

OOJ LAB TEST

RECORD

EVALUATION

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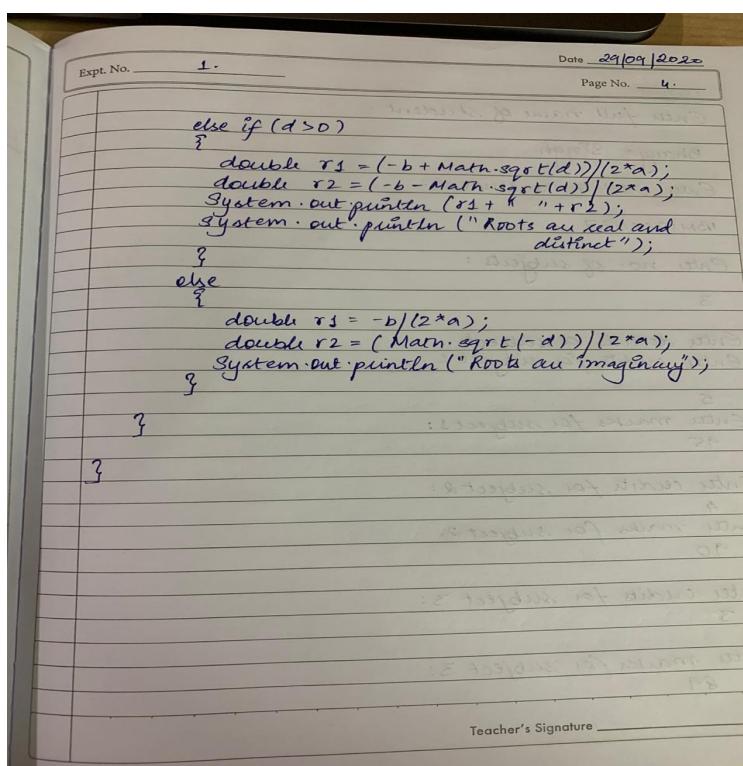
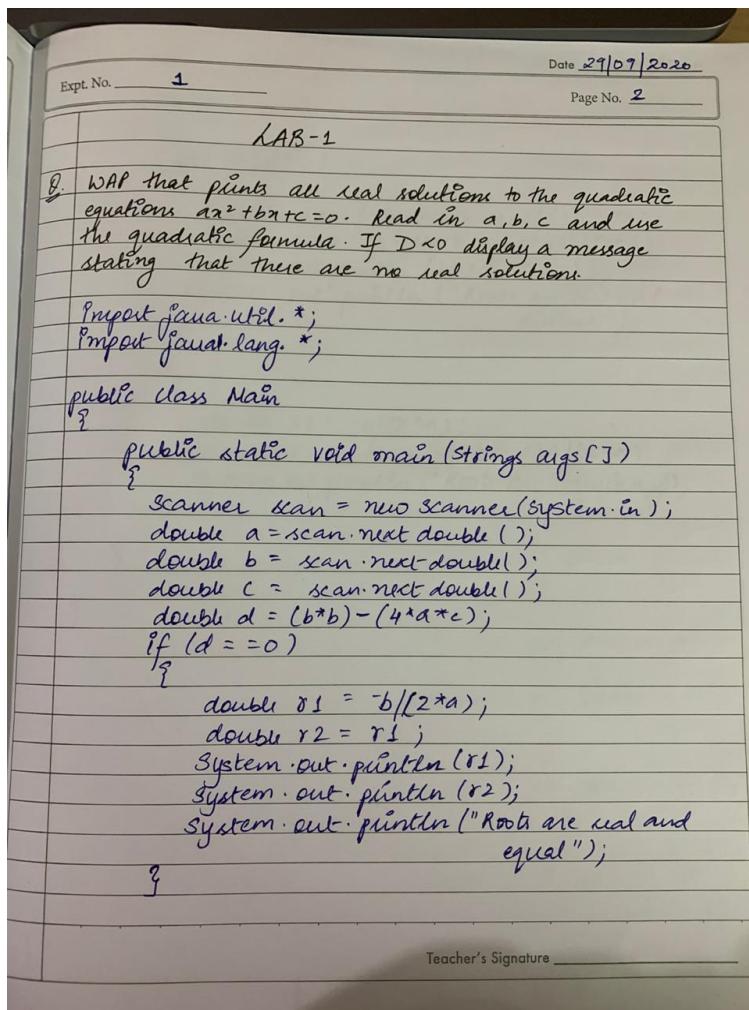
Semester: 3

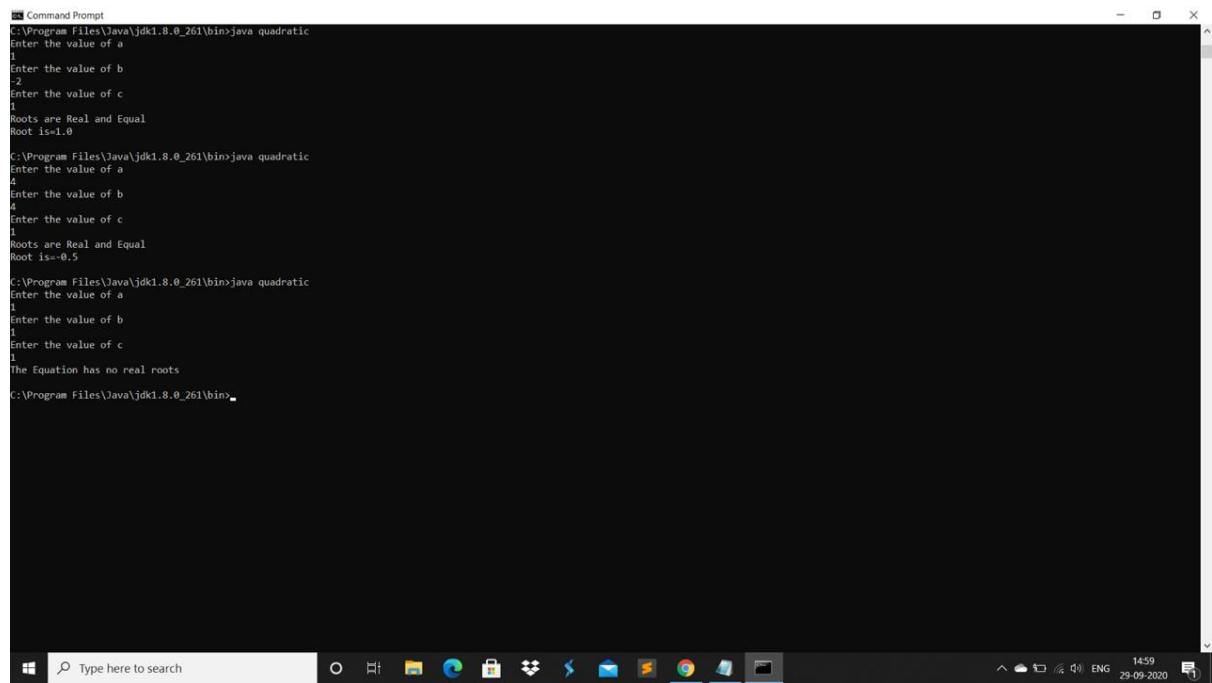
Section: A

Program-1

Develop a Java program that prints all real solutions to the quadratic equation $a(x^2)+bx+c = 0$.

