Program 1

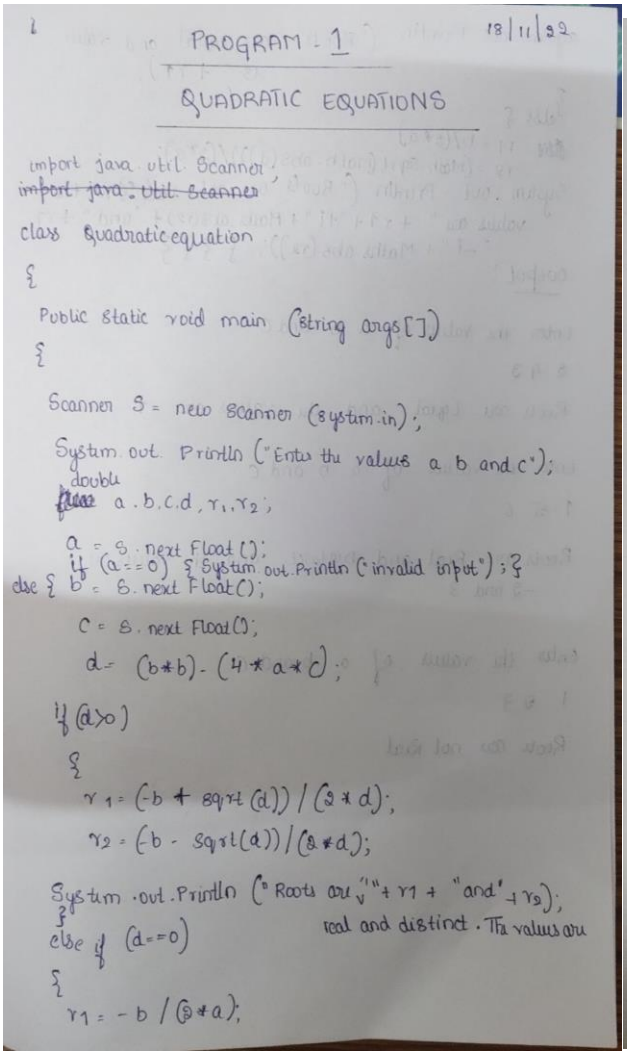
Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2 -4ac is negative, display a message stating that there are no real solutions.

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));
            }
        }
      }

}
```

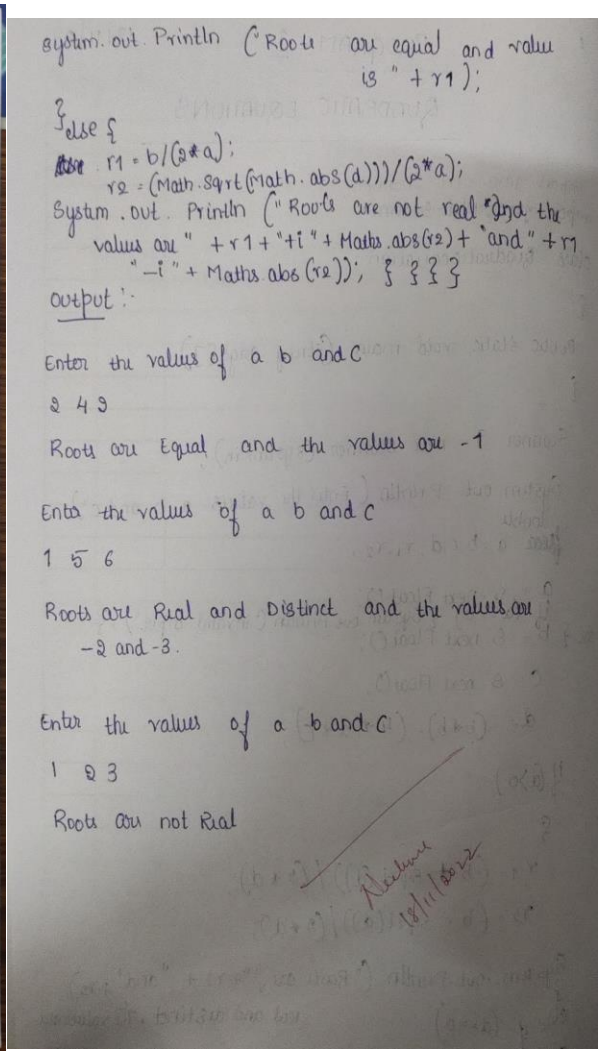
Observation:



PROGRAM - 1 18/11/22

QUADRATIC EQUATIONS

```
import java.util.Scanner;
class Quadraticequation
{
 Public static void main (String args[])
 {
  Scanner S = new Scanner (system.in);
  System.out.Println ("Enter the values a b and c");
  double a,b,c,d,r1,r2;
  a = S.next Float();
  if (a==0) { System.out.Println ("invalid input"); }
else { b = S.next Float();
  c = S.next Float();
  d = (b*b) - (4*a*c);
 if (d>0)
 {
  r1 = (-b + sqrt(d)) / (2*d);
  r2 = (-b - sqrt(d)) / (2*d);
 System.out.Println ("Roots are "+ r1 + "and" + r2);
 }
 else if (d==0)
 {
  r1 = -b / (2*a);
```



