LAB RECORD : PROGRAMS 1-10

OOJ LAB

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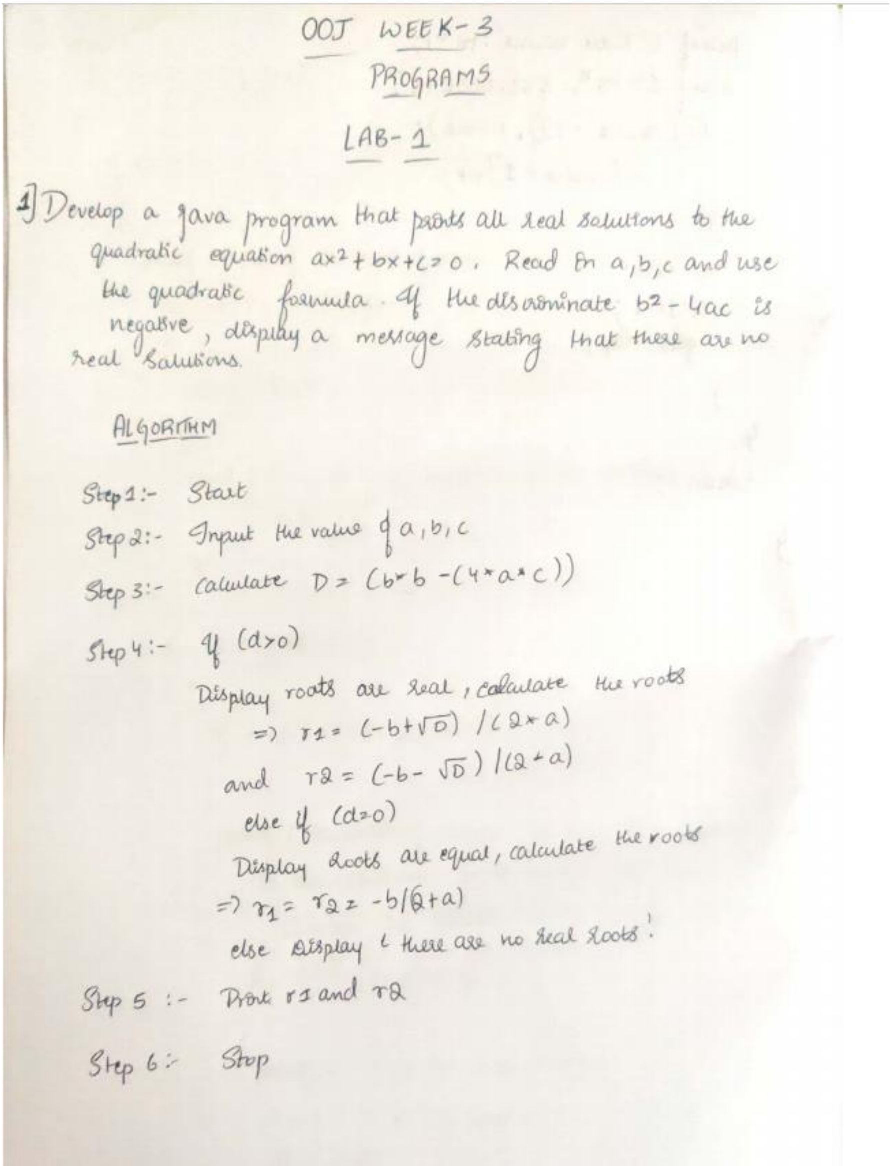
1BM19CS079

LAB-1

Develop a Java program that prints all the real solutions to the quadratic equations ax^2+bx+c. Read in a,b,c and use the quadratic formula. If the discriminate b^2-4ac is negative display a message stating that there are no real solutions.

OBSERVATION-



OOJ WEEK-3

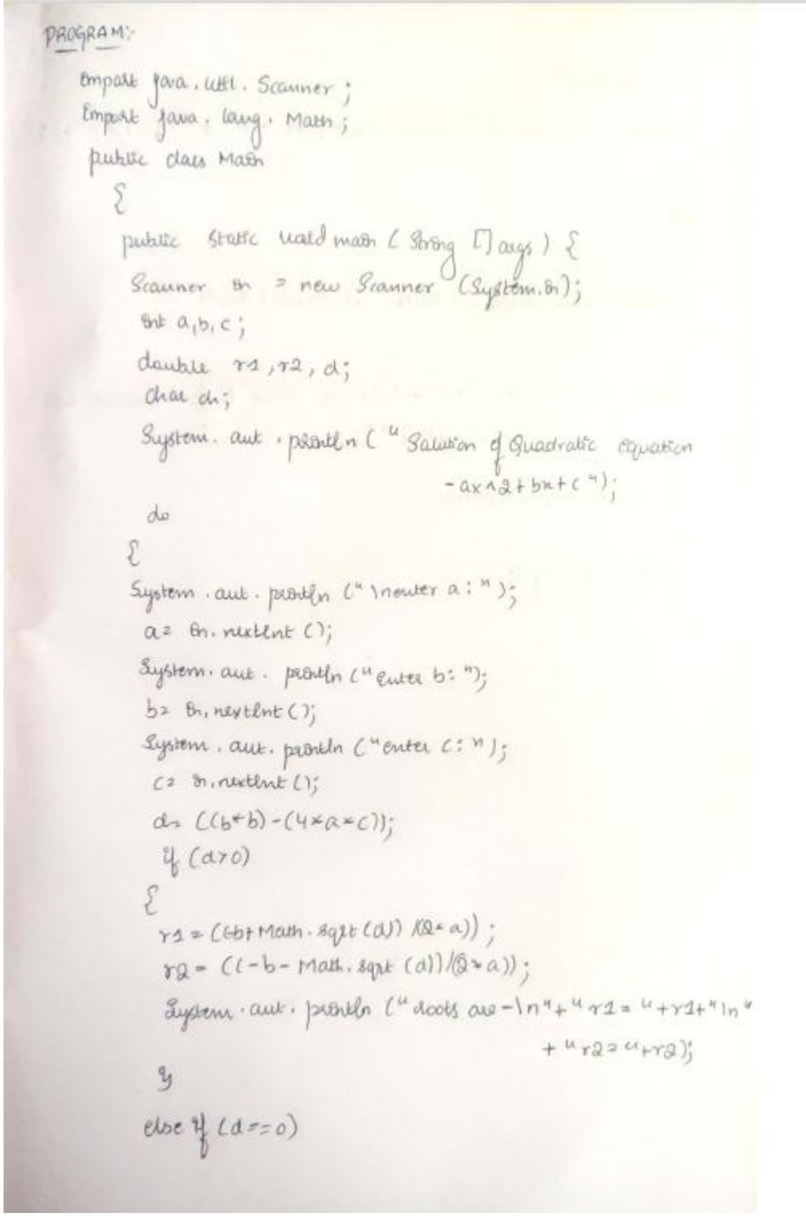
PROGRAMS

LAB-1

1] Develop a Java program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a,b,c and use the quadratic formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

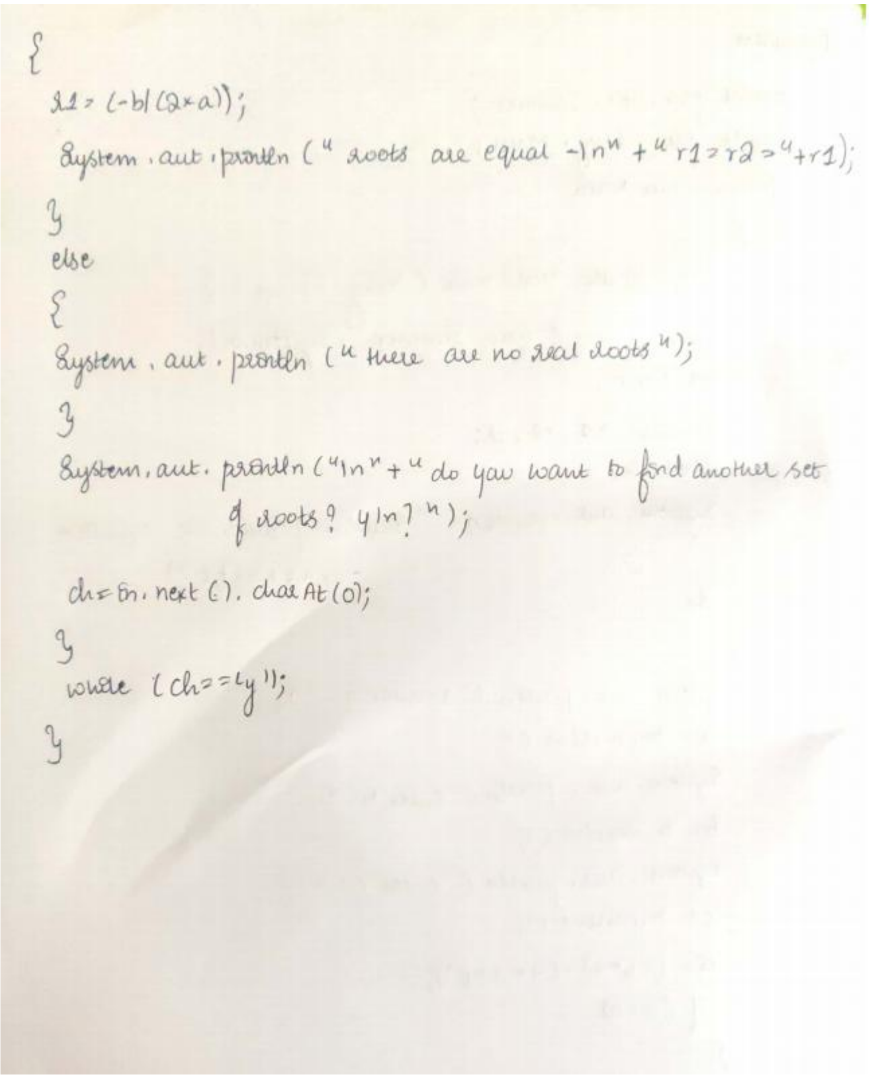
ALGORITHM

```
Step 1:-  Start
Step 2:-  Input the value of a,b,c
Step 3:-  Calculate $D = (b*b - (4*a*c))$
Step 4:-  If (d>0)
              Display roots are real, calculate the roots
                  => $r1 = (-b+\sqrt{D}) / (2*a)$
              and $r2 = (-b-\sqrt{D}) / (2*a)$
              else if (d=0)
              Display roots are equal, calculate the roots
              => $r_1 = r_2 = -b/(2*a)$
              else Display 'there are no real roots'
Step 5 :-  Print r1 and r2
Step 6 :-  Stop
```



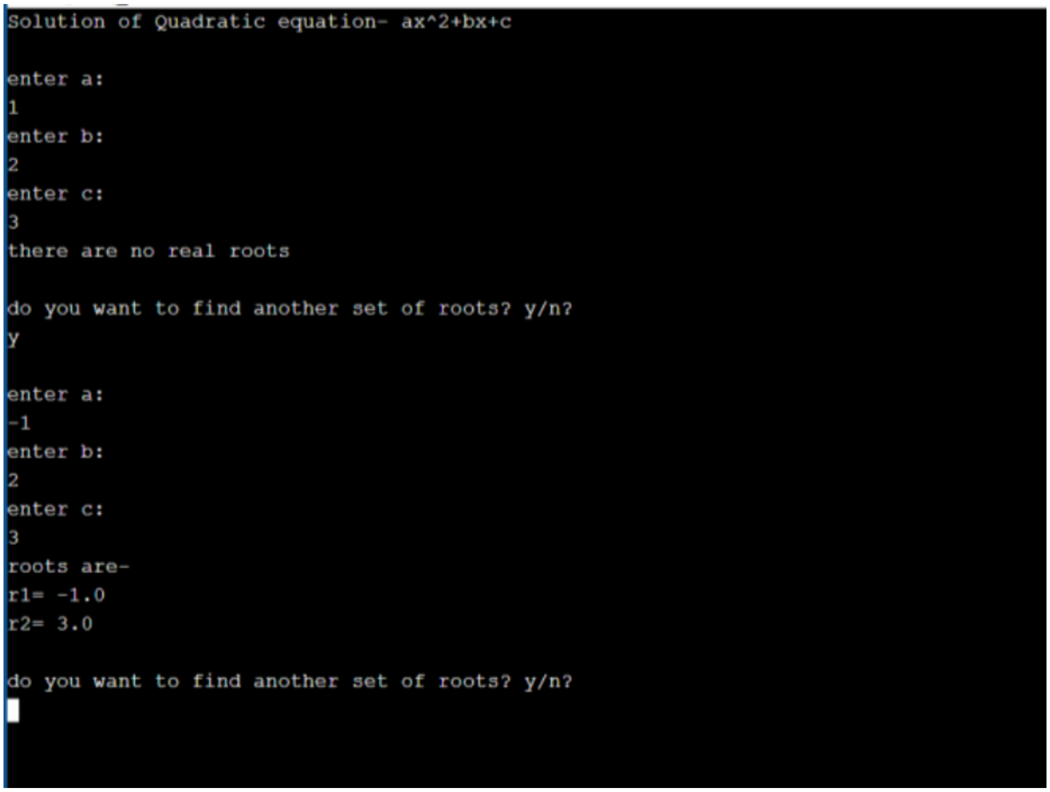
PROGRAM:-

```
import java.util.Scanner;
import java.lang.Math;
public class Math
 {
  public static void main (String [] args) {
   Scanner in = new Scanner (System.in);
   int a,b,c;
   double r1,r2,d;
   char ch;
   System.out.println (" Solution of Quadratic equation
                          -ax^2+bx+c ");
   do
  {
  System.out.println ("\nenter a: ");
   a= in.nextInt ();
  System.out.println ("enter b: ");
   b= in.nextInt ();
  System.out.println ("enter c: ");
   c= in.nextInt ();
   d= ((b*b)-(4*a*c));
    if (d>0)
   {
    r1 = ((-b+Math.sqrt (d))/(2*a));
    r2 = ((-b-Math.sqrt (d))/(2*a));
    System.out.println ("Roots are -\n"+"r1 = "+r1+"\n"
                                    +"r2 = "+r2);
   }
  else if (d==0)
```



```
{
r1=(-b/(2*a));
System.aut.prontln ("roots are equal -\n"+"r1=r2="+r1);
}
else
{
System.aut.prontln ("there are no real roots");
}
System.aut.prontln ("\n"+"do you want to find another set
            of roots? y/n? ");

ch=sn.next().charAt(0);
}
while (ch=='y');
}
```

OUTPUT-



```
Solution of Quadratic equation- ax^2+bx+c

enter a:
1
enter b:
2
enter c:
3
there are no real roots

do you want to find another set of roots? y/n?
y

enter a:
-1
enter b:
2
enter c:
3
roots are-
r1= -1.0
r2= 3.0

do you want to find another set of roots? y/n?
```

LAB-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.

