

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT on

Object Oriented Java Programming

Submitted by

Gagandeep Kattennanavar
(1BM21CS064)

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING

(Autonomous Institution under VTU)

BENGALURU-560019

October-2022 to Feb-2023

**B. M. S. College of Engineering,
Bull Temple Road, Bangalore 560019**

(Affiliated To Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering



CERTIFICATE

This is to certify that the Lab work entitled "Object Oriented Java Programming(22CS3PCOOJ)" carried out by GAGANDEEP KATTENNANAVAR (1BM21CS064), who is bonafide student of B. M. S. College of Engineering. It is in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belgaum during the year 2022. The Lab report has been approved as it satisfies the academic requirements in respect of a Database Management Systems (22CS3PCDBM) work prescribed for the said degree.

Nandhini Vineeth

Department of CSE
CSE BMSCE, Bengaluru
Bengaluru

Dr. Jyothi S Nayak
Professor and Head
Department of
BMSCE,

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.

Program - 1

Date 18/11/2021
Page

Quadratic Equation

import java.util.Scanner;

Class quadratic

{ public static void main (String args) }

Scanner s = new Scanner (System.in);

System.out.println ("Enter the values a b and c");

double a,b,c,d,g1,g2;

a = s.nextFloat();

b = s.nextFloat();

c = s.nextFloat();

d = (b*b) - (4*a*c);

if { d > 0)

$$g_1 = (-b + \sqrt{d}) / (2*a);$$

$$g_2 = (-b - \sqrt{d}) / (2*a);$$

System.out.println ("Roots are " + g1 + " and " + g2);

} }

else if (d == 0)

{

$$g_1 = -b / (2*a);$$

System.out.println ("Roots are equal and value
is " + g1);

}

```
else
```

```
{
```

```
System.out.println(" Roots are Imaginary");
```

```
}
```

```
}
```

Output

① Enter a b and c
2 4 2

Roots are equal and value is -1.0.

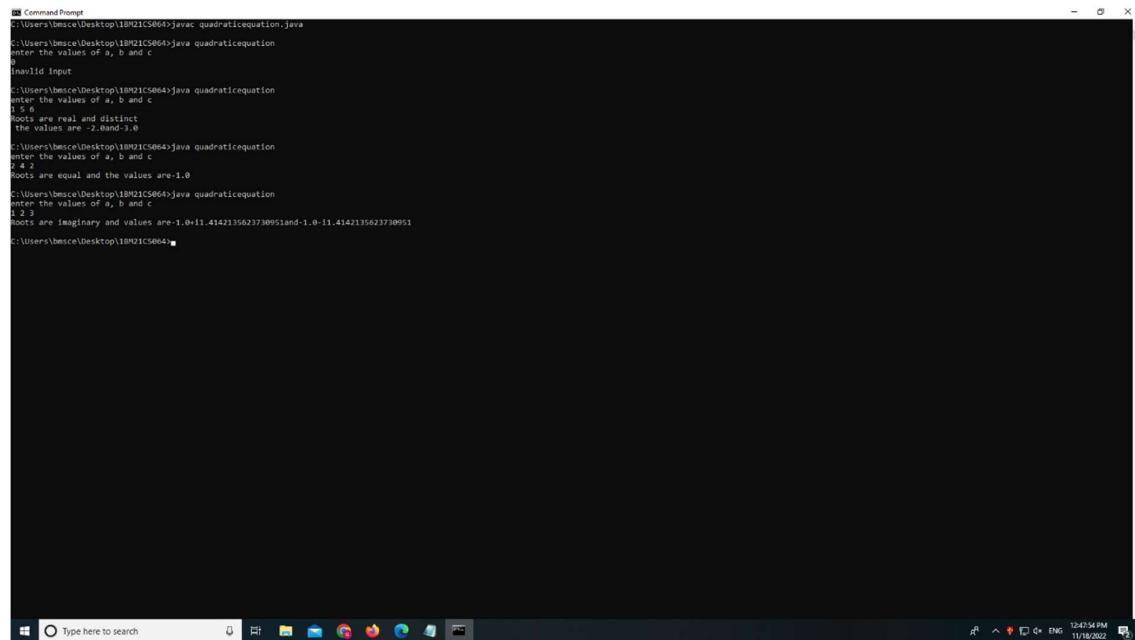
② Enter values a b and c
1 5 6

Roots are real and distinct and the values are

③ Enter values a b and c
1 2 3

Roots are Imaginary

*Nestor
18/1/2022*



```
C:\ Command Prompt
C:\Users\bmsce\Desktop\IBM21CS064>javac quadraticequation.java
C:\Users\bmsce\Desktop\IBM21CS064>java quadraticequation
enter the values of a, b and c
Invalid input
C:\Users\bmsce\Desktop\IBM21CS064>java quadraticequation
enter the values of a, b and c
1 5 3
roots are real and distinct
the values are -2.0 and -1.0
C:\Users\bmsce\Desktop\IBM21CS064>java quadraticequation
enter the values of a, b and c
2 4 4
roots are equal and the values are -1.0
C:\Users\bmsce\Desktop\IBM21CS064>java quadraticequation
1 2 3
roots are imaginary and values are -1.0+11.414213562373995i and -1.0-11.414213562373995i
C:\Users\bmsce\Desktop\IBM21CS064>
```

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.