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.





```
Command Prompt
C:\Program Files\Java\jdk1.8.0_261\bin>java quadratic
Enter the value of a
1
Enter the value of b
2
Enter the value of c
1
Roots are Real and Equal
Root is=1.0

C:\Program Files\Java\jdk1.8.0_261\bin>java quadratic
Enter the value of a
1
Enter the value of b
1
Enter the value of c
1
Roots are Real and Equal
Root is=-0.5

C:\Program Files\Java\jdk1.8.0_261\bin>java quadratic
Enter the value of a
1
Enter the value of b
1
Enter the value of c
2
The Equation has no real roots

C:\Program Files\Java\jdk1.8.0_261\bin>
```

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

Ques: Develop a java program to create a class with members USN, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student

Import java.util.*;
class Student

{

private String USN;
private String name;
private int n;
private double SGPA = 0;
private int totalCredits = 0;
private int credits[];
private double marks[];
Scanner in = new Scanner(System.in);

void accept()

{

System.out.println("Enter full name of the
student");

name = in.nextLine();

System.out.println("Enter USN of the student:");

USN = in.nextLine();

System.out.println("Enter number of subjects");

n = in.nextInt();

credits = new int[n];

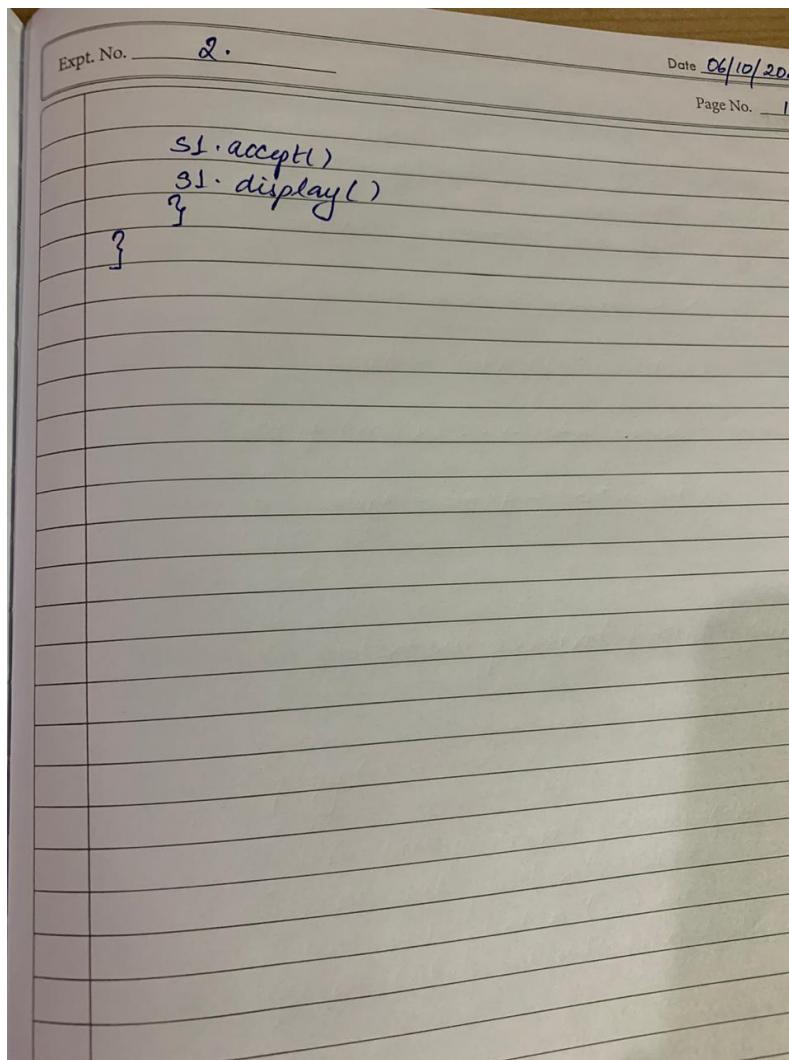
Teacher's Signature _____

```
marks = new double[n];
System.out.println("Enter details of the subjects: ");
for (int i=0; i<n; i++) {
    System.out.println("Enter the credits for subject"
        + (i+1));
    credits[i] = in.nextInt();
    System.out.println("Enter the marks for subject"
        + (i+1));
    marks[i] = in.nextInt();
    calculate(credits[i], marks[i], i);
}
void calculate (int credit, double marks, int j) {
    totalcredits = totalcredits + credit;
    if (marks >= 90 && marks <= 100) {
        SGPA = SGPA + (10 * credit);
    } else if (marks >= 80 && marks <= 89) {
        marks();
        SGPA = SGPA + (9 * credit);
    } else if (marks >= 70 && marks <= 79) {
        SGPA = SGPA + (8 * credit);
    }
}
```

Teacher's Signature _____

```
if  
else if (marks >= 60 && marks <= 69)  
    SGPA = SGPA + (7 * credit);  
else if (marks >= 50 && marks <= 59)  
    SGPA = SGPA + (6 * credit);  
else if (marks >= 40 && marks <= 49)  
    SGPA = SGPA + (5 * credit);  
else  
    System.out.println("Failed in Subject " + (j + 1));  
}  
void display()  
{  
    System.out.println("Details of the Student");  
    System.out.println("USN: " + USN);  
    System.out.println("Name: " + name);  
    System.out.println("SGPA of Student: " + (SGPA /  
        totalCredits));  
}  
class main  
{  
    Student s1 = new Student();  
}
```

