static void main (string angs[])
                                                                 Enter the value of a b and C
   Scanner S = new Scanner (8 yster in);
                                                                 2 49
    System out Println ("Ents the values a b and c");
                                                                 Roots are Equal and the values are -1
     double
    fre a.b.c.d, r. . 72;
                                                                Ento the values of a b and c
a = 8. next Float ();

If (a == 0) { Systim out Printin ("invalid input"); }

clief b = 6. next Float ();
                                                                 1 5 6
                                                                 Roots are Real and Distinct and the values are
      C = S. next Float();
                                                                    -2 and -3.
      d= (b*b)- (4 * a * d);
    4 (a>>)
                                                                Enter the values of a band c
                                                                 1 23
     71= (-b + 89/7+ (d)) / (2 x d).
                                                                 Roots ou not Real
       72 = (b - Sgrt(a))/(2*d);
    System out Printle (" Roots on ""+ 17 + "and" + 12)
                              real and distinct. The values are
   else if (d==0)
     71 = - b / (3+a);
```



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.Scanner;
class student
 student(){}
 String name;
 String usn;
 double result=0;
 int credits[]=new int[3];
 int marks[]=new int[3];
 int total=0;
void accept()
Scanner s=new Scanner(System.in);
System.out.println("Enter your Name ");
name=s.nextLine();
System.out.println("Enter USN ");
usn=s.nextLine();
System.out.println("Enter credits and marks of each subject respectively ");
 for(int i=0; i<3; i++)
this.credits[i]=s.nextInt();
this.marks[i]=s.nextInt();
void calculate()
  for(int i=0; i<3; i++)
if(marks[i]>=90 && marks[i]<=100)
result+=10*credits[i];
if(marks[i] >= 80 \&\& marks[i] < 90)
result+=9*credits[i];
if(marks[i]>=70 && marks[i]<80)
result+=8*credits[i];
if(marks[i] > = 60 \&\& marks[i] < 70)
result+=7*credits[i];
```

```
if(marks[i] >= 50 \&\& marks[i] < 60)
result+=6*credits[i];
if(marks[i] > = 40 \&\& marks[i] < 50)
result+=5*credits[i];
else result+=0*credits[i];
    for(int i=0;i<3;i++)
    total+=credits[i];
    result=result/total;
void display()
System.out.println("Name:"+name+" USN:"+usn);
System.out.println("credits Marks");
for(int i=0; i<3; i++)
  System.out.println(credits[i]+"
                                       "+marks[i]);
  System.out.println("Total credits="+total);
   System.out.println("SGPA="+result);
```

```
redit [i] · S. next Int ();
                  Program - 2
                                                                  marks [i] = s. rext int();
                                to create a days student
                                                              void calculate ()
 Develop a jora program
                                                              for (int i=0; i<5; i++)
import java util Scanner
                                                               if (morts[i]>=90 && morts[i]<.100)
class student
                                                                 result += 10 + credit [7]
  Student () {}
                                                                4 (marks [i] >= 80 fg marks [i] <90)
 String name :
                                                                 result + = 9 + credity (i7)
 String USN;
                                                               4 (marks [7] >= 70 38 marks [1] < 80)
  int mortes [] - new int [6];
 int credit [] = new int [5];
                                                                  result += 8 * credita [i];
  int total = 0;
                                                               if (marks [1] >= 60 && marks [;] <70)
  dooble result = 0
                                                                  result += 7 * credib [];
 void acupt ()
                                                               4 (marks [i]>:50 & f marks [i]<60)
 Scanner S - new Scanner (system.in);
                                                                 result + = 6 + credits [i]
 System out Printle ("Enter your Name");
                                                               if (marks [i] >= 40 & & marks [i] < 50)
 name = S. nextline();
                                                                 result += 5 * credit [i]
 System out Println ("Ento USN");
 USN . S. nextlinel):
                                                                   result + = 0 + aedita [i];
 System out Println ('Esta credit and mark');
 for (int 1=0; 1 < 5; 1++)
```

```
Program & - Output
  for (int 1.0; kn sitt)
   total t = credit [];
                                             Enter Your marine
  result - result / total;
                                             Gamana
                                             Enton Your USN
 void display()
                                             18Maics 065
                                             Enter credits and marks of each subject respectively
 system out Println ("Name: "+ name + "usn: "+usn);
                                             8 30 3 40 starting of
 Eystim out Println ("credit Marks");
                                             Name: gamona USN: 18M21CS065
 for (int i-0; 1<5; i++)
 System out . Println (credit [i] + " + marki [i]);
                                              crediti Marks
System out Printlin ( Total credit = + total);
                                              9
 System out Privales ("SGPA="fresult),
                                                     40
  }
                                             $ 80
                                             Total credits : 7
Public Static rold main (string [] args)
Estudint S1-newstadint ():
Student ST reasons.

S1. acupt (); S1. calculate;

S1. display ();

31. display ();
```

```
cs Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

C:\Users\bmsce\Cd C:\Users\bmsce\Desktop\1BM21C5065>

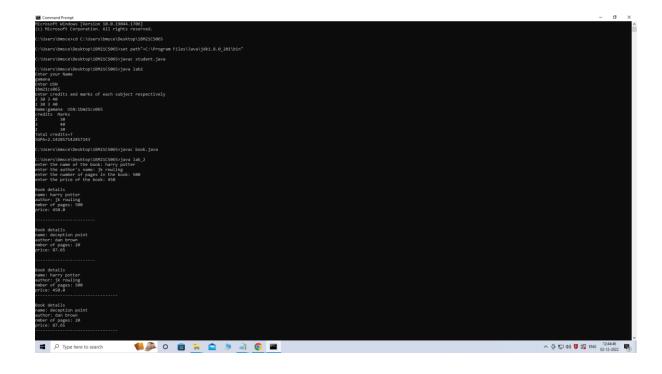
C:\Users\bmsce\Desktop\1BM21C5065>; ava student.java

C:\Users\bmsce\Desktop\1BM21C5065> java lab2
Enter your Name
gamana
Enter USN
1bm21c5065
Enter credits and marks of each subject respectively
2 30 3 40
Name:gamana USN:1bm21c5065
credits Marks
2 30 3 40
Name:gamana USN:2bm21c5065
credits Marks
2 30 3 40
C:\Users\bmsce\Desktop\1BM21C5065> java book.java

C:\Users\bmsce\Desktop\1BM21C5065> java book.java

C:\Users\bmsce\Desktop\1BM21C5065> java lab2
Enter credits name of the book: harry potter
enter the name of the book: harry potter
enter the name of pages in the book: 500
enter the price of the book: 450

Rock details.
```