OBSERVATION-

06-10-2020

OOJ WEEK-4

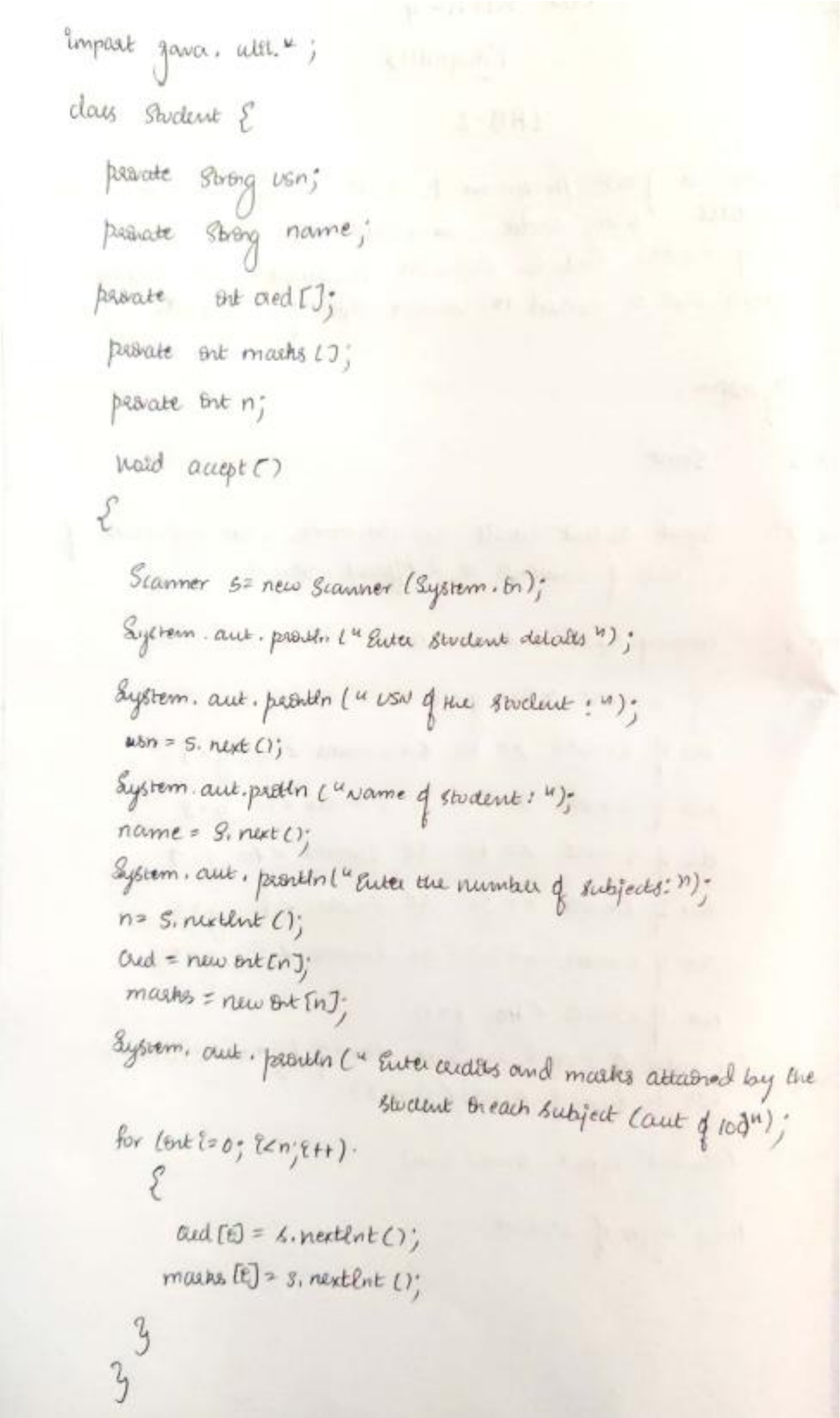
PROGRAMS

LAB-2

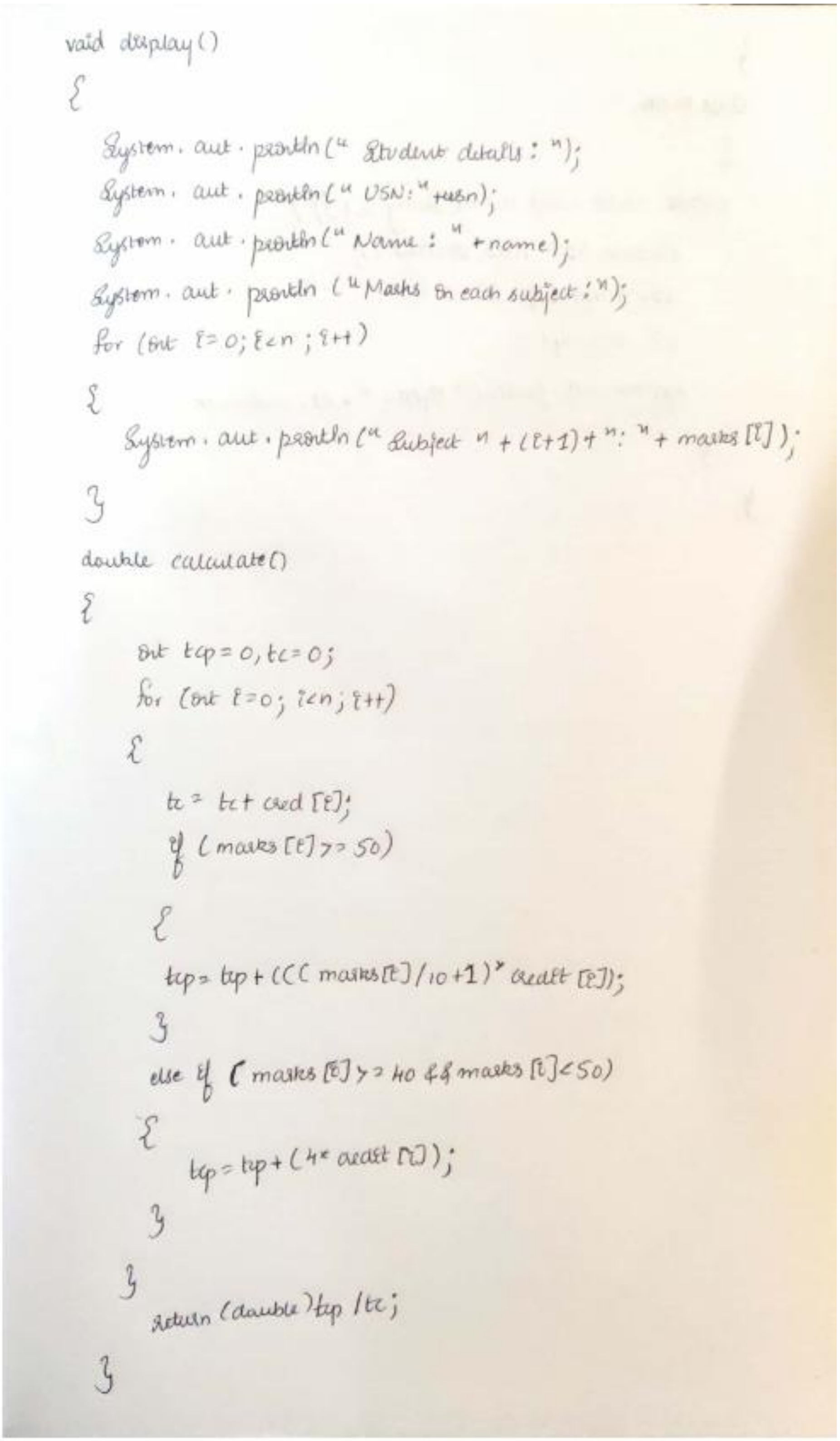
1) Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

Algorithm :-

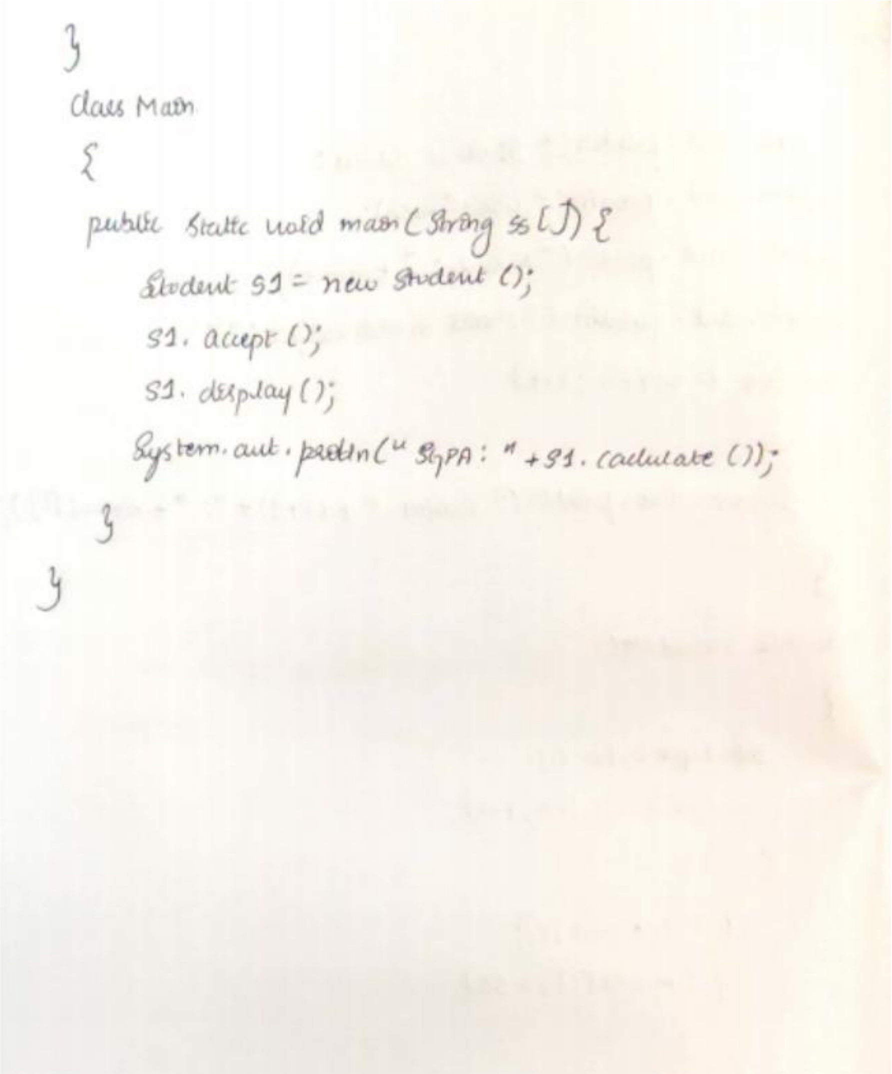
```
Step 1 :-  Start

Step 2 :-  Input Student details i.e, usn, name, credits and marks (of
           each of 5 subjects in 2 different arrays)

Step 3 :-  Display the Student details

Step 4 :-  if s marks > 90, g = 10
           else if s marks >= 80 && s marks < 90, g = 9
           else if s marks >= 70 && s marks < 80, g = 8
           else if s marks >= 60 && s marks < 70, g = 7
           else if s marks >= 50 && s marks < 60, g = 6
           else if s marks >= 40 && s marks < 50, g = 5
           else if s marks < 40, g = 0

Step 5 :-  Get value of g and calculate sum of (g*credits) (sum)
           Get to sum of credits (sum2)

Step 6 :-  Calculate sgpa = sum / sum2

Step 7 :-  Print sgpa of student
```



```
import java. util.* ;
class Student {
  private String usn;
  private String name;
  private int cred[];
  private int marks[];
  private int n;
  void accept()
  {
    Scanner s= new Scanner (System.in);
    System.out.println ("Enter Student details");
    System.out.println ("USN of the Student :");
    usn = s.next();
    System.out.println ("Name of student :");
    name = s.next();
    System.out.println("Enter the number of subjects:");
    n= s.nextInt();
    cred = new int[n];
    marks = new int[n];
    System.out.println (" Enter credits and marks attained by the
                         student in each subject (out of 100");
    for (int i=0; i<n; i++).
     {
       cred[i] = s.nextInt();
       marks[i] = s.nextInt();
     }
  }
```

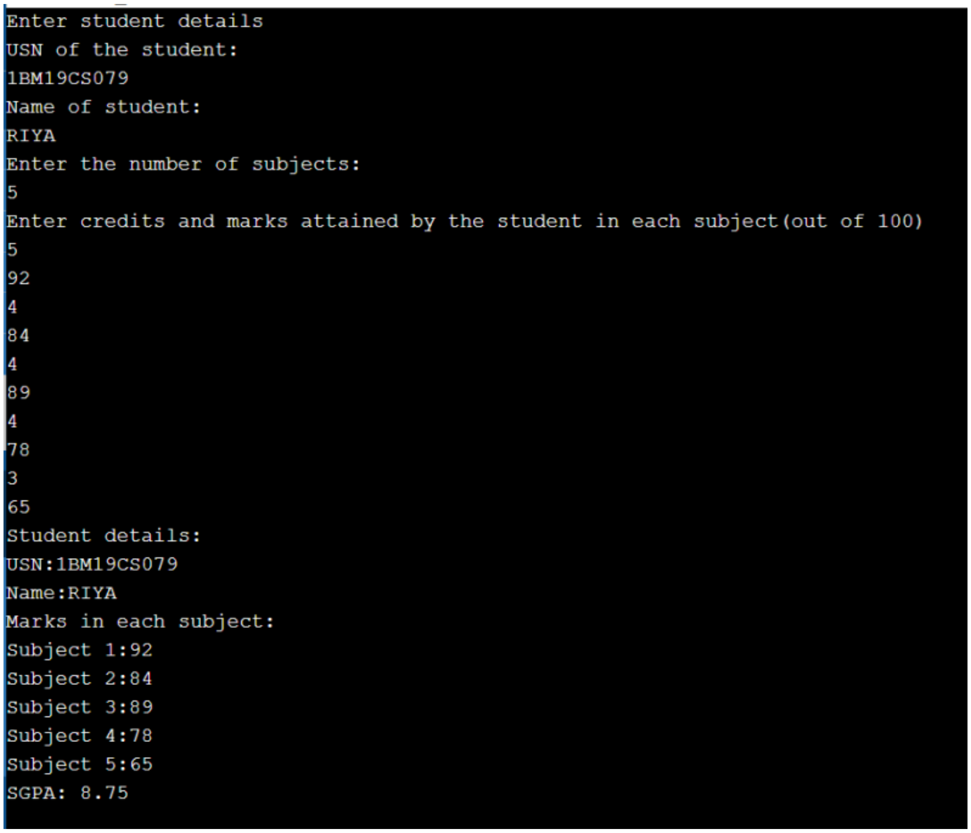


```
vaid display()
{
  System. aut . println(" Student details : ");
  System. aut . println(" USN: "+usn);
  System . aut . println(" Name : " +name);
  System . aut . println (" Marks in each subject :");
  for (int i=0; i<n ; i++)
  {
    System . aut . println(" Subject " + (i+1) + ": " + marks [i]);
  }
double calculate()
{
    int tcp = 0, tc = 0;
    for (int i=0; i<n; i++)
    {
      tc = tc+ cred [i];
      if (marks [i] >= 50)
      {
      tcp = tcp + (((marks[i]/10+1)* credit [i]);
      }
      else if (marks [i] >= 40 && marks [i]<50)
      {
         tcp = tcp + (4* credit [i]);
      }
    }
      return (double)tcp /tc;
  }
```



```
}
class Main
 {
 public static void main(String ss[]) {
      Student s1 = new Student();
      s1. accept();
      s1. display();
     System.out.println("SGPA: "+s1.calculate());
   }
}
```