Program - 2

Date 21/12/23
Page

- ★ 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 CGPA of a student.

→ import java.util.Scanner;
class Student {
 String USN, name;
 int credits[], marks[], gradepoints[], n; n=0;
 double cgpa;

Void accept()
{

Scanner s = new Scanner(System.in);

System.out.println("Enter student name, usn");

name = s.next();

USN = s.next();

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

n = s.nextInt();

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

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

marks[i] = s.nextInt();

System.out.println("Enter subject" + (i+1) + "Credits");

```
credits[i] = s.nextInt();  
demon += credits[i];
```

}

```
Void calculate()
```

{

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

{

```
if (marks[i] >= 90)
```

```
gradepoints[i] = 10;
```

```
else if (marks[i] >= 80 && marks[i] < 90)
```

```
gradepoints[i] = 9;
```

```
else if (marks[i] >= 70 && marks[i] < 80)
```

```
gradepoints[i] = 8;
```

```
else if (marks[i] >= 60 && marks[i] < 70)
```

```
gradepoints[i] = 7;
```

```
else if (marks[i] >= 50 && marks[i] < 60)
```

```
gradepoints[i] = 6;
```

```
else if (marks[i] >= 40 && marks[i] < 50)
```

```
gradepoints[i] = 4;
```

```
else
```

```
gradepoints[i] = 0;
```

```
} num += credits[i] * gradepoints[i];
```

sgpa = name / dname;

Void display()

```
System.out.println ("Student details");  
System.out.println ("name" + name + " " + usn  
+ "\n");
```

```
System.out.println ("marks & grade");  
for (i=0; i<n; i++)  
{ System.out.println (marks[i] + " " + grade[i]);  
System.out.println ();
```

```
} System.out.println ("SGPA" + sgpa);
```

Class StudentDemo

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

```
Student s = new Student();  
s.accept();  
s.calculate();  
s.display();
```

Output
 Enter the student name, usn
 gagan 18MUK1064
 Enter the number of subjects
 4
 Enter subject 1 marks
 89
 Enter subject 1 credits
 4
 Enter subject 2 marks
 90
 Enter subject 2 credits
 4
 Enter subject 3 marks
 56
 Enter subject 3 credits
 3
 Enter subject 4 marks
 78
 Enter subject 4 credits
 Student_details
 name: gagan
 usn: 18MUK1064
 Marks Grade
 89 9
 90 10
 56 6
 78 8
 SGPA: 8.0

Needless
2/12/2022

```

C:\Users\bmcsl\Desktop\18N21CS064>javac Studentdemo.java
C:\Users\bmcsl\Desktop\18N21CS064>java Studentdemo
enter student name ,usn
gagan 18MUK1064
enter the number of subjects
4
enter subject1marks
89
enter subject1credits
4
enter subject2marks
90
enter subject2credits
4
enter subject3marks
56
enter subject3credits
3
enter subject4marks
78
enter subject4credits
4
Student_details
name :gagan
usn :18MUK1064
Marks and Grade
89 9
56 6
SGPA :8.0
C:\Users\bmcsl\Desktop\18N21CS064>

```

LAB PRPGRAM-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

106 Program - 3

Date _____
Page _____

```
import java.util.Scanner;  
class Book{  
    int numPages;  
    double price;  
    String name;  
    String author;  
    Book(){  
        numPages = 0;  
        price = 0.0;  
        name = "Some book";  
        author = "gegendeep";  
    }  
    Book(int numPages, double price, String name,  
         String author){  
        this.numPages = numPages;  
        this.price = price;  
        this.name = name;  
        this.author = author;  
    }  
    void getDetail()  
    {  
        System.out.println("Book details")  
        + "name : " +  
        + name + "\n" + "author : " + "\n"  
        + "number of pages : " + numPages +  
        + "\n" + "price : " + price);  
    }  
}
```

System.out.println ("In --- \n");

} public String toString() {
 String bookDetails = "Name : " + name +
 "Author : " + author + "No. of pages : "
 + numPages + "Price : " +
 price + "\n");

}

Class Lab 2 {

public static void main (String args[]) {

Book b1 = new Book();

Scanner s = new Scanner (System.in);

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

String name = s.nextLine();

System.out.println ("Enter the author's name");

String author = s.nextLine();

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

int numPages = s.nextInt();

System.out.println ("Enter the price");

double price = s.nextDouble();

System.out.println ();

b1.setDetails (numPages, price, name, author);

Book b2 = new Book (20, 57, 65, "deependra");

b2.printDetails ();

```
b1.git_data();  
b2.git_data();  
b1ter.out.println(b1);  
b1ter.out.println(b2);  
s.close();  
}
```

Output

Enter the name of book : Harry Potter
Enter the authors name : J.K. Rowling
Enter the number of pages : 500

