

## Lab Program - 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 discriminant  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.

9/10/2020

JP PAGE DATE / /

LAB 1

Name - TUSHAR PAI  
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Quadratic equation.

```
import java.util.Scanner;  
  
public class quadEquation {  
  
    static double findDiscriminante(float a, float b, float c) {  
  
        double D = b * b - (4 * a * c);  
        return D;  
    }  
  
    static void checkD(float a, float b, double D) {  
        if (a == 0)  
            System.out.println("Not a valid quadratic equation");  
  
        else if (D < 0)  
            System.out.println("The roots are imaginary");  
        else  
            System.out.println("The imaginary roots are " + (-b / 2 * a) + "  
" + "i" + " " + (Math.sqrt(-D) / (2 * a)) + " and " + (-b / 2 * a) + " - " + "i" + " "  
" + (Math.sqrt(-D) / (2 * a)));  
    }  
  
    static void printRoots(float a, float b, float c) {  
        double r1 = (-b + Math.sqrt(D)) / (2 * a);  
        double r2 = (-b - Math.sqrt(D)) / (2 * a);  
        System.out.println("The roots are " + r1 + " and " + r2);  
    }  
}
```

Sulekha2

```
public static void main (String args[]) {  
    Scanner s = new Scanner (System.in);  
  
    System.out.println ("The equation is of the form ax^2+bx+c.");  
    System.out.println ("Enter the value of a, b and c respectively");  
  
    float a = s.nextFloat();  
    float b = s.nextFloat();  
    float c = s.nextFloat();  
  
    double D = findDiscriminate (a, b, c);  
    checkD (a, b, D);  
}  
}
```

## Output-Lab Program 1

```
Command Prompt  
Microsoft Windows [Version 10.0.18362.1082]  
(c) 2019 Microsoft Corporation. All rights reserved.  
C:\Users\tusha>d:  
D:\>cd Java  
D:\Java>javac quadEquation.java  
D:\Java>java quadEquation  
The equation is of the form ax^2+bx+c.  
Enter the value of a,b and c respectively  
1  
-7  
12  
The roots are 4.0 and 3.0  
D:\Java>java quadEquation  
The equation is of the form ax^2+bx+c.  
Enter the value of a,b and c respectively  
1  
1  
1  
The roots are imaginary  
The imaginary roots are -0.5+i0.8660254037844386 and -0.5-i0.8660254037844386  
D:\Java>
```

## 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.

LAB-2

import java.util.\*;

Name: TUSHAR A. PAI  
USN: 18M19CS174

Class student {

String name, usn;

double credits[] = new double[5];

double marks[] = new double[5];

double sgpa[] = new double[5];

double total = 0, tc = 0, sgpa = 0, tmc = 0,

void getDetails () {

Scanner in = new Scanner (System.in);

System.out.println ("Enter name and usn");

name = in.nextLine();

usn = in.nextLine();

for (int i=0; i<5; i++) {

System.out.println ("Enter marks and credits of subject " + (i+1));

marks[i] = in.nextDouble();

credits[i] = in.nextDouble();

}

}

void displayDetails () {

System.out.println ("Name : " + name);

System.out.println ("USN : " + usn);

for (int j=0; j<5; j++) {

total += marks[j];

}

System.out.println ("Total marks : " + total);

}

```
void SGPA() {  
    for (int j = 0; j < 5; j++) {  
        if (marks[j] >= 90)  
            a[j] = 10.0;  
        else if (marks[j] > 80 && marks[j] < 90)  
            a[j] = 9.0;  
        else if (marks[j] > 70 && marks[j] < 80)  
            a[j] = 8.0;  
        else if (marks[j] > 60 && marks[j] < 70)  
            a[j] = 7.0;  
        else if (marks[j] >= 50 && marks[j] < 60)  
            a[j] = 6.0;  
        else  
            a[j] = 0.0  
    }  
}
```

```
for (int n = 0; n < 5; n++) {  
    tc += credits[n];  
    tmc += (credits[n] * a[n]);  
}  
}
```

```
sgpa = (tmc / tc);  
System.out.println("SGPA : " + sgpa);  
}  
}
```

```
public class studentSGPA {  
    public static void main (String [] args) {  
        Student s1 = new Student();  
        s1.getDetails();  
        s1.displayDetails();  
        s1.SGPA();  
    }  
}
```