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.

```
import java.util.Scanner;
class Book{
 int num_pages;
 double price;
 String name;
 String author;
 Book(){
  num_pages=0;
  price=0.0;
  name="some book";
  author="gamana";
 Book(int num_pages,double price, String name, String author){
  this.num_pages=num_pages;
  this.price=price;
  this.name=name;
  this.author=author;
 void set_data(int num_pages,double price, String name, String author) {
    this.num_pages=num_pages;
    this.price=price;
    this.name=name;
    this.author=author;
 void get_data(){
  System.out.println("Book details\nname: "+name+"\nauthor: "+author+"\nnmber of pages:
"+num_pages+"\nprice: "+price);
  System.out.println("\n----\n");
 public String toString(){
  return ("Book details\nname: "+name+"\nauthor: "+author+"\nnmber of pages:
"+num_pages+"\nprice: "+price+"\n-----\n");
 }
```

```
class lab_2 {
 public static void main(String[] args) {
  Book b1=new Book();
  Scanner s=new Scanner(System.in);
  System.out.print("enter the name of the book: ");
  String name=s.nextLine();
  System.out.print("enter the author's name: ");
  String author=s.nextLine();
  System.out.print("enter the number of pages in the book: ");
  int num_pages=s.nextInt();
  System.out.print("enter the price of the book: ");
  double price=s.nextDouble();
  System.out.println();
  b1.set_data(num_pages,price,name,author);
  Book b2=new Book(20,87.65,"deception point","dan brown");
  b1.get_data();
  b2.get_data();
  System.out.println(b1);
  System.out.println(b2);
  s.close();
  }
}
```

```
author + "In number of pages "+ nom - pages + "In
              Program-
                                                   System out println (" In -- -- In");
import java util sannon
class Book {
                                                   Public String to- String () {
 the num_Pages
                                                     return ( Book ditails In name: " + name + " In
double price;
                                                               author : "+ author + "In number of pages
 String name.
                                                              "+ nom fogus + "In pria : "+ pria + "In")
 String author;
 Book to &
 num - pages = 0;
                                                     class lab_ 2 }
 prices = 0.0:
                                                      Public static roid main (string [] angs) &
 name = "some_book";
                                                       Book - b1 = new Book();
 author . " gamana";
                                                      Scanner S = new scannon (system in);
                                                      System out Printly Conta the name of the book!").
 Book (int num-Pages, double price, string name
                                                       Otring name - B. nextline();
       string author ) {
                                                      System out Printin C'enter the author's name: ");
  this, num-pages = num-pages
                                                      string name = 8. next lind);
  this fria = fria:
                                                      System out Println ("enter the number of fages:");
   this name = name ;
   this, author, author.
                                                      Int num-bogs . S. nextlinel);
                                                      system out println ("ento the price!");
                                                       double pria = s. next Double();
void get_data()
                                                       System. out . println ()
System out. Printh (" Book details In name!" 4 name + " In
```

```
61. Set data (num Pages, Price, name, author).
                                                       Program - 3 - Output -
Book be - new book (80, 87.65 ," duption point"
                          " dan brown");
                                                       enter the name of book: harry bottom
b1. get_data ();
                                                      enter the author's name: JK Rowling
bo.gd-data();
                                                       enter the number of bages: 500
System . Dut . Println (61);
System. out. Println (62);
                                                      enter the price ! 450
 s. close().
                                                       Book details
                                                       name: hany potler
                                                       author! IK Racking
                                                        number of pages: 500
                                                        pria: 450
                                                        Book details
                                                       name: deaption point
                                                       author! dan brown
                                                       number of fages: 20
                                                       price: 87.66
```

```
Total credits-7

Total-1/18/97/18/95/14/95/14/95

Citisar-Namac-Desktop18/92/56/95/javac book, java

Citisar-Namac-Desktop18/92/56/95/javac book, java

Citisar-Namac-Desktop18/92/56/95/javac book, java

Citisar-Namac-Desktop18/92/56/95/javac book, java

Octobra-Desktop18/92/56/95/javac book, javac

Octobra-Desktop18/92/56/95/javac

Octobr
```

