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1BM19CS099

Lab 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.

```
import java.util.*;
class quadratic
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                int a,b,c;
                double d,r1,r2;
                System.out.println("enter values of a b and c in a quadratic equation");
                a=sc.nextInt();
                b=sc.nextInt();
                c=sc.nextInt();
                d=b*b-(4*a*c);
                if(d<0)
                        System.out.println("no real solution");
                else
                {
                        d=Math.sqrt(d);
                        r1=(-b+d)/(2.0*a);
                        r2=(-b-d)/(2.0*a);
                        System.out.println("roots are real ");
                        System.out.println(" roots of the equation are "+r1+" and "+r2);
                }
        }
```

}

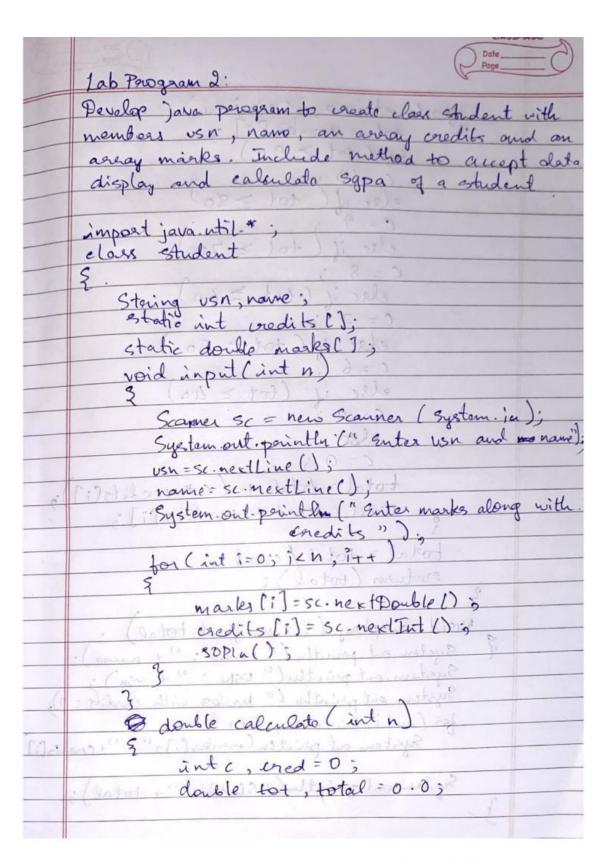
```
C:\Users\Prashanth\Documents\java programs>javac quadratic.java
C:\Users\Prashanth\Documents\java programs>java quadratic
enter values of a b and c in a quadratic equation
1 -3 10
no real solution
C:\Users\Prashanth\Documents\java programs>java quadratic
enter values of a b and c in a quadratic equation
1 -3 -10
roots are real
  roots of the equation are 5.0 and -2.0
C:\Users\Prashanth\Documents\java programs>
```

Lab 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.

```
{
                  marks[i]=sc.nextDouble();
                  credits[i]=sc.nextInt();
                  System.out.println();
         }
 }
 double calculate(int n)
 {
         int c,cred=0;
         double tot,total=0.0;
         for(int i=0;i<n;i++)
         {
                  tot=marks[i];
                  if(tot>=90)
c=10;
else if(tot>=80)
c=9;
else if(tot>=70)
c=8;
else if(tot>=60)
c=7;
else if(tot>=50)
c=6;
else if(tot>=40)
                 c=4;
            else
                  c=0;
           total=total+(c*credits[i]);
                  cred=cred+credits[i];
         }
         total=total/cred;
```

```
return(total);
        }
        void display(int n,float total)
        {
                System.out.println("name of student : "+name);
                System.out.println("usn of student : "+usn);
                System.out.println("marks of student along with credits of course");
                for(int i=0;i<n;i++)
                {
                        System.out.println(marks[i]+" "+credits[i]);
                }
                System.out.println("sgpa of student : "+total);
        }
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                student obj=new student();
                System.out.println("enter no of course ");
                int n=sc.nextInt();
                credits=new int[n];
                marks=new double[n];
                obj.input(n);
                double total=obj.calculate(n);
                float res=(float)total;
                obj.display(n,res);
        }
}
```



```
total = total / cored;
 System out println (" Marks with credits: ");
 for Canti= 0; i < n : i++ ) system out print in [marks[:]+" "+ credits[:]
System out pointla ("SGPA: "+ total);
```

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	Student of:- Scanner (system in).	
X	System out - student ()	
1	Student obj = new Scanner (system in); System. out. pointly (" enter no of rourse int n = sc. next Int ();	22
	wint n = sc. next Int();	-
1	coredits = new an int[n];	
	chouldern?	
	mput (n)	
	double total = objected to (1).	
	Twat res = (10 - 1) 1 1	
	2 obj. display (n, eres);	
	2 Page 1, sees),	
2		
)		

```
C:\Users\Prashanth\Documents\java programs>java student
enter no of course
enter usn and name
1bm19cs099
neha
enter marks along with credits
80.05
77.0 4
66.0 3
81.0 4
91.0 3
name of student : neha
usn of student : 1bm19cs099
marks of student along with credits of course
80.0
77.0
66.0 3
81.0 4
91.0
      3
sgpa of student : 8.631579
  \Users\Prashanth\Documents\iava
```