## Output-Lab Program 2

```
Command Prompt - X

D:\>cd Java

D:\Java>javac studentSgpa.java

D:\Java>java studentSgpa
Enter name and usn
Tushar
1BM19CS174
Enter marks and credits of subject 1
89
3
Enter marks and credits of subject 2
76
4
Enter marks and credits of subject 3
97
2
Enter marks and credits of subject 4
88
1
Enter marks and credits of subject 5
76
2
Name      : Tushar
USN      : 1BM19CS174
Total marks : 426.0
SGPA      : 8.666666666666666

D:\Java>
```

### 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.

LAB-3

Name : TUSHAR A. PAR

VSN : I BM19CS174

```
import java.util.*;  
  
class TestBook {  
    public static void main (String args[]) {  
        Scanner sc = new Scanner (System.in);  
        System.out.println ("Enter the number of books:");  
        int n = sc.nextInt();  
        Book B[] = new Book[n];  
        for (int i=0; i<n; i++) {  
            B[i] = new Book();  
        }  
        for (int i=0; i<n; i++) {  
            System.out.println (B[i]);  
            System.out.println ();  
        }  
    }  
}
```

```
class Book {  
    String book-name, book-author;  
    int price, num-pages;  
    Book () {}  
    Scanner sc = new Scanner (System.in);  
    System.out.print ("Enter the Name of the book: \t");  
    book-name = sc.nextLine();  
    System.out.print ("Enter the Author of book "+book-name+": \t");  
    book-author = sc.nextLine();  
    System.out.print ("Enter the price of book "+book-name+": \t");  
    price = sc.nextInt();  
    System.out.print ("Enter the number of pages: \t");  
    num-pages = sc.nextInt();  
}
```

```
sc.nextLine();  
System.out.println();  
}
```

Name: TUSHAR A PAR  
USN: 16M19C5174

```
public String toString(){
```

```
return ("Name of Book : " + this.book-name + " | Author : " +  
       + this.book-author + " | Price : " + this.price + " | Number  
       of Pages : " + this.num-pages);
```

```
}
```

```
}
```

### Output-Lab program 3

```
D:\Java>java TestBook  
Enter the Number of Books:  
2  
Enter the Name of The book: java  
Enter the Author of book java : Tarun  
Enter the Price of book java : 800  
Enter the Number of pages: 1456  
  
Enter the Name of The book: HTML  
Enter the Author of book HTML: Jalk Baki  
Enter the Price of book HTML: 900  
Enter the Number of pages: 974  
  
Name of Book : java  
Author : Tarun  
Price : 800  
Number of Pages: 1456  
  
Name of Book : HTML  
Author : Jalk Baki  
Price : 900  
Number of Pages: 974  
  
D:\Java>
```

## 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.

Lab - 4

Name : TUSHAR - PAJ  
USN : 1BM19CS174

```
import java.util.Scanner;  
abstract class Shape {  
    int a;  
    int b;  
    Shape (int a, int b)  
    { this.a=a;  
        this.b=b;  
    }  
    Shape (int a)  
    { this.a=a;  
    }  
    Shape ()  
    { this.a=0;  
        this.b=0;  
    }  
    void printArea()  
    {  
    }  
    {  
    }  
    class triangle extends Shape  
    { triangle (int a, int b)  
        { super(a,b); }  
        void printArea()  
        { System.out.println ("The area of the triangle is = "+(a*b)/2); }  
    }  
}
```

Class rectangle extends Shape.

Name : TUSHAR PAT

{ rectangle (int a, int b)

JSN : 1 AM 19 CS194

{ super (a, b); }

void printArea ()

{ System.out.println ("The area of rectangle is = " + (a \* b));

}

}

Class circle extends Shape

{ circle (int a)

{ super (a); }

void printArea ()

{ System.out.println ("The area of the circle is = " + (3.14 \* a \* a));

}

}

Class shapes {

public static void main (String [] args) {

Scanner scan = new Scanner (System.in);

int ch, a, b;

while (true) {

System.out.println ("Enter 1 for TRIANGLE");

System.out.println ("Enter 2 for RECTANGLE");

System.out.println ("Enter 3 for CIRCLE");

System.out.println ("Enter 4 to EXIT");

ch = scan.nextInt();

switch (ch) {

case 1: System.out.println ("Enter base and height of triangle");

a = scan.nextInt();

b = scan.nextInt();

triangle t = new triangle (a, b);

t.printArea();