Enter the price : 450

Book details

name : Harry Potter

author : J.K. Rowling

number of pages = 500

price = 450

New book details

27/2/20 name : dawson point

author : dan brown

number of pages : 20

price : 87.65

```
C:\ Command Prompt
enter the book details
91
99
enter the book details
91
99
96
98
C:\Users\bmscel\Desktop\IBM21CS064>java lab_2
C:\Users\bmscel\Desktop\IBM21CS064>java lab_2
enter the name of the book: harrypotter
enter the author's name: j k rowling
enter the number of pages in the book: 645
enter the price of the book: 675
Book details
name: harrypotter
author: j k rowling
number of pages: 645
price: 675.0
-----
Book details
name: harrypotter
author: j k rowling
number of pages: 645
price: 675.0
-----
Book details
name: harrypotter
author: j k rowling
number of pages: 645
price: 675.0
-----
Book details
name: harrypotter
author: j k rowling
number of pages: 645
price: 675.0
-----
C:\Users\bmscel\Desktop\IBM21CS064>
```

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.

Program - 4

Abstract Class

```
import java.util.Scanner;  
abstract class Shape  
{  
    shape()  
    int h, b;  
    abstract void printArea();  
}
```

Class rectangle extends shape

```
Scanner s = new Scanner(System.in);  
void printArea()  
{
```

```
System.out.println("Enter height & width of  
rectangle");
```

h = s.nextInt();

b = s.nextInt();

```
System.out.println("Area of rectangle "+(h*b));
```

rectangle()
}

Class triangle extends shape

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

Date _____
Page _____

{ System.out.println ("Enter the height & base of triangle");
 h = s.nextInt();
 b = s.nextInt();
 System.out.println ("Area of triangle is " + 0.5 * b * h);
}
triangle() } }

{ Class circle extends shape
 Scanner s = new Scanner (System.in)
 void printArea ()
 {
 System.out.println ("Enter the radius of circle");
 r = s.nextInt();
 System.out.println ("Area of circle " + 3.14 * r * r);
 }
 circle() } }

{ Class main
 {
 public static void (String args) {
 rectangle r1 = new rectangle ();
 }

```

S. print area();
Circle c = new Circle();
c.printArea();

```

Output:
Enter height & width of rectangle
20
30
Area of Rectangle is 600

Enter height and base of triangle
20
30
Area of Triangle is 300

Enter radius of circle.
20
Area of circle is 1256.8^{approx}

```

C:\> Command Prompt
1. Area of rectangle
2. Area of triangle
3. Area of circle
Enter your choice
1
Enter length and breadth:
20 30
Area of rectangle= 600.0
C:\Users\bsmce\Desktop\IBM21CS064>java abstarea
1. Area of rectangle
2. Area of triangle
3. Area of circle
Enter your choice
2
Enter base and height:
20 30
Area of triangle= 300.0
C:\Users\bsmce\Desktop\IBM21CS064>java abstarea
1. Area of rectangle
2. Area of triangle
3. Area of circle
Enter your choice
3
Enter radius:
20
Area of circle= 1256.8
C:\Users\bsmce\Desktop\IBM21CS064>javac account.java

```

Lab program-5

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called a savings account and the other a current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Cur-acct and Sav-acct to make them more specific to their requirements.

Include the necessary methods in order to achieve the following tasks:

- a) Accept deposit from customer and update the balance.
- b) Display the balance.
- c) Compute and deposit interest
- d) Permit withdrawal and update the balance Check for the minimum balance, impose penalty if necessary and update the balance

Program - 5

Date _____
Page _____

- ③ Develop a java program to create a Java Bank that maintains two kinds of accounts called Savings account & other (Current account).

```
import java.util.Scanner;  
import java.lang.Math;
```

Class account

{

```
String name = new String();
```

```
int accno;
```

```
double bal;
```

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

```
void set()
```

{

```
System.out.println("Enter customer name");
```

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

```
System.out.println("Enter " + name + " account no");
```

```
accno = s.nextInt();
```

```
System.out.println("Enter balance amount");
```

```
bal = s.nextDouble();
```

}

Void display()

```
System.out.println("Customer Name" + name);
```

```
System.out.println ("Customer name" + name);
System.out.println ("Your account number" + accno);
System.out.println ("Your account balance" + bal);
}
account()
{
class search extends account
{
Scanner s = new Scanner (System.in);
search()
{
}
System.out.println ("Unique Facility not available");
void deposit()
{
int ch;
double amt;
System.out.println ("Press 1 to deposit");
ch = s.nextInt();
if (ch == 1)
{
System.out.println ("Enter amount to deposit");
amt = s.nextDouble();
bal = bal + amt;
}
System.out.println ("Final amount be deposited");
amt = S.nextInt();
bal = bal + amt;
}
}
```

else

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

void inc()

System.out.println ("Enter rate of interest");

double r = Scanner.nextDouble();

System.out.println ("Enter number of time interest
applied per time period");

int n = Scanner.nextInt();

System.out.println ("Enter number of time periods")

int t = Scanner.nextInt();

double x = $(1 + (r/100))^t$;

double Ci = bal * Math.pow(x, n*t);