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.

CODE:

```
import java.util.Scanner;
abstract class shape
{
 shape(){}
 int h,b;
 abstract void printArea();
}
 class rectangle extends shape
  {
      Scanner s=new Scanner(System.in);
      void printArea()
      {
       System.out.println("Enter height and width of rectangle");
       h=s.nextInt();
       b=s.nextInt();
       System.out.println("Area of Rectangle is "+b*h);
      }
       rectangle(){}
  }
 class triangle extends shape
  {
      Scanner s=new Scanner(System.in);
      void printArea()
    {
       System.out.println("Enter height and base of triangle");
       h=s.nextInt();
       b=s.nextInt();
```

```
System.out.println("Area of Triangle is "+0.5*b*h);
      }
       triangle(){}
  }
 class circle extends shape
       Scanner s=new Scanner(System.in);
      void printArea()
         System.out.println("Enter radius of Circle");
         h=s.nextInt();
         System.out.println("Area of Circle is "+3.14*h*h);
       circle(){}
  }
class main
  public static void main(String xx[])
  {
       rectangle r=new rectangle();
       r.printArea();
      triangle t=new triangle();
      t.printArea();
       circle c=new circle();
       c.printArea();
   }
}
```

OBSERVATION:

```
PROGRAM-4
            Abstract class
Emport java util Scamer,
abstract dass shape
 Shape () {}
 abstract void print aua ();
class sudangle extends shape
 Scanner &= new Scanner (system in);
 void print arua ()
   System out Println (" Enter hight & width of suctangle");
  h = S. next Int ();
   b = 8. next Int ();
   System out Println (" Area of suctangle (8 "+ b*h);
   redarge () {}
Class triangle extends shape
 Scanner 8 = new scanner (system.in);
void print aua()
```

```
System. out Println (Finter the height & base of triangle")
 h = s. nextInt(); subb for And ()
  b = s next Int ();
 System out. Println ("Area of triangle is" + 0.6 * b * h);
triangle () {}
Class cfrell extends shape
 Scanner 3 = new Scanner (System:in)
 void printagua ()
   System out Println ("Entir the radius of airde");
 h- s. nextlnt();
  System out Println ("Area of circle" + 3.14 * h * h);
 3
 Circle (723
 Public Static void main (string XX[])
  rectangle r = new rectangle ():
  r. Print asua ():
  trianglet = new triangle ():
   t. Print and O:
   Circle c - new winde ()
   c. Print auac):
```

```
Enter height and width of suctangle

30
30
Area of Rectangle is 600
Area of Triangle is 300

Enter radius of circle

20
Area of circle 28 1956

Area of circle 28 1956

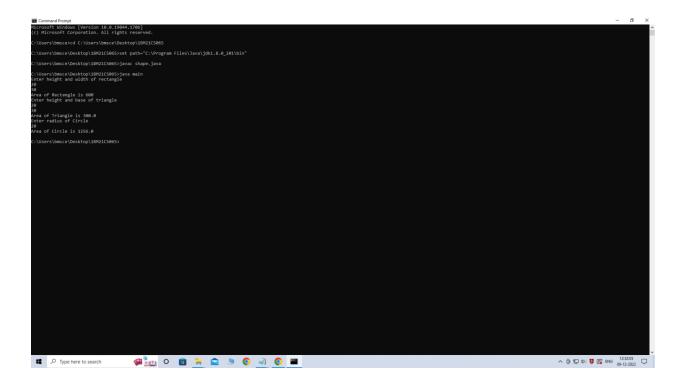
Charles are and circle 20

Area of circle 28 1956

Charles are and circle 20

Charles are and ci
```

OUTPUT:



Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called a savings account and the other a 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 Cur-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:

- a) Accept deposit from customer and update the balance.
- b) Display the balance.
- c) Compute and deposit interest
- d) Permit withdrawal and update the balance Check for the minimum balance, impose penalty if necessary and update the balance.

CODE:

```
import java.util.Scanner;
import java.lang.Math;
class account
        String name=new String();
        int accno;
        double bal;
        Scanner s=new Scanner(System.in);
               void set()
                        System.out.println("Enter customer name");
                        name=s.nextLine();
                        System.out.println("Enter "+name+"'s account number");
                        accno=s.nextInt();
                        System.out.println("Enter balance amount ");
                        bal=s.nextDouble();
               void display()
                        System.out.println("Customer Name:"+name);
                        System.out.println("Your account number:"+accno);
```

```
System.out.println("Your Account Balance:"+bal);
        account(){}
}
class savacct extends account
        Scanner s=new Scanner(System.in);
        savacct()