```
System.out.Println ("Roots are equal and value
                     is " + 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" + Maths.abs(r2) + "and" + r1
  "-i" + Maths.abs(r2)); } } }
```

output :-

Enter the values of a b and c

2 4 3

Roots are Equal and the values are -1

Enter the values of a b and c

1 5 6

Roots are Real and Distinct and the values are -2 and -3.

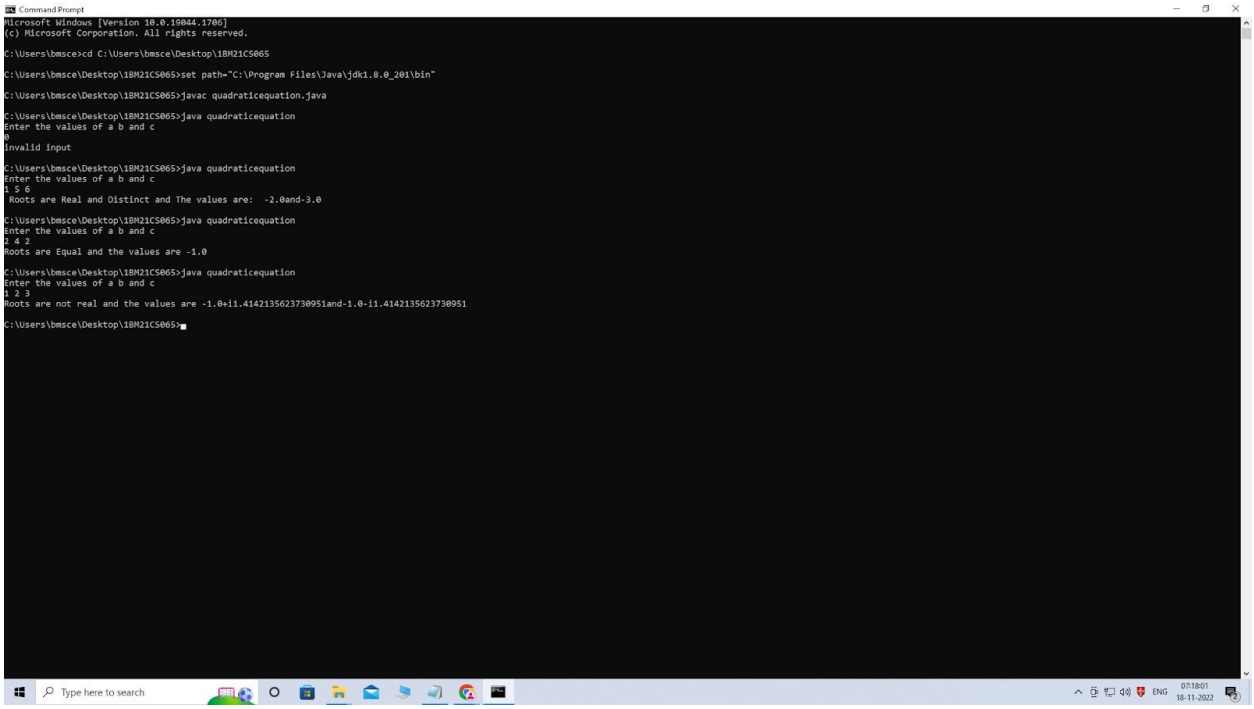
Enter the values of a b and c

1 2 3

Roots are not Real

Checked 18/11/22

Output:

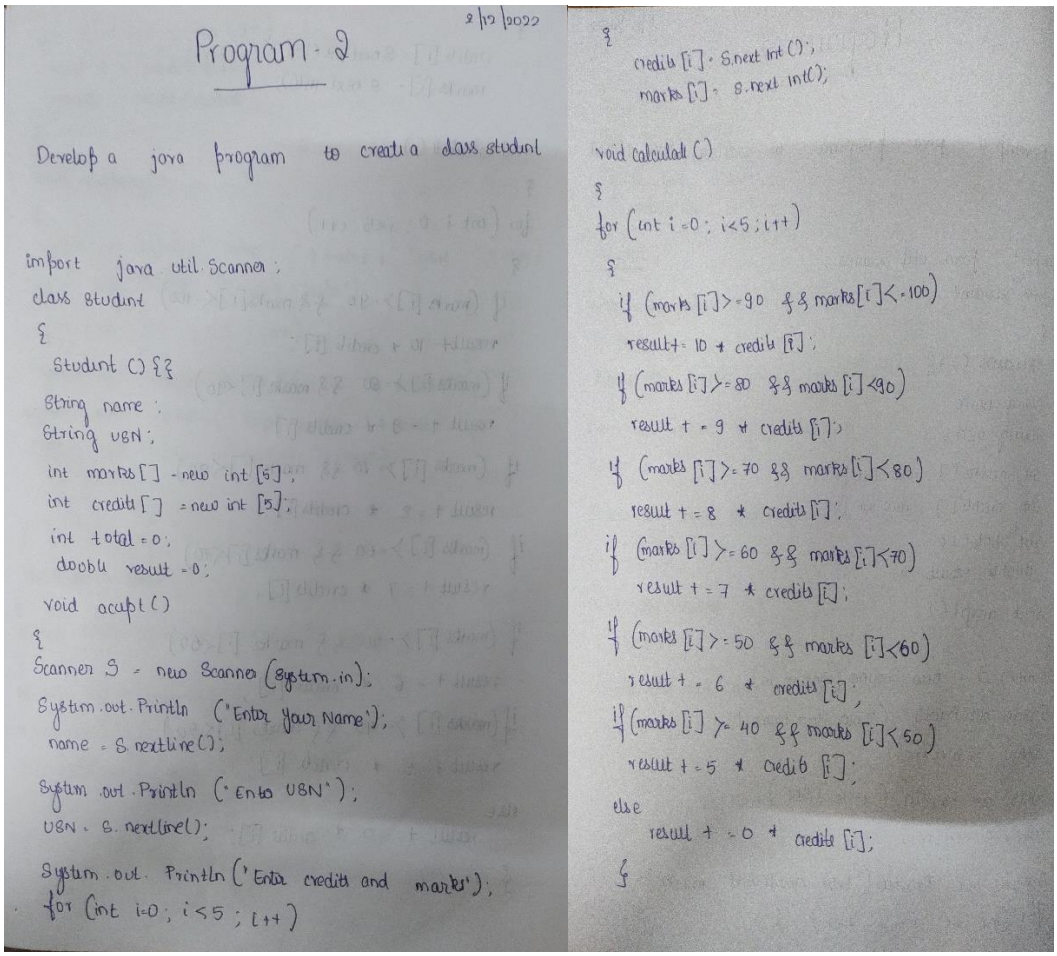

Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065
C:\Users\bmsce\Desktop\1BM21CS065>set path="C:\Program Files\Java\jdk1.8.0_201\bin"
C:\Users\bmsce\Desktop\1BM21CS065>javac quadraticequation.java
C:\Users\bmsce\Desktop\1BM21CS065>java quadraticequation
Enter the values of a b and c
0
invalid input
C:\Users\bmsce\Desktop\1BM21CS065>java quadraticequation
Enter the values of a b and c
1 5 6
Roots are Real and Distinct and The values are: -2.0and-3.0
C:\Users\bmsce\Desktop\1BM21CS065>java quadraticequation
Enter the values of a b and c
2 4 2
Roots are Equal and the values are -1.0
C:\Users\bmsce\Desktop\1BM21CS065>java quadraticequation
Enter the values of a b and c
1 2 3
Roots are not real and the values are -1.0+i1.4142135623730951and-1.0-i1.4142135623730951
C:\Users\bmsce\Desktop\1BM21CS065>
Type here to search
ENG
07:18:01
18-11-2022

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.

```
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];
```

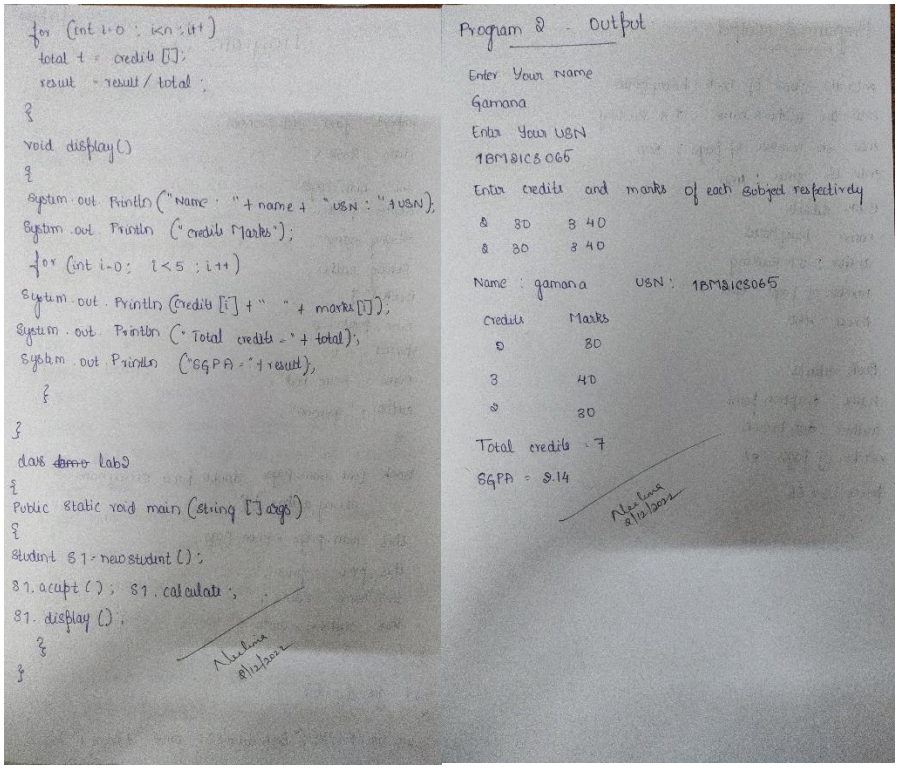
```
if(marks[i]>=50 && marks[i]<60)
result+=6*credits[i];
if(marks[i]>=40 && marks[i]<50)
result+=5*credits[i];
else result+=0*credits[i];
    }
      for(int i=0;i<3;i++)
      total+=credits[i];
      result=result/total;
 }
void display()
  {
System.out.println("Name:"+name+"  USN:"+usn);
System.out.println("credits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