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break;

case 2 : System.out.println("Enter the length and breadth ");  
a = scan.nextInt();  
b = scan.nextInt();  
rectangle r = new rectangle(a, b);  
r.printArea();  
break;

case 3 : System.out.println("Enter the radius of circle ");  
a = scan.nextInt();  
circle c = new circle(a);  
c.printArea();  
break;

case 4 : scan.close();  
break;

default : System.out.println("Invalid input ");

}

## Output -Lab Program 4

```
Command Prompt
Microsoft Windows [Version 10.0.18362.1119]
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C:\Users\luisa\id:
D:\>cd Java
D:\Java>javac shapes.java

D:\Java>java shapes
ENTER 1 FOR TRIANGLE
ENTER 2 FOR RECTANGLE
ENTER 3 FOR CIRCLE
ENTER 4 FOR EXIT
1
enter the base and height of triangle
5
7
the area of the triangle is = 17
ENTER 1 FOR TRIANGLE
ENTER 2 FOR RECTANGLE
ENTER 3 FOR CIRCLE
ENTER 4 FOR EXIT
2
enter the length and breadth of rectangle
5
4
the area of the rectangle is = 20
ENTER 1 FOR TRIANGLE
ENTER 2 FOR RECTANGLE
ENTER 3 FOR CIRCLE
ENTER 4 FOR EXIT
3
enter the radius of the circle
9
the area of the circle is = 254.34
ENTER 1 FOR TRIANGLE
ENTER 2 FOR RECTANGLE
ENTER 3 FOR CIRCLE
ENTER 4 FOR EXIT
4
ENTER 1 FOR TRIANGLE
ENTER 2 FOR RECTANGLE
ENTER 3 FOR CIRCLE
ENTER 4 FOR EXIT
Exception in thread "main" java.lang.IllegalStateException: Scanner closed
    at java.util.Scanner.ensureOpen(Unknown Source)
    at java.util.Scanner.next(Unknown Source)
    at java.util.Scanner.nextInt(Unknown Source)
    at java.util.Scanner.nextInt(Unknown Source)
```

## 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:

- 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.

LAB - 5

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```
import java.util.*;  
class account {  
    String customer-name;  
    int account-number;  
    String account-type;  
  
    class curr-acct extends account {  
        Scanner s = new Scanner(System.in);  
        double temp = 0.0;  
        double amount = 0.0;  
        double fine = 0.0;  
        double min-amount = 1000.0;  
        void getdetails() {  
            customer-name = s.nextLine();  
            account-number = s.nextInt();  
        }  
        void deposit() {  
            System.out.print("Enter the deposit amount : ");  
            temp = s.nextDouble();  
            amount += temp;  
        }  
        void showbalance() {  
            if (amount >= min-amount) {  
                System.out.println("Balance is : " + amount);  
            } else {  
                fine = (amount * 1.0 + 10) / 100;  
                amount -= fine;  
                System.out.println("The fine imposed : " + fine);  
                System.out.println("Balance is : " + amount);  
            }  
        }  
    }  
}
```

Name: Tushar Pas  
USN: 18M19CS174

}

}

void withdrawal () {

System.out.print("Enter the withdrawal amount : ");

temp = n.nextDouble();

amount -= temp;

}

}

class Sav-Acc extends Account {

Scanner n = new Scanner (System.in);

double temp = 0.0;

double amount = 0.0;

double interest = 0.0;

void getdetails () {

customer\_name = n.nextLine();

account\_number = n.nextInt();

}

void deposit () {

System.out.print("Enter the deposit amount : ");

temp = n.nextDouble();

amount += temp;

}

void showbalance () {

System.out.println("Balance is : " + amount);

}

void withdrawl () {

System.out.print("Enter the withdrawal amount : ");

temp = n.nextDouble();

amount -= temp;

}

void interest () {

$$\text{interest} = (\text{amount} * 1.0 + 3) / 100;$$

amount + = interest;

System.out.println("Interest added : " + interest);

System.out.println("Balance is : " + amount);

}

3.

public class Main {

public static void main (String [] args) {

int opt = 0;

String type = null;

Scanner x = new Scanner (System.in);

System.out.println("Welcome to bank service");

System.out.println("Enter the account (curr-acct / sav-acct)");

type = x.nextLine();

if (type.equals ("curr-acct")) {

curr-acct a = new curr-acct();

System.out.println("Enter the customer-name, account-number : ");

a.getdetails();

while (true) {

System.out.println("Press 1 : Accept deposite and update the balance");

System.out.println("Press 2 : Display the balance");

System.out.println("Press 3 : Withdrawal and update balance");

System.out.println("Enter option : ");

opt = x.nextInt();

switch (opt) {

case 1 : a.deposit();

a.showbalance();

break;

case 2 : a.showbalance();

break;