OUTPUT-

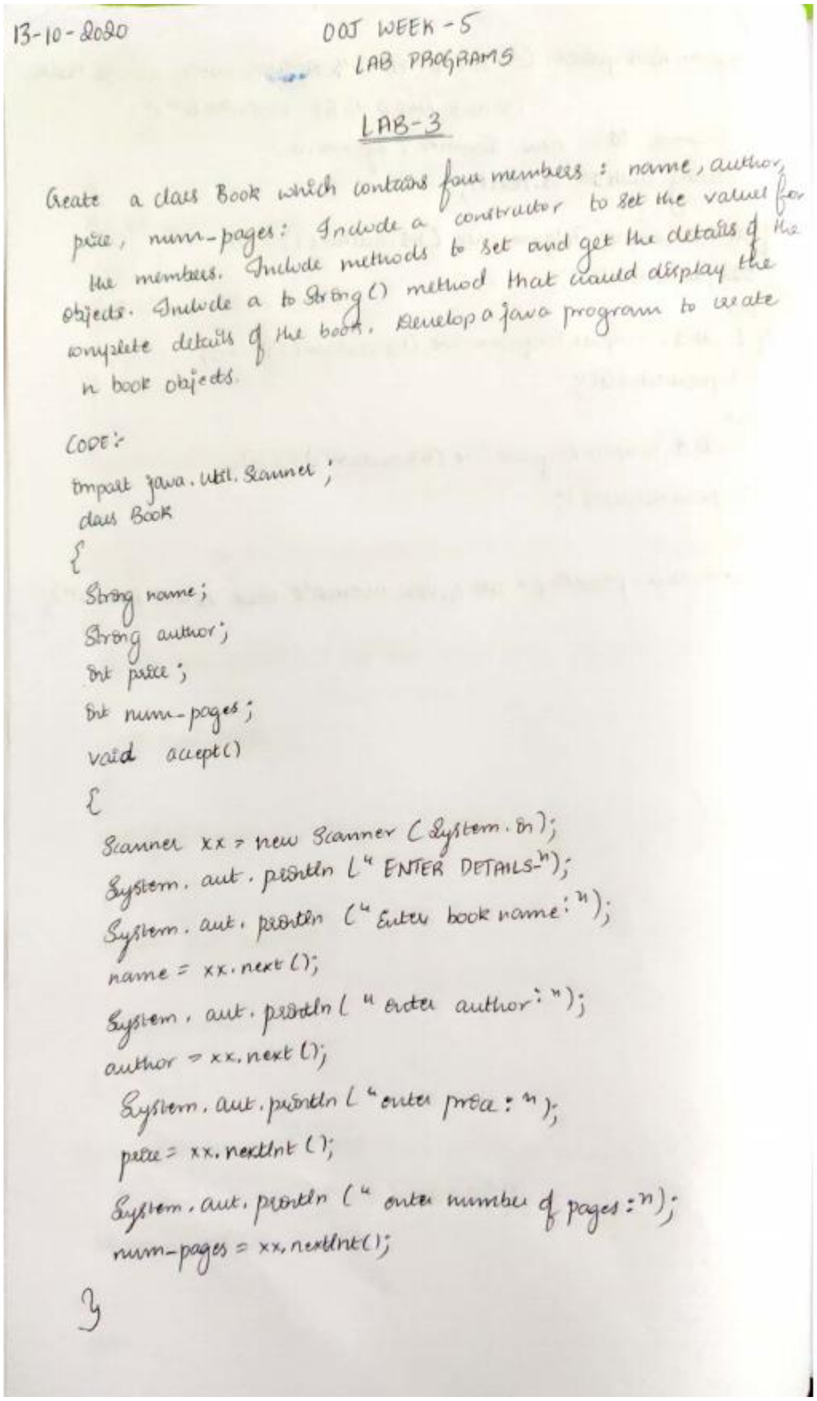


```
Enter student details
USN of the student:
1BM19CS079
Name of student:
RIYA
Enter the number of subjects:
5
Enter credits and marks attained by the student in each subject(out of 100)
5
92
4
84
4
89
4
78
3
65
Student details:
USN:1BM19CS079
Name:RIYA
Marks in each subject:
Subject 1:92
Subject 2:84
Subject 3:89
Subject 4:78
Subject 5:65
SGPA: 8.75
```

LAB-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.

OBSERVATION-



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OOJ WEEK - 5

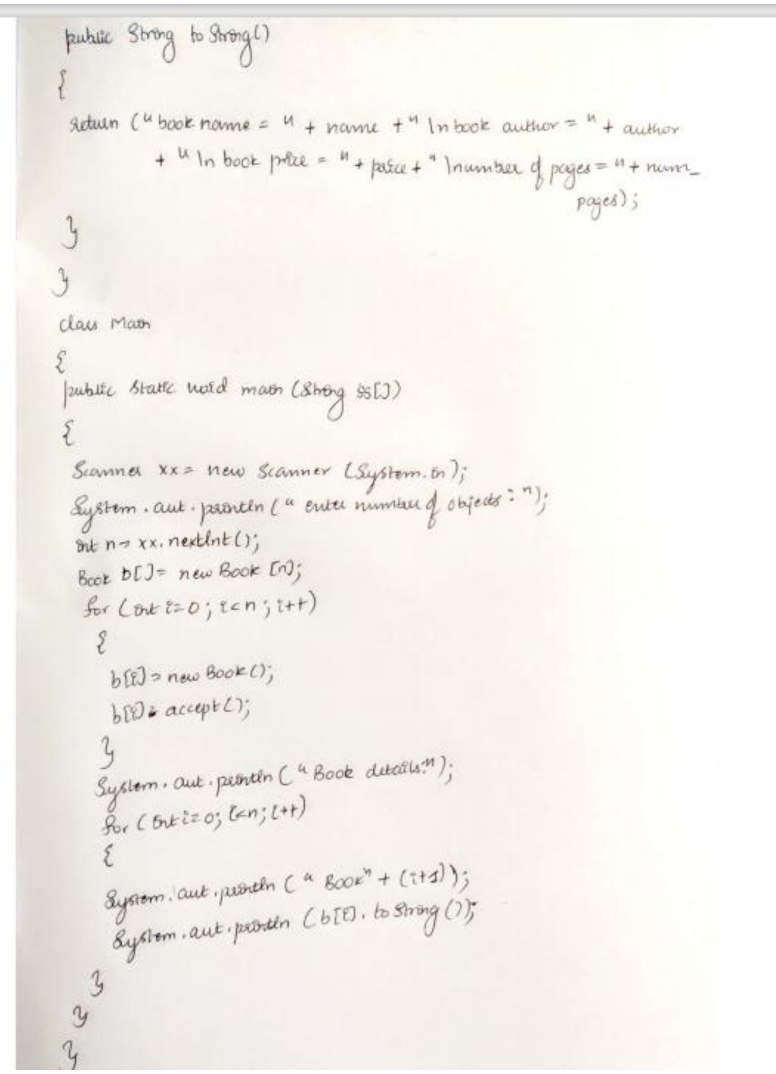
LAB PROGRAMS

LAB-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.

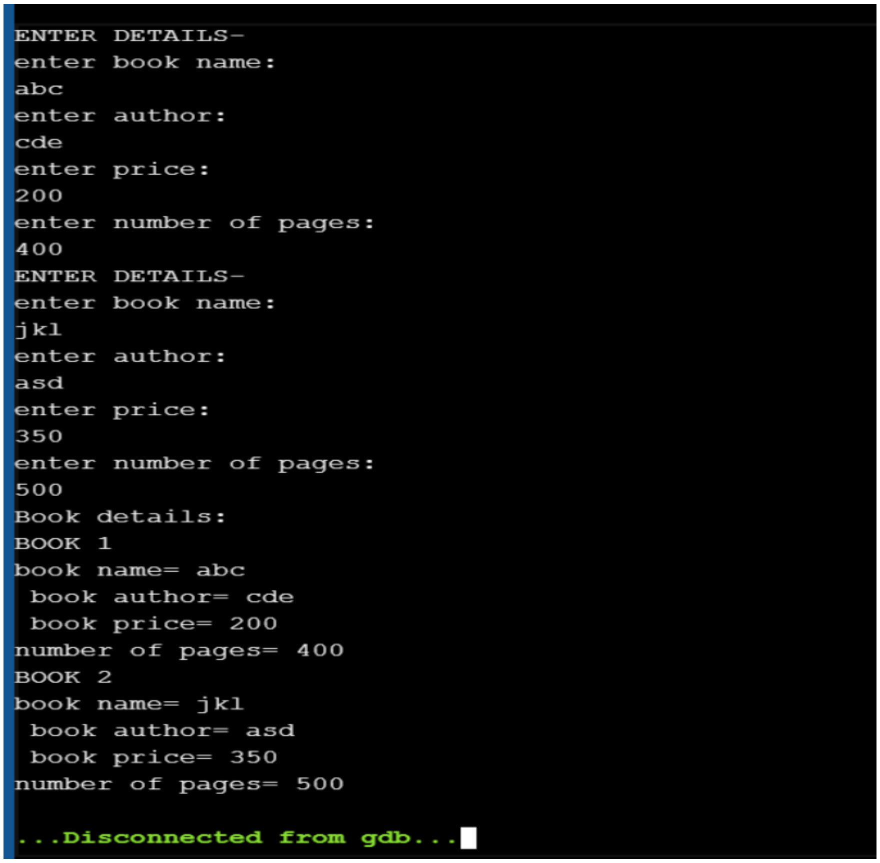
CODE:-

```
import java.util.Scanner;
class Book
{
 String name;
 String author;
 int price;
 int num-pages;
 void accept()
 {
  Scanner xx = new Scanner (System.in);
  System.out.println ("ENTER DETAILS-");
  System.out.println ("Enter book name:");
  name = xx.next ();
  System.out.println ("enter author:");
  author = xx.next ();
   System.out.println ("enter price :");
   price = xx.nextInt ();
  System.out.println (" enter number of pages :");
  num-pages = xx.nextInt();

}
```



```
public String toString()
{
 return ("book name = " + name +" \nbook author = " + author
          + " \n book price = " + price + " \number of pages = " + num_
                                                           pages);
}
}
class Main
{
public static void main (String ss[])
{
 Scanner xx = new Scanner (System.in);
 System.aut.println (" enter number of objects : ");
 int n= xx.nextInt();
 Book b[]= new Book [n];
  for (int i=0 ; i<n ; i++)
   {
    b[i]= new Book();
    b[i]. accept();
   }
  System.aut.println (" Book details:");
  for ( int i=0; i<n; i++)
  {
  System.aut.println (" Book" + (i+1));
   System.aut.println (b[i]. toString();
  }
 }
}
```

OUTPUT-

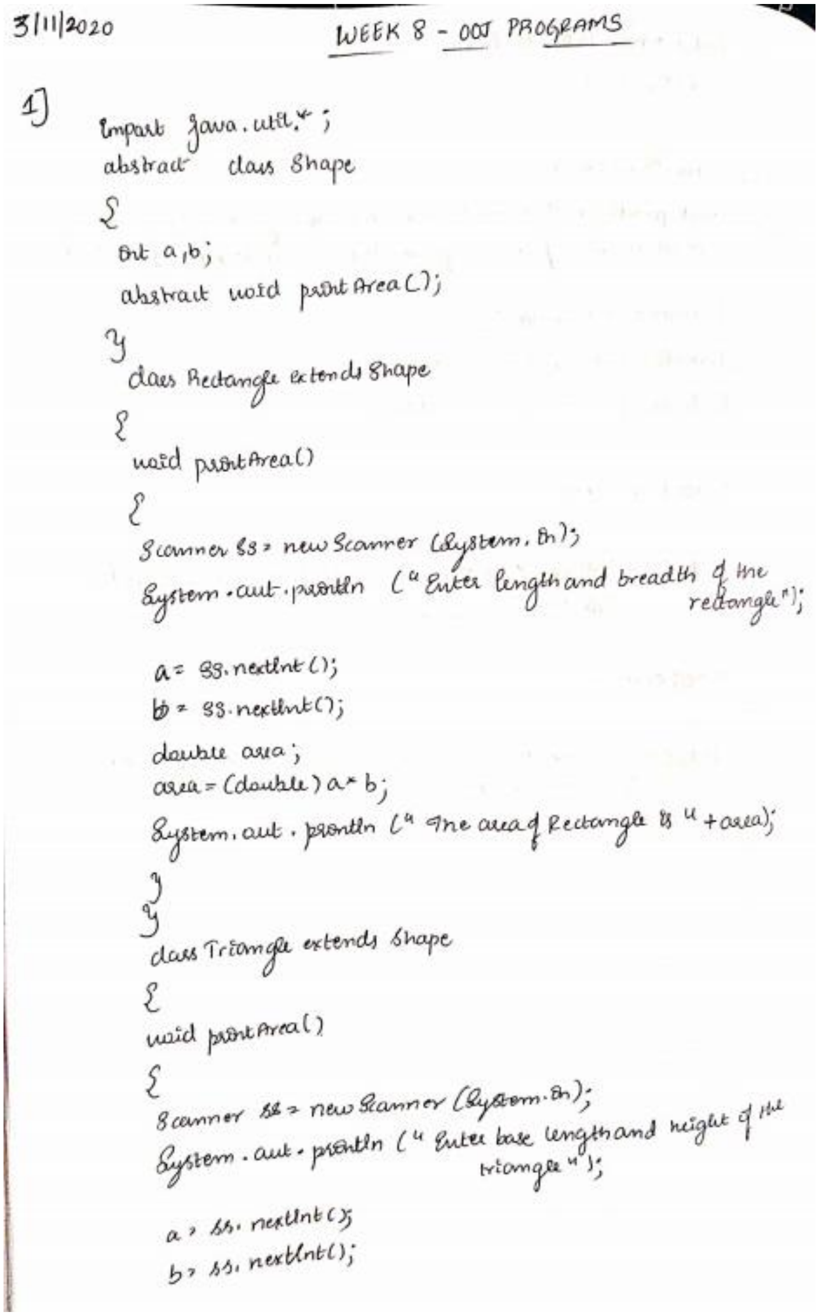


```
ENTER DETAILS-
enter book name:
abc
enter author:
cde
enter price:
200
enter number of pages:
400
ENTER DETAILS-
enter book name:
jkl
enter author:
asd
enter price:
350
enter number of pages:
500
Book details:
BOOK 1
book name= abc
 book author= cde
 book price= 200
number of pages= 400
BOOK 2
book name= jkl
 book author= asd
 book price= 350
number of pages= 500

...Disconnected from gdb...
```

LAB-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.