Program - 2

Develop a java program to create a class student

```
import java.util.Scanner;
class student
{
  Student (){{
  String name;
  String USN;
  int marks[] = new int[5];
  int credits[] = new int[5];
  int total = 0;
  doublu result = 0;
  void acept()
{
Scanner S = new Scanner(System.in);
System.out.println("Enter your Name");
 name = S.nextline();
System.out.println("Ento USN");
USN = S.nextline();
System.out.println("Enter credits and marks");
 for(int i=0; i<5; i++)
{
 credits[i] = S.next int();
 marks[i] = S.next int();
void calculat()
{
for(int i=0; i<5; 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 * credit[i];
  else
     result + = 0 * credits[i];
 }
```



```
for (int i=0 ; i<n ; i++)
 total t = credits [i];
 result = result / total ;
}
void display()
{
System.out.println("Name : "+name+ "USN : "+USN);
System.out.println("credits Marks");
for (int i=0; i<5 ; i++)
System.out.println(credits [i] + "  " + marks[i]);
System.out.println("Total credits = "+ total);
System.out.println("SGPA ="+result);
  }
}
class demo lab2
{
Public static void main (String [] args)
{
Student S1 = new student();
S1.accept(); S1.calculate();
S1.display();
  }
}
```

Program 2 - Output

```
Enter Your Name
Gamana
Enter Your USN
1BM21CS065
Enter credits and marks of each subject respectively
2  30  3  40
2  30  3  40
Name : gamana        USN : 1BM21CS065
credits    Marks
  2          30
  3          40
  2          30
Total credits : 7
SGPA = 2.14
```

Output:

```
Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
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C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065

C:\Users\bmsce\Desktop\1BM21CS065>set path"=C:\Program Files\Java\jdk1.8.0_201\bin"

C:\Users\bmsce\Desktop\1BM21CS065>javac student.java

C:\Users\bmsce\Desktop\1BM21CS065>java lab2
Enter your Name
gamana
Enter USN
1bm21cs065
Enter credits and marks of each subject respectively
2 30 3 40
2 30 3 40
Name:gamana  USN:1bm21cs065
credits  Marks
2         30
3         40
2         30
Total credits=7
SGPA=2.142857142857143

C:\Users\bmsce\Desktop\1BM21CS065>javac book.java

C:\Users\bmsce\Desktop\1BM21CS065>java lab_2
enter the name of the book: harry potter
enter the author's name: jk rowling
enter the number of pages in the book: 500
enter the price of the book: 450

Book details
```
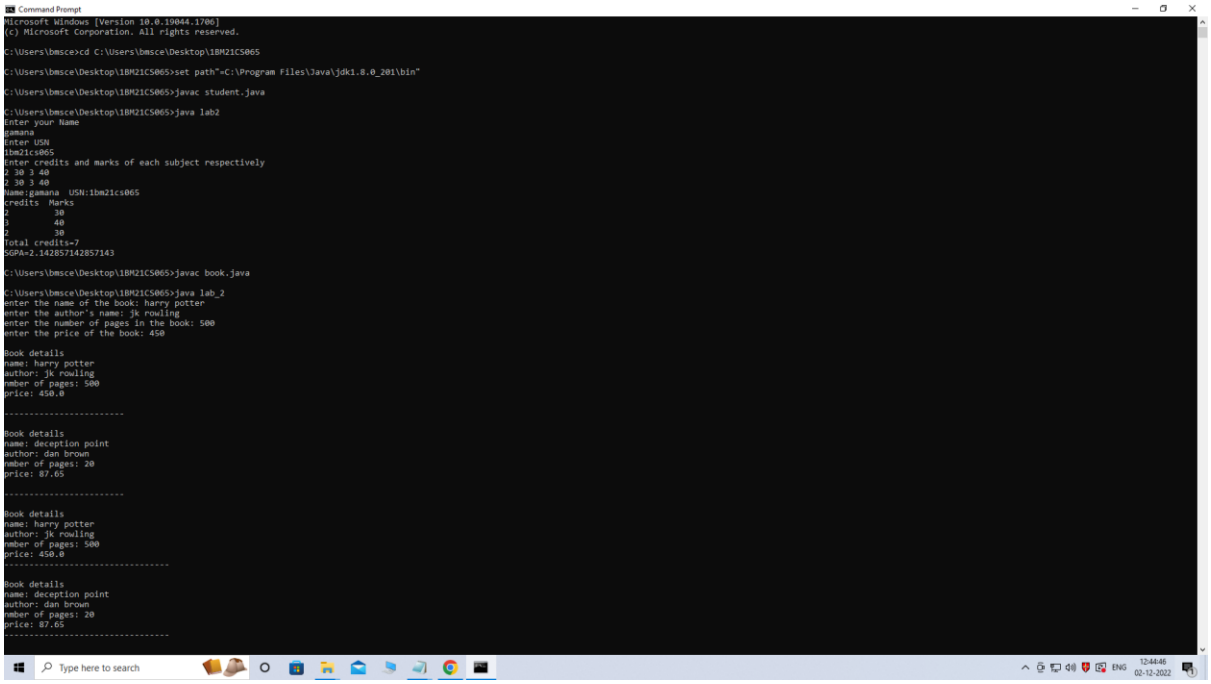
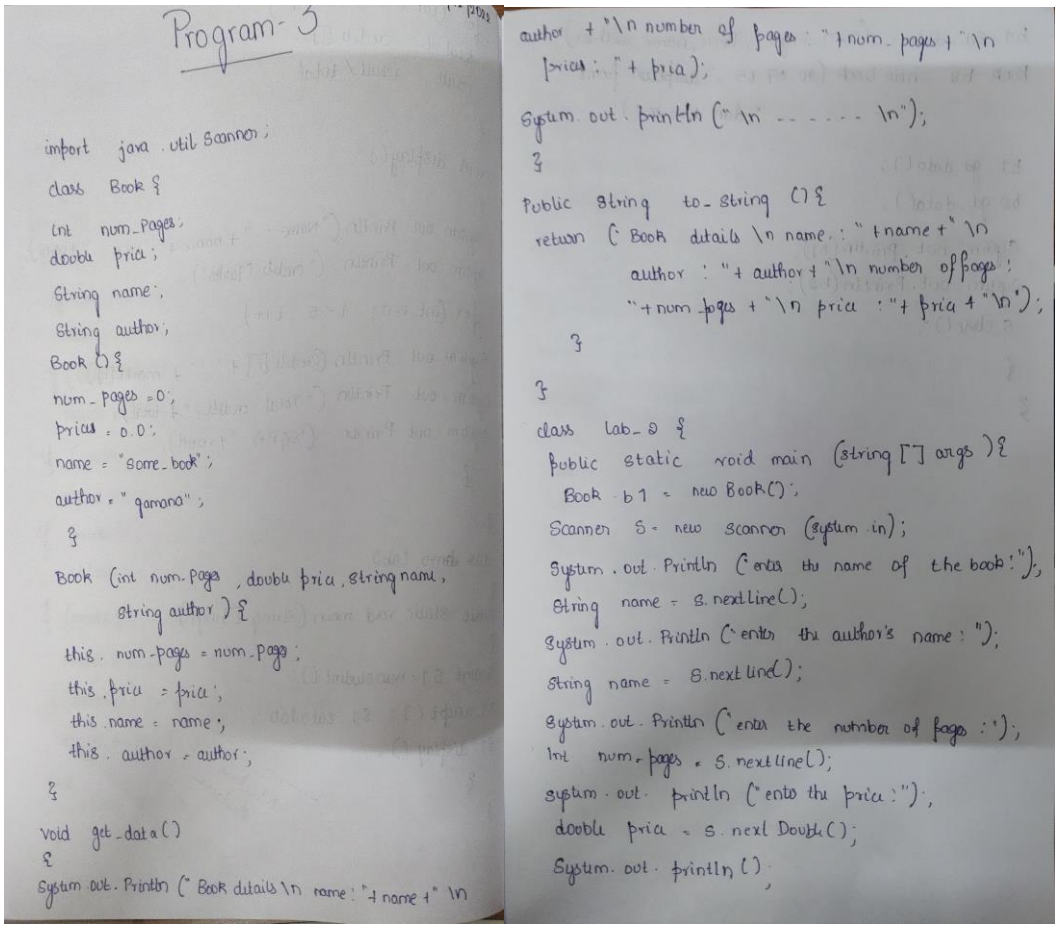


Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065
C:\Users\bmsce\Desktop\1BM21CS065>set path"=C:\Program Files\Java\jdk1.8.0_201\bin"
C:\Users\bmsce\Desktop\1BM21CS065>javac student.java
C:\Users\bmsce\Desktop\1BM21CS065>java lab2
Enter your Name
gamana
Enter USN
1bm21cs065
Enter credits and marks of each subject respectively
2 30 3 40
2 30 3 40
Name:gamana USN:1bm21cs065
credits Marks
2 30
3 40
2 30
Total credits=7
SGPA=2.142857142857143
C:\Users\bmsce\Desktop\1BM21CS065>javac book.java
C:\Users\bmsce\Desktop\1BM21CS065>java lab_2
enter the name of the book: harry potter
enter the author's name: jk rowling
enter the number of pages in the book: 500
enter the price of the book: 450
Book details
name: harry potter
author: jk rowling
mber of pages: 500
price: 450.0
Book details
name: deception point
author: dan brown
mber of pages: 20
price: 87.65
Book details
name: harry potter
author: jk rowling
mber of pages: 500
price: 450.0
Book details
name: deception point
author: dan brown
mber of pages: 20
price: 87.65
Type here to search
ENG
12:44:46
02-12-2022

PROGRAM 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.

```
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();

    }

}
```



Program-3

```
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="ganana";
}
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 get_data()
{
System.out.println("Book details\n name:"+name+"\n
author+"\n number of pages:"+num_pages+"\n
price:"+price);
System.out.println("\n------\n");
}
public String to_string(){
return("Book details\n name:"+name+"\n
      author:"+author+"\n number of pages:
      "+num_pages+"\n price:"+price+"\n");
  }
}
class lab_2{
public static void main(String[] args){
 Book b1=new Book();
Scanner s=new Scanner(System.in);
System.out.println("enter the name of the book:");
String name=s.nextLine();
System.out.println("enter the author's name:");
String name=s.nextLine();
System.out.println("enter the number of pages:");
int num_pages=s.nextLine();
system.out.println("enter the price:");
double price=s.nextDouble();
System.out.println();
```

```
b1.set_data (num_pages, Price, name, author);
Book b8 = new book (80, 87.65, "duaption point",
                    "dan brown");

b1.get_data();
b8.get_data();

System.out.println(b1);
System.out.println(b8);
S.close();
}
}
```

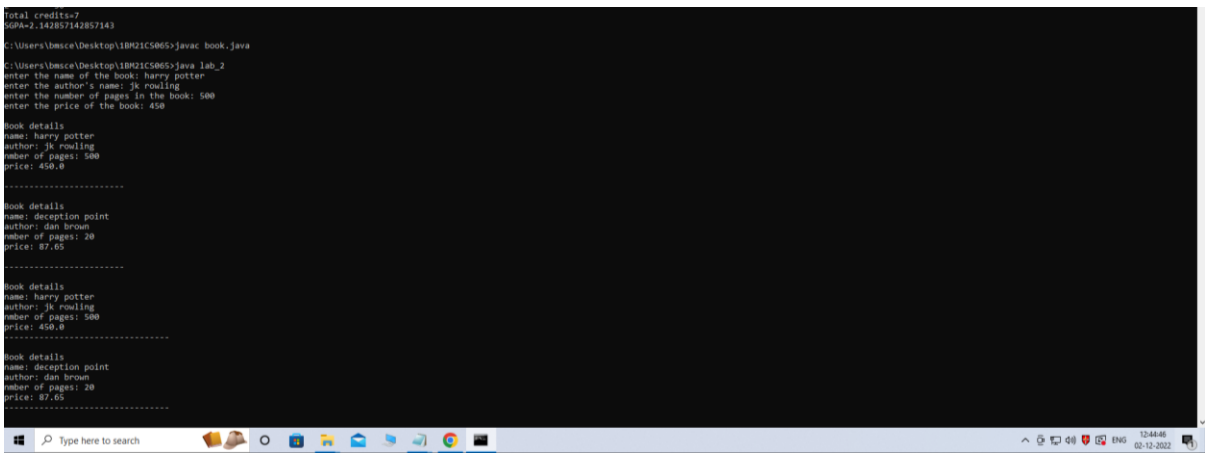
Program-3 - Output

enter the name of book: harry potter
enter the author's name: JK Rowling
enter the number of pages: 500
enter the price: 450

Book details
name: harry potter
author: JK Rowling
number of pages: 500
price: 450

Book details
name: duaption point
author: dan brown
number of pages: 80
price: 87.65

Output:



PROGRAM 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.

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

9/10/22

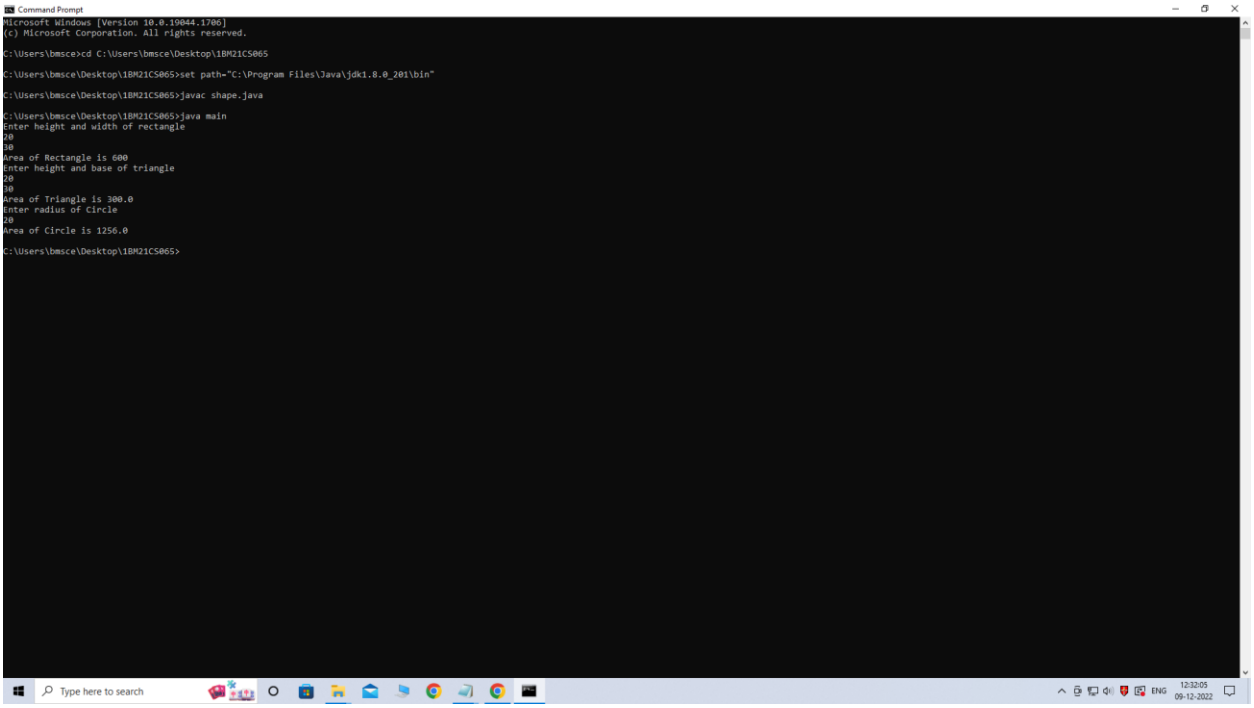
Abstract class

```
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 & 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 the height & 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 the radius of circle");
   h = s.nextInt();
   System.out.println("Area of circle" + 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();
} }
```