```
case 3 : a.withdrawal();  
a.showbalance();  
break;  
}  
}
```

Name : Tushar Patil  
USN : 1BMIT9CS124

```
}  
if ( type.equals ("sav-acct") ) {
```

```
Sav-acct a = new Sav-acct();
```

```
System.out.println ("Enter customer name, account number : ");  
a.getdetails();
```

```
while ( true ) {
```

```
System.out.println ("Press 1 : Accept deposit and update the balance");  
System.out.println ("Press 2 : Display the balance");  
System.out.println ("Press 3 : Compute and deposit interest");  
System.out.println ("Press 4 : Withdrawal and update the balance");
```

```
System.out.println ("Enter option : ");  
opt = n.nextInt();
```

```
switch ( opt ) {
```

```
case 1 : a.deposit();  
a.showbalance();  
break;
```

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

```
case 3 : a.interest();  
a.showbalance();  
break;
```

Case 4: a.withdrawal();  
a.showbalance();  
break;

}

}

}

}

Name: TUSHAR PAJ  
U.S.N - 1EM19CS174

## Output-Lab Program-5

```
Command Prompt - java Main
Enter the type of account (curr_acct/sav_acct)
curr_acct
Enter the customer_name,account_number:
Tushar
98479
press 1 : Accept deposit and update the balance
press 2 : Display the balance
press 3 : Withdrawal and update the balance
Enter option : 1
Enter the deposit amount : 10000
Balance is : 10000.0
press 1 : Accept deposit and update the balance
press 2 : Display the balance
press 3 : Withdrawal and update the balance
Enter option : 2
Balance is : 10000.0
press 1 : Accept deposit and update the balance
press 2 : Display the balance
press 3 : Withdrawal and update the balance
Enter option : 3
Enter the withdrawal amount : 985
Balance is : 9015.0
press 1 : Accept deposit and update the balance
press 2 : Display the balance
press 3 : Withdrawal and update the balance
Enter option : 4
```

## 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.

Lab - Program - 6

```
import java.util.*;  
package CIE;  
class package  
class student  
{ String usn;  
String name;  
int sem;  
Student ( String name , String usn , int sem )  
{ this . name = name ;  
this . usn = usn ;  
this . sem = sem ;  
}  
void getdetails ()
```

```
{ System.out.println (" Student name : " + this.name );  
System.out.println (" Student usn : " + this.usn );  
System.out.println (" Semester : " + this.sem );  
}
```

```
{ }
```

```
class Internals .
```

```
{ int marks [ ] = new int [ 5 ] ;  
void setmarks ()  
{ Scanner scan = new Scanner ( System.in ) ;  
for ( int i = 0 ; i < 5 ; i ++ )  
{ marks [ i ] = scan.nextInt ( ) ; }  
}  
}
```

Name : TUSHAR PAZ

USN : 1RM19C8174

```
import java.util.*;  
import CIF.Student;  
package SEE;
```

class External extends Student

```
{ int marks[] = new int[5];  
void setmarks()  
{ Scanner scan = new Scanner (System.in);  
for (int i=0; i<5; i++)  
{ marks[i] = scan.nextInt(); }  
}  
}
```

```
import java.util.*;
```

```
import CIF.*;
```

```
import SEE.*;
```

Class Democlass {

```
public static void main (String args[]) {
```

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