Lab 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.*;
class book
{
         String name,author;
         int price,num_pages;
         book(String nam,String a,int p,int nno)
         {
```

```
name=nam;
       author=a;
       price=p;
       num_pages=no;
}
static String accept_name()
{
       Scanner sc=new Scanner(System.in);
       System.out.println("enter name of the book");
       return(sc.nextLine());
}
static String accept_author()
{
       Scanner sc=new Scanner(System.in);
       System.out.println("enter name of the author");
       return(sc.nextLine());
}
static int accept_price()
{
       Scanner sc=new Scanner(System.in);
       System.out.println("enter price of the book");
       return(sc.nextInt());
}
static int accept_pages()
{
       Scanner sc=new Scanner(System.in);
       System.out.println("enter no of pages of the book");
       return(sc.nextInt());
}
public String toString()
{
```

```
return("name: "+name+"\n author: "+author+"\n price: "+price+"\n no of pages:
"+num_pages);
       }
       public static void main(String args[])
       {
               Scanner sc=new Scanner(System.in);
               int n;
               System.out.println("enter value of n");
               n=sc.nextInt();
               String nam,a;
               int p,no;
               book []obj=new book[n];
               for(int i=0;i<n;i++)
               {
                       nam=accept_name();
                  a=accept_author();
                       p=accept_price();
                       no=accept_pages();
                       obj[i]=new book(nam,a,p,no);
               }
               int x=1;
               for(int i=0;i<n;i++)
               {
                       System.out.println("BOOK "+(x++));
                       System.out.println(obj[i]);
               }
       }
}
```

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	LAB Paragram - 3.
	import java. uti(+;
-	E string name, anthou;
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4 (1° 38)	book (String ram string a, intp, int no)
	CA (II) FARINGE CHARACTER
	name = nom;
	author = a;
	perice = p; (n) togat igd.
	(n) rum pages = no;
	3. Datat Money Com boll
	Static String accept name()
- 0	Scanner Sc = new Scanner (System 14)
	Scanner Sc= new Scanner (system. 1/2); SOPM (" Enter name of book");
	netum (si.nextline());
	J destallar militaria
	static storing accept_author()
	Scanner Sc= new Scanner(System.in); SDPIn ("Enter author name");
	SoPhu (" Enter author name");
	geturn (sc. next line(1);
	y and a second s
	Static int accept-periel)
	& Sconner Sc= new Scanner (System.in);
	SOPlu ("Enter perice of book");
	eneturn (sc.next Int ());
	1 men (sinen ini)
	state int accept and 1)
	Static int accept-pages ()
	Scanner Sc: new Scanner (system in); Sorth (a Guter no of pages is);
	sorth (a guter no. of pages 13)
	grotugu (S(. next_lat())
	3
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	classmate Date
	Public Storing toStering()
	3 prot C
	proturn (name + " " + author + " " + paire + " , y + num pages);
	y num-pages);
	Public static void main (Stering arga[7)
	Tublic static void main (Stering arget?) E Scanner sc = new Scanner (system. in); int n;
	SoPlu(" cuter value q u ");
	n = sc.next Int ();
	Storing nam, a;
	ant p. no:
	book []obj = new book[n];
	Bor Lint i=0; icn; i+1
	name = accept_name();
	a = a (cept - author);
	P = accept -price ();
	no = accept - pages ();
	g obj[i] = new book (nam, a, p, no);
	int x = 1
	for (int i=0; icn; i++)
	System. out-perint ln ("BOOK"+ (2(++)); System.out. perint ln (Obj[i]);
	2 yestemout. penut in (Obj[i]);
	2
	3
	3

```
C:\Users\Prashanth\Documents\java programs>java book
enter value of n
enter name of the book
harry potter
enter name of the author
jk rowlings
enter price of the book
enter no of pages of the book
1200
enter name of the book
moby
enter name of the author
jake wills
enter price of the book
enter no of pages of the book
enter name of the book
sherlock holmes
enter name of the author
robin
enter price of the book
enter no of pages of the book
955
```

```
BOOK 1
name : harry potter
author : jk rowlings
price : 750
no of pages : 1200
BOOK 2
name : moby
author : jake wills
price : 550
no of pages : 800
BOOK 3
name : sherlock holmes
author : robin
price : 650
no of pages : 955