System.out.println ("Interest amount = " + Ci + "
Balance amount without interest is " +
bal);

bal = bal + Ci;

System.out.println ("Available balance after
updating is " + bal);

} void wd()

System.out.println ("Please enter withdraw
amount");

```
int ch = System.in.read();  
if (ch == 1)
```

```
    System.out.println("Enter the amount to be  
    withdraw");
```

```
    double withdraw = Double.parseDouble();
```

```
    bal = bal - withdraw;
```

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

```
}
```

```
else
```

```
    System.out.println("Invalid input");
```

```
} class current extends account
```

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

```
current()
```

```
{
```

```
    System.out.println("Cheque facility avail");
```

```
void deposit()
```

```
{
```

```
    int ch;
```

```
    double amt;
```

```
    System.out.println("Press 1 to deposit");
```

```
    ch = s.nextInt();
```

{ if (ch == 1)

System.out.println("Enter amount to be deposited");
amt = sc.nextDouble();
bal = bal + amt;

else

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

void wd()

{

System.out.println("Please withdraw the
amount");

int ch = sc.nextInt();

if (ch == 1)

{

System.out.println("Enter amount to be
withdrawn");

double wdDraw = sc.nextDouble();

bal = bal - wdDraw;

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

else

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

if (bal < 1000)

System.out.println ("You are running out of minimum
balance. A penalty amount of 20.50
has been deducted as service charge
for having low balance");

bal = bal - 50;

System.out.println ("Your available balance" + bal);

}

{

public class lab5

{

public static void main (String xx[])

{
Scanner s = new Scanner (System.in)
int ch;

System.out.println ("1. If your
account is saving account
2. if your account is current
account");

ch = s.nextInt();

switch (ch)

{

case 1 :

```
savaut s1 = new savaut();  
s1.set();  
s1.display();  
s1.deposit();  
s1.in();  
s1.wd();  
break;
```

Case 2:

```
curact .c1 = new curact();  
c1.set();  
c1.display();  
c1.deposit();  
c1.wd();  
break;
```

default: System.exit(0);

}
}

Output

Press

1. If your account is Savings account
2. if your account is Current account

1

Cheque facility not available

Enter customer name

Gagan

Enter Gagan's account number

123456

Enter balance amount

10000

Enter Customer name : gagan

Your account number : 123456

Your account balance = 10000

Press 1 to deposit

1

Enter Amount to be deposited

1000

Enter rate of interest

2

Enter number of times interest applied per time period

2

Enter number of time periods

2

Interest amount = 176000

Balance amount without interest is 110000

Available balance after updating is 181700

Press 1 to withdraw amount

1

Enter the amount to be withdrawn

1000

Available Balance : 18600

Press

1. if your account is saving account
2. if your account is saving account

Cheque facility

Enter customer name :

Gagan

Enter gagan's account number

123456

Enter balance amount

10000

Customer name : Gagan

Your account number : 123456

Your account Balance : 10000

Press 1 to deposit

Enter amount to be deposited

1000

Press 1 to withdraw amount

1

Enter the amount to be withdrawn

1000

Available Balance : 10000

✓ NID
30/12/2022

```
C:\Users\bmsce\Desktop\IBM21C5064>java account
1.Savings account
2.Current account
1
Enter your name
gagan
Enter the balance amount
10000
Name : gagan
Cheque service not available
Do you want to deposit(1 for yes ,2 for no)
1
Enter the amount to be deposited
20000
Amount in bank insufficient
Current balance : 10000.0
Enter the rate of interest
2
Enter the number of times interest applied per time period
2
Enter the time elapsed
2
Compound interest is 1.6E17
Enter the amount to be withdrawn
1222
Withdrawn : 1222.0
Current balance : 8778.0
```

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

LAB PROGRAM-6

Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called “Father” and derived class called “Son” which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge() when the input age<0. In Son class, implement a constructor that cases both father and son’s age and throws an exception if son’s age is >=father’s age.

Program - 6

Date _____
Page _____

Exception

import java.util.*;
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");
```

Class Father {

```
int age;
```

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

```
Father () {
```

```
System.out.println ("Enter the Father's age : ");
```

age = in.readInt();

} void con() throws FatherAgeException

{ if (age < 0)

throw new FatherAgeException();

}

}

Class Son extends Father {

int age;
Son(){

System.out.println("Enter the age of son:");

age = in.readInt();

}

void con2() throws SonAgeException {

if (age < 0 || age > super.age) {

throw new SonAgeException(age);

}

}

}

```
Public class except {
    public static void main (String[] args) {
        Son s = new Son();
        try {
            s.even();
        }
```