Output:

```
Enter height and width of rectangle
20
30
Area of Rectangle is 600

Enter height and base of triangle
80
80
Area of Triangle is 3200

Enter radius of circle
20
Area of circle is 1256
```

OUTPUT:


Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065
C:\Users\bmsce\Desktop\1BM21CS065>set path="C:\Program Files\Java\jdk1.8.0_201\bin"
C:\Users\bmsce\Desktop\1BM21CS065>javac shape.java
C:\Users\bmsce\Desktop\1BM21CS065>java main
Enter height and width of rectangle
20
30
Area of Rectangle is 600
Enter height and base of triangle
20
30
Area of Triangle is 300.0
Enter radius of Circle
20
Area of Circle is 1256.0
C:\Users\bmsce\Desktop\1BM21CS065>
Type here to search
ENG
12:32:05
09-12-2022

PROGRAM 5

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\nPress\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

9/10/22

Develop a Java program to create a class Bank that maintains two kinds of accounts called Savings account & other current account.

```
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 no.");
      accno = s.next Int();
      System.out.println("Enter balance amount");
      bal = s.next Double();
    }
  void display()
  {
   System.out.println("customer name," + name);
   System.out.println("Your account number :" + accno);
   System.out.println("Your Account balance :" + bal);
  }
account(){}
```

```
class Saracct extends account
{
 Scanner s = new Scanner(System.in);
  Saracct()
  {
   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.next Double();
     bal = bal + amt;
    }
     else
       System.out.println("Invalid input");
   }
 void in()
 {
 System.out.println("Enter rate of interest");
 double r = s.next Double();
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 + "\n Balance 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 amount");
  int ch = s.nextInt();
  if (ch==1)
  {
   System.out.println("Enter the amount to be withdrawn");
   double wdraw = s.next Double();
   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.next Double();
   bal = bal + amt;
  }
  else
    System.out.println("Invalid input");
void wd()
 {
  System.out.println("Press 1 to withdraw the amount");
  int ch = s.nextInt();
  if (ch==1)
  {
   System.out.println("Enter amount to be withdrawn");
   double wdraw = s.next Double();
   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
                     balana \n^ Amount of rs 50 has
                     bun credited as servia charge for having
                     low balana");

  bal = bal - 50;
  System. out. Println ("your available balana" + 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 \n
                       2. if your account is current
                                          account");

  ch = s.nextInt();
  Switch (ch)
  {
    case 1:
            Saracct s1 = new saradt();
            s1.set();
            s1.display();
            s1.deposit();
            s1.in();
            s1.wd();
            break;

    case 2:
            curacct c1 = new curacct();
            c1.setdata();
            c1.display();
            c1.deposit();
            c1.wd();
            break;
      default: system.exit(0);
     }
   }
}
```

Output-

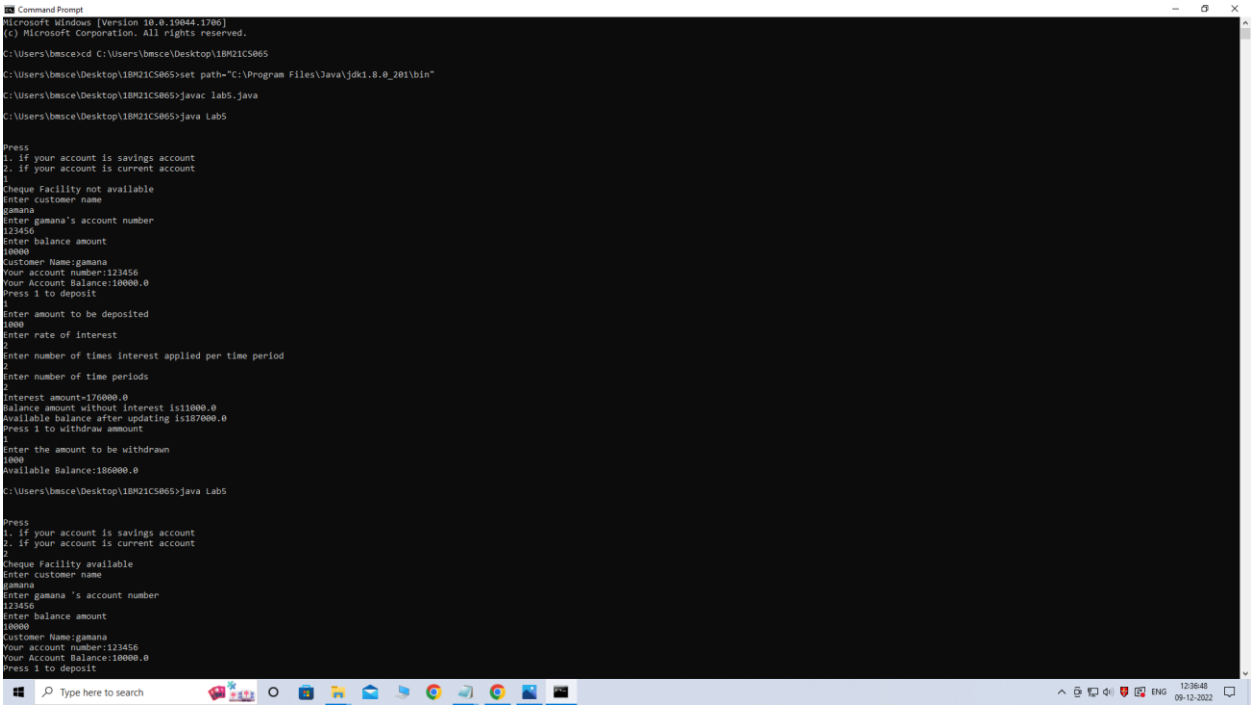
```
Press
1. if your account is savings account
2. if your account is current account

1.
Cheque Facility not available
Enter customer name
Gamana
Enter Gamana's account number
123456
Enter balana amount
10000
```