C:\Users\Prashanth\Documents\java programs>
```

Lab 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.

/*Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.*/

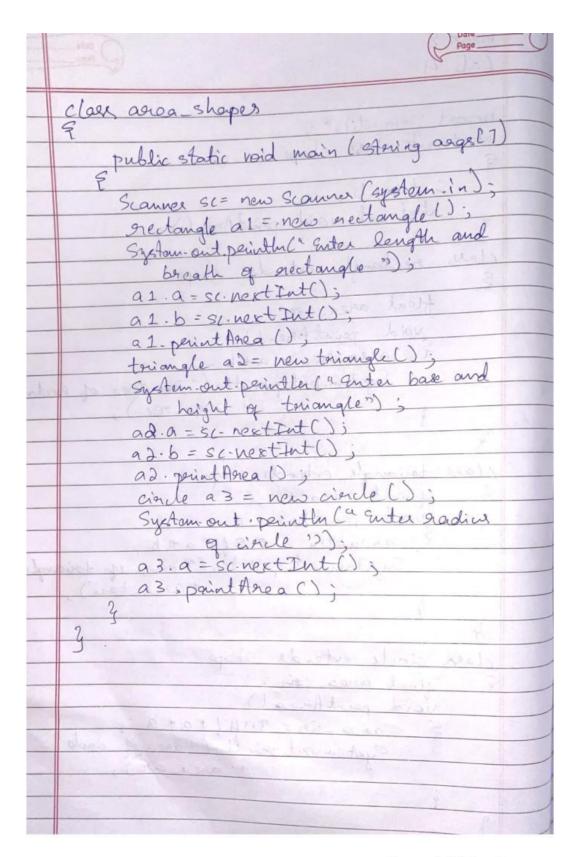
```
import java.util.*;
abstract class shape
{
        int a,b;
        abstract void printArea();
}
class rectangle extends shape
{
        float area_rec;
        void printArea()
        {
                area_rec=a*b;
                System.out.println("area of rectangle = "+area_rec);
        }
}
class triangle extends shape
{
        float area_tri;
        void printArea()
        {
                area_tri=0.5f*a*b;
```

```
System.out.println("area of triangle = "+area_tri);
        }
}
class circle extends shape
{
        float area_cir;
        void printArea()
        {
                area_cir=3.14f*a*a;
                System.out.println("area of circle = "+area_cir);
        }
}
class area_shapes
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                rectangle a1=new rectangle();
                System.out.println("enter length and breath of rectangle");
                a1.a=sc.nextInt();
                a1.b=sc.nextInt();
                a1.printArea();
                triangle a2=new triangle();
                System.out.println("enter base and height of triangle");
                a2.a=sc.nextInt();
                a2.b=sc.nextInt();
                a2.printArea();
                circle a3=new circle();
                System.out.println("enter radius of circle");
                a3.a=sc.nextInt();
                a3.printArea();
```

classmate Week.8. abstract void perint Anea () float agea_ enec; + area - teri extends shape float area-criq area - in = 3.14 / * a * a System. out. paintln (" area of

}

}



```
C:\Users\Prashanth\Documents\java programs>javac week8-1.java
C:\Users\Prashanth\Documents\java programs>java area_shapes
enter length and breath of rectangle
5 10
area of rectangle = 50.0
enter base and height of triangle
5 10
area of triangle = 25.0
enter radius of circle
5
area of circle = 78.5
C:\Users\Prashanth\Documents\java programs>
```

Lab Program 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

```
Scanner sc=new Scanner(System.in);
               System.out.println("----enter account details----");
               System.out.println("enter customer name ");
               cust_name=sc.nextLine();
               System.out.println("enter customer account number");
               acc_no=sc.nextLong();
               System.out.println("enter customer's account type 1.savings account 2.current
account");
               type_acc=sc.nextInt();
               System.out.println("enter customer's balance amount in account");
               balance=sc.nextDouble();
       }
       void display()
       {
               System.out.println("----customer's account details----");
               System.out.println("customer name\t"+cust_name);
               System.out.println("customer account number\t"+acc_no);
               System.out.println("customer's account type\t"+type_acc);
               System.out.println("customer's balance amount in account\t"+balance);
       }
       void deposit()
       {
                               Scanner sc=new Scanner(System.in);
               double amt;
               System.out.println("enter amount to be deposited ");
               amt=sc.nextDouble();
               balance=balance+amt;
               System.out.println("customer's balance amount in account\t"+balance);
       }
}
class Sav_acct extends account
```

```
{
       double interest;
       void compute_interest()
       {
               Scanner sc=new Scanner(System.in);
               int rate, time;
               System.out.println("enter rate and time period");
               rate=sc.nextInt();
               time=sc.nextInt();
               interest=balance*Math.pow(1+rate/100.0,time)-balance;
               System.out.println("compound interest = "+interest);
               balance=balance+interest;
               System.out.println("customer's balance amount in account\t"+balance);
       }
       void withdrawal()
       {
               Scanner sc=new Scanner(System.in);
               double with;
               System.out.println("enter amount to be withdrawn");
               with=sc.nextDouble();
               if(with>balance)
                       System.out.println("withdrawal not possible due to insufficiant balance");
               else
               {
                       balance=balance-with;
                 System.out.println("customer's balance amount in account\t"+balance);
               }
       }
       void check()
       {
               double penalty;
```

```
if(balance<2000.0)
               {
                       penalty=200.0;
                       balance=balance - penalty;
                       System.out.println("balance amount lesser than minimum balance");
                       System.out.println("penalty of Rs.200");
                 System.out.println("customer's balance amount in account\t"+balance);
               }
       }
}
class Curr_acct extends account
{
       void withdrawal()
       {
               Scanner sc=new Scanner(System.in);
               double with;
               System.out.println("enter amount to be withdrawn");
               with=sc.nextDouble();
               if(with>balance)
                       System.out.println("withdrawal not possible due to insufficiant balance");
               else
               {
                       balance=balance-with;
                 System.out.println("customer's balance amount in account\t"+balance);
               }
       }
       void check()
       {
               double penalty;
               if(balance<2000.0)
               {
```