```
int n, sem;
```

```
String name, mn;
```

```
System.out.print("Enter the no. of Students");
```

```
n = scan.nextInt();
```

```
Student s[] = new Student[n];
```

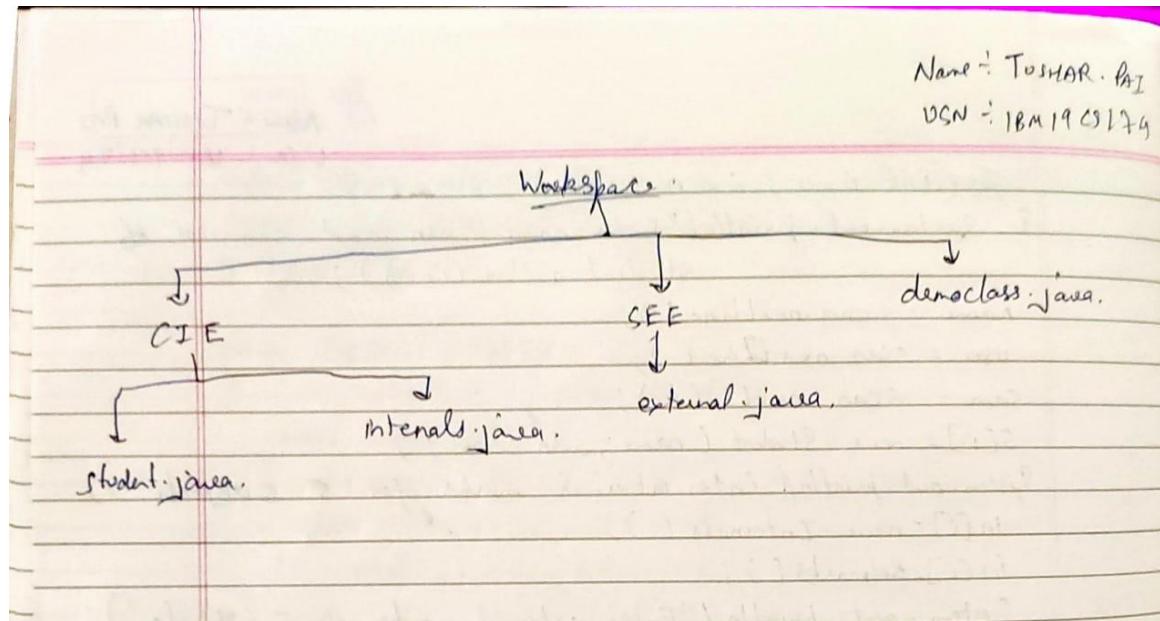
```
Internal in[] = new Internal[n];
```

```
External e[] = new External[n];
```

```
for(int i=0; i<n; i++)  
{ System.out.println("Enter name, usn and semester of  
student : " + (i+1));  
name = scan.nextLine();  
usn = scan.nextLine();  
sem = scan.nextInt();  
S[i] = new Student(name, usn, sem);  
System.out.println("Enter internal marks for 5 subjects");  
in[i] = new Internals();  
in[i].setmarks();  
System.out.println("Enter external marks of 5 subjects");  
e[i] = new External();  
e[i].setmarks();  
}  
}
```

```
int final_marks[][] = new int[n][5];  
for(int i=0; i<n; i++)  
{ for(int j=0; j<5; j++)  
{  
final_marks[i][j] = in[i].marks[j] + (e[i].marks[j]/2);  
}  
}
```

```
for(int i=0; i<n; i++)  
{ System.out.println("Student " + (i+1) + " details are");  
S[i].getdetails();  
System.out.println("Final marks in 5 subjects are: ");  
for(int j=0; j<5; j++)  
{  
System.out.println(final_marks[i][j]);  
}  
}
```



## Output-Lab Program-6

```

Command Prompt
D:\Java>javac Main.java
D:\Java>java Main
Enter number of students : 2
----Student 1-----
Enter Name : Tushar
Enter USN : 1BM19CS174
Enter Semester : 3
Enter CIE marks in course 1 : 50
Enter CIE marks in course 2 : 45
Enter CIE marks in course 3 : 50
Enter CIE marks in course 4 : 45
Enter CIE marks in course 5 : 50

Enter SEE marks in course 1 : 78
Enter SEE marks in course 2 : 68
Enter SEE marks in course 3 : 66
Enter SEE marks in course 4 : 86
Enter SEE marks in course 5 : 68
----Student 2-----
Enter Name : Tarun
Enter USN : 1BM19CS171
Enter Semester : 3
Enter CIE marks in course 1 : 45
Enter CIE marks in course 2 : 50
Enter CIE marks in course 3 : 45
Enter CIE marks in course 4 : 50
Enter CIE marks in course 5 : 45

Enter SEE marks in course 1 : 99
Enter SEE marks in course 2 : 88
Enter SEE marks in course 3 : 77
Enter SEE marks in course 4 : 69
Enter SEE marks in course 5 : 100
-----STUDENT DETAILS-----
----Student 1-----
Name : Tushar
USN : 1BM19CS174
  
```