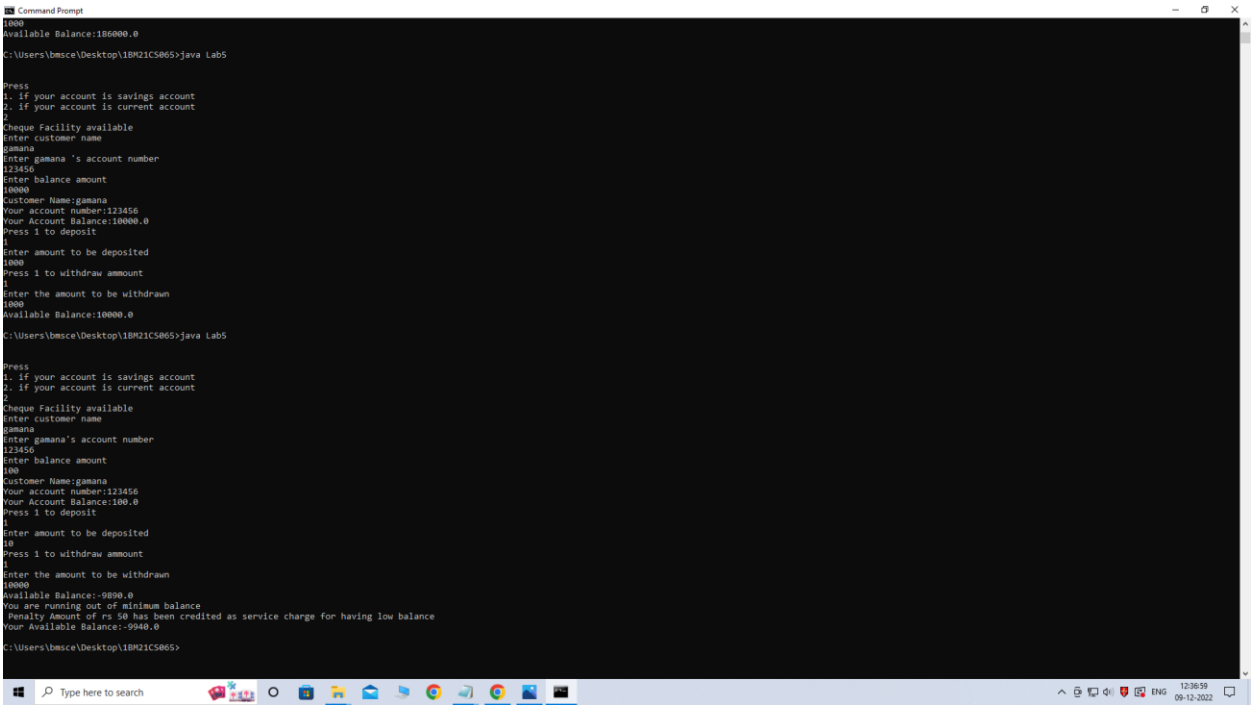
```
Customer Name : gamana
Your Account Number : 123456
Your Account Balana : 10000

Press 1 to deposit
1
Enter Amount to be deposited
1000
Enter rate of interest
2
Enter number of times interest applied per time period
2
Enter number of time periods
8

Interest amount = 176000
Balana amount without interest is 11000
Available balana after updating is 187000

Press 1 to withdraw amount
1
Enter the amount to be withdrawn
1000
Available Balana : 186000

Press
1. if your account is savings account
2. if your account is current account
2
Cheque Facility
```

```
Enter customer name
gamana
Enter gamana's account number
123456
Enter balana amount
10000

Customer name : Gamana
Your Account number : 123456
Your Account Balana : 10000

Press 1 to deposit
1
Enter amount to be deposited
1000
Press 1 to withdraw amount
1
Enter the amount to be withdrawn
1000
Available Balana : 10000
```

SSS
9/12/2021

OUTPUT:


Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065
C:\Users\bmsce\Desktop\1BM21CS065>set path="C:\Program Files\Java\jdk1.8.0_201\bin"
C:\Users\bmsce\Desktop\1BM21CS065>javac lab5.java
C:\Users\bmsce\Desktop\1BM21CS065>java Lab5
Press
1. if your account is savings account
2. if your account is current account
2
Cheque Facility not available
Enter customer name
gamana
Enter gamana's account number
123456
Enter balance amount
10000
Customer Name:gamana
Your account number:123456
Your Account Balance:10000.0
Press 1 to deposit
1
Enter amount to be deposited
1000
Enter rate of interest
2
Enter number of times interest applied per time period
2
Enter number of time periods
2
Interest amount=176000.0
Balance amount without interest is11000.0
Available balance after updating is187000.0
Press 1 to withdraw ammount
1
Enter the amount to be withdrawn
1000
Available Balance:186000.0
C:\Users\bmsce\Desktop\1BM21CS065>java Lab5
Press
1. if your account is savings account
2. if your account is current account
1
Cheque Facility available
Enter customer name
gamana
Enter gamana 's account number
123456
Enter balance amount
10000
Customer Name:gamana
Your account number:123456
Your Account Balance:10000.0
Press 1 to deposit
Type here to search
ENG
12:36:48
09-12-2022


Command Prompt
1000
Available Balance:186000.0
C:\Users\bmsce\Desktop\1BM21CS065>java Lab5
Press
1. if your account is savings account
2. if your account is current account
1
Cheque Facility available
Enter customer name
gamana
Enter gamana 's account number
123456
Enter balance amount
10000
Customer Name:gamana
Your account number:123456
Your Account Balance:10000.0
Press 1 to deposit
1
Enter amount to be deposited
1000
Press 1 to withdraw ammount
1
Enter the amount to be withdrawn
1000
Available Balance:10000.0
C:\Users\bmsce\Desktop\1BM21CS065>java Lab5
Press
1. if your account is savings account
2. if your account is current account
2
Cheque Facility available
Enter customer name
gamana
Enter gamana's account number
123456
Enter balance amount
100
Customer Name:gamana
Your account number:123456
Your Account Balance:100.0
Press 1 to deposit
1
Enter amount to be deposited
10
Press 1 to withdraw ammount
1
Enter the amount to be withdrawn
10000
Available Balance:-9890.0
You are running out of minimum balance
Penalty Amount of rs 50 has been credited as service charge for having low balance
Your Available Balance:-9940.0
C:\Users\bmsce\Desktop\1BM21CS065>
Type here to search
ENG
12:36:59
09-12-2022

PROGRAM 6

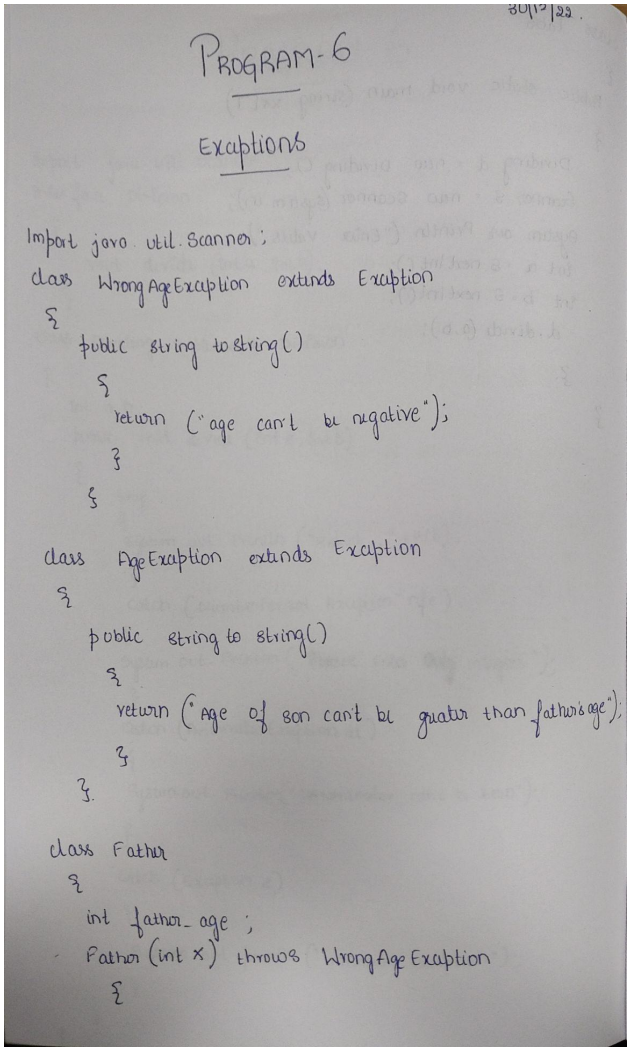
Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called “Father” and derived class called “Son” which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge( ) when the input age<0. In Son 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);
                }
```