```
penalty=200.0;
                       balance=balance - penalty;
                       System.out.println("balance amount lesser than minimum balance");
                       System.out.println("penalty of Rs.200");
                  System.out.println("customer's balance amount in account\t"+balance);
               }
               else
                       System.out.println(" balance amount greater than minimum balance \n no
penalty");
       }
}
class bank
{
        public static void main(String args[])
       {
        Sav_acct o1=new Sav_acct();
        Curr_acct o2=new Curr_acct();
               Scanner sc=new Scanner(System.in);
        System.out.println("enter customer's account type 1.savings account 2.current account");
        int ch=sc.nextInt();
        int n=0;
        if(ch==1)
       {
               o1.input();
               o1.display();
               while(n!=3)
               {
               System.out.println("enter 1.deposit 2.withdrawal 3.exit");
               n=sc.nextInt();
               if(n==1)
                  o1.deposit();
```

```
if(n==2)
                  o1.withdrawal();
               }
               o1.compute_interest();
                o1.check();
       }
       else if(ch==2)
       {
                o2.input();
                o2.display();
               while(n!=3)
                {
               System.out.println("enter 1.deposit 2.withdrawal 3.exit");
                n=sc.nextInt();
                if(n==1)
                  o2.deposit();
    if(n==2)
                  o2.withdrawal();
               }
               o2.check();
       }
        else
               System.out.println("invalid choice");
}
}
```

4	
0	week 8 classmate
	Lab 5
	1400
1	banking.
	import java util. *;
1	class account
1	a storing cust name.
1	long acc_no;
	double balance;
1	dut type_acc;
	void input()
	E Scanner Sc= new Scanner (aystern in);
	Sop (" enter account del vila - ").
	SOP (" Enter custamer name");
	cust name = sc.nextline();
	Sol (" Enter customer account number");
	ace_no = Si.next[ong();
	SOP (" anter occount type 1 savings account
	d. current account ").
,000	type_acc = sc. next Int().
	SoP (" anter cuetomer's balance amount ").
	balance = Sc. nextDouble ();
	meeting restain progress 1 1 300
special control	void display ()
	3 SOP[" auxtomer's account details ");
	SOP(" customer name It"+ cust_name);
	SOP ("austomor account number \t'+ acc-no);
	SoP ("astomer's account type 1+" + type acc);
	SOP (" balance amount in account (t? + balance);
	2 Alaman Theorem
	La malande altum la
	Marilyan The Language High Maril
	of amount transference

void deposit (amt = Sc. next Double (); balance = balance + ount display (); clare savacet extends account void compute interest () new Scanner (system.in) = Sop (" Enter grate and time posied"); oate = sc. next Int (); time = SI- next Int (): interest: balance & Math. pon (1+ nale / 000). - balance . balance = balance + interest : SOP (" compound interest = "+ interest SOP (" customer's balance amount = " + balance void with drawal () Scanner Sc= new Scanner (System in); SOP (" Enter amount to be withdrawn") with = Sc. next Double if (with > balance SOP (" withdraw I not possible due to insufficient balanco ?)

1	
	classmate
	DateC
	elec
	a balance = balance - with;
	SOP(" austomer's balance amount="+ balance);
	3
	void check ().
	¿ double pen;
	if (balance (2000.6) & pen = 200.0.
	balance - balance - pen;
	SOD ("Penalty: "+ pen);
	So P (" customer's balance amount="4 balance);
	2 9
	3
	class Cure acct extends account
	Void withdrawl ()
	2 Scanna Si = new Scanna (System in);
	de Alexander Harrison
	GOP (" Enter amount to be withdrawn");
	with= sc.nextDouble();
	halance il (wolth > balance)
	SOP(" Insufficient balance "),
	else
944	E balance = balance - with;
	Sopl''austomer's balance amount = "4 balance);
	paramer) 3
	7
	The Company of the Co

```
void check()
        double pen;
        if C balance (2000.0
           SOP (" cue tomes balance = ">+ balance
class bank
  public static void main (storing args[]
      Cura-aut od = new Cura-acet () ;
     int ch = sc. next Ind
     int n=0;
     if (ch == 1
         01. input 1);
        01. display ():
         while (n != 03)
           SOP ("1- deposit 2. withdrawal 3. exit)
            n=sc.nextInt();
            il (n == 1)
                01. deposif
               01. withdrawal ():
       01. compute_interest ();
```

	Page_	
else if (ch == 2) & od.input();		
S od.input();		
02-display();		
1.1. (n1=3)		1
S SOP (" 1. deposit 2. with	draw 3.	exit ")=
n=sc. next Int();		
$i_{\beta} (n=1)$		
ododeposit();		
if(n==2)		
od-withdrawal();		
3		-
oa, check ();		1
4		
elae		
Sop/"Invalid choice");		
24		
2		
J .		
		1
		1

```
C:\Users\Prashanth\Documents\java programs>javac week8-2.java

C:\Users\Prashanth\Documents\java programs>java bank
enter customer's account type 1.savings account 2.current account

1
----enter account details----
enter customer name
neha
enter customer account number