        {
                System.out.println("Cheque Facility not available ");
        }
        void deposit()
        {
                int ch;
                double amt;
                System.out.println("Press 1 to deposit ");
                ch=s.nextInt();
                if(ch==1)
                {
                         System.out.println("Enter amount to be deposited");
                         amt=s.nextDouble();
                         bal=bal+amt;
                else
                         System.out.println("Invalid Input");
        }
        void in()
        {
                System.out.println("Enter rate of interest ");
                double r=s.nextDouble();
                System.out.println("Enter number of times interest applied per time period");
                int n=s.nextInt();
                System.out.println("Enter number of time periods");
                int t=s.nextInt();
                double x=(1+(r/n));
                double ci=bal*Math.pow(x,n*t);
                System.out.println("Interest amount="+ci+" \nBalance amount without interest is"+bal);
                bal=bal+ci;
                System.out.println("Available balance after updating is"+bal);
        }
        void wd()
                System.out.println("Press 1 to withdraw ammount");
                int ch=s.nextInt();
                if(ch==1)
                {
```

```
System.out.println("Enter the amount to be withdrawn ");
                double wdraw=s.nextDouble();
                bal=bal-wdraw;
                System.out.println("Available Balance:"+bal);}
                else System.out.println("Invalid input");
        }
}
class curacct extends account
        Scanner s=new Scanner(System.in);
        curacct()
        {
                System.out.println("Cheque Facility available ");
        void deposit()
                int ch;
                double amt;
                System.out.println("Press 1 to deposit ");
                ch=s.nextInt();
                if(ch==1)
                {
                        System.out.println("Enter amount to be deposited ");
                        amt=s.nextDouble();
                        bal=bal+amt;
                }
                else
                        System.out.println("Invalid Input");
void wd()
                System.out.println("Press 1 to withdraw ammount");
                int ch=s.nextInt();
                if(ch==1)
                System.out.println("Enter the amount to be withdrawn ");
                double wdraw=s.nextDouble();
                bal=bal-wdraw;
                System.out.println("Available Balance:"+bal);}
                else System.out.println("Invalid input");
                if(bal<1000)
                {
                        System.out.println("You are running out of minimum balance \n Penalty Amount
of rs 50 has been credited as service charge for having low balance");
                        bal=bal-50;
                        System.out.println("Your Available Balance:"+bal);
```

```
}
        }
}
public class Lab5
public static void main(String xx[])
        Scanner s=new Scanner(System.in);
        int ch;
        System.out.println ("\n\n\Press\n1. if your account is savings account \n2. if your account is current
account");
        ch=s.nextInt();
        switch(ch)
        {
                case 1:
                                 savacct s1=new savacct();
                                 s1.set();
                                 s1.display();
                                 s1.deposit();
                                 s1.in();
                                 s1.wd();
                                 break;
                case 2:
                                 curacct c1=new curacct();
                                 c1.set();
                                 c1.display();
                                 c1.deposit();
                                 c1.wd();
                                 break;
                default: System.exit(0);
        }
}
}
```