```
Command Prompt
-----STUDENT DETAILS-----
-----Student 1-----
Name : Tushar
USN : 1BM19CS174
Semester : 3

Marks scored in course 1 : 89
Marks scored in course 2 : 79
Marks scored in course 3 : 83
Marks scored in course 4 : 88
Marks scored in course 5 : 84
-----

-----Student 2-----
Name : Tarun
USN : 1BM19CS171
Semester : 3

Marks scored in course 1 : 94
Marks scored in course 2 : 94
Marks scored in course 3 : 83
Marks scored in course 4 : 84
Marks scored in course 5 : 95
-----

D:\Java>
```

## Lab program 7

Write a program to demonstrate generics with multiple object parameters.

Lab - Program - 7      Name: TUSHAR PAI  
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Generic class with multiple object parameters

```
class TwoGen<T, V> {
    T ob1;
    V ob2;

    TwoGen(T o1, V o2) {
        ob1 = o1;
        ob2 = o2;
    }

    void showTypes() {
        System.out.println("Type of T is " + ob1.getClass().getName());
        System.out.println("Type of V is " + ob2.getClass().getName());
    }

    T getOb1() {
        return ob1;
    }

    V getOb2() {
        return ob2;
    }
}

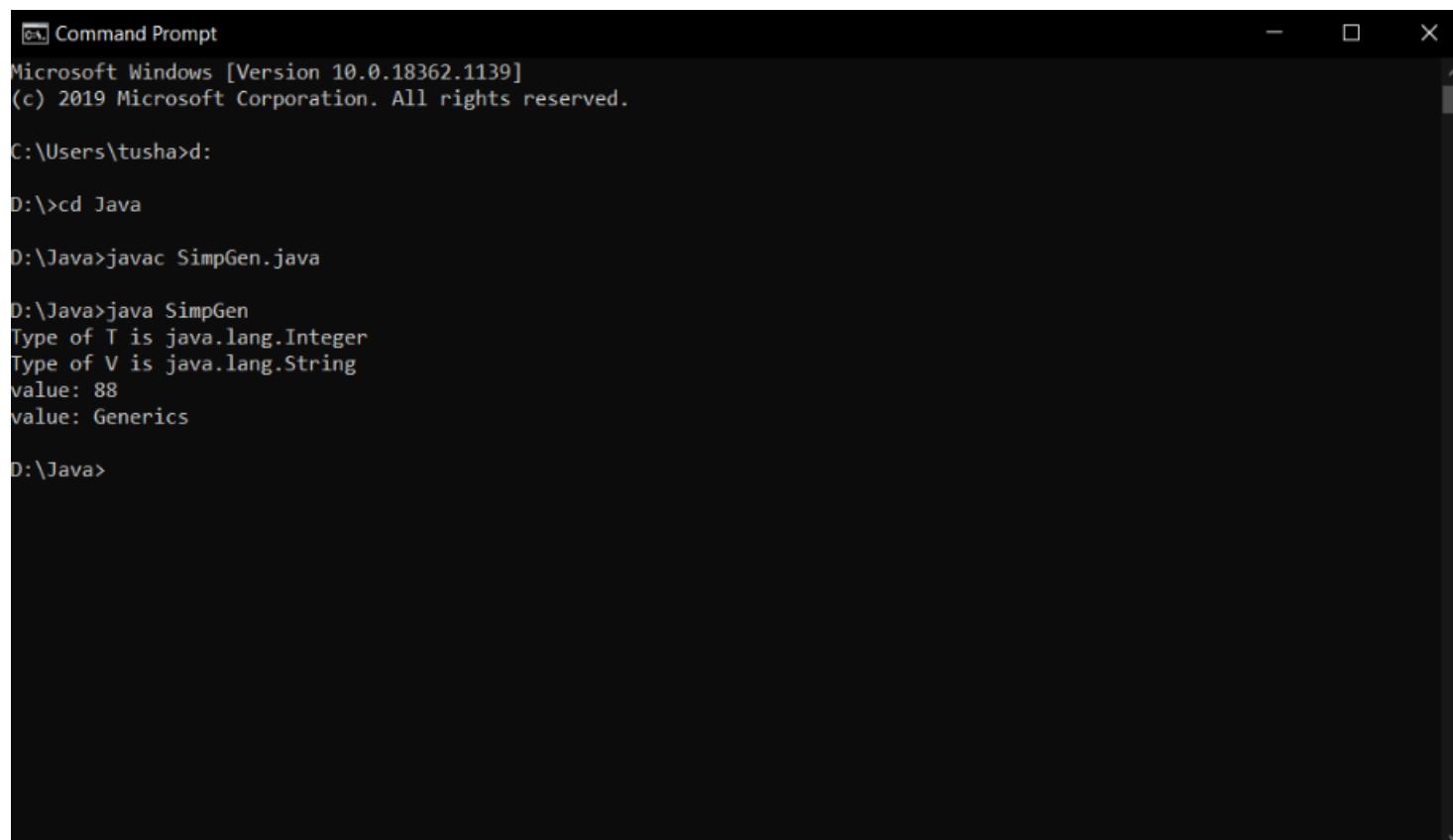
class SimpleGen {
    public static void main(String args[]) {
        TwoGen<Integer, String> tObj =
```

Submit

Name: TUSHARR. A PAZ  
USN: 1BM19CS174