123456
enter customer's account type 1.savings account 2.current account

1
enter customer's balance amount in account
5000.0
-----customer's account details-----
customer name neha
customer account number 123456
customer's account type 1
customer's balance amount in account
5000.0
```

```
enter 1.deposit 2.withdrawal 3.exit
enter amount to be deposited
1000.0
customer's balance amount in account
                                        6000.0
enter 1.deposit 2.withdrawal 3.exit
enter amount to be withdrawn
4000.0
customer's balance amount in account
                                        2000.0
enter 1.deposit 2.withdrawal 3.exit
enter rate and time period
5 2
compound interest = 205.0
customer's balance amount in account
                                       2205.0
C:\Users\Prashanth\Documents\java programs>javac week8-2.java
```

```
neha
enter customer account number
enter customer's account type 1.savings account 2.current account
enter customer's balance amount in account
10000.0
 ----customer's account details-----
customer name
                neha
customer account number 123456
customer's account type 2
customer's balance amount in account
                                        10000.0
enter 1.deposit 2.withdrawal 3.exit
enter amount to be withdrawn
5000.0
customer's balance amount in account
                                         5000.0
enter 1.deposit 2.withdrawal 3.exit
enter amount to be withdrawn
customer's balance amount in account
                                        1000.0
enter 1.deposit 2.withdrawal 3.exit
balance amount lesser than minimum balance
penalty of Rs.200
customer's balance amount in account
C:\Users\Prashanth\Documents\java programs>
```

Lab Program 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.

```
package CIE;
import java.util.*;
public class Student
```

```
{
        public String usn,name;
        public int sem;
        public void input()
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("---enter student details---");
                System.out.print("name : ");
                name= sc.nextLine();
                System.out.print("usn : ");
                usn=sc.nextLine();
                System.out.print("sem :");
                sem=sc.nextInt();
                System.out.println();
        }
        public void display()
        {
                System.out.println("---student details---");
                System.out.println("name : "+name);
                System.out.println("usn : "+usn);
                System.out.println("sem : "+sem);
       }
}
        package SEE;
import CIE.*;
import java.util.*;
```

```
public class External extends CIE.Student
{
        public int see_marks[]=new int[5];
        public void input()
        {
        Scanner sc=new Scanner(System.in);
  System.out.println("enter see marks in 5 courses:");
        for(int i=0;i<5;i++)
                see_marks[i]=sc.nextInt();
        }
        public void display()
        {
                System.out.println("see marks : ");
                for(int i=0;i<5;i++)
                        System.out.print(see_marks[i]+" ");
                System.out.println();
       }
}
package CIE;
import java.util.*;
public class Internals
{
        public int cie_marks[]=new int[5];
        public void input()
        Scanner sc=new Scanner(System.in);
  System.out.println("enter cie marks in 5 courses :");
        for(int i=0;i<5;i++)
```

```
cie_marks[i]=sc.nextInt();
        }
        public void display()
        {
                System.out.println("cie marks : ");
                for(int i=0;i<5;i++)
                        System.out.print(cie_marks[i]+" ");
                System.out.println();
        }
}
import CIE.*;
import SEE.*;
import java.util.*;
class main
{
        int final_marks[]=new int[5];
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter no of students");
                int n=sc.nextInt();
                CIE.Student []o1=new CIE.Student[n];
                CIE.Internals []o2=new CIE.Internals[n];
                SEE.External[]o3=new SEE.External[n];
                main []obj=new main[n];
                for(int i=0;i<n;i++)
                {
```