OBSERVATION:

```
PROGRAM-5
Develop a Java program to create a class Bank that maintains two kinds of accounts called
gavings account & the current account.
import java util Scanner;
Emport java long math;
class account
  String name = new string()
Ent accno;
    double bal:
   Scanner 8: new Scanner (system-in)
       void set ()
         System out Println ("Enter austomer name"):
           name = s.nextline();
        System out Println ("Enter" + name" 's account no. "):
         acono - s. next Int ();
        System out Println (" Enter balance amount").
         bal - s next Double ();
   void display()
    System out Printin ("customer name," + name);
   System out Println ("Your account number: "+accoo);
   System. out Println ( your Account balance: "+ bal);
 account () EZ
```

```
ch = 8. next Int ():
                                                                      4 (n==1)
                                                                       System out Println ("Enter amount to be deposited")
                                                                         ant = 8 next Double ();
                                                                         bal - bal + amt;
                                                                           System out println ("invalid Input");
                                                                   vaid in ()
                                                                   System out. Println (" Ento rate of interest");
                                                                    double r = S. next Double ();
                                                                  System out Println (Enter number of times intoust applied for time bould );
                                                                     int n = 9. next Int();
                                                                  System out Printle C"Enter number of time pounds 1):
                                                                   Int t . s . next Intl);
double X both (1+ (1/n));
double Cf anath pow (x, n+1);
                                                               roid diposit ()
                                                                  Ent ch
System out printly ("Intrust amount=" + c2 + " \n Balana amount
                                                                   double amt;
                  without entirest is "+ bal);
                                                                   system out prouth ( Pros 1 to deposit ").
                                                                   ch - s next Int () ? I am to the man and
 bal = bal + ci.
System at Printin ("Available balance after updating is "+bot"
                                                                   if (ch == 1)
                                                                    System out printle (Enter amount to be deposited ");
void wall
                                                                   amt . 9 next Double ():
                                                                    bal - bal +amt;
  System out Println ("Press 1 to withdraw amount")
  in t ch = & nextInt();
                                                                     System out println ( invalid bipilt").
    System out printer ("Enter the amount to be with drawn").
                                                                  roid wdc)
    double wodnaw . S. next Double ()
                                                                    System out Println (Press 1 to withdraw the amount ")
    bal-bal-waraw
                                                                    ent on = 8 number ();
   System out printin ("Available balana: "+ bal);
                                                                   il (ch = =1)
    else
                                                                    System out. println ("Enter amount to be withdrawn");
       System out Println (" Invalid input")
                                                                     double waraw = 5. next Double ();
                                                                     bal - bal - waraw;
  class currect extends account
                                                                    System out Printin (" Available balance" + bal )
   Scanners - new Scanner (system in);
   award ()
     System out printin (" origin Facility available");
                                                                     System out println ("invalid inbut");
```

class savacet extinds account

Savacet ()

Void deposit ()

int ch; double amt

Beanner & - new Beannor (system in).