```
        catch (fatherAgeException e) {
            System.out.println (e);
        }
```

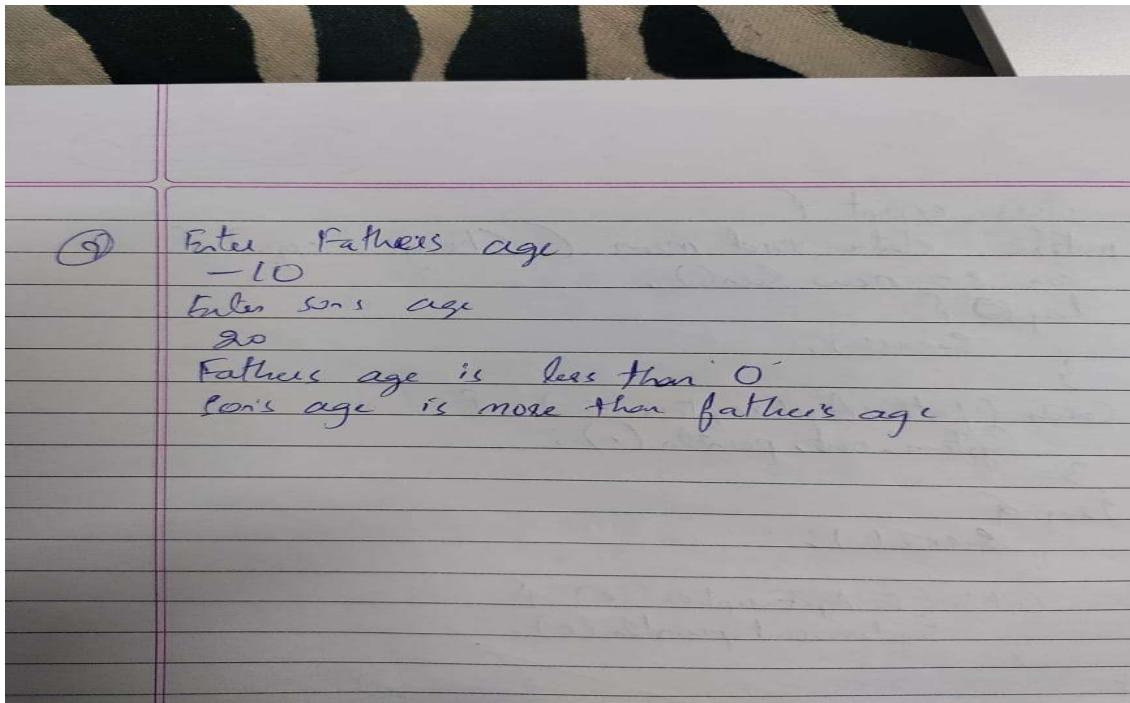
```
    try {
        s.end();
    }
```

```
    catch (SonAgeException e) {
        System.out.println (e);
    }
```

Output
 Enter father's age
 56

Enter son's age
 19

ND
 20/12/2022



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.22000.1219]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Users\hghat\Documents
C:\Users\hghat\Documents>set path=C:\Program Files\Java\jdk-19\bin
C:\Users\hghat\Documents>javac fs.java

C:\Users\hghat\Documents>java main
Enter the fathers age:
-9
Age cannot be negative

C:\Users\hghat\Documents>java main
Enter the fathers age:
14
Enter the sons age:
22

C:\Users\hghat\Documents>java main
Enter the fathers age:
26
Enter the sons age:
90
Father's age cannot be less than son's age

C:\Users\hghat\Documents>java main
Enter the fathers age:
23
Enter the sons age:
-1
Age cannot be negative

C:\Users\hghat\Documents>
```

LAB PROGRAM-7

Write a program which creates two threads, one thread displaying "BMS College of Engineering" once every ten seconds and another displaying "CSE" once every two seconds.

Lab - 7
Date: 6/1/23
Page:

Class Call implements Runnable

```
class Call implements Runnable {
    String a;
    int x, time;
    Thread t;
    Call (String tn, int ti, int ex)
    {
        a = tn;
        x = ex;
        time = ti;
        t = new Thread (this, a);
        t.start ();
    }
    public void run()
    {
        try {
            for (int i = 0; i < x; i++)
            {
                System.out.println (a);
                Thread.sleep (time);
            }
        } catch (InterruptedException ie)
        {
        }
    }
}
```

{
 System.out.println("Talukdar");
}
}

CSE
CSE
CSE
CSE.

Class Lab8.

public static void main (String args)
{
 new Cell ("BMS College of Engineering", "10000");
 new Cell ("CSE", 2000, 10);
}

N
Others

Output

BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE

LAB PROGRAM-8

Create a package CIE which has two classes- Student and Internals- a subclass of Student. The class Student 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 Internals. 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.

Clue:

All classes except the class with main method need to be public.

Create 4 files -

File 1 -> package CIE with class Student

File 2 -> package CIE with class Internals

File 3 -> package SEE with class Externals

File 4-> Default package - class with main method

Method 1:

Create two packages - CIE and SEE

Keep all .java files in the root. Compile Student.java, shift class file to CIE folder, then compile Internals.java, shift .class to CIE, Compile Externals.java and shift class file in SEE folder. Compile and execute the main class.

Use imports appropriately.