```
new TwoGen<Integer, String>(88, "Generics").  
tgObj. ShowTypes();  
int v = tgObj.getob1();  
System.out.println("value: " + v);  
  
String str = tgObj.getob2();  
System.out.println("value" + str);  
}  
}
```

## Output-Lab Program-7



```
Command Prompt  
Microsoft Windows [Version 10.0.18362.1139]  
(c) 2019 Microsoft Corporation. All rights reserved.  
  
C:\Users\tusha>d:  
D:\>cd Java  
D:\Java>javac SimpGen.java  
D:\Java>java SimpGen  
Type of T is java.lang.Integer  
Type of V is java.lang.String  
value: 88  
value: Generics  
D:\Java>
```

## 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 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.

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Lab - Program - 8 (Exception)

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```
import java.util.Scanner;

class Main {
    public static void main(String args[]) {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter father's age : ");
        int fatherAge = in.nextInt();
        System.out.print("Enter son's age : ");
        int sonAge = in.nextInt();
        in.close();

        Son son;
        try {
            son = new Son(sonAge, fatherAge);
            System.out.println("No error");
        } catch (AgeLessThanZeroException exception) {
            System.out.println(exception.getMessage());
        } catch (SonOlderThanFatherException exception) {
            System.out.println(exception.getMessage());
        }
    }
}
```

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public class AgeLessThanZeroException extends Exception {

AgeLessThanZeroException (String message) {

super(message);

}

}

public class SonOlderThanFatherException extends Exception {

SonOlderThanFatherException (String message) {

super(message);

}

}

public class Father {

int age = 0;

message = "Father's age cannot be less than zero";

Father () { }

Father (int age) throws ~~Age less than~~ AgeLessThanZeroException

{

if (age < 0)

throw new AgeLessThanZeroException (message);

this.age = age;

}

}

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public class Son extends Father {

String message1 = "Son's age cannot be greater than father's  
age";

String message2 = "Son's age cannot be less than zero";  
int age;

Son (int sonAge, int FatherAge) throws AgeLessThanZeroException,  
SonOlderThanFatherException.

{

super (fatherAge);

if (sonAge < 0)

throws new AgeLessThanException (message2);

if (sonAge >= fatherAge)

throws new SonOlderThanFatherException (message1);

age = sonAge;

}

}

## Output-Lab Program-8

```
C:\ Command Prompt
Microsoft Windows [Version 10.0.18363.1256]
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C:\Users\tusha>d:

D:\>cd Java

D:\Java>cd prog 8

D:\Java\prog 8>javac Main.java

D:\Java\prog 8>java Main
Enter father's age : 38
Enter son's age : 49
Age of son can't be greater than age of father

D:\Java\prog 8>javac Main.java

D:\Java\prog 8>java Main
Enter father's age : -19
Enter son's age : 20
Father's age cannot be less than zero

D:\Java\prog 8>java Main
Enter father's age : 40
Enter son's age : -9
Son's age cannot be less than zero

D:\Java\prog 8>java Main
Enter father's age : 40
Enter son's age : 13
No Errors

D:\Java\prog 8>
```