```
o1[i]=new CIE.Student();
                         o2[i]=new CIE.Internals();
                         o3[i]=new SEE.External();
                         obj[i]=new main();
                         o1[i].input();
                         o2[i].input();
                         o3[i].input();
                         for(int j=0;j<5;j++)
                                 obj[i].final_marks[j]=o2[i].cie_marks[j]+(o3[i].see_marks[j]/2);
                }
                 for(int i=0;i<n;i++)
                 {
                         o1[i].display();
                         o2[i].display();
                         o3[i].display();
                         System.out.println("final marks in 5 courses");
                         for(int j=0;j<5;j++)
                                 System.out.print(obj[i].final_marks[j]+" ");
                         System.out.println();
                 }
        }
}
```

-	Lab Perogram 6.
	package CIE;
	import java · util. *;
	public clase Student
1	public con
	2 A/2 07: 17010 100100 1
	public Storing Usn, namo; public int seun;
	pristic ant sem;
	public void input ()
1	1
	Scanner Sc= new Scanner (System.in); SOP System out println (" enter details-")
	SEP System out println (" - enter details -)
	Sop ("name : ");
	nome = sc.nextline();
	SOP ("USN:");
	usn = sc-nextline();
	50P ("Bem: ");
- 36	Sem = S(. next. Int ();
	public void display ().
	\$
	System out perint (" student dolails ");
	(mans);
	(USN);
	2 " (sem),
	4 (Sem)
	4

package CIE; import java. util. +; public wid input 1 Scanner Sc- new Scanner (Gystem-in)3 Soplal" Enter cie marke for (int i=0; i<5; i++) Cie manker (i) = sc. next Int (): public void display () for (int 1:0;1<5; SOP (cie mantes P:)

package SEE

import CIE. *;
import java.util. *;
public class External extends CIE. Studands

public int See-mooks [] = new int [5]:

public int See-mooks [] = new int [5]:

public void input ()

Scanner Si = new Scanner (System.in)

System. and perutla ("enter 3 co market)

tol (int i = 0; i < 5; i + 1)

See marks [i] = si. next. Int ();

public void display ()

3 system. ant. pointla ("see marks:");

tol (int i=0; i < 5; i + 1)

System. and. printla ("see marks ?i);

3

(C) sage impost CIE. +; import SEE. *; impost java util *, closs main int final works] - new but (57; public static void main (Storing ango [7) Scanner 30 = new Scaurer (System in) sopin("ender no ex Andente"); CIE. Student C101 = now CIE. student CN1: CIE. Internals [102 : new CIE. Internals [n]; SEE. Enternals [103 : now SEE Externals (n); main [] of; = new main [n]; tos (inti = 0; ich ; i++) 02(i) = new (IE. Studend() 02[i] = new CIE stade Indequals (); 03(i) = new SEE - Extraval (); 06; [i] = new main (); of [i] inpud (); odfil input (); der (int j=0; j <5; j++)

obj [i] final marks [j] = 0 = n leienskij + (03(i). See makes (j) / 2);

La series	Frage_
for (ind i=0; i/n; i+	+1)
S	1982 Joungesta
0 1 [i] · display [);	map learning
Daril display ():	7 300 203 4
parti dicalous	91
Oscil display (); oscil display (); SOD (" find man	los: 11):
for (int j=0; j < 5	1 111
en Di phi sil	11 0 4 m bo B7
301(00) 11).	final marks (37)
9	A Company of the Comp
3	
2	
J	EVR STATE
A STATE OF THE PARTY OF THE PAR	
Part and Street	Early Call
THE PARTY NAMED IN	atasian .
	4.80/
The state of the s	

```
C:\Users\Prashanth\Documents\java programs\lab6>java main
enter no of students
---enter student details---
name : neha
usn : 123
sem : 3
enter cie marks in 5 courses :
45 40 45 40 50
enter see marks in 5 courses :
90 95 90 95 100
---enter student details---
name : nikhil
usn : 456
sem : 3
enter cie marks in 5 courses :
40 40 50 40 40
enter see marks in 5 courses :
80 80 100 80 80
---student details---
name : neha
usn : 123
sem : 3
cie marks :
45 40 45 40 50
see marks :
90 95 90 95 100
```

```
---student details---
name : neha
usn : 123
sem : 3
cie marks :
45 40 45 40 50
see marks :
90 95 90 95 100
final marks in 5 courses
90 87 90 87 100
---student details---
name : nikhil
usn : 456
sem : 3
cie marks :
40 40 50 40 40
see marks :
80 80 100 80 80
final marks in 5 courses
80 80 100 80 80
C:\Users\Prashanth\Documents\java programs\lab6>
```

Lab Program 7:

```
class Gen<T1, T2>
{
       T1 ob1;
  T2 ob2;
  Gen(T1 o1, T2 o2)
       {
    ob1 = o1;
    ob2 = o2;
       }
void showTypes()
{
System.out.println("Type of T1 is " +ob1.getClass().getName());
System.out.println("Type of T2 is " +ob2.getClass().getName());
}
T1 getob1() {
return ob1;
}
T2 getob2() {
return ob2;
}
}
class demo
{
public static void main(String args[])
{
```

```
Gen<Integer, String> obj = new Gen<Integer, String>(100, "hello!");
obj.showTypes();
int v = obj.getob1();
System.out.println("T1 value: " + v);
String str = obj.getob2();
System.out.println("T2 value: " + str);
}
```

```
Week 10.
Lab Perogerous 7
Class Gren < T1, T2 >
     T1 061
    Ta oba
     Gen (7101, Ta 02)
           Ob1 = 01;
           062 = 02;
  upid show Types ()
     System-outpointly ("Type of T1 -"+ ob1-get(lass)
                       ("Type of T2:" + 062-get (has)
    T1 optob1 ()
         greture obs ;
     To get obs ()
        protuere obd;
    public static word main (claring angett)
      Gren (Integer, Stering ) obj = new Gren & Integer, Storage
     int v = obj. get obs();
String s = obj. get obs();
SOP("TI value"+ v
SOP("TO value"+ s
```