Lab-8

Date _____
Page _____

Student.java

```
package CIE  
import java.util.*;  
public class student {  
    Scanner sc = new Scanner(System.in);  
    public String usn, name;  
    public int sem;  
  
    public void accept(){  
        System.out.println("Enter USN, Name and current  
        semester : ");  
        usn = sc.nextLine();  
        name = sc.nextLine();  
        sem = sc.nextInt();  
    }  
  
    public void display(){  
        System.out.println("In Student Details");  
        System.out.println("Name : " + name);  
        System.out.println("USN : " + usn);  
        System.out.println("Semester : " + sem);  
    }  
}
```

intervals.java

```
package CTE;
import java.util.*;

public class intervals extends CTE.Student {
    public class interval {
        public int start;
        public int end;
    }
}

public void accept() {
    int i;
    for (i = 0; i < 5; i++)
        System.out.println("TE made of " + (i + 1));
    sum[0] = sc.nextInt();
    sum[1] = sc.nextInt();
}
}

public void accept() {
    for (int i = 0; i < 5; i++)
        System.out.println("TE made of " + (i + 1));
    sum[0] = sc.nextInt();
    sum[1] = sc.nextInt();
}
```

ambiguously.java

```
package SEE;
import CTE.*;

public class intervals extends CTE.Student {
    public class interval {
        public int start;
        public int end;
    }
}

public void accept() {
    int i;
    for (i = 0; i < 5; i++)
        System.out.println("TE made of " + (i + 1));
    sum[0] = sc.nextInt();
    sum[1] = sc.nextInt();
}
```



Vakinger.java

```
import CSE.*;
import SEE.*;
import java.util.*;
```

```
Class total {
```

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

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

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

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

```
        j = sc.nextInt();
```

```
        CSE.Student s[] = new CSE.Student[j];
```

```
        CSE.internals g[] = new CSE.internals[j];
```

```
        SEE.internals h[] = new SEE.internals[j];
```

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

```
            s[i] = new CSE.Student("Student" + (i + 1));
```

```
            g[i] = new CSE.internals("Internals" + (i + 1));
```

```
            h[i] = new SEE.internals("Exams" + (i + 1));
```

Output

```
Edu number of students:
```

```
1
```

```
CSE.Student
```

```
SEE.internals
```

```
SEE.internals
```

```
Edu student: data1  
13MCS064  
Programmer
```

```
2  
SEE.accept();
```



Date _____		Page _____	
<u>Enter CIE marks of Subject 1</u>		<u>Details of student 1</u>	
- 33	" " Subject 2	Student Details	
- 31	" " Subject 3	Name: gagandeep	
- 24	" " Subject 4	USN: 1BMS12064	
97	" " Subject 5	Semester: 3	
38		Total marks in Subject 1: 123	
90	" " " 2	Total marks in Subject 2: 119	
88	" " " 3	Total marks in Subject 3: 102	
78	" " " 4	Total marks in Subject 4: 106	
79	" " " 5	Total marks in Subject 5: 137	
99		<i>NLP</i> 27/1/2023	

```
C:\Users\bmsce\Desktop\1BM21CS064>
C:\Users\bmsce\Desktop\1BM21CS064>javac packages.java

C:\Users\bmsce\Desktop\1BM21CS064>java total
Enter number of students:
1

Enter student 1 details
Enter USN, Name and Current semester:
1bm21cs064
gagandep
3
Enter CIE marks of subject 1
33
Enter CIE marks of subject 2
31
Enter CIE marks of subject 3
24
Enter CIE marks of subject 4
27
Enter CIE marks of subject 5
38
Enter SEE marks of subject 1
90
Enter SEE marks of subject 2
88
Enter SEE marks of subject 3
78
Enter SEE marks of subject 4
79
Enter SEE marks of subject 5
99

Details of student 1

Student Details
Name: gagandep
USN: 1bm21cs064
Semester: 3
Total marks in subject 1: 123
Total marks in subject 2: 119
Total marks in subject 3: 102
Total marks in subject 4: 106
Total marks in subject 5: 137

C:\Users\bmsce\Desktop\1BM21CS064>
```

Practice programs

/*3. Create an abstract class Calculate which has three double members say x, y and result.

Include a method calc.

Derive three classes from Calculate which performs any three arithmetic operations on the two variables x and y and assign the result to the variable result.

Make appropriate declarations and definitions.*/

```
import java.util.Scanner;      abstract class Calculate
{
    double x,y,result;
    abstract void calc();
}

class Addition extends Calculate
{
    void accept()
    {
        Scanner ss = new Scanner(System.in);

        System.out.println("Enter the value of x and y");
        x = ss.nextDouble();           y = ss.nextDouble();

    }

    void calc()
    {
        result = x+y;

        System.out.println(x+" + "+y+" = "+result);
    }
}

class Subtraction extends Calculate
{

    void accept()
    {
        Scanner ss = new Scanner(System.in);

        System.out.println("Enter the value of x and y");
        x = ss.nextDouble();           y = ss.nextDouble();
    }
}
```

```

        }

    void calc()
    {
        result = x-y;
        System.out.println(x+" - "+y+" = "+result);
    }
}

class Multiplication extends Calculate
{
    void accept()
    {
        Scanner ss = new Scanner(System.in);
        System.out.println("Enter the value of x and y");
        x = ss.nextDouble();
        y = ss.nextDouble();
    }
    void calc()
    {
        result = x*y;
        System.out.println(x+" * "+y+" = "+result);
    }
}

class AbstractCalc
{
    public static void main(String args[])
    {
        Addition a = new Addition ();
        Subtraction s = new Subtraction ();
        Multiplication m = new Multiplication ();
        System.out.println("Addition");
        a.accept();
        a.calc();
        System.out.println("Subtraction");
        s.accept();
        s.calc();
        System.out.println("Multiplication");
        m.accept();
        m.calc();
    }
}