OBSERVATION-



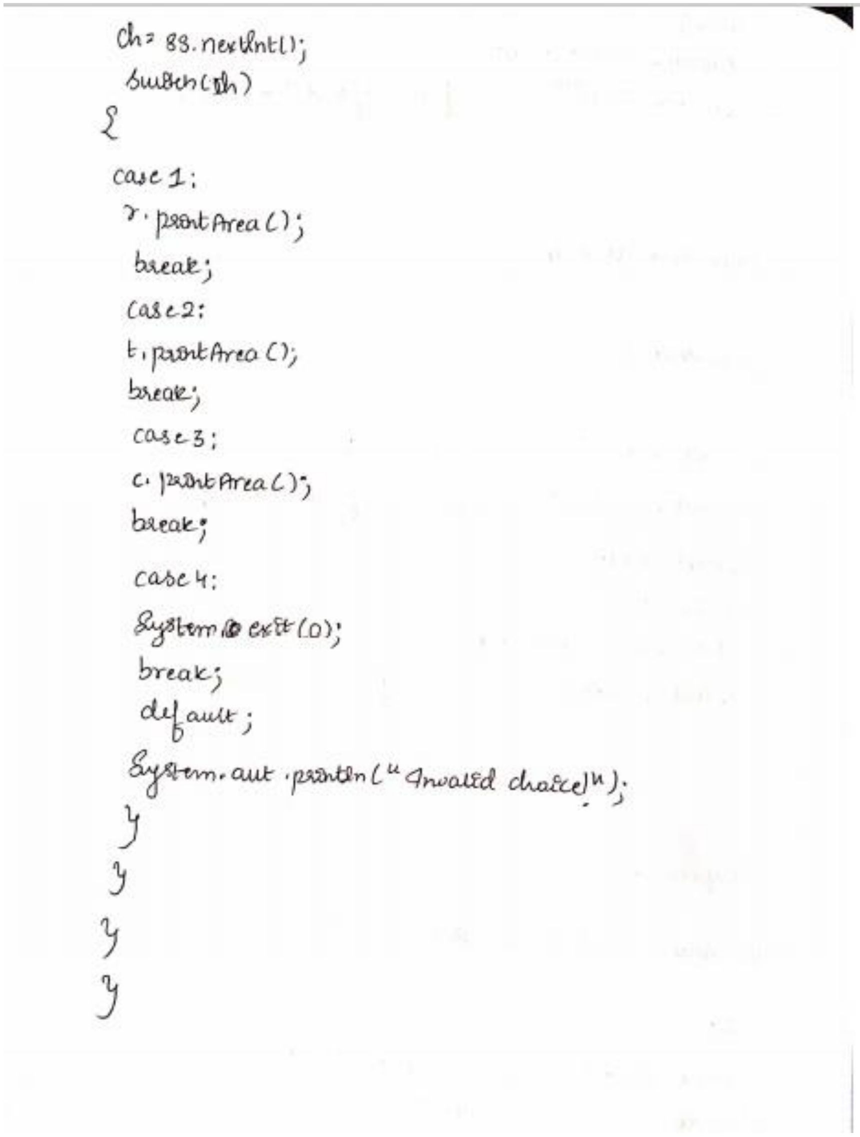
3/11/2020

WEEK 8 - OOJ PROGRAMS

1]

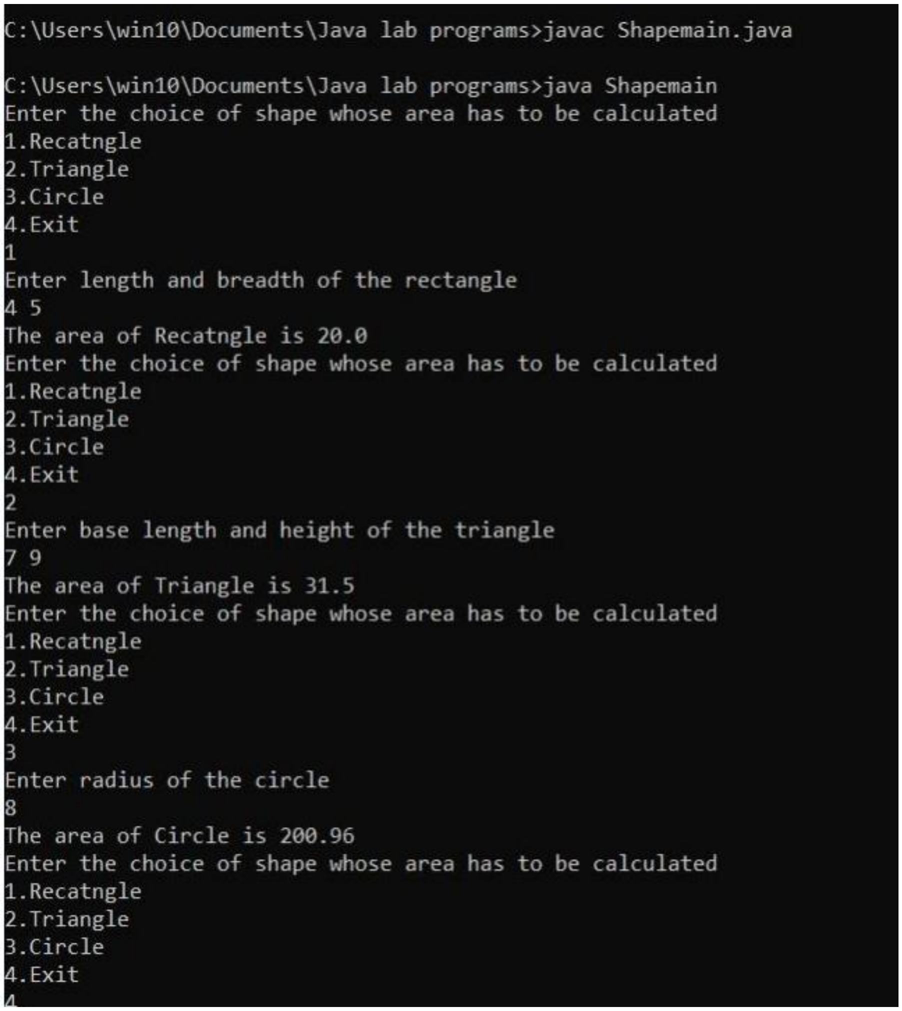
```
import java.util.*;
abstract class Shape
{
 int a,b;
 abstract void printArea();
}
 class Rectangle extends Shape
 {
  void printArea()
  {
   Scanner ss = new Scanner (System.in);
   System.out.println ("Enter length and breadth of the
                                              rectangle");

    a = ss.nextInt();
    b = ss.nextInt();
    double area;
    area = (double) a * b;
    System.out.println (" The area of Rectangle is " + area);
   }
  }
  class Triangle extends Shape
  {
  void printArea()
  {
   Scanner ss = new Scanner (System.in);
   System.out.println (" Enter base length and height of the
                                  triangle ");

    a = ss.nextInt();
    b = ss.nextInt();
```

```
double area;
 area = (double)0.5*a*b;
System.out.println("The area of Triangle is "+area);

}
}
class Circle extends Shape
{
void printArea()
{
Scanner ss= new Scanner(System.in);
 System.out.println(" Enter radius of the circle");
  a= ss.nextInt();
  double area;
  area = (double) 3.14*a*a;
 System.out.println(" The area of Circle is "+area);

}

}

class Shapemain
 {
  public static void main(String args[])
  {
   int ch;
   Scanner ss= new Scanner(System.in);
   Rectangle r= new Rectangle();
    Triangle t= new Triangle();
    Circle c= new Circle();
     while(true){
      System.out.println(" Enter the choice of Shape whose area
                                                    has to be calulated");

      System.out.println("1.Rectangle \n2.Triangle \n3.Circle \n4.Exit");
```



```
Ch= ss.nextInt();
 switch(ch)
{
case 1:
 r.printArea();
 break;
 case2:
 t.printArea();
 break;
 case 3:
 c.printArea();
 break;
 case 4:
 System.exit(0);
 break;
 default;
 System.out.println("Invalid choice");
 }
 }
}
}
```

OUTPUT-

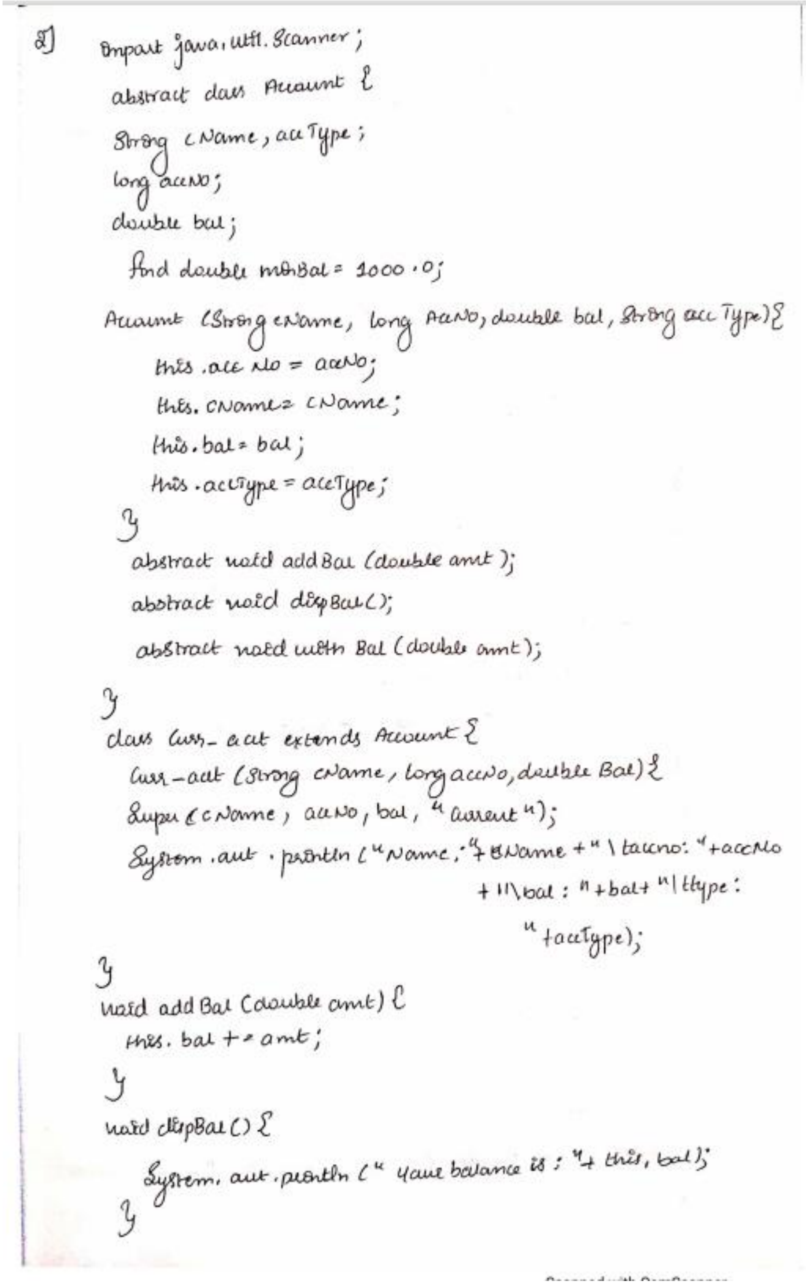


```
C:\Users\win10\Documents\Java lab programs>javac Shapemain.java

C:\Users\win10\Documents\Java lab programs>java Shapemain
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
1
Enter length and breadth of the rectangle
4 5
The area of Recatngle is 20.0
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
2
Enter base length and height of the triangle
7 9
The area of Triangle is 31.5
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
3
Enter radius of the circle
8
The area of Circle is 200.96
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
4
```

LAB-5

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks: • Accept deposit from customer and update the balance. • Display the balance. • Compute and deposit interest • Permit withdrawal and update the balance • Check for the minimum balance, impose penalty if necessary and update the balance.