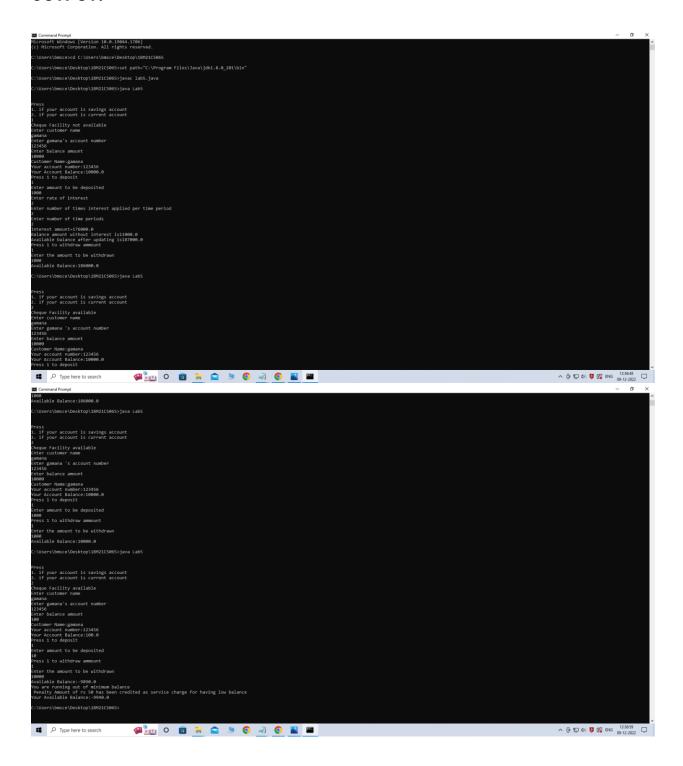
System out Println ("chique Facility not available")

System out Println (" Press 1 to deposit");

```
if (pal < 1000)
                                                                    81 diposit()
                                                                   81. in ():
 System out Printle ( you are summing out of minimum balana In a Amount of 18 50 has
                                                                   s1.wdC).
                                                                  break;
                  bun tredited as service charge for having
                                                             Case 2 !
                  tow balance");
                                                              curacit e 1 - nuo avacit ();
                                                                 c1 sutdata ();
  bal = bal - 50;
 System out Printin ("Your orailable balana" + bal)
                                                                  c1 display();
                                                                c1 abosit()
                                                                  break:
                                                               default: system exit (0),
Public class lab 5
Public static void main (string *x())
 Scanner S= new Scanner (system in)
  System out frintln ("In In Press In 1. if your account
                                                         Press
                     is bavings amount in
                                                         1. if your account is savings account
                                                        a if your account is current account
                     2. if your account is withen
                           awount");
                                                         cheque Facility not available
  on = s. nextint ();
                                                         Enter customer name
   swetch (chi)
                                                         Gamana
                                                         Enter Gamana's account number
              Savacel 31 - new savade ();
                                                          123456
               51 set();
                                                         Enta balana amount
              81. display ();
                                                          10 000
 customer Name : gamana
                                                         Enter customer name
 Your Account Number: 193456
                                                          gamana
```

```
Enter customer name
gamana
Enter gamana's account number
12.3.456
Enta balance amount
10.000
customer name: Gamana
Yaco Account number: 133466
Your Account Balana: 10000
Press 1 to alposit
1
Enter amount to be deposited
1000
Press 1 to calledoano amount
1
Ento the amount to be withdrawn
1000
A vailable Balance: 10000
```

OUTPUT:



Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called "Father" and derived class called "Son" which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge() when the input age<0. In Son class, implement a constructor that cases both father and son's age and throws an exception if son's age is >=father's age.

```
import java.util.Scanner;
class WrongAgeException extends Exception{
      public String toString(){
           return ("age can't be negative");
      }
}
class AgeException extends Exception{
      public String toString(){
           return("Age of son can't be greater than father's age");
      }
}
class Father
{
      int father age;
      Father(int x) throws WrongAgeException
  {
           father_age=x;
           if(father_age<0)
     {
                 throw new WrongAgeException();
      }
}
```

```
class Son extends Father{
     int son age;
     Son(int x,int y) throws AgeException, WrongAgeException{
           super(x);
           son_age=y;
           if(son_age<0){
                 throw new WrongAgeException();
           if(son_age>=father_age){
                 throw new AgeException();
    }
  }
}
class lab7
     public static void main(String args[]) {
           try {
                 Scanner s=new Scanner(System.in);
                 System.out.println("Enter father's age:");
                 int x=s.nextInt();
                 System.out.println("Enter son's age:");
                 int y=s.nextInt();
                 Son S=new Son(x,y);
                 System.out.println("Father age is " + S.father_age +
"\nSon age is " + S.son age);
    }
           catch (WrongAgeException wa) {
                 System.out.println(wa);
           catch (AgeException a){
                 System.out.println(a);
           }
```