```

```

}
}

abstract - Notepad
File Edit Format View Help
import java.util.Scanner;
abstract class Calculate{
    double x,y,result;
    abstract void calc();
}
class Add extends Calculate{
void calc(){
Scanner ss = new Scanner(System.in);
System.out.println("Enter the value of x and y");
x = ss.nextDouble();
y = ss.nextDouble();
result = x+y;
System.out.println(x+
)
}
class Subtract extends Calculate{
void calc(){
Scanner ss = new Scanner();
System.out.println("Enter the value of x and y");
x = ss.nextDouble();
y = ss.nextDouble();
result = x-y;
System.out.println(x+
)
}
class Multiply extends Calculate{
void calc(){
Scanner ss = new Scanner();
System.out.println("Enter the value of x and y");
x = ss.nextDouble();
y = ss.nextDouble();
result = x*y;
System.out.println(x+
)
}
class AbstractCalc{
public static void main()
{
Add a = new Add();
Subtract s = new Subtract();
Multiply m = new Multiply();
System.out.println("Addition");
a.calc();
System.out.println("Subtraction");
s.calc();
System.out.println("Multiplication");
m.calc();
}
}
C:\Users\DHANUSH\Documents\NetBeansProjects\abstract>javac abstract.java
C:\Users\DHANUSH\Documents\NetBeansProjects\abstract>java AbstractCalc
Microsoft Windows [Version 10.0.19045.2251]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DHANUSH>D:\>java AbstractCalc
Enter the value of x and y
8.0
5.0
8.0 + 5.0 = 13.0
Enter the value of x and y
8.0
4.0
8.0 - 4.0 = 4.0
Enter the value of x and y
4.0
6.0
4.0 * 6.0 = 24.0
D:\>

```

Ln 48, Col 2 100% Windows (CRLF) UTF-8
25°C Partly sunny 12:26 18-12-2022

*/*Programs that can be tried out in lab today are given here. Complete all of these and upload in github as Additional programs done before T1.*

1. Create a class Customer with the following specifications.

Private Members :Customer_no , Customer_name, Qty , Price, TotalPrice,

Discount, Netprice.

Methods: Public members:1. A parameterized constructor to assign initial

2. Input() – to read data members. Call Caldiscount().

3. Caldiscount () – To calculate Discount according to TotalPrice and NetPrice

TotalPrice = Price*Qty

TotalPrice >=50000 – Discount 25% of TotalPrice

TotalPrice >=25000 - Discount 10% of TotalPrice

Netprice= TotalPrice-Discount

4.Show() – to display Customer details. Develop a Java program to accept details of n customers, calculate the discounts given to them and print their complete

details.*/

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

```

class Customer
{
    private int cno, qty;
    private double price, totalprice, discount, netprice;
    private String cname;

    public Customer(int cNo,int Qty,double Price,double tprice,double
dis,double nprice,String cName )
    {
        cno=cNo;
        qty=Qty;
        price=Price;
        totalprice=tprice;
        discount=dis;
        netprice=nprice;
        cname
        = cName;
    }

    public void Input()
    {
        Scanner ss = new Scanner(System.in);
        System.out.println("Enter the Customer name, Customer
number, Quantity and the Price ");
        cname=ss.next();
        cno=ss.nextInt();           qty=
        ss.nextInt();               price=ss.nextDouble();
        netprice= CalDiscount();
    }

    public double CalDiscount()
    {

        totalprice=price*qty;
        if(totalprice>=50000)

        {
            discount=0.25*totalprice;
        }
    }
}