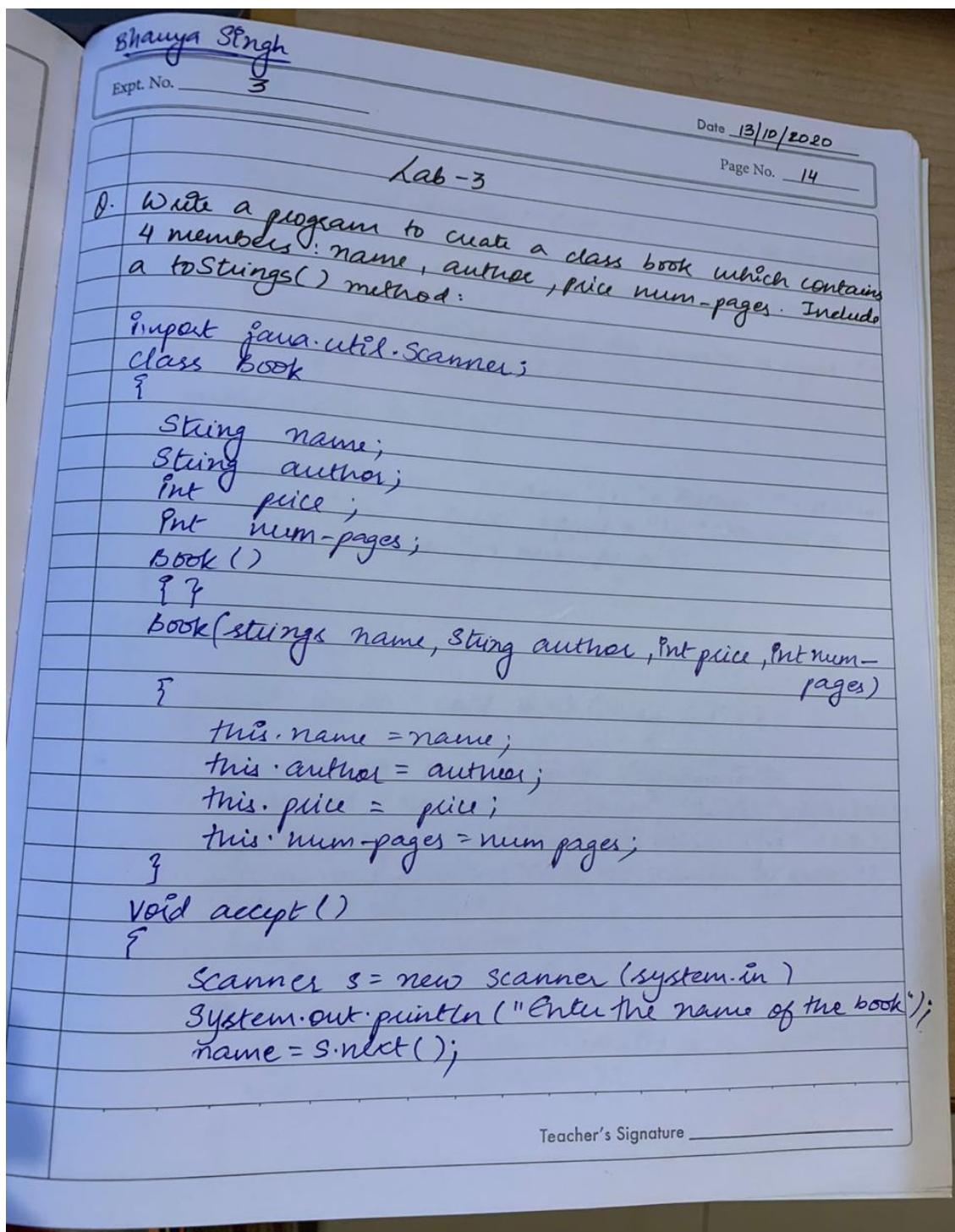
Teacher's Signature _____



```
Command Prompt
C:\Users\bhavya Sharma>cd C:\Program Files\Java\jdk1.8.0_261\bin
C:\Program Files\Java\jdk1.8.0_261\bin>javac student1.java
C:\Program Files\Java\jdk1.8.0_261\bin>java Main
Enter USN of the student
1B19CS036
Enter Name of the student
BHAWA
Enter no of subjects
3
Enter details of the subjects:
Enter credits for subject 1
5
Enter marks for subject 1
88
Enter credits for subject 2
4
Enter marks for subject 2
99
Enter credits for subject 3
3
Enter marks for subject 3
88
Details of the Student
USN: 1B19CS036
Name :BHAWA
SGPA of Student 9.333333333333334
C:\Program Files\Java\jdk1.8.0_261\bin>
```

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.



```
System.out.println("Enter the author of the book");
author = s.next();
System.out.println("Enter the price of the book");
price = s.nextInt();
System.out.println("Enter the number of pages:");
num-pages = s.nextInt();
}
```

```
public String toString()
```

```
return ("Name :" + name + " | " + "Author :" + author
+ " | " + "Price :" + price + " | " + "Number of
pages :" + num-pages);
}
```

```
Class Main
```

```
public static void main(String ss[])
}
```

```
Scanner a = new Scanner (System.in)
```

```
Book b1 = newbook ("Methua", "Anush", 414, 345);
```

```
System.out.println ("Constructor values : | " + b1);
```

```
System.out.println ("Enter the number of books");
```

```
int n = a.nextInt();
```

```
Book b[] = newbook [n]
```