## Lab Program-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.

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```
Class thread1 extends Thread
{
    thread1()
    {
        new Thread ("thread1");
        start();
    }

    public void run()
    {
        while (true)
        {
            try
            {
                System.out.println ("BMS college of engineering");
                Thread.sleep (10000);
            }
            catch (InterruptedException ie)
            {
                System.out.println ("Interrupted");
            }
        }
    }
}
```

```
class thread2 extends Thread
{
    thread1()
    {
        new Thread ("thread2");
        start();
    }

    public void run()
    {
        while (true)
        {
            try
            {
                System.out.println ("CSE");
                Thread.sleep (2000);
            }
        }
    }
}
```

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```
    catch (InterruptedException ie)
    {
        System.out.println("Interrupted");
    }
}
```

```
class threadmain
{
    public static void main(String args[])
    {
        System.out.println("Enter Control + C to stop");
        Thread t1 = new Thread1();
        Thread t2 = new Thread();
    }
}
```

## Output-Lab Program-9

```
Command Prompt
Microsoft Windows [Version 10.0.18363.1198]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\tusha>d:

D:\>cd Java

D:\Java>javac threadmain.java

D:\Java>java threadmain
Enter CONTROL+C to stop
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
D:\Java>
```

## 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 ArithmeticException. Display the exception in a message dialog box.

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Lab program - 10

```
import javax.awt.*;  
import javax.awt.event.*;  
  
class Division1 extends Frame implements ActionListener {  
  
    Frame f;  
    TextField tf1;  
    TextField tf2;  
    TextField tf3;  
    Button b;  
    Dialog d1;  
  
    Division1() {  
        setSize(300, 300);  
        setVisible(true);  
        setLayout(null);  
  
        addWindowListener(new WindowAdapter() {  
            public void windowClosing(WindowEvent e) {  
                dispose();  
            }  
        });  
  
        tf1 = new TextField("Number1");  
        tf2.setBounds(10, 70, 200, 30);  
        add(tf2);  
  
        b = new Button("/");  
        b.setBounds(10, 110, 200, 30);
```

b.addActionListener(hui);  
add(b);

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```
tf3 = new JTextField("Output");  
tf3.setBounds(10, 150, 200, 30);  
add(tf3);  
}
```

public void actionPerformed(ActionEvent e) {

try {

```
String num1 = tf1.getText();  
int n1 = Integer.parseInt(num1)  
String num2 = tf2.getText();  
int n2 = Integer.parseInt(num2);  
int result = n1 / n2;  
tf3.setText(Integer.toString(result));
```

}

catch (NumberFormatException e2) {

```
d1 = new Dialog(f, "error", true);  
Label l = new Label(" "+e2);  
d1.add(l);  
d1.setSize(300, 50);  
d1.setVisible(true);
```

}

catch (ArithmaticException e1) {

```
d1 = new Dialog(f, "error", true);  
Label l = new Label(" "+e1);  
d1.add(l);  
d1.setSize(300, 50);  
d1.setVisible(true);
```

} }

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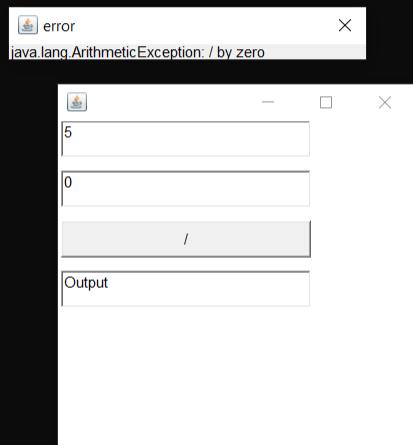
```
public class Labprog10 {  
    public static void main(String[] args) {  
        Division d = new Division();  
        ?  
        ?  
    }  
}
```

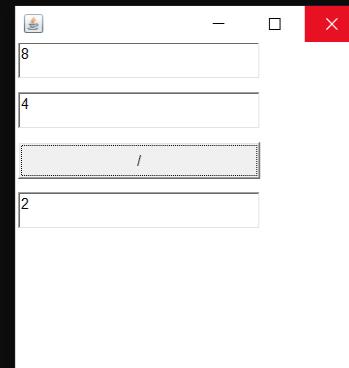
## Output-Lab Program-10

Command Prompt - java Labprog10

D:\Java>javac Labprog10.java

D:\Java>java Labprog10





```
C:\ Command Prompt - java Labprog10
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C:\Users\tusha>d:
D:\>cd Java
D:\Java>javac Labprog10.java
D:\Java>java Labprog10
```