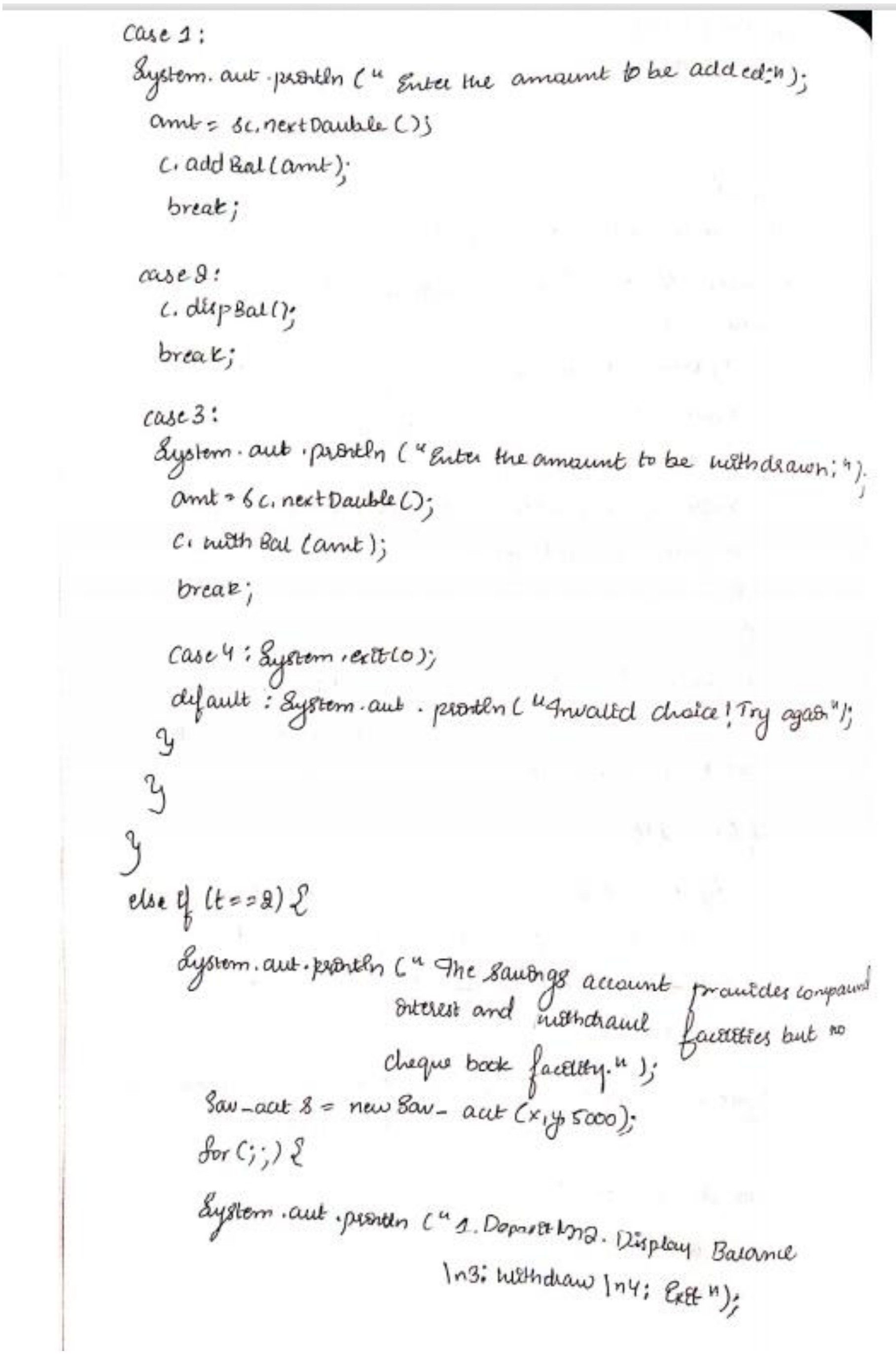
OBSERVATION-



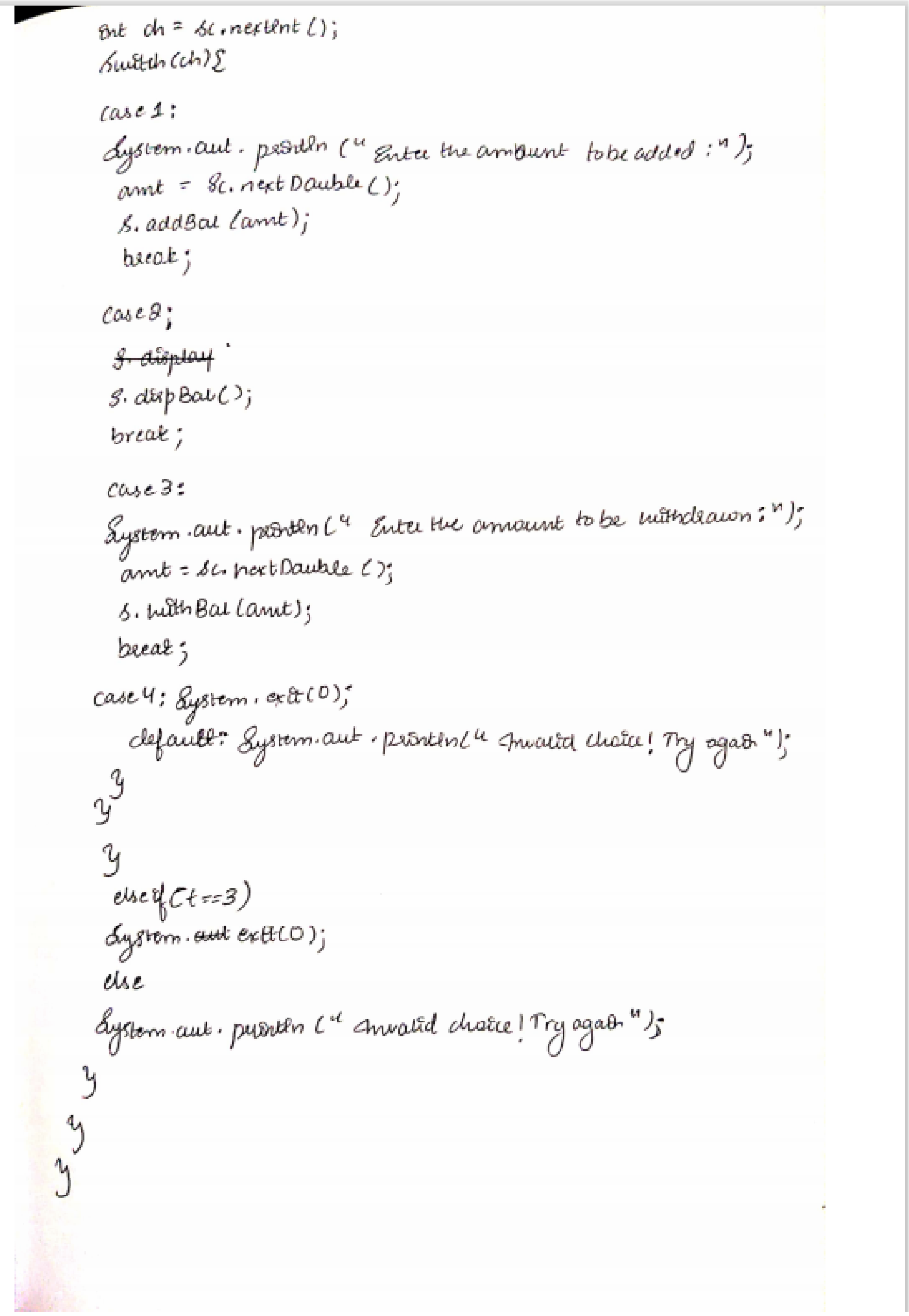
```
2)  import java.util.Scanner;
    abstract class Account {
    String cName, accType;
    long accNo;
    double bal;
      final double minBal = 1000.0;
    Account (String cName, long AccNo, double bal, String accType){
          this.acc No = accNo;
          this. cName= cName;
          this.bal= bal;
          this.accType = accType;
     }
      abstract void addBal (double amt);
      abstract void dispBal();
      abstract void with Bal (double amt);
    }
    class Curr_acct extends Account {
      Curr_acct (String cName, long accNo, double Bal){
      Super (cName, accNo, bal, "current");
      System.out.println ("Name:"+cName + "\taccno: "+accNo
                                        +"\bal: "+bal+"\ttype:
                                             "+accType);
    }
    void addBal (double amt) {
      this. bal += amt;
     }
    void dispBal() {
        System.out.println (" your balance is : "+ this, bal);
     }
```

```
void checkBal(){
 if (this.bal< minBal){
     System.out.println("Insufficient balance, penalty
                               imposed");
     this.bal = this.bal *0.02;
   }
 }
 void withBal(double amt){
   this.Bal = -amt;
   check Bal();
  }
}
class Sav-acct extends Accounts{
  Sav-acct (String cName, long accNo, double bal){
   Super(cName, accNo, bal, "Savings");
  System.out.println("name: "+cName +"\taccno: "
                   + "\tbal: "+ bal + "\ttype: "+ accType);
 }
 void add Bal (double amt){
   this. bal += amt;
   addIntr();
 }
 void addIntr(){
   this.bal + = this.bal * 0.07;
 }
 void dispBal(){
   System.out.println("Your balance is: "+ this.balance);
 }
```

```
void withBal (double amt) {
   this. bal=amt;
 }
}
class Bank{
  public static void main (String [] args) {
    Scanner sc= new Scanner (System.in);
    Double amt;
        System.out.println (" Enter your details:");
        System.out.println (" Name");
        String x= sc.next ();
        System.out.println (" Account Number:");
        long y = sc.nextLong ();
        for (;;)
      {
      System.out.println ("Type of account: \n1. current account
                              \n2. Savings account \n3. Exit ");
      int t = sc.nextInt();

      if (t==1){

        System.out.println(" The current account provides
          cheque book facility but no interest:");
        curr_ acct c= new curr_acct (x,y, 50000);
      for(;;)

     System.out.println (" 1: Deposit \n2. Display Balance \n3:
                              withdraw \n4: Exit");

      int ch = sc.nextInt();

      switch (ch) {
```

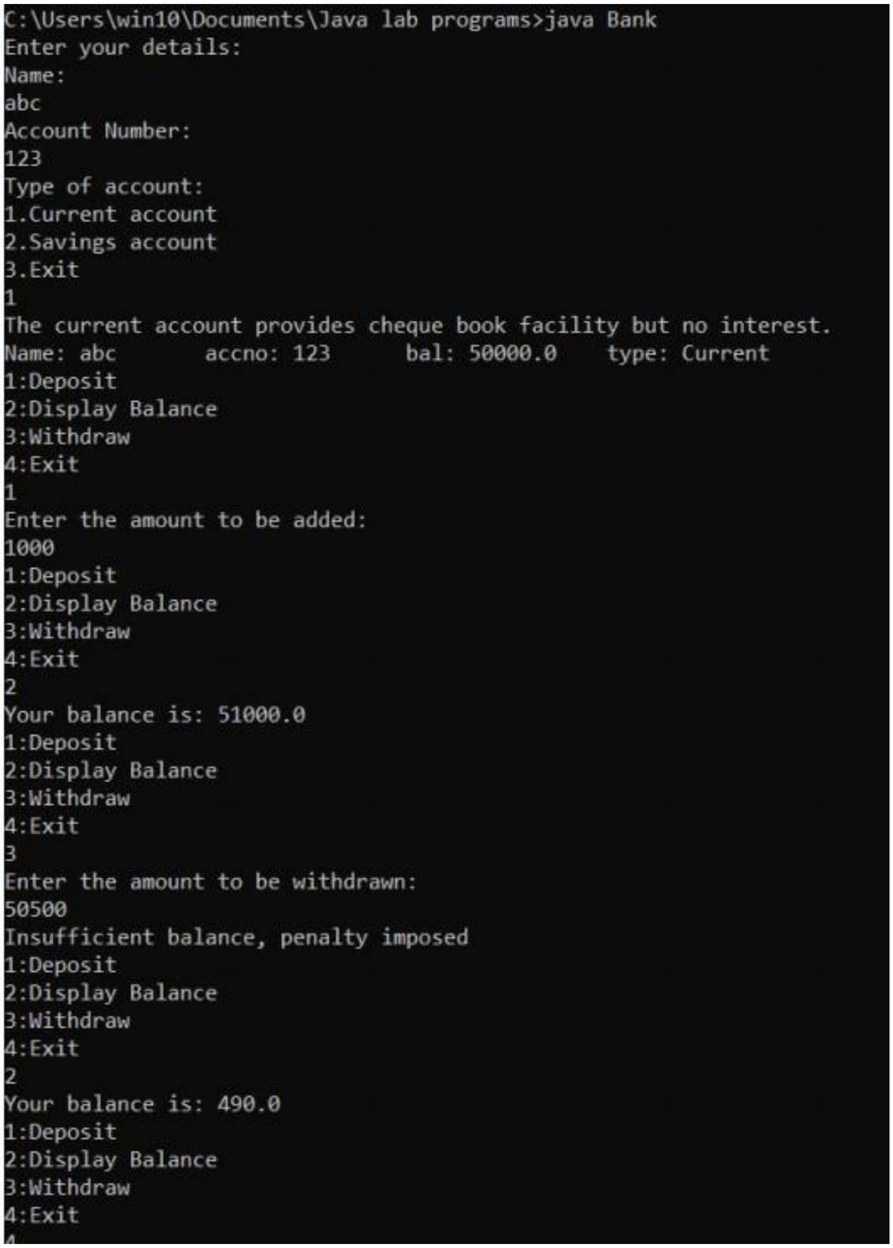


```
Case 1:
System.out.println ("Enter the amount to be added:");
 amt = sc.nextDouble ();
  c.addBal(amt);
   break;

 case 2:
  c.dispBal();
  break;

 case 3:
 System.out.println ("Enter the amount to be withdrawn:");
  amt = sc.nextDouble();
  c.withBal (amt);
   break;

  Case 4: System.exit(0);
  default : System.out.println ("Invalid choice! Try again");
 }
 }
}
else if (t==2) {
    System.out.println ("The Savings account provides compound
                  interest and withdrawl facilities but no
                  cheque book facility.");
   Sav_act s = new Sav_act (x,y,5000);
   for(;;) {
   System.out.println ("1. Deposit\n2. Display Balance
                     \n3: Withdraw \n4: Exit");
```

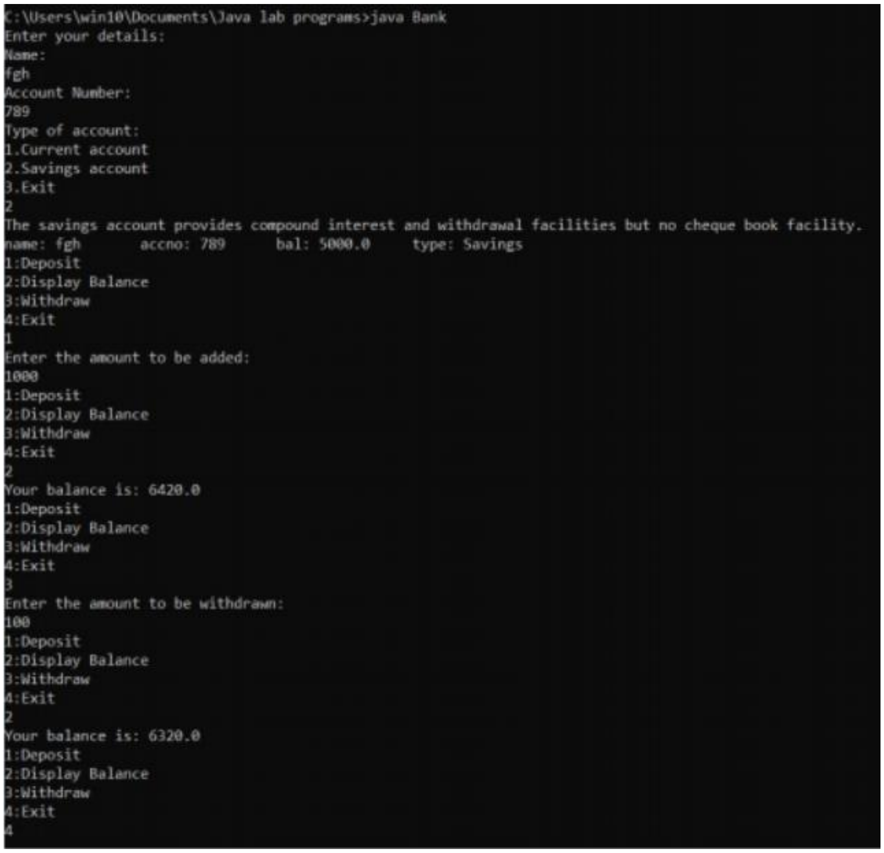


```
int ch = sc.nextInt();
switch(ch){

case 1:
System.out.println("Enter the amount tobe added :");
 amt = sc.nextDouble();
 s.addBal(amt);
 break;

case 2;
 ~~s.display~~
 s.dispBal();
 break;

 case 3:
System.out.println(" Enter the amount to be withdrawn:");
 amt = sc.nextDouble();
 s.withBal(amt);
 break;
case 4: System.exit(0);
   default: System.out.println(" Invalid choice! Try again");
 }
}

 }
 else if(t==3)
 System.~~out~~ exit(0);
 else
System.out.println(" Invalid choice! Try again");
}
}
}
```

OUTPUT-



```
C:\Users\win10\Documents\Java lab programs>java Bank
Enter your details:
Name:
abc
Account Number:
123
Type of account:
1.Current account
2.Savings account
3.Exit
1
The current account provides cheque book facility but no interest.
Name: abc       accno: 123      bal: 50000.0    type: Current
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
1000
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 51000.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
50500
Insufficient balance, penalty imposed
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 490.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4
```