```
C:\Users\Prashanth\Documents\java programs>javac week10-1.java
C:\Users\Prashanth\Documents\java programs>java demo
Type of T1 is java.lang.Integer
Type of T2 is java.lang.String
T1 value: 100
T2 value: hello!
C:\Users\Prashanth\Documents\java programs>
```

Lab Program 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.*/
/*import java.util.*;

class F_Ex extends Exception
{
    public String toString()
    {
        return ("Father's age is less than 0");
    }
}

class S_Ex extends Exception
{
    int a;
```

```
S_Ex(int age)
       {
               a=age;
       }
       public String toString()
       {
               if(a<0)
                      return ("Son's age is less than 0");
               else
                      return ("Son's age is more than father's age");
       }
}
class father
{
       public int age_f;
       father(int a)
       {
               age_f=a;
       void ex1() throws F_Ex
       {
               if(age_f<0)
                      throw new F_Ex();
       }
}
class son extends father
{
```

```
public int age_s;
       son(int a,int b)
       {
              super(a);
              age_s=b;
       }
       void ex2() throws S_Ex
       {
              if(age_s<0 || age_s>age_f)
                      throw new S_Ex(age_s);
       }
}
class fatherson
{
       public static void main(String args[])
       {
              Scanner sc=new Scanner(System.in);
              System.out.print("Enter father's age: ");
              int a=sc.nextInt();
              System.out.print("Enter son's age: ");
              int b=sc.nextInt();
              son s=new son(a,b);
              try
              {
                      s.ex1();
              }
              catch(F_Ex e)
              {
```

```
System.out.println(e);
              }
              try
              {
                     s.ex2();
              }
              catch(S_Ex e)
              {
                     System.out.println(e);
              }
       }
}*/
import java.util.Scanner;
class WrongAge extends Exception{
  int age;
  WrongAge(int x)
  {
    age=x;
 public String toString()
  {
    return "AGE OF SON="+age+" IS ENTERED INCORRECTLY";
  }
}
class father
{
int a;
```

```
father(int x)
{
a=x;
}
}
class son extends father{
  int age;
  son(int fage,int sage){
    super(fage);
    age=sage;
 }
  void compute() throws WrongAge{
    if(age>=a)
    {
      throw new WrongAge(age);
    }
    else{
      System.out.println("THE AGES ARE ENTERED CORECTLY");
      System.out.println("FATHER'S AGE="+a+"\t"+"SON'S AGE="+age);
    }
  }
}
class expmain
{
  public static void main(String args[])
  {
```

```
Scanner s=new Scanner(System.in);

System.out.println("ENTER FATHER'S AGE");

int f=s.nextInt();

System.out.println("ENTER SON'S AGE");

int so=s.nextInt();

son ss=new son(f,so);

try{

ss.compute();

}catch(WrongAge e)

{

System.out.println(e);

}

}
```

Lab Program 8.

import javantil 7;

class introphyse extends txaption

gate age 1.

public Gening toString ()

actuar ("Age of son "1" age 1" is

entered incoarectly ");

class father

int age;

father (int 2)

age = 2;

y

class son extends father

int age;

Son (int fage, int sage)

super (fage);

age = sage;

void compute () thorows wavegage

if (age >= a)

throw new whong age (age);

else

foop ("The ages one consect")

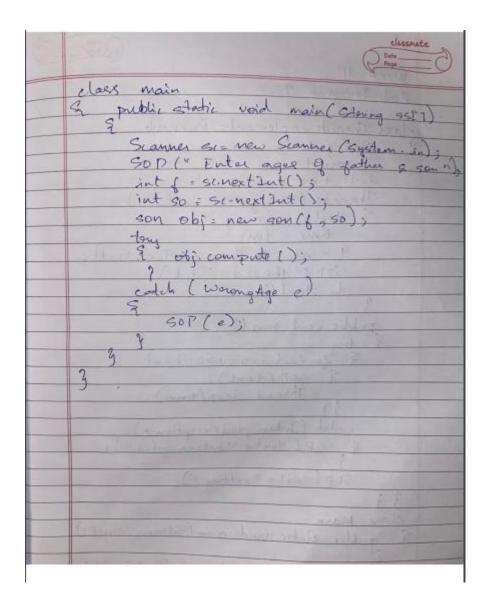
sop ("father age = "1" + a);

sop ("sons" age = "1" + age),

int age;

sons one whong age = "1" + age),

sop ("sons" age = "1" + age),



~	Execute Me	ode, Version, Inputs & Arguments
(JDK 11.0.4	•

Result compiled and executed in 6.463 sec(s)

```
ENTER FATHER'S AGE
40
ENTER SON'S AGE
42
AGE OF SON=42 IS ENTERED INCORRECTLY
```

Lab Program 9:

```
class Threads implements Runnable {
  String text;
  Thread t;
  int time;
  Threads(String threadname,int tm) {
  text= threadname;
  time=tm;
  t = new Thread(this, text);
  System.out.println("thread:"+ t);
  t.start();
  public void run() {
  try {
  for(int i = 5; i > 0; i--) {
  System.out.println(text);
  Thread.sleep(time);
  }
  } catch (InterruptedException e) {
  System.out.println(text + "Interrupted");
  }
  System.out.println(text + " exiting.");
  }
  class Main {
  public static void main(String args[]) {
  Threads t1=new Threads("BMS COLLEGE OF ENGINEERING",10000);
  Threads t2=new Threads("CSE",2000);
```

```
classmate
 Week 11
lab Perogram T.
class Thomas implements Punnoble
     Storing text;
       Thorand to
      int time ;
      Thereads (Storing namp, int tur)
       & toxt = name;
            time = tu;
          t = new to Thorond ( this , text) ;
          SOP ( " thousand : " + + );
          t. stand ().
     public void own ()
       tery

if for lind i=6; i>0; i--)

if sop (text),

Thread. sleep (time);
       catch (Interrupted Exception e) = 5 COP ( text + "Interrupted"),
        sop ( text + " exiting ").
 class Main
a public static word main (String args[])
       Threads to new Theroads (" BMS COLLEGE
OF ENGINEERING" , 10 000)
     Thereads 12 = new threads ("ESE", some);
```

```
C:\Users\Prashanth\Documents\java programs>javac week11-lab.java
C:\Users\Prashanth\Documents\java programs>java Main
thread:Thread[BMS COLLEGE OF ENGINEERING,5,main]
thread:Thread[CSE,5,main]
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
BMS COLLEGE OF ENGINEERING
CSE exiting.
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING
BMS COLLEGE OF ENGINEERING exiting.
C:\Users\Prashanth\Documents\java programs>
```