```
                catch (Exception e){
                        System.out.println("enter valid numbers");
        }
    }
}
```

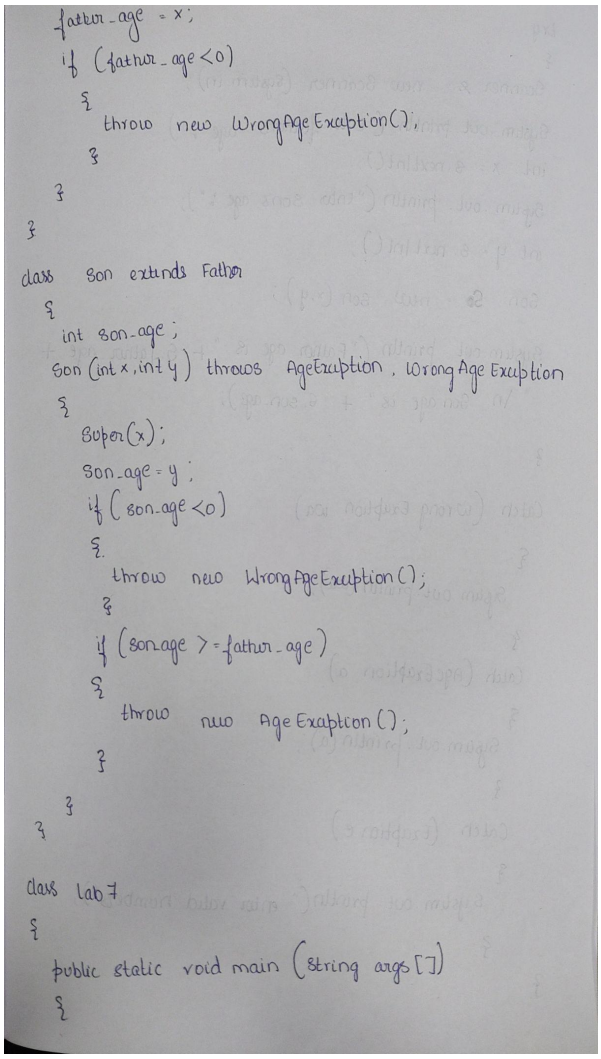
observation:



PROGRAM-6

Exceptions

```
Import java.util.Scanner;
class WrongAgeException extends Exception
 {
   public string toString()
    {
      return ("age can't be negative");
    }
 }

class AgeException extends Exception
 {
   public string to string()
    {
      return ("Age of son can't be grater than father's age");
    }
 }

class Father
 {
   int father_age ;
   Father (int x) throws WrongAge Exception
    {
```



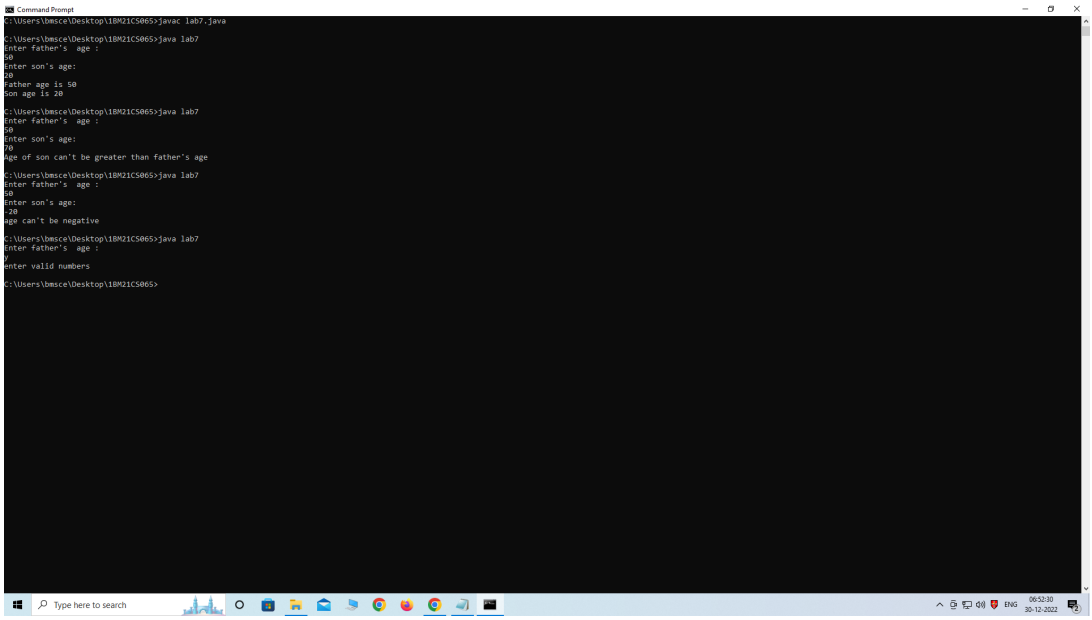
```
    father_age = x;
    if (father_age<0)
     {
       throw new WrongAge Exception();
     }
  }
}

class Son extends Father
 {
   int son_age;
   Son (int x, int y) throws AgeException, WrongAge Exception
   {
     Super(x);
     son_age = y;
     if (son_age<0)
     {
       throw new WrongAge Exception();
     }
     if (son_age >= father_age)
     {
       throw new Age Exception();
     }
   }
}

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 +
" \n Son age is " + S.son_age);
}
Catch (Wrong Exception wa)
{
System.out.println (wa);
}
Catch (AgeExeption a)
{
System.out.println (a);
}
Catch (Exception e)
{
System.out.println(" enter valid numbers");
}
}
```

```
Output:-
Enter Father's age : 50
Enter Son's age : 20
Father age is 50
Son age is 20

Enter Father's age : 50
Enter Son's age : 70
Age of Son can't be grater than father's age

Enter Father's age : 50
Enter Son's age : -20
age can't be negative

Enter Father's age : y
enter valid numbers
```

30/12/2022

Output:



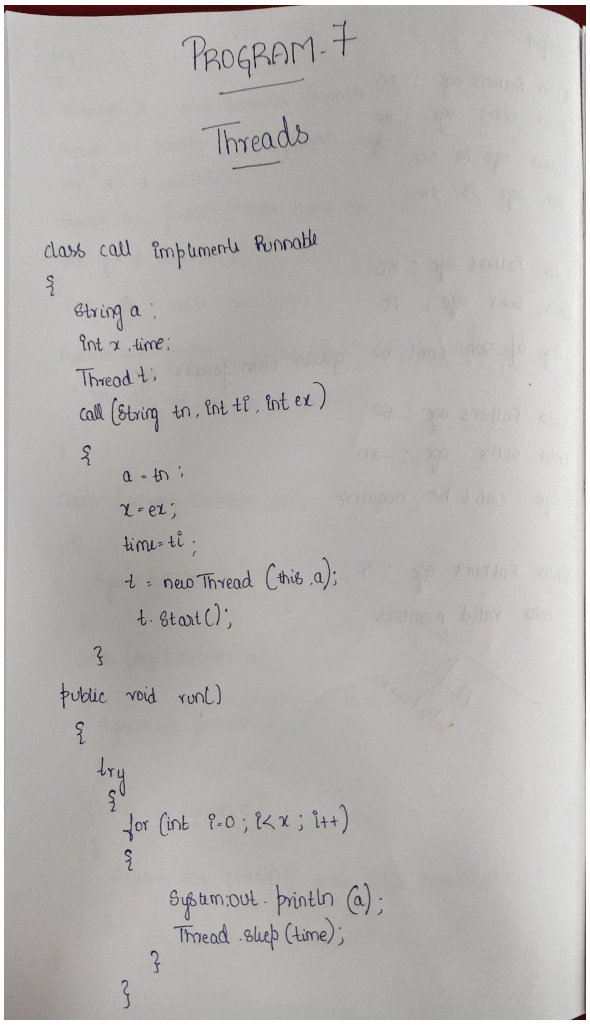
Program 7

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);
}
```