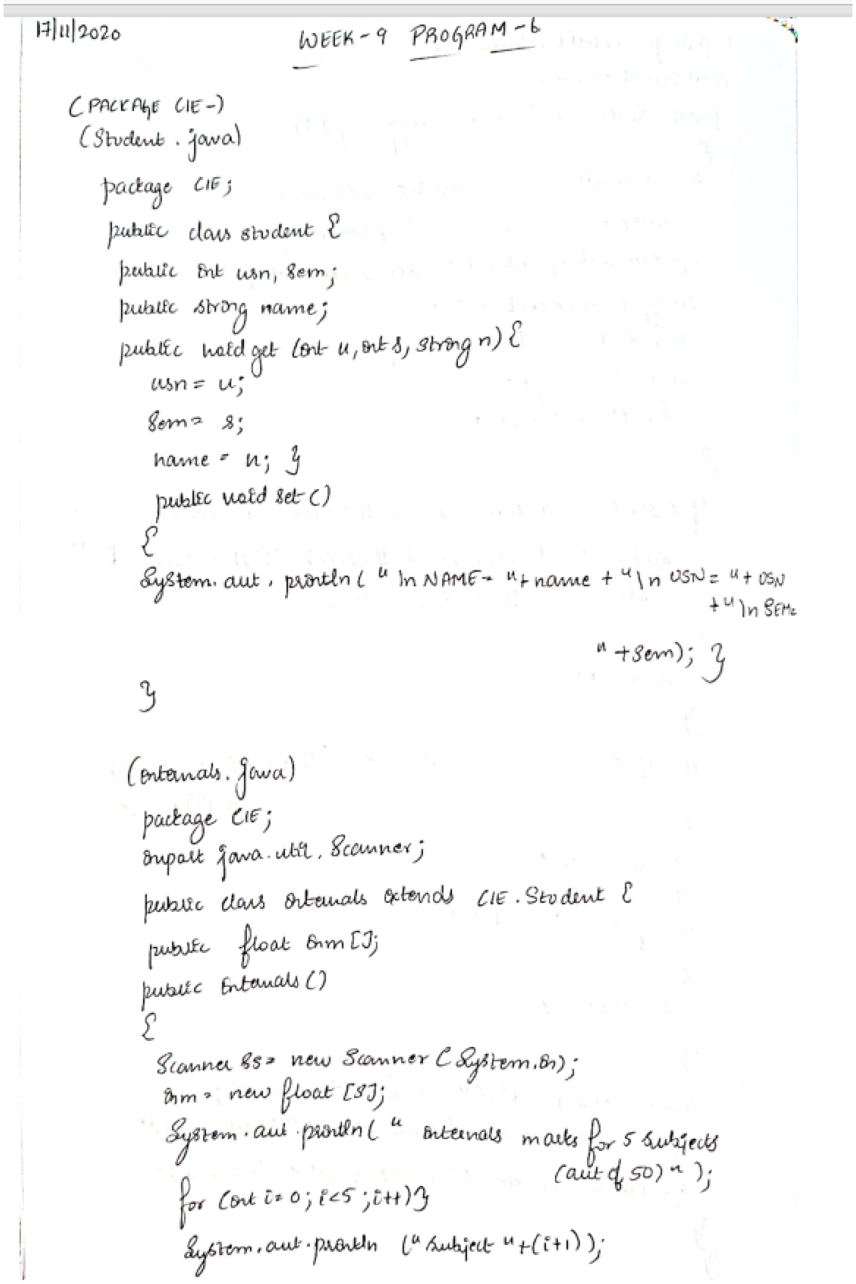


```
C:\Users\win10\Documents\Java lab programs>java Bank
Enter your details:
Name:
fgh
Account Number:
789
Type of account:
1.Current account
2.Savings account
3.Exit
2
The savings account provides compound interest and withdrawal facilities but no cheque book facility.
name: fgh       accno: 789      bal: 5000.0     type: Savings
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
1000
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 6420.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
100
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 6320.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4
```

LAB-6

Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class Internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses.

OBSERVATION-



17/11/2020

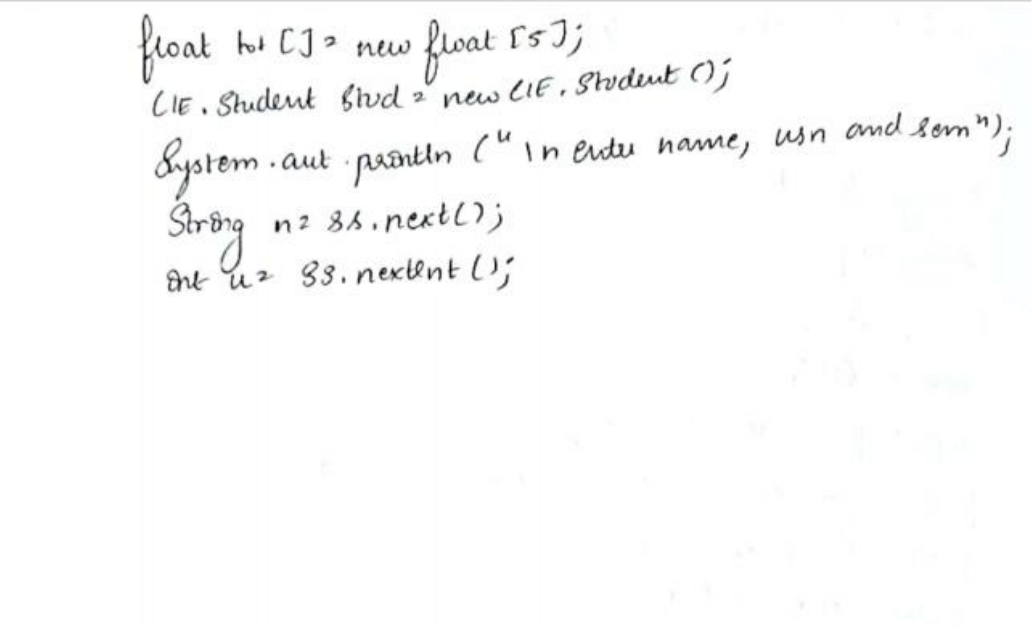
WEEK-9 PROGRAM-6

(PACKAGE CIE-)
(Student.java)

```
 package CIE;
 public class student {
  public int usn, sem;
  public string name;
  public void get (int u, int s, string n){
    usn = u;
    sem = s;
    name = n; }
    public void set()
   {
   System.out.println(" \n NAME= "+ name + "\n USN = "+ USN
                                                   +"\n SEM=
                                       "+sem); }

   }
```

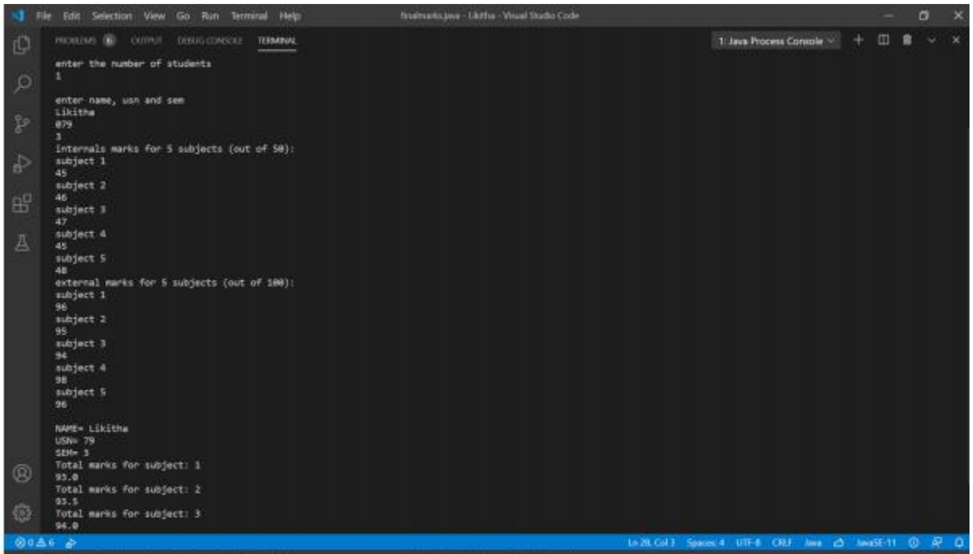
(internals.java)

```
  package CIE;
  import java.util.Scanner;
  public class internals extends CIE.Student {
  public float inm[];
  public Internals()
  {
   Scanner ss= new Scanner(System.in);
   inm= new float[5];
   System.out.println(" internals marks for 5 subjects
                                      (out of 50)" );
    for (int i=0; i<5; i++)}
    System.out.println ("Subject "+(i+1));
   enm [i] = ss.nextFloat(); }

}
}
(Package SEE-)
 (external.java)

 package SEE;
  import CIE*;
  import java.util.Scanner;
  public class external extends CIE.Student {
  public float exam[];
   public external (){
   Scanner ss= new Scanner (System.in);
    exam= new float [5];
   System.out.println (" external marks for 5 Subject
                                                  (out of 100); ");
    for (int i=0;i<5;i++){
   System.out.println("Subject "+(i+1));
    exm [i]= SS.nextFloat (); }
   }
  }

(Driver class-)
 (finalmarks.java)
 import CIE.*;
 import SEE.*;
 import java.util.Scanner;
  class finalmarks {
  public static void main (Strings args [])[
  Scanner ss= new Scanner (System.in);
  System.out.println (" enter the number of students ");
  int no= ss.nextInt();
  for (int j=0 ; j<no; j++){
```



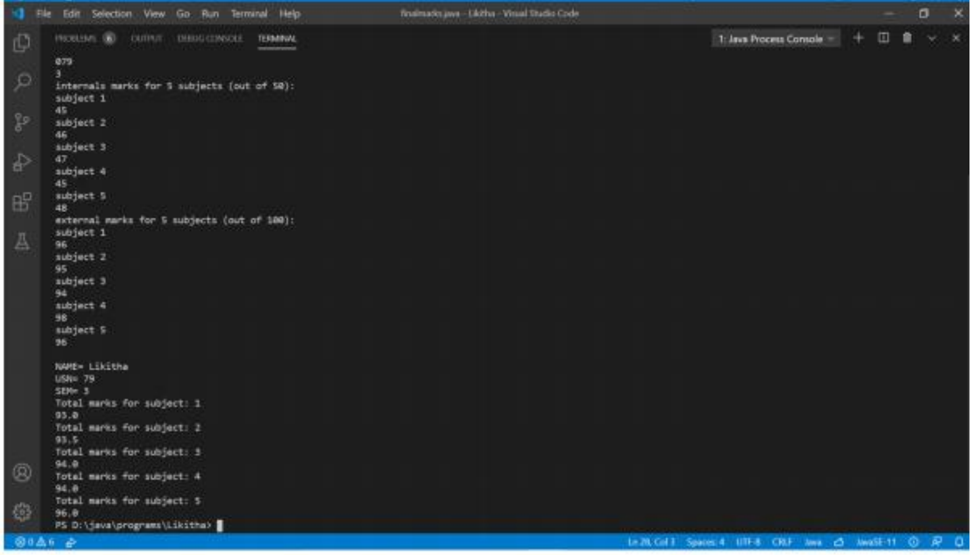
```
float tot [] = new float [5];
CIE.Student stud = new CIE.Student ();
System.out.println ("\n enter name, usn and sem");
String n = ss.next();
int u = ss.nextInt ();
```

OUTPUT-



File Edit Selection View Go Run Terminal Help
finalmarks.java - Likitha - Visual Studio Code
PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL
1: Java Process Console
Ln 28, Col 3 Spaces: 4 UTF-8 CRLF Java JavaSE-11

```
enter the number of students
1

enter name, usn and sem
Likitha
079
3
internals marks for 5 subjects (out of 50):
subject 1
45
subject 2
46
subject 3
47
subject 4
45
subject 5
48
external marks for 5 subjects (out of 100):
subject 1
96
subject 2
95
subject 3
94
subject 4
98
subject 5
96

NAME= Likitha
USN= 79
SEM= 3
Total marks for subject: 1
93.0
Total marks for subject: 2
93.5
Total marks for subject: 3
94.0
```

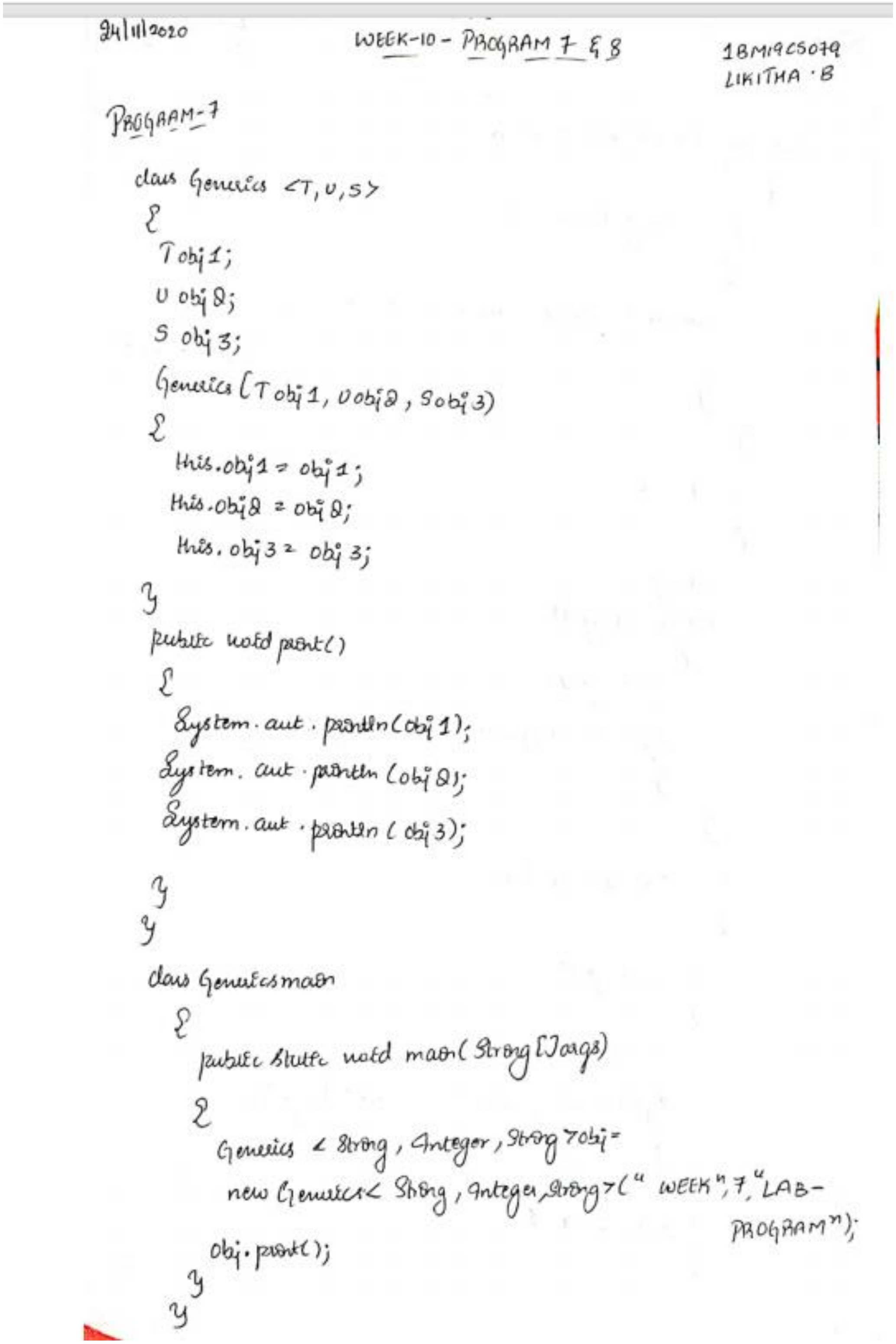


File Edit Selection View Go Run Terminal Help
finalmarks.java - Likitha - Visual Studio Code
PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL
1: Java Process Console
Ln 28, Col 3 Spaces: 4 UTF-8 CRLF Java JavaSE-11

```
079
3
internals marks for 5 subjects (out of 50):
subject 1
45
subject 2
46
subject 3
47
subject 4
45
subject 5
48
external marks for 5 subjects (out of 100):
subject 1
96
subject 2
95
subject 3
94
subject 4
98
subject 5
96

NAME= Likitha
USN= 79
SEM= 3
Total marks for subject: 1
93.0
Total marks for subject: 2
93.5
Total marks for subject: 3
94.0
Total marks for subject: 4
94.0
Total marks for subject: 5
96.0
PS D:\java\programs\Likitha>
```