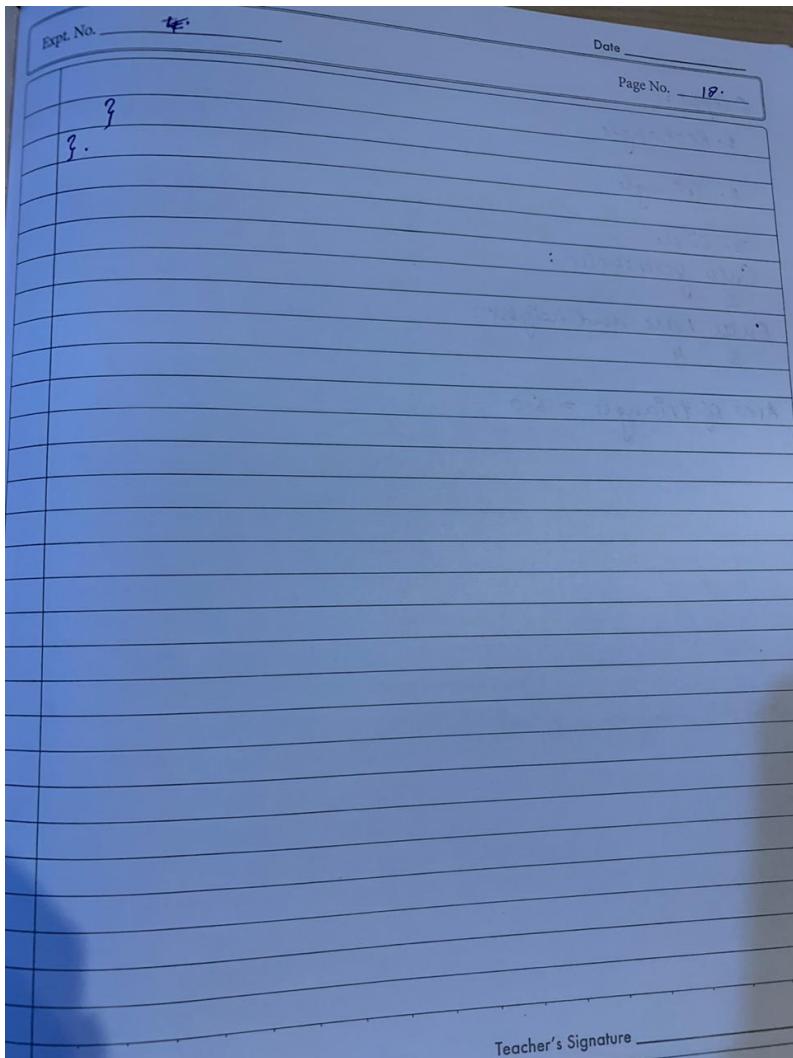
```
for (int i = 0; i < n; i++)
}
```

```
System.out.println ("Details of the book " + (i + 1));

```

```
System.out.println (b[i]);
}
```

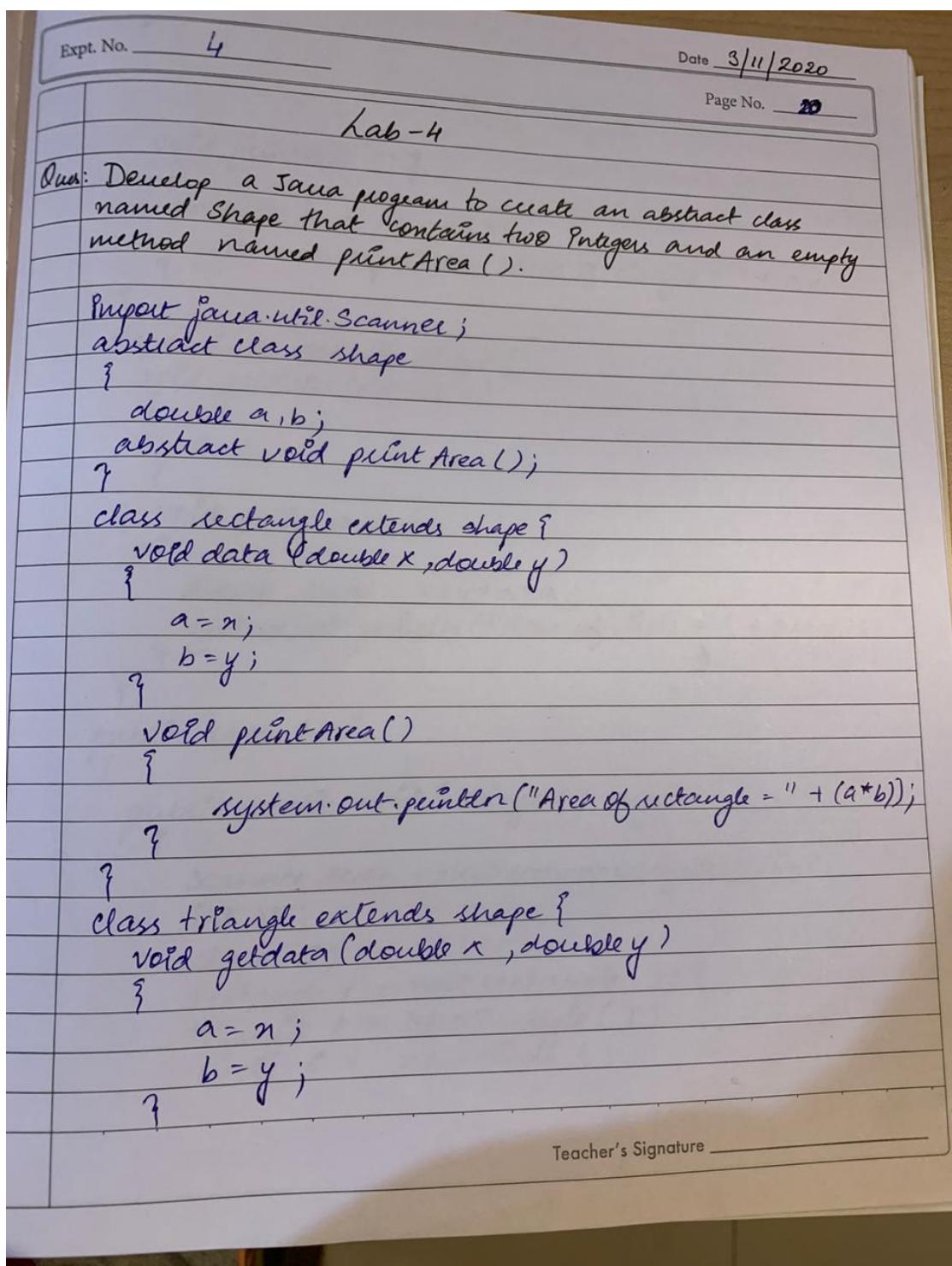
Teacher's Signature _____



```
Constructor Values:  
Name: Heights  
Author: Anne  
Price: 299  
Number of pages: 345  
Enter the number of books  
2  
Enter the details of 1 book  
Enter the name of the book  
melhua  
Enter the author of the book  
amish  
Enter the price of the book  
250  
Enter the number of pages of the book  
342  
Enter the details of 2 book  
Enter the name of the book  
vayuputras  
Enter the author of the book  
amish  
Enter the price of the book  
345  
Enter the number of pages of the book  
450  
Details of book 1  
Name: melhua  
Author: amish  
Price: 250  
Number of pages: 342  
Details of book 2  
Name: vayuputras  
Author: amish  
Price: 345  
Number of pages: 450  
...Program finished with exit code 0
```