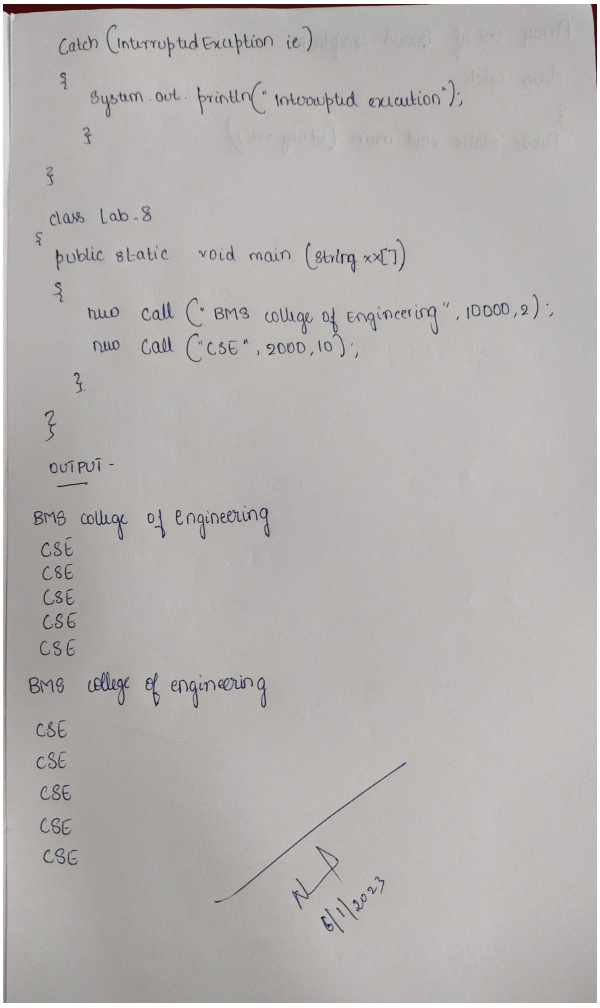
Observation:



PROGRAM-7

Threads

```
class call implements Runnable
{
  String a;
  int x, time;
  Thread t;
  call(String tn, int ti, int ex)
  {
     a = tn;
     x = ex;
     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);
      }
     }
```



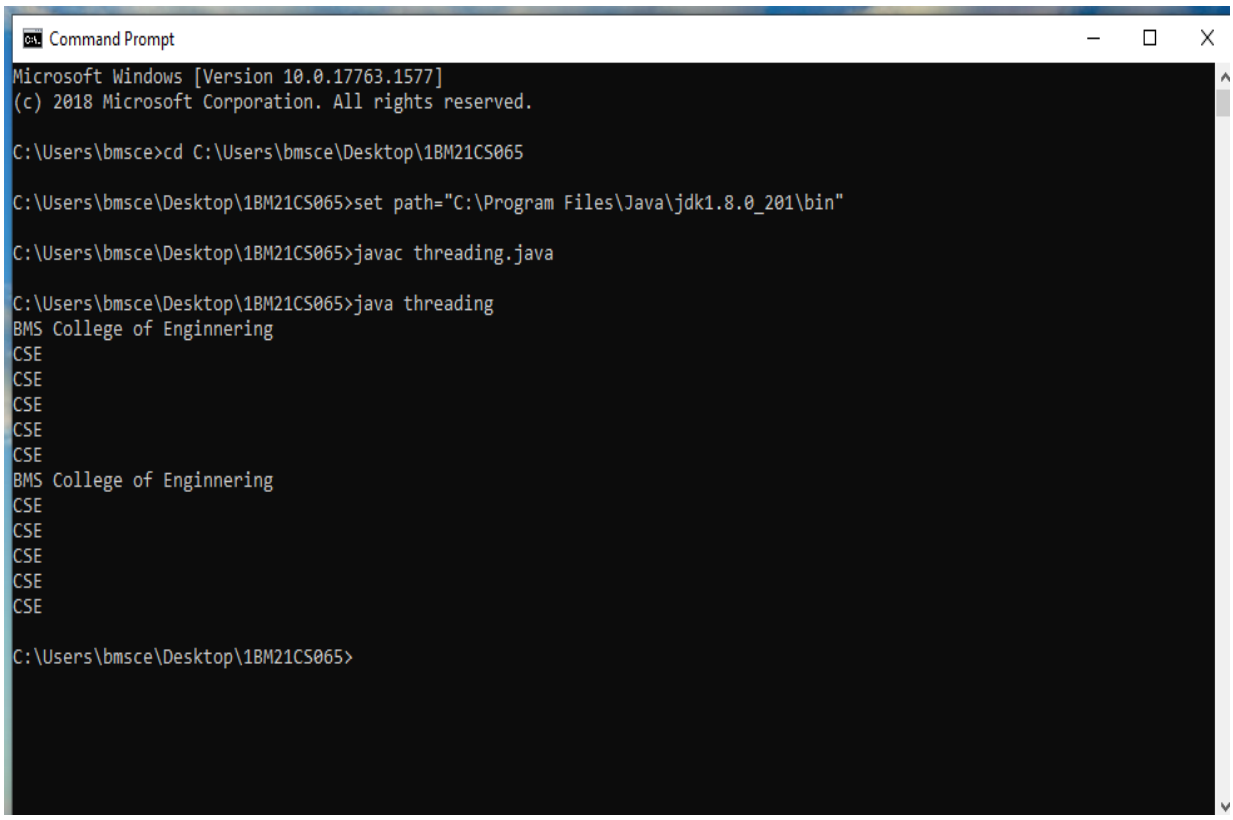
```
    catch (InterruptedException ie)
    {
      System.out.println("Interrupted exception");
    }
}
class Lab-8
{
 public static void main(String xx[])
 {
    new Call("BMS college of Engineering", 10000, 2);
    new Call("CSE", 2000, 10);
 }
}
```

OUTPUT -

```
BMS college of Engineering
CSE
CSE
CSE
CSE
CSE
BMS college of engineering
CSE
CSE
CSE
CSE
CSE
```

8/11/2023

output:


Command Prompt
Microsoft Windows [Version 10.0.17763.1577]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM21CS065
C:\Users\bmsce\Desktop\1BM21CS065>set path="C:\Program Files\Java\jdk1.8.0_201\bin"
C:\Users\bmsce\Desktop\1BM21CS065>javac threading.java
C:\Users\bmsce\Desktop\1BM21CS065>java threading
BMS College of Enginnering
CSE
CSE
CSE
CSE
CSE
BMS College of Enginnering
CSE
CSE
CSE
CSE
CSE
C:\Users\bmsce\Desktop\1BM21CS065>