LAB-7

Write a program to demonstrate generics with multiple object parameters



24|11|2020

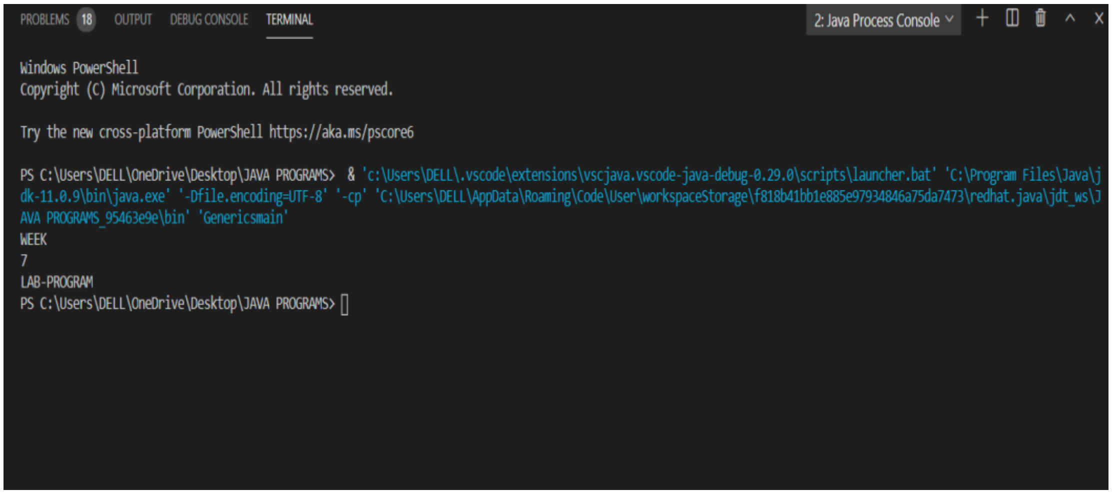
WEEK-10 - PROGRAM 7 & 8

1BM19CS079
LIKITHA · B

PROGRAM-7

```
class Generics <T,U,S>
{
 T obj1;
 U obj2;
 S obj3;
 Generics (T obj1, U obj2 , S obj3)
 {
   this.obj1 = obj1;
   this.obj2 = obj2;
   this.obj3 = obj3;
 }
 public void print()
  {
   System.out.println(obj1);
  System.out.println (obj2);
   System.out.println ( obj3);

  }
}
class Genericsmain
  {
   public static void main(String[]args)
   {
    Generics < String , Integer , String >obj=
    new Generics< String , Integer, String>(" WEEK",7,"LAB-
                                          PROGRAM");
    obj.print();
   }
  }
```

OUTPUT-



```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS>  & 'c:\Users\DELL\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\j
dk-11.0.9\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\DELL\AppData\Roaming\Code\User\workspaceStorage\f818b41bb1e885e97934846a75da7473\redhat.java\jdt_ws\J
AVA PROGRAMS_95463e9e\bin' 'Genericsmain'
WEEK
7
LAB-PROGRAM
PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS> ▯
```

LAB-8

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 Wrong Age(when the input age=father’s age.

OBSERVATION-

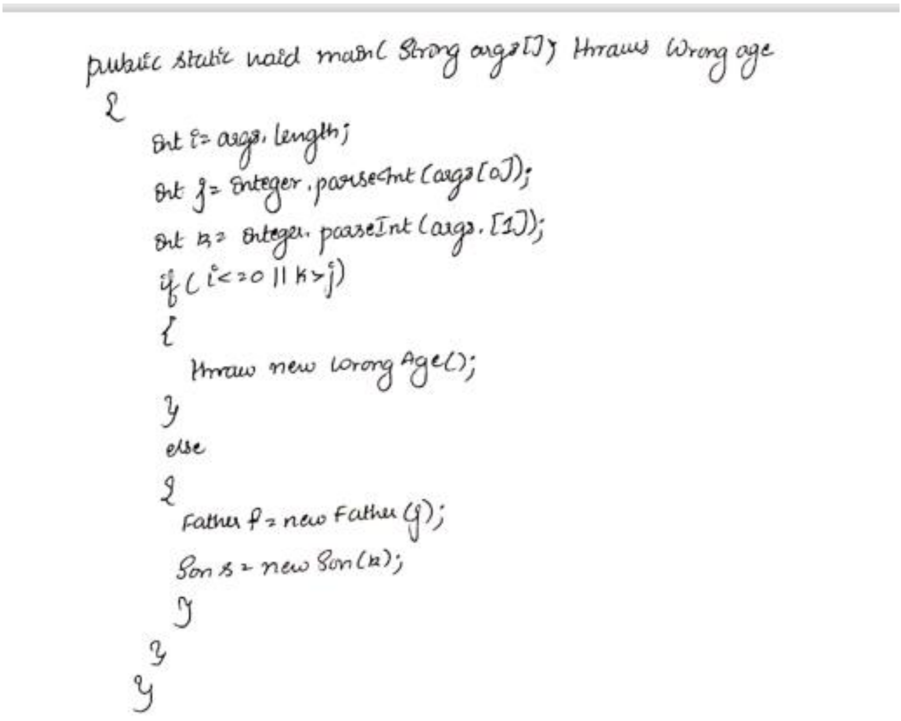
24/11/2020

B

1BM19CS079

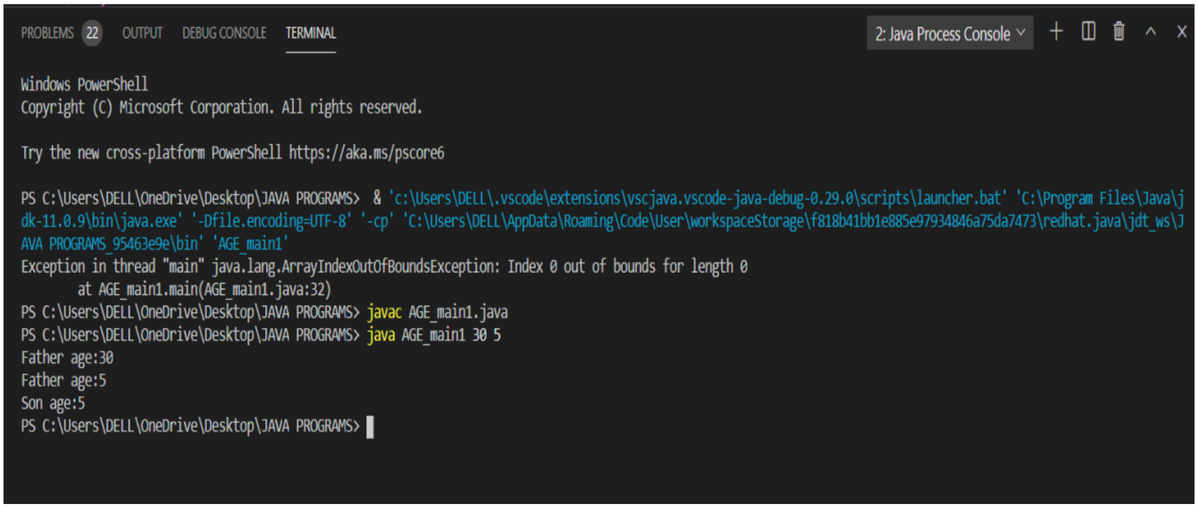
PROGRAM-8

```
class WrongAge extends Exception
  {
    public String toString()
     {
       return " Please enter the right age : "+" Son's age >
                                               Father's age";
     }
   }
   class Father
   {
      int age;
      Father (int age1)
        {
          age = age 1;
          System.out.println( " Father age : " +age);
          }
     }
     Class Son extends Father
     {
       Son (int age1)
       {
         super (age 1);
         System.out.println(" Son age! "+age);
         }
       }
       class AGE_main1
       {
```



```
public static void main( String args[]) throws Wrong age
{
    int i= args.length;
    int j= Integer.parseInt(args[0]);
    int k= Integer.parseInt(args.[1]);
    if( i<=0 || k>j)
    {
      throw new WrongAge();
    }
    else
    {
     Father f = new Father(j);
     Son s = new Son(k);
     }
  }
}
```

OUTPUT-



```
Windows PowerShell
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PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS>  & 'c:\Users\DELL\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\j
dk-11.0.9\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\DELL\AppData\Roaming\Code\User\workspaceStorage\f818b41bb1e885e97934846a75da7473\redhat.java\jdt_ws\J
AVA PROGRAMS_95463e9e\bin' 'AGE_main1'
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 0 out of bounds for length 0
        at AGE_main1.main(AGE_main1.java:32)
PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS> javac AGE_main1.java
PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS> java AGE_main1 30 5
Father age:30
Father age:5
Son age:5
PS C:\Users\DELL\OneDrive\Desktop\JAVA PROGRAMS> 
```
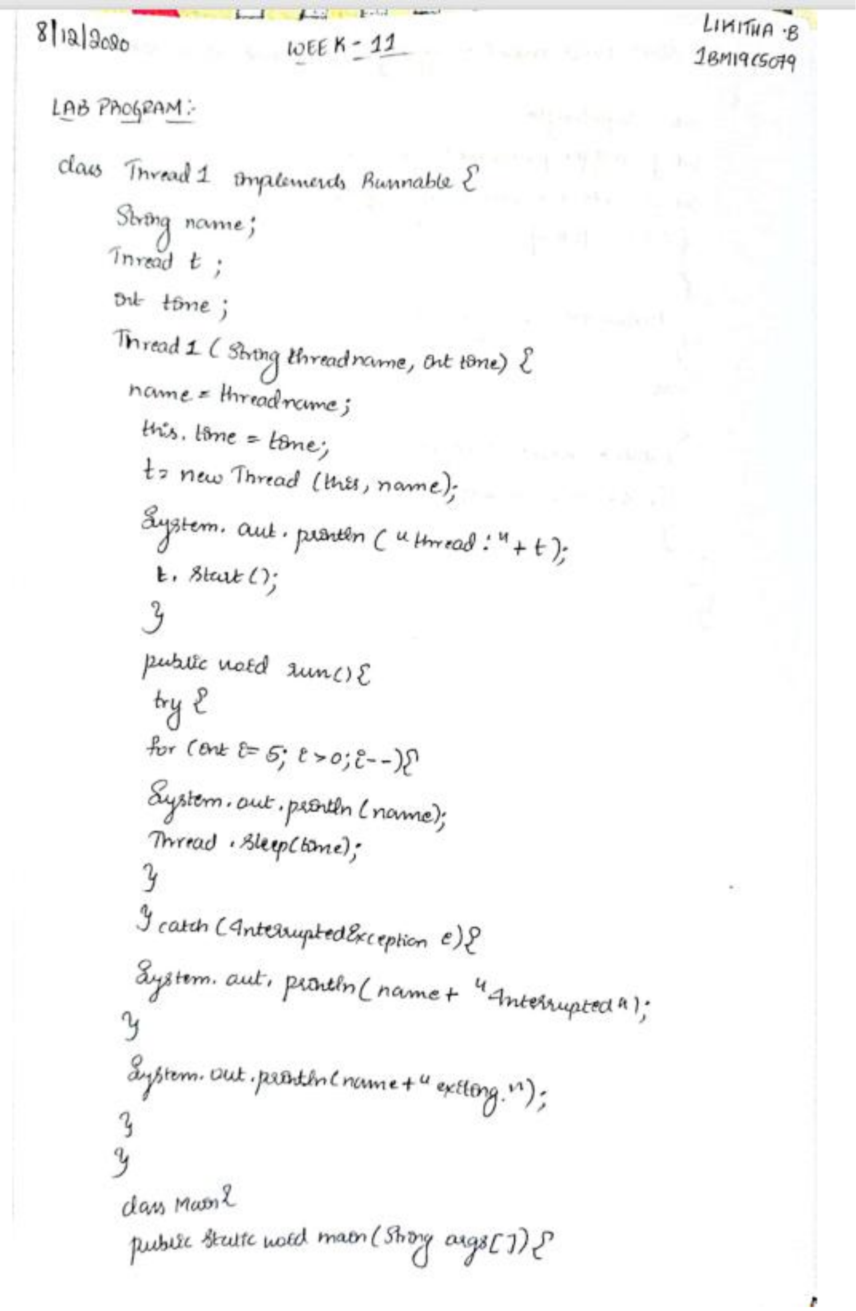

LAB-9

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.