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.



```
void printArea() {  
    double area = 0.5 * a * b;  
    System.out.println("Area of triangle = " + area);  
}  
  
class Circle extends Shape {  
    void getdata(double x) {  
        a = x;  
    }  
    void printArea() {  
        double area = 3.14 * a * a;  
        System.out.println("Area of circle = " + area);  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner scan = new Scanner(System.in);  
        int ch;  
        Shape s;  
        Rectangle r = new Rectangle();  
        Triangle t = new Triangle();  
        Circle c = new Circle();  
    }  
}
```

Teacher's Signature _____

System.out.println("1. Rectangle\n2. Triangle\n3. Circle")
Enter your choice: ")
ch = scan.nextInt();
switch (ch)
{

case 1: System.out.println("Enter length and
breadth: ");
double l = scan.nextDouble();
double b = scan.nextDouble();
t.getData(l, b);
t.printArea();
break;

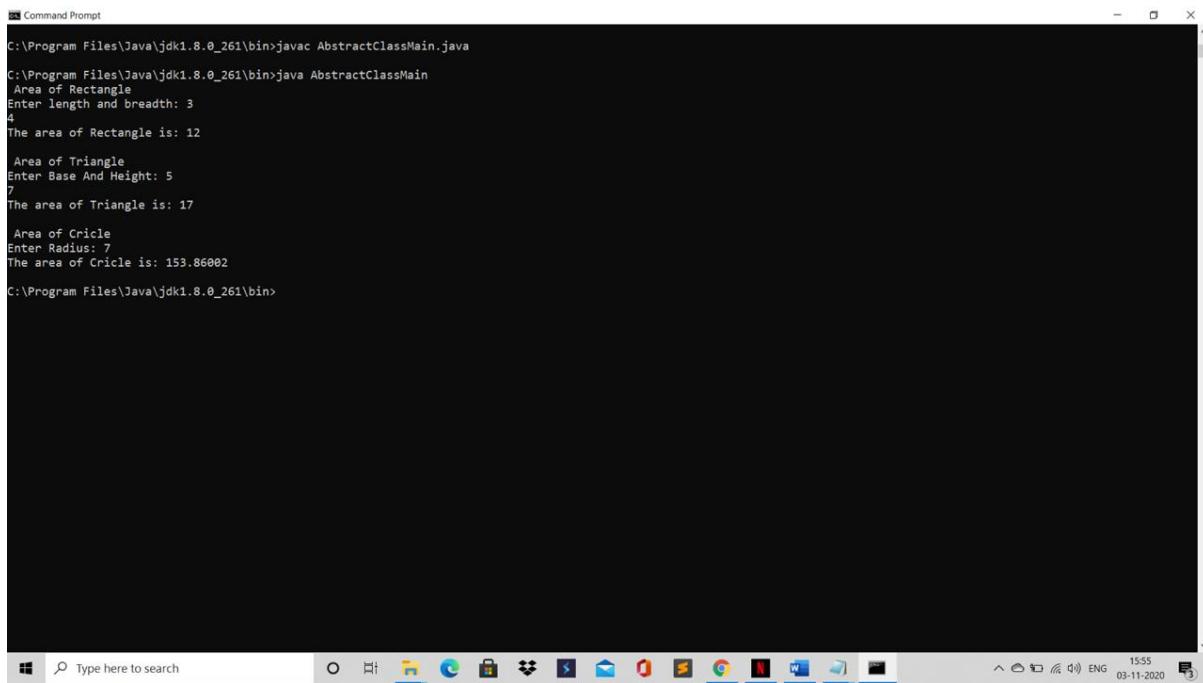
case 2: System.out.println("Enter base and height: ");
double b1 = scan.nextDouble();
double h = scan.nextDouble();
t.getData(b1, h);
t.printArea();
break;

case 3: System.out.println("Enter radius: ");
double r1 = scan.nextDouble();
c.getData(r1);
c.printArea();
break;

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

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Teacher's Signature _____



```
Command Prompt
C:\Program Files\Java\jdk1.8.0_261\bin>javac AbstractClassMain.java
C:\Program Files\Java\jdk1.8.0_261\bin>java AbstractClassMain
Area of Rectangle
Enter length and breadth: 3
4
The area of Rectangle is: 12

Area of Triangle
Enter Base And Height: 5
7
The area of Triangle is: 17

Area of Circle
Enter Radius: 7
The area of Circle is: 153.86002
C:\Program Files\Java\jdk1.8.0_261\bin>
```

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.

Lab-5

Q. Banking system: 2 accounts 1. savings account
2. current account

```
import java.util.Scanner
```

```
import java.lang.Math;
```

```
class bank
```

```
{
```

```
    String name;
```

```
    int acc-no;
```

```
    float bal, si;
```

```
    void accept()
```

```
{
```

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

```
    System.out.println();
```

```
    System.out.println("Enter the name of account holder: ")
```

```
    name = scan.nextLine();
```

```
    System.out.println("Enter the account number: ")
```

```
    acc-no = scan.nextInt();
```

```
    System.out.println("Enter account balance: ")
```

```
    bal = scan.nextFloat();
```

```
{
```

```
    void display()
```

```
{
```

```
    System.out.println();
```

```
    System.out.println("Details");
```

```
    System.out.println("Name: " + name + "\nAccount
```

```
    number: " + acc-no + "\nBalance " + bal);
```

```
}
```

Teacher's Signature _____

void deposits()

{

System.out.println();

Scanner scan = new Scanner(System.in);

System.out.println("Do you want to deposit
(1 for yes, 2 for no): "));

int d = scan.nextInt();

If (d == 1)

{

System.out.println("Enter the amount to be
deposited: "));

int amt = scan.nextInt();

bal = bal + amt;

System.out.println("Available balance = " + bal);

{

{

class current extends bank

{

float service_charge = 100;

void cheque()

{

{

System.out.println("Cheque service Available");

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

{

Teacher's Signature _____

```
system.out.println("Minimum balance = Rs 1000.00");
system.out.println("Enter the amount to be withdrawn:");
amount = scan.nextFloat();
if(amount > bal)
    system.out.println("Balance is insufficient");
else
    bal = bal - amount
    if(bal < 1000)
        bal = bal - service-charge;
    system.out.println("Service charge of Rs " + service-
        charge + " is added");
    system.out.println("Available balance = " + bal);
else
    system.out.println(amount + " withdrawn");
    system.out.println("Available balance = " + bal);
```

class savings extends banks

void cheque()

system.out.println("\n No cheque services ");