Lab Program 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.*/

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
public class integerdivision extends Frame implements ActionListener
{
    TextField n1,n2,res;
    Label ln1,ln2,lres;
    Button b;
```

```
public integerdivision()
      {
    setLayout(new FlowLayout());
    Label In1=new Label("NUMBER 1",Label.RIGHT);
    Label In2=new Label("NUMBER 2",Label.RIGHT);
    Label lres=new Label("RESULT",Label.RIGHT);
    n1=new TextField(12);
    n2=new TextField(8);
    res=new TextField(10);
    b=new Button("DIVISION");
    add(ln1);
    add(n1);
    add(ln2);
    add(n2);
    add(b);
    add(Ires);
    add(res);
    b.addActionListener(this);
 addWindowListener(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.valueOf(num3));
```

}

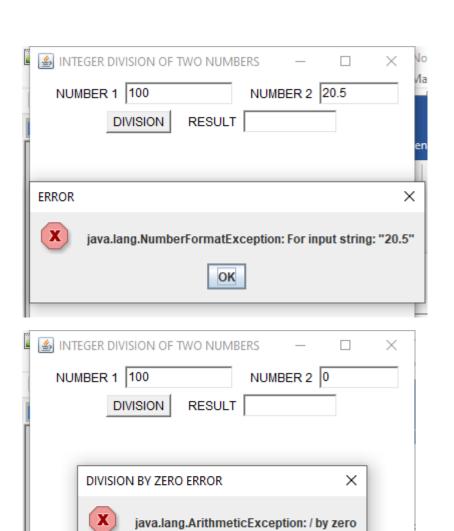
{

```
}
       catch(NumberFormatException e )
    JOptionPane.showMessageDialog(this,e,"ERROR", JOptionPane.ERROR_MESSAGE);
  }
  catch(ArithmeticException a)
      {
    JOptionPane.showMessageDialog(this,a,"DIVISION BY ZERO ERROR",
JOptionPane.ERROR_MESSAGE);
  }
}
}
public static void main(String args[])
{
  integerdivision i=new integerdivision();
  i.setSize(new Dimension(400,400));
  i.setTitle("INTEGER DIVISION OF TWO NUMBERSs");
  i.setVisible(true);
}
class WindowAdapter1 extends WindowAdapter{
  public void windowClosing(WindowEvent we)
  {
    System.exit(0);
  }
}
}
```

Date Poge Week 13 Oab Brogram 10 import java aut . *; import java. aut. event. *; public class integerdivision extends Frame implements Action Listoner Textfield n1, n2, nes; Labol las, Ind, lace; Sublic inlegendivision () Button 6: Setlayout (new Flowlayout ()); label Propriet 1", Label Propriet label Ind = new Label ("Number 2", Labol & (GHT); Label loves = new Label (" Desult", Label At GH7), n1 = new Text Field (12), nd = new Text Field (8), nox = new Text field (10); b = new Button ("Division"); add (In1)4 add (n1); add (l na); add (no); add (lnes); add (eres); b. add Action Listener (this): add Window (istoner (new Window Adaptor ());

	The state of the s
public void action Parforme	d (Action Event ac)
2 if (as gotSoverce () =	= 6)
of the days	and the state
tony S	tageter !
1 + munt - Tulo roer - B	sacre Int (n 1 get Text ());
int num d = Integer po	rege Int (nd. get Text())
int num3 - num 1/	/ mars 2 ;
g presiset Text (Storing. ,	value of (min 3));
3	
catch (Number Formattro	eptione)
9	A self of
Joption Pane. show Message	Dialog (this, e, " +DPOP!
Joption Pane - good	EPROP_MESSAGE);
7	The lates of the l
catche Anithmetic Exception	a
7	13 H.N. S.
Jophon Pare showledge Dial	log (this, a, " EPPOP!
& Jostlen Pare - ERPOR -	MESSAGNE);
4	100
	Contract of the second
	CE COLOR A S.
ablic Static world main (Storing 3	(1)
ANDERSON I - MA - 1	AL TONOR DE LA CONTRACTION DEL CONTRACTION DE LA CONTRACTION DE LA CONTRACTION DE LA CONTRACTION DE LA CONTRACTION DEL CONTRACTION DE LA C
i sottigelnew Dimension (4	Samme ();
w. set Title (" Division ") -	(00, 400));
is set visible (time);	
lace window Adapters extend public void window Closin	3 hillada ne
public void windowClosis. & system. exit (0):	a Cwinda 5
& system. exit (0);	J want we

ě	
	NUMBER 1 100 NUMBER 2 20
	DIVISION RESULT 5



OK