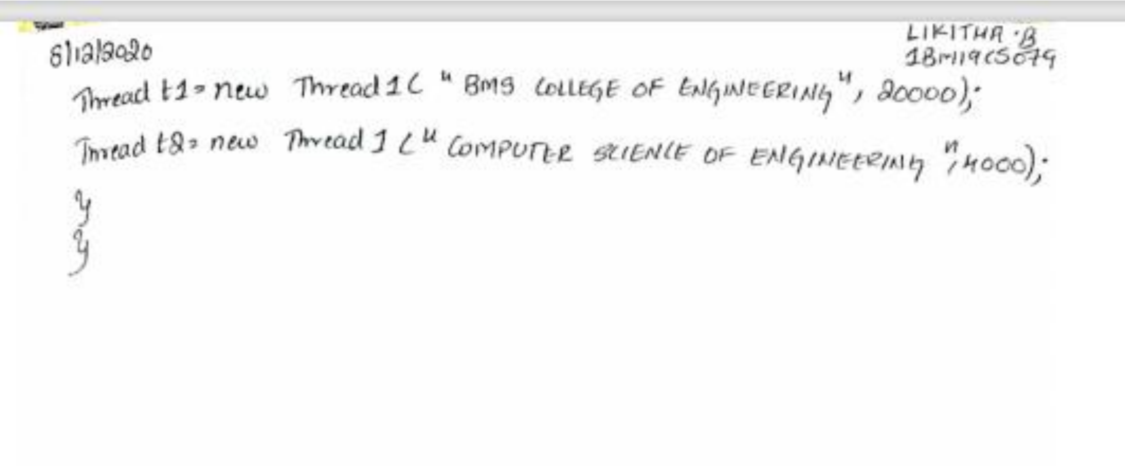
OBSERVATION-



8/12/2020 WEEK - 11 LIKITHA ·B
1BM19CS079

LAB PROGRAM :-

```
class Thread1 implements Runnable {
     String name;
     Thread t;
     int time;
     Thread1 ( String threadname, int time) {
      name = threadname;
       this.time = time;
       t = new Thread (this, name);
       System.out.println ( "thread:" + t);
        t.start();
       }
       public void run(){
        try {
        for (int i= 5; i>0; i--){
        System.out.println(name);
        Thread.sleep(time);
        }
       } catch (InterruptedException e){
       System.out.println(name+ "Interrupted");
      }
      System.out.println(name+" exiting.");
     }
    }
    class Main{
     public static void main (String args[]){
```

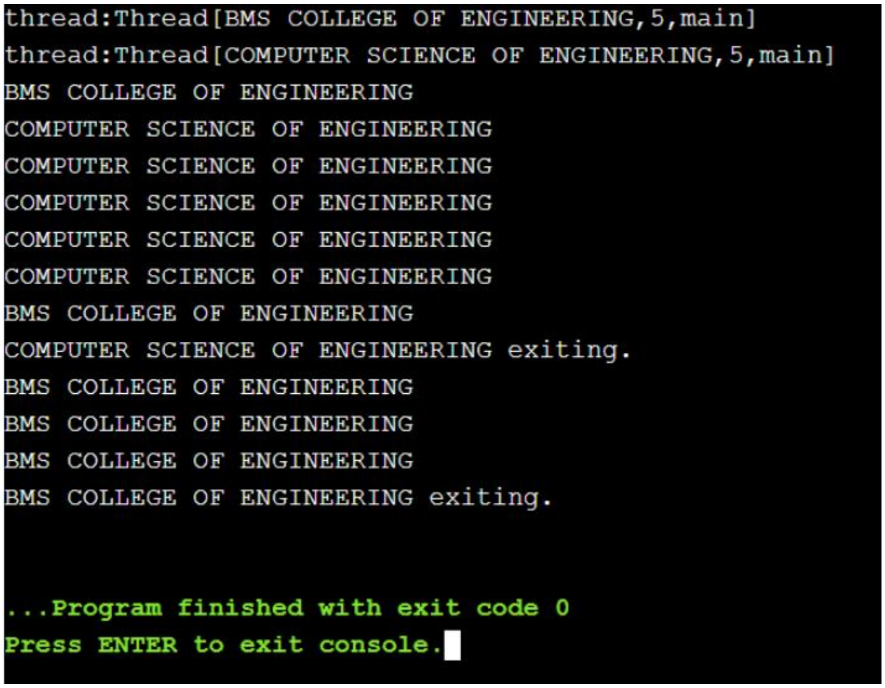


6|12|2020

LIKITHA.B
1BM19CS079

```
Thread t1= new Thread1( "BMS COLLEGE OF ENGINEERING", 20000);
Thread t2= new Thread1 (" COMPUTER SCIENCE OF ENGINEERING ",4000);
}
}
```

OUTPUT-

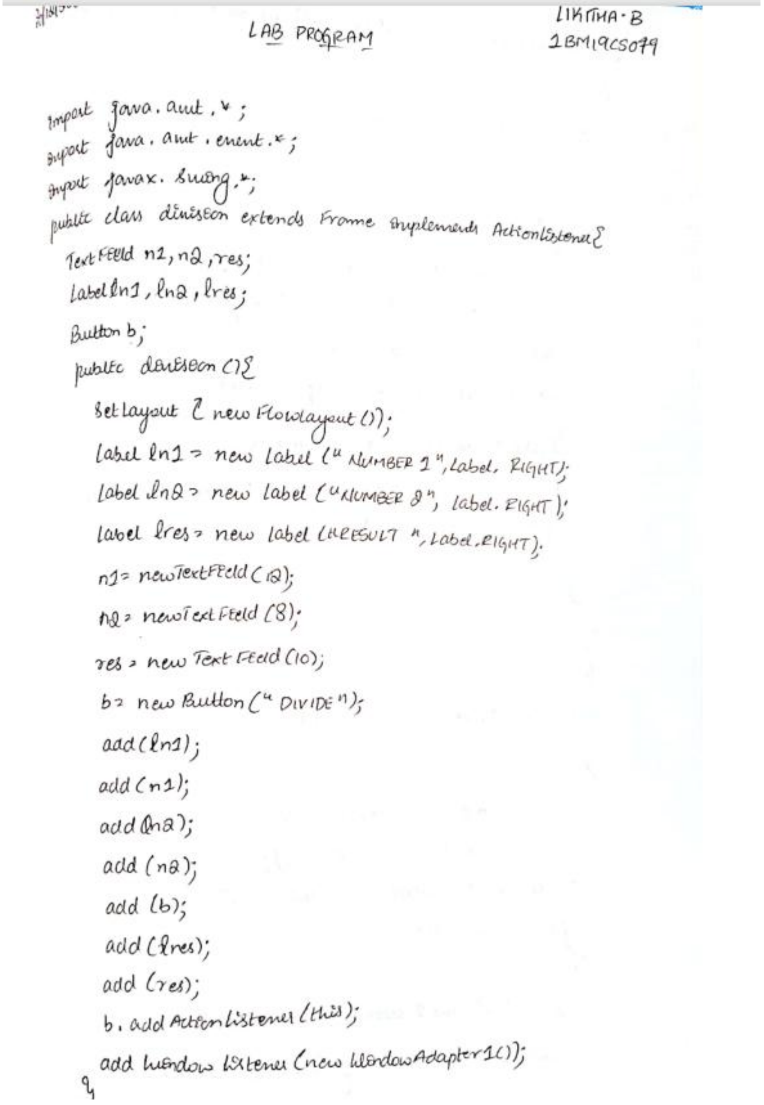


```
thread:Thread[BMS COLLEGE OF ENGINEERING,5,main]
thread:Thread[COMPUTER SCIENCE OF ENGINEERING,5,main]
BMS COLLEGE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING
BMS COLLEGE OF ENGINEERING
COMPUTER SCIENCE OF ENGINEERING exiting.
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING exiting.


...Program finished with exit code 0
Press ENTER to exit console.
```

LAB-10

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

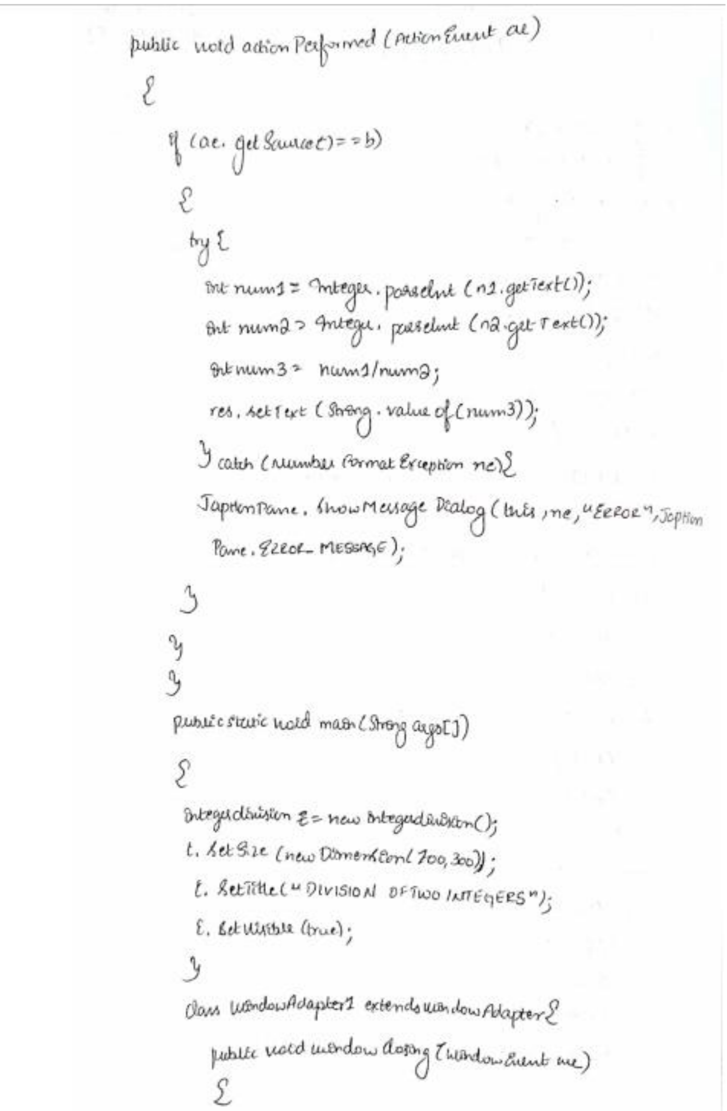
OBSERVATION-



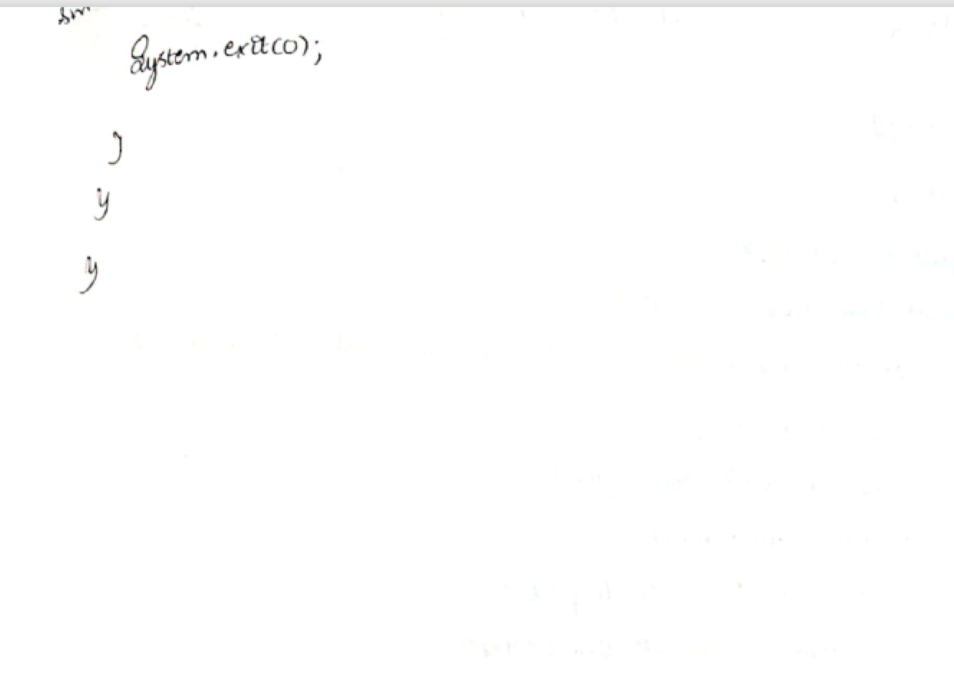
LAB PROGRAM

LIKITHA·B
1BM19CS079

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
public class division extends Frame implements ActionListener{
  TextField n1,n2,res;
  Label ln1, ln2, lres;
  Button b;
  public division (){
    Setlayout ( new Flowlayout ());
    label ln1 = new Label ("NUMBER 1", Label. RIGHT);
    label ln2 = new label ("NUMBER 2", label. RIGHT);
    label lres = new label ("RESULT ", Label.RIGHT).
    n1= newTextField (12);
    n2 = newTextField (8);
    res = new TextField (10);
    b = new Button ("DIVIDE");
    add(ln1);
    add (n1);
    add(ln2);
    add (n2);
    add (b);
    add (lres);
    add (res);
    b. add ActionListener (this);
    add window Listener (new WindowAdapter1());
  }
```

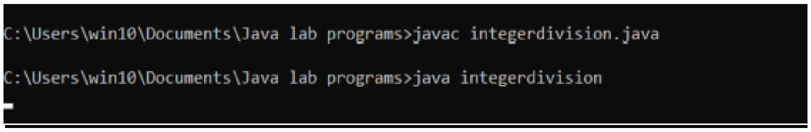


```
public void actionPerformed (ActionEvent ae)
 {
   if (ae. getSource()==b)
    {
     try {
       int num1 = Integer. parseInt (n1.getText());
       int num2 = Integer. parseInt (n2.getText());
       int num3 = num1/num2;
       res. setText (String. value of(num3));
     } catch (NumberFormatException ne){
     JoptionPane. showMessage Dialog (this, ne, "ERROR", Joption
       Pane. ERROR_MESSAGE);
    }
  }
  }
  public static void main(String args[])
  {
   Integerdivision t = new Integerdivision();
   t. setSize (new Dimension(700,300));
    t. setTitle("DIVISION OFTWO INTEGERS");
    t. setVisible (true);
  }
  class WindowAdapter1 extends windowAdapter{
     public void window closing (WindowEvent we)
     {
```

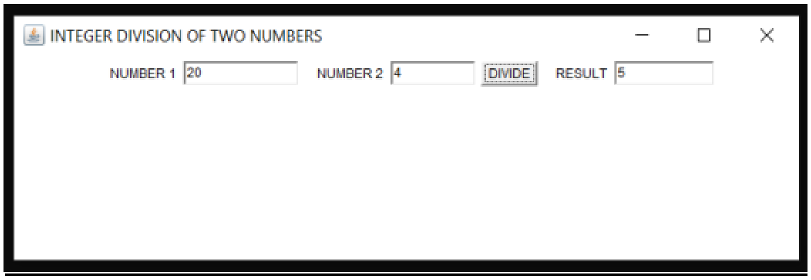


```
      System.exit(0);

    }
   }
  }
```

OUTPUT-

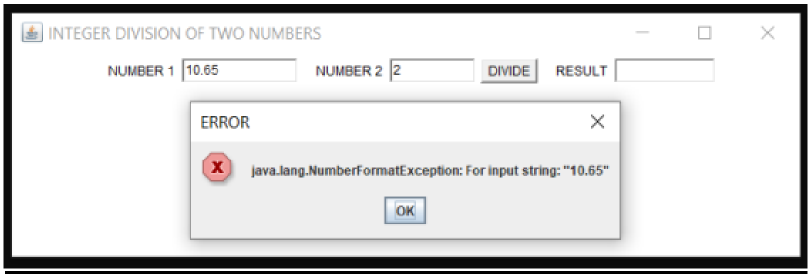


```
C:\Users\win10\Documents\Java lab programs>javac integerdivision.java

C:\Users\win10\Documents\Java lab programs>java integerdivision
```



INTEGER DIVISION OF TWO NUMBERS

NUMBER 1 20 NUMBER 2 4 RESULT 5

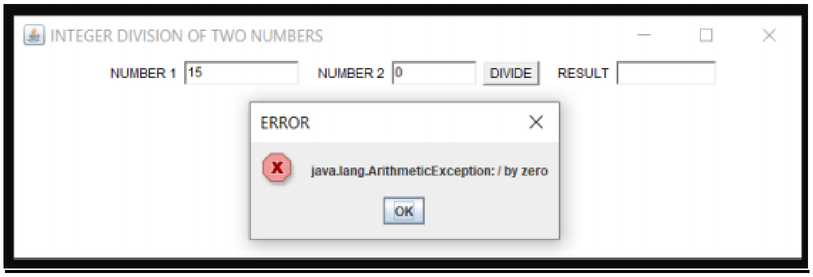


INTEGER DIVISION OF TWO NUMBERS

NUMBER 1 10.65 NUMBER 2 2 RESULT

ERROR

java.lang.NumberFormatException: For input string: "10.65"



INTEGER DIVISION OF TWO NUMBERS

NUMBER 1 15 NUMBER 2 0 RESULT

ERROR

java.lang.ArithmeticException: / by zero