Teacher's Signature _____

```
void simpleInterest()
{
    System.out.println();
    Scanner scan = new Scanner(System.in);
    System.out.println("Enter rate of interest: ");
    int r = scan.nextInt();
    System.out.println("Enter the number of times
    Interest applied per time period: ");
    int n = scan.nextInt();
    System.out.println("Enter the time elapse: ");
    int t = scan.nextInt();
    float si = bal * (1 + r/n);
    System.out.println("Simple Interest = Rs " + (Math.pow
    (si, n*t)));
}
```

```
void withdrawal()
```

```
float amount;
Scanner scan = new Scanner(System.in);
System.out.println("No minimum balance required");
System.out.println("Enter the amount to be withdrawn");
amount = scan.nextFloat();
if (amount > bal)
    System.out.println("Balance insufficient");
else
{
    bal = bal - amount;
    System.out.println(amount + " withdrawn");
}
```

Teacher's Signature _____

```
    { q system.out.println("Available balance = " + bal);  
    { q  
    Public class Main  
    { q  
    Public static void main(Strings [] args)  
        savings obj1 = new savings();  
        current obj2 = new current();  
        system.out.println("1. Savings");  
        system.out.println("2. Current");  
        system.out.println("Enter your choice");  
        scanner scan = new scanner(system.in);  
        Int ch = scan.next Int();  
        switch (ch)  
    {
```

```
        case 1: obj1 = new savings();  
        obj1 .accept();  
        obj1 .display();  
        obj1 .cheque();  
        obj1 .deposit();  
        obj1 .simpleInterest();  
        obj1 .withdrawal  
        break;
```

case 2 : Obj2 = new current();
Obj2. accept();
Obj2. display();
Obj2. cheque();
Obj2. deposit();
Obj2. simpleInterest();
Obj2. withdrawal();
break;

default : system.out.println("Invalid Input");

^q
 ^q
 ^q

Teacher's Signature _____

```
132         System.out.println("Invalid Input");
133     }
134 }
135     default: System.out.println("Invalid Input");
136 }
137 }
138 }

v . s
Enter your choice: 2 input

Enter the name of the account holder:
Bhavya
Enter account number:
1432
Enter account balance:
432

Details
Name: Bhavya
Account number: 1432
Balance: 432.0

Cheque service available

Do you want to deposit (1 for yes 2 for no):
1
Enter the amount to be deposited:
123
Available balance= 555.0
Minumun balance = Rs 1000.00

v . s
Enter the name of the account holder:
Bhavya
Enter account number:
12345
Enter account balance:
1234

Details
Name: Bhavya
Account number: 12345
Balance: 1234.0

No cheque service

Do you want to deposit (1 for yes 2 for no):
1
Enter the amount to be deposited:
12
Available balance= 1246.0

Enter Rate of interest:
10
Enter the number of times interest applied per time period
1
Enter the time elapse:
1
Simple interest = Rs 13706.0
No minimum balance required
Enter the amount to be withdrawn
```

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.


```
for (i=0; i<n; i++)
```

```
    System.out.println ("Details of student " + (i+1));
```

```
    s[i].display();
```

```
    for (j=0; j<5; j++)
```

```
        total[j] = cl[i].clem[j] + se[i].seem[j];
```

```
    System.out.println ("Total marks in subject " +
```

```
        (j+1) + " : " + total[j]);
```

```
    System.out.println();
```

```
    System.out.println();
```

Teacher's Signature _____

```
import CIE.*;
import SEE.*;
import java.util.Scanner;
```

```
class TotalMarks
```

```
{
```

```
    public static void main(Strings[] args)
```

```
        int i, j, n;
```

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

```
        int total[] = new int[5];
```

```
        System.out.println("Enter the number of students : ");
```

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

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

```
        CIE.Internals ci[] = new CIE.Internals[n];
```

```
        SEE.Externals se[] = new SEE.Externals[n];
```

```
        for (i=0; i<n; i++)
```

```
{
```

```
        System.out.println("Enter student"+(i+1)+"details");
```

```
        s[i] = new CIE.Student();
```

```
        s[i].accept();
```

```
        ci[i] = new CIE.Internals();
```

```
        ci[i].accept();
```

```
        se[i] = new SEE.Externals();
```

```
        se[i].accept();
```

```
}
```

```
package SEE;
import CIE.*;
import java.util.Scanner;
public class External extends CIE.Students
```

```
Scanner scan = new Scanner (System.in);
public int seem[] = new int [5];
```

```
public void accept()
{
```

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

```
System.out.println ("Enter SEE Marks of subject"
+ (i+1));
seem[i] = scan.nextInt();
```

```
}
```

```
}
```

Teacher's Signature _____

Lab-6

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

```
{  
    Scanner scan = new Scanner(System.in);  
    public String usn, name;  
    public int sem;  
    public void accept()
```

```
{  
    System.out.println("Enter usn : ");  
    usn = scan.nextLine();  
    System.out.println("Enter name : ");  
    name = scan.nextLine();  
    System.out.println("Enter sem : ");  
    sem = scan.nextInt();
```

```
{  
    public void display()
```

```
{  
    System.out.println("Name : " + name);  
    System.out.println("USN : " + usn);  
    System.out.println("Sem : " + sem);
```

```
package CIE;  
import java.util.Scanner;  
public class Internals extends CIE.Student  
{  
    Scanner scan = new Scanner(System.in);  
    public int clem[] = new int[5];  
  
    public void accept()  
    {  
        for (int i = 0; i < 5; i++)  
        {  
            System.out.print("Enter CIE marks of subject" + (i + 1));  
            clem[i] = scan.nextInt();  
        }  
    }  
}
```

Teacher's Signature _____

```
Command Prompt - X

C:\JAVA\bin\Package progs>javac Program6.java
C:\JAVA\bin\Package progs>java Program6
Number of students : 2
Student 1
Enter the following information :
Name : aaa
USN : 1bm19cs000
Semester : 3
Enter the marks scored in CIE :
Subject 1 : 34
Subject 2 : 45
Subject 3 : 43
Subject 4 : 23
Subject 5 : 41
Enter SEE marks of the student :
Subject 1 : 42
Subject 2 : 44
Subject 3 : 46
Subject 4 : 41
Subject 5 : 35
Student 2
Enter the following information :
Name : bbb
USN : 1bm19cs999
Semester : 3
Enter the marks scored in CIE :
Subject 1 : 43
Subject 2 : 48
Subject 3 : 37
Subject 4 : 29
Subject 5 : 33
Enter SEE marks of the student :
Subject 1 : 41
Subject 2 : 29
Subject 3 : 39
Subject 4 : 31
Subject 5 : 45
Student Details are as follow:-
Student 1
Name : aaa
USN : 1bm19cs000
Semester : 3
CIE Marks :
Subject 1 : 34
Subject 2 : 45
Subject 3 : 43
Subject 4 : 23
Subject 5 : 41
SEE marks :
Subject 1 : 42
Subject 2 : 44
Subject 3 : 46
Subject 4 : 41
Subject 5 : 35
Total marks :
Subject 1 : 76
Subject 2 : 89
Subject 3 : 89
Subject 4 : 64
```