```

```

        }

        else if(totalprice>=25000)

        {

            discount=0.10*totalprice;

        }

        else discount=0;

        netprice=totalprice-discount;

    return netprice;

}

public void Show()

{

    System.out.println("Customer name:"+cname);

    System.out.println("Customer number:"+cno);

    System.out.println("Quantity of item:"+qty);

    System.out.println("Price of item:"+price);

    System.out.println("Total price:"+totalprice);

    System.out.println("Discount for the item:"+discount);

    System.out.println("Net price:"+netprice+"\n");

}

}

class Maincus

{

    public static void main(String args[])

    {

        Scanner sc = new Scanner(System.in);

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

        int n=sc.nextInt();

        Customer c[]=new Customer [n];

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

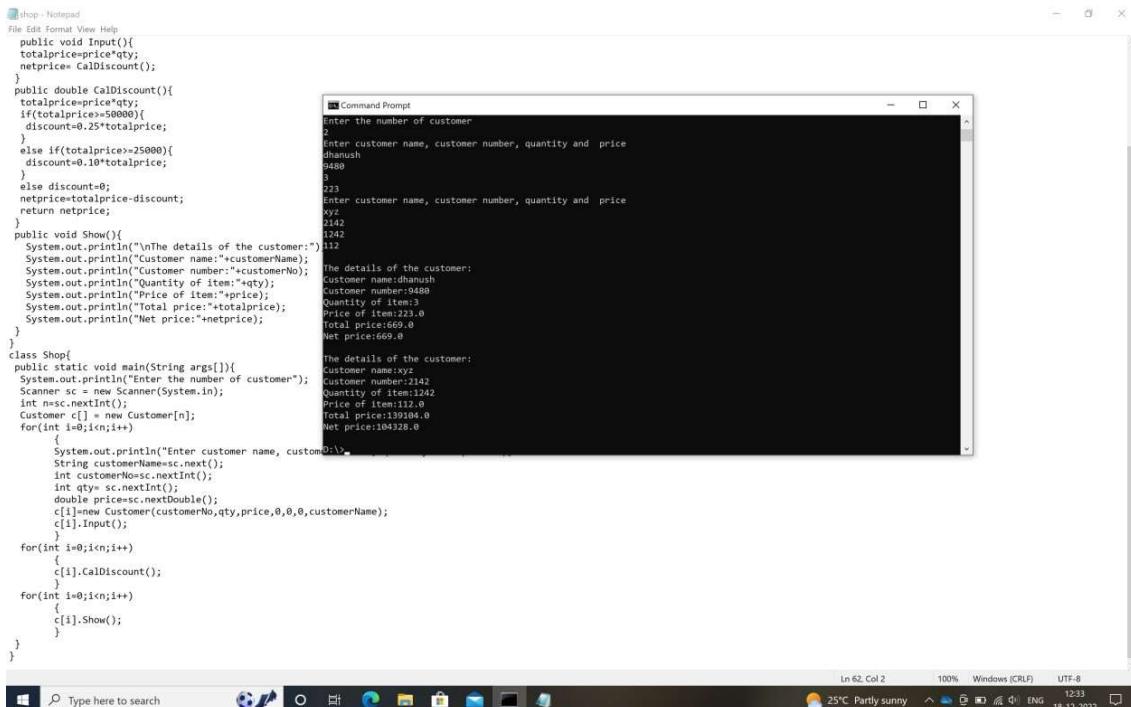
    {

        c[i]=new Customer (0,0,0,0,0,null);

        System.out.println("Enter Customer "+(i+1)+""

```

```
details");  
    c[i].Input();  
}  
  
}  
  
for(int i=0;i<n;i++)  
{  
    System.out.println("\nCustomer "+(i+1)+" :");  
    c[i].Show();  
}  
  
}  
}
```



*/*Develop a Java program to create a class Patient with data members pt_id, pt_name, pt_age, doc.*

The program should include the following functionalities.

Accept n patient details.

Accept a patient id and display his/her details.

Accept the name of the doctor and display the names of all the patients

treated by him/her*/

```
import java.util.*;      class Patient
```

{

```
int pt_id, pt_age;
```

```

String pt_name, doc;

void accept()
{
    System.out.println("Enter the Patient ID of the Patient :");
    Scanner sc= new Scanner(System.in);           pt_id=sc.nextInt();

    System.out.println("Enter the Name of the Patient :");
    pt_name=sc.next();
    System.out.println("Enter the age of Patient :");
    pt_age=sc.nextInt();
    System.out.println("Enter the Patient's Doctor :");
    doc=sc.next();
}

//void display()
//{
//System.out.println("Patient ID : "+pt_id+"\nName of the
Patient : "+pt_name+"\nThe Age of the Patient : "+pt_age+"\nName of the
Doctor : "+doc);
//}

//void displayp()
//{
//System.out.println("\n"+pt_name);
//}

void display_id(int id)
{
    if(id==pt_id)
    {
        System.out.println("Patient ID : "+pt_id+"\nName of
the Patient : "+pt_name+"\nThe Age of the Patient : "+pt_age+"\nName of the
Doctor : "+doc);
    }
}

```

```

    }

    void display_doc(String doctor)
    {
        if(doctor.equals(doc))
        {
            System.out.println("\nName of the Patient : ");
            System.out.println(pt_name);
        }
    }

}

class Mainp
{
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number of Patients");
        int n=sc.nextInt();
        Patient p[]=new Patient[n];
        for(int i=0;i<n;i++)
        {
            p[i]=new Patient();
            System.out.println("Enter Patient "+(i+1)+" details");
            p[i].accept();
        }

        System.out.println("Enter the Patient ID who's details you
want to display");
        int
pt_id=sc.nextInt();

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

```
p[i].display_id(pt_id);
```

```
System.out.println("Enter the Doctor's name who's Patients you want  
to display");
```

```
String doc=sc.next();
```

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

{

```
p[i].display doc(doc);
```

1

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

113

```
//System.out.println("Book "+(j+1)+" ");
```

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

11

U

1