observation:

```
PROGRAM-6
                 Exaptions
Import javo util Scanner;
class Wrong Age Exception extends Exception
    public string to string ()
        return ("age carre be negative");
      Age Exaption extends Exaption
      poblic string to string()
        veturn ( Age of son can't be quater than fatherisage");
  class Father
     int father_age;
     Pathon (int x) throws Wrong Age Exaption
```

```
if (father_age <0)
     throw new Wrong Age Exception ();
  son extends Father
int son-age;
son (intx, inty) throws Agetzuption, wrong Age Exuption
  Super(x);
   if (800-age <0)
      throw new Wrong Age Exception ();
    if (sonage >= father age)
       throw
               nuo Age Exaption ();
  lab 7
public static void main (string args [7)
```

```
fry

Scanner & new Scanner (System. in);

System. out. println ("Enter father's age:");

int x = 8. next Int();

System. out. println ("Enter Son's age:");

int y & next Int();

Son So new Son (x,y);

System. out. println ("Father age is " + 5. father age +

" In Son age is " + 6. son age);

3

Catch (wrong Exabtion wa)

2

System. out. println (wa);

3.

Catch (Age Exabtion a)

2

System. out. println (a);

3

Catch (Exabtion e)

2

8 ystem. out. println ("enter valid numbers");

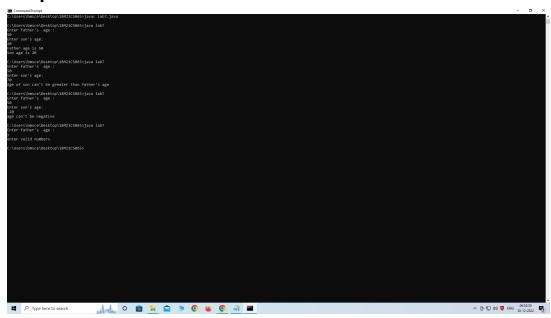
3

3

3
```

```
Enter Father's age: 50
Enter Father's age: 50
Enter Father's age: 50
Enter Father's age: 40
Age of son can't be greater than father's age
Enter Father's age: 50
Enter Father's age: 50
Enter Father's age: -20
age can't be negative

Enter Father's age: 4
enter ratio numbers
```



Program 7

Write a program which creates two threads, one thread displaying "BMS

College of Engineering" once every ten seconds and another displaying

"CSE" once every two seconds.

```
class Call implements Runnable
{
      String a;
      int x,time;
      Thread t;
      Call(String t1,int ti,int x1)
      {
            a=t1;
            x=x1;
            time=ti;
            t=new Thread(this,a);
            t.start();
      public void run()
            try{
                  for(int i=0;i<x
                                     ;i++)
                  {
                        System.out.println(a);
                        Thread.sleep(time);
            catch(InterruptedException ie)
            {
                  System.out.println("Interrupted execution");
```

```
}
}
class lab_8
{
public static void main(String xx[])
{
    new Call("BMS College of Engineering",10000,3);
    new Call("CSE",2000,10);
}
```

Observation:

```
PROGRAM-7
                                                                  Catch (Interrupted Exception ie)
                                                                     system out println (" intorupted execution"):
                 Threads
                                                                 class Lab-8
class call implemente Runnable
                                                                 public static void main (string xXT)
   String a
                                                                     nuo call ( BM3 college of Engineering ", 10000,2);
   Port x time
                                                                     nuo call ("CSE", 2000, 10);
   Thread to
   call (String to, Ent ti, int ex)
                                                                OUTPUT -
        x = ex;
                                                               BMB college of engineering
        time=ti;
       t = new Thread (this,a);
          t. Stort();
                                                                CSE
                                                                CSE
  public roid runt)
                                                              BMB college of engineering
                                                               CSE
                                                               CSE
        For (int \ell=0; \ell<\chi; \ell++)
                                                                CSE
                                                                CSE
             System: out println (a);
              Thread shep (time);
```

output:

```
| Microsoft Windows [Version 10.0.17763.1577]
| (c) 2018 Microsoft Corporation. All rights reserved.
| C:\Users\bmsce\cd C:\Users\bmsce\Desktop\18M21C5065
| C:\Users\bmsce\Desktop\18M21C5065>set path="C:\Program Files\Java\jdk1.8.0_201\bin"
| C:\Users\bmsce\Desktop\18M21C5065>javac threading.java
| C:\Users\bmsce\Desktop\18M21C5065>javac threading |
| BMS College of Enginnering |
| CSE |
| CSE
```