Program-7

Write a program to demonstrate generics with multiple object parameters.

class Main

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

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

```
System.out.println ("Enter any string: ");  
String s = System.in.readLine();
```

```
String s = scan.nextLine();
System.out.println ("Enter any Integer: ");
int i = scan.nextInt();
```

System.out.println();

```
System.out.println("Enter any strings: ");
```

String st = scan.next();

```
System.out.print("Enter any double: ");  
double d = scan.nextDouble();
```

multiple < String, Integers > tg obj = new multiple < string *, Integers > (s, i);

七〇九

String str = tgeobj->getobj1();

```
System.out.println("Value of set1: " + str);
```

int v = tgoobj.getobj();

```
System.out.println("Value of set1 :- " + v);
```

System.out.println();

Teacher's Signature

Lab - 7

```
import java.util.Scanner;  
class multiple<T, V>
```

{

```
    T ob1;  
    V ob2;
```

```
    multiple<T O1, V O2>
```

{

```
    ob1 = O1;
```

```
    ob2 = O2;
```

{

```
    void showTypes()
```

{

```
        System.out.println("Type of first : "+ ob1.getClass().  
                           getName());
```

```
        System.out.println("Type of second : "+ ob2.getClass().  
                           getName());
```

{

```
    T getob1()
```

{

```
        return ob1;
```

{

```
    V getob2()
```

{

```
        return ob2;
```

{

{

Teacher's Signature _____

multiple < string, Double > tobj = new multiple < string,
Double > (st, d);

tobj.showTypes();

String strn = tobj.getOb1();

System.out.println("Value of set 2 : " + strn);

Double vd = tobj.getOb2();

System.out.println("Value of set 2 : " + vd);

7

Teacher's Signature _____

```
Command Prompt
C:\JAVA\bin>javac GenericMain.java

C:\JAVA\bin>java GenericMain
A is java.lang.Integer
B is java.lang.String
C is java.lang.Double
Value of Integer: 47
String: qwerty
Value od Double: 1500.99

C:\JAVA\bin>
```

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.

class Father

{

 public int age1;

 Scanner scan = new Scanner(System.in);

 int age1;

 Father()

{

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

 age1 = scan.nextInt();

 void ex1() throws fatherAgeException

{

 if (age1 < 0)

 throw new fatherAgeException();

}

class Son extends Father

{

 public int age2;

 Son()

{

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

 age2 = scan.nextInt();

}

 void ex2() throws sonAgeException

{

 if (age2 < 0 || age2 > super.age1)

 throw new sonAgeException(age2);

}

Teacher's Signature _____

Lab-8

```
import java.util.Scanner;
```

```
class fatherAgeException extends Exception
```

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

```
{ return ("Father's age is less than 0");
```

```
}
```

```
class sonAgeException extends Exception
```

```
{
```

```
int a;
```

```
sonAgeException (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");
```

```
}
```

Teacher's Signature _____

```
7
class Main
{
```

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

```
    Son s = new Son(); }
```

```
    try {
```

```
        s.ex1();
```

```
}
```

```
    try {
```

```
        s.ex2();
```

```
}
```

```
    catch (SonAgeException e)
```

```
{
```

```
    System.out.println(e);
```

```
    }
```

```
}
```

```
C:\JAVA\bin>java ExceptionsMain
ENTER FATHER'S AGE:
25
ENTER SON'S AGE:
25
AGE OF SON=25 IS ENTERED INCORRECTLY

C:\JAVA\bin>java ExceptionsMain
ENTER FATHER'S AGE:
30
ENTER SON'S AGE:
3
THE AGES ARE ENTERED CORECTLY
FATHER'S AGE=30 SON'S AGE=3
```

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.

Lab - 9

class NewThread implements Runnable {

```
String name;  
long time;  
int x;  
Thread t;
```

```
NewThread (String threadname, long time, int x1)  
{
```

```
    name = threadname;
```

```
    x = x1;
```

```
    time1 = time;
```

```
    t = new Thread (this, name);  
    t.start();
```

```
}
```

```
public void run()  
{
```

```
    try
```

```
    for (int i = x; i > 0; i--)
```

```
        System.out.println (name);
```

```
        Thread.sleep (time1);
```

```
}
```

```
    catch (InterruptedException)
```

```
{
```

```
        System.out.println (name + " Interrupted");
```

```
}
```

Teacher's Signature _____

{
y
}

class week11Thread

{
f

public static void main (strings args[])

new NewThread ("BMS COLLEGE OF ENGINEERING"
,1000,2);

new NewThread ("CSE",2000,10);

{
y
}

Teacher's Signature _____

```
Command Prompt - X
C:\JAVA\bin>java Threadmain1
CSE
BMS college of engineering
CSE
CSE
BMS college of engineering
BMS college of engineering

C:\JAVA\bin>javac Threadmain1.java

C:\JAVA\bin>java Threadmain1
BMS college of engineering
CSE
CSE
CSE
BMS college of engineering
BMS college of engineering

C:\JAVA\bin>javac Threadmain1.java

C:\JAVA\bin>java Threadmain1
CSE
BMS college of engineering
CSE
CSE
BMS college of engineering
BMS college of engineering

C:\JAVA\bin>
```

Program-10(a)

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 theResult 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.

lab-10

(a) `import java.awt.*;`
`import java.awt.event.*;`

`public class main extends frame implements`
`ActionListener {`

`Text field tf1, tf2;`
`label l;`
`Button b;`

`Main()`

`{`

`tf1 = new Textfield();`
`tf1.setBounds(50, 50, 200, 25);`

`tf2 = new Textfield();`
`tf2.setBounds(50, 100, 200, 25);`

`l = new Label();`
`l.setBounds(50, 150, 200, 50);`

`b = new Button("Divide");`
`b.setBounds(50, 200, 100, 50);`
`b.addActionListener(this);`

`add(b);`
`add(tf1);`
`add(tf2);`

Teacher's Signature _____

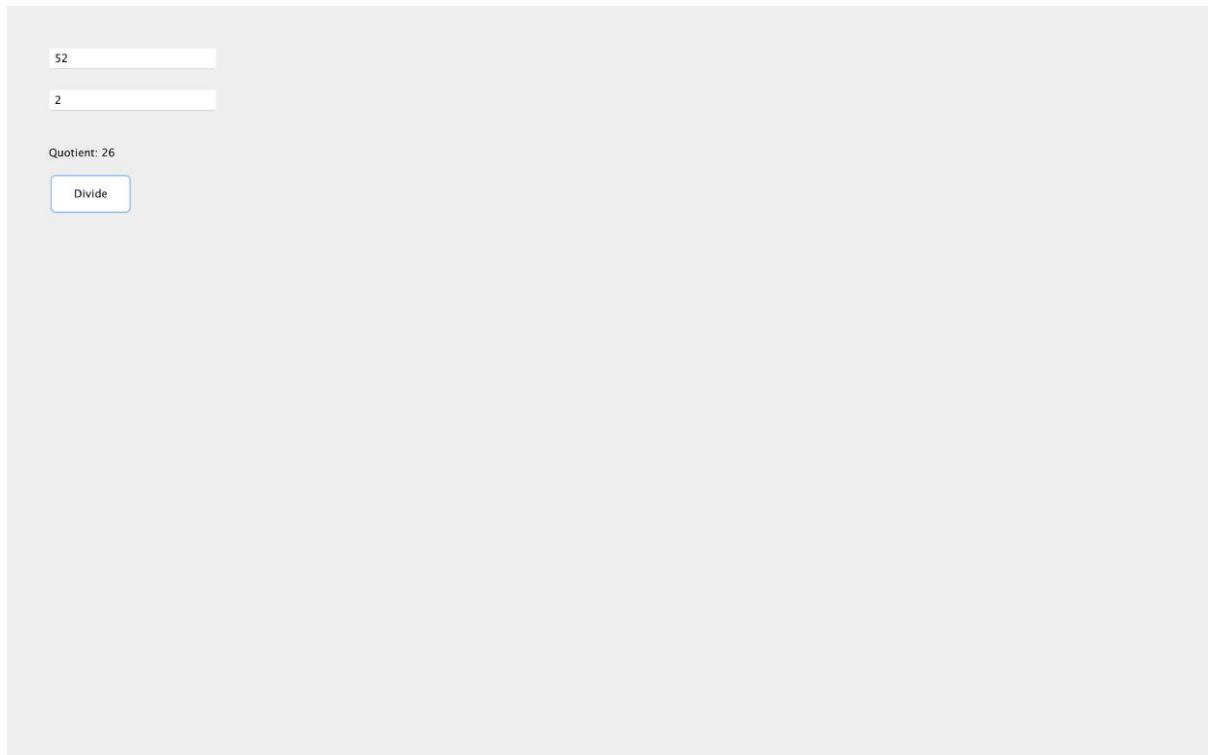
```
add(l);
setSize(800, 800);

setLayout(null);
setVisible(true);

public void actionPerformed(ActionEvent e)
{
    try {
        String n1 = tf1.getText();
        String n2 = tf2.getText();
        l.setText("Quotient: " + (Integer.parseInt(n1) / Integer.parseInt(n2)));
    }
    catch (NumberFormatException ze) {
        l.setText("Cannot divide non-numerical/ non-integer values");
    }
    catch (ArithmaticException ze) {
        l.setText("Cannot divide by zero");
    }
    catch (Exception ex) {
        System.out.println(ex);
    }
}
```

Teacher's Signature _____

```
public static void main(Strings [] args)
{
    new Main();
}
```



Program 10 (b)

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.

Lab - 10(b)

(b) `import java.awt.*;`
`import java.awt.event.*;`

class SampleDialog extends Dialog implements
ActionListener {

division div;

SampleDialog(Frame parent, String title)
{

super(parent, title, false);
div = (Division) parent;
setLayout(new FlowLayout());
setSize(400, 150);
add(new Label(div.msg));
Button b;
add(b = new Button("OK"));
b.addActionListener(this);

}

public void actionPerformed(ActionEvent ae)

{

dispose();

}

{

Teacher's Signature

```
public class Division extends Frame implements  
ActionListener  
{  
    String msg = " ";  
    String msg1 = " ";  
    TextField n1, n2, res;  
    Button b;  
    Label result = new Label ("Result: ", Label.RIGHT);  
  
    public Division()  
    {  
        setLayout (new FlowLayout());  
        Label num1 = new Label ("Number 1: ", Label.RIGHT);  
        Label num2 = new Label ("Number 2: ", Label.RIGHT);  
        Button div = new Button ("Divide");  
        n1 = new TextField (10);  
        n2 = new TextField (10);  
        res = new TextField (35);  
  
        add (num1);  
        add (n1);  
        add (num2);  
        add (n2);  
        b = (Button) add (div);  
        add (result);  
        add (res);  
    }  
}
```

Teacher's Signature _____

n1.add ActionListener (this);
n2.add ActionListener (this);
b.add ActionListener (this);

addWindowListener (new WindowAdapter ())

{
public void windowClosing (WindowEvent we)
{
system.exit (0);
}};

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

Dimension appwin = new Dimension ();
appwin.setSize (new Dimension (450, 180));
appwin.setTitle ("Integer-Division");
appwin.setVisible (true);
}}

public void actionPerformed (ActionEvent ae)

{
if (! (n1.getText () .equals ("")) && ! (n2.getText () .
equals ("")))

{
try

Teacher's Signature _____

```
msg1 = "" + (Integer.parseInt(in1.getText()) /  
             Integer.parseInt(in2.getText()));  
res.setText(msg1);  
}  
catch (NumberFormatException c)  
{  
    msg = "Error : Enter only Integers!";  
    res.setText("");  
    SampleDialog d = new SampleDialog(this, "Error");  
    d.setVisible(true);  
}  
catch (ArithmeticException e)  
{  
    msg = "Error : Divisor CANNOT be ZERO!";  
    res.setText("");  
    SampleDialog d = new SampleDialog(this, "Error");  
    d.setVisible(true);  
}  
else  
{  
    msg = "ERROR : Number fields should NOT be EMPTY!";  
    res.setText("");  
    SampleDialog d = new SampleDialog(this, "ERROR");  
    d.setVisible(true);  
}
```

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