

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.



## LAB REPORT on

### Object Oriented Java Programming

Submitted by

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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)  
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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 DHANUSH HV (1BM21CS052), 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.

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## Quadratic equation

( $a \neq 0$ )  $\Rightarrow$  roots

```

import java.util.Scanner; // (1) d = a * b * c + 1 float
class Quadratic {
    public static void main (String args[]) {
        double a, b, c;
        double root, root1, root2, i, d;
        Scanner sc = new Scanner (System.in);
        System.out.println ("Enter the coefficients a, b, c");
        a = sc.nextDouble();
        b = sc.nextDouble();
        c = sc.nextDouble();
        d = (b*b) - (4*a*c); d = b^2 - 4ac
        if (a==0) { d < 0 no solution with roots (i)
            System.out.println ("it's not a quadratic equation
                Enter valid inputs");
        } else if (d>0) { d > 0 two distinct real roots
            root1 = (-b + Math.sqrt(d)) / (2*a);
            root2 = (-b - Math.sqrt(d)) / (2*a);
            System.out.println ("the roots are real and distinct
                root1 = " + root1 + " , root2 = " + root2);
        } else if (d<0) { d < 0 two complex roots
            root = -b / (2*a);
            i = Math.sqrt (-d) / (2*a);
            System.out.println ("the roots are distinct and
                imaginary");
            System.out.println ("root1 = " + root + " + " + i + "i");
            System.out.println ("root2 = " + root + " - " + i + "i");
        }
    }
}

```

```
else if (d == 0)
    { root1 = root2 = -b/(2*a); // roots are real and equal
        System.out.println ("the roots are real and equal");
        System.out.println ("roots = " + root1 + " + " + root2);
    }
else
    { System.out.println ("roots are invalid");
    }
```

Sample output

for student form 2B + 3

$$x^2 + 10x + 25 = 0$$

(i) enter the coefficients a, b, c

(a == 0)

perhaps starting 3 form 2B+3 after two steps {  
{ 80 0 0 14 } set it}

its not a quadratic equation. Enter valid input.

(ii) enter ((the)) coefficients.  $a, b, c, d$ ) =  
 $i(2^{\frac{1}{2}}) + (b)$  imaginary part =  $d = 0$

which has been "rooted" in "book" and taught the  
"roots of "therefore" are real and distinct:

$$\text{root } 1 = -6.8639906$$

$$\text{root } 2 = -11.136009$$

(ans)

### Command Prompt

```
enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+1i.1989578888281798
root2 -0.75-i1.1989578888281798

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic
enter the coefficients a,b,c
2
9
1
the roots are real and distinct:root1 -6.863999063670617root2 -11.13600093632938
3

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic
enter the coefficients a,b,c
0
3
4
it's not a quadratic equation

C:\Users\STUDENT\Desktop\1BM21CS044>
```

(iii) enter the coefficients  $a, b, c, \dots$  (as per the question)  
Ans:  $a = 1, b = -2, c = 1$

The roots are distinct and imaginary.

$$\text{root 1} \approx -0.75 + i1.19895$$

$$\text{root 2} \approx -0.75 - i1.19895$$

### Command Prompt

```
A
Exception in thread "main" java.util.InputMismatchException
  at java.base/java.util.Scanner.throwFor(Scanner.java:860)
  at java.base/java.util.Scanner.next(Scanner.java:1497)
  at java.base/java.util.Scanner.nextDouble(Scanner.java:2467)
  at quadratic.main(quadratic_equation.java:8)

C:\Users\STUDENT\Desktop\IBM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\IBM21CS044>java quadratic
enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+ii.1989578808281798
root2 -0.75-ii.1989578808281798

C:\Users\STUDENT\Desktop\IBM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\IBM21CS044>java quadratic
enter the coefficients a,b,c
2
9
1
the roots are real and distinct:root1 -6.863999063670617root2 -11.13600093632938
3

C:\Users\STUDENT\Desktop\IBM21CS044>
```

(iv) enter the coefficients  $a, b, c$

2

4

2

the roots are real and equal roots = -1.0 -1.0

### Command Prompt

```
C:\Users\STUDENT\Desktop\IBM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\IBM21CS044>java quadratic
enter the coefficients a,b,c
4
5
6
the roots are distinct and imaginary
root1 -0.625+ii.0532687216470449
root2 -0.625-ii.0532687216470449
C:\Users\STUDENT\Desktop\IBM21CS044>java quadratic
enter the coefficients a,b,c
2
?
1
the roots are real and distinct:root1 -5.399218940641788root2 -8.600781059358212
C:\Users\STUDENT\Desktop\IBM21CS044>java quadratic
enter the coefficients a,b,c
2
4
2
the roots are real and equal roots=-1.0 -1.0
C:\Users\STUDENT\Desktop\IBM21CS044>
```

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

```
import java.util.Scanner;  
class Student {  
    String usn, name;  
    int credits[], marks[], gradePoints[];  
  
    int totCredits()  
    {  
        int t=0, i;  
        for (i=0; i<3; i++)  
            t = t + credits[i];  
        return t; }  
  
    float SGPA()  
    {  
        public static void main(String args[])  
        {  
            S.O.P ("enter the student name, usn")  
            int i; t;  
            float SGPA = 0;  
            Scanner sc = new Scanner (System.in);  
            Student s1 = new Student();  
            s1.name = sc.nextLine();  
            s1.usn = sc.nextLine();  
            S.O.P ("marks and credit of each subject  
            are \n");  
            for (i=0; i<3; i++)
```

```

if (S1.marks[i] == SC.nextInt()); // marks in science
if (S1.marks[i] == 100) {
    S2.marks[i] = (S2.marks[i]/10); // divide by 10
} else {
    S1.marks[i] = (S1.marks[i]/10)+1; // add 1
    S1.credit[i] = SC.nextInt();
    Sgpa = Sgpa + S1.marks[i]*S1.credit[i];
}
t = S1.totalCredit();
Sgpa = Sgpa/t;
System.out.println("GPA of " + S1.name + " is " + Sgpa);
}

```

Sample output

Enter the student name, usn  
Dhanush .H.V  
CS052  
marks and credit of each subjects are

Maths	95	3	Pass
Physics	85	4	Pass
Chemistry	96	3	Pass

Sgpa at Dhanush.H.V is  
~~9.6~~ 9.6

(Grade at first attempt)

Now we can calculate the average  
Average of 6 subjects is  
~~9.6~~ 9.6

```
enter the student name, usn
```

```
Dhanush
```

```
52
```

```
marks and credit of each subjects are
```

```
86 3
```

```
98 3
```

```
75 3
```

```
sgpa of Dhanush is
```

```
9.0
```

3) Create a class Book which contains four members: name, author, price, num-pages. Include a constructor to set the values of the members. Include methods to set and get the values of the objects. Include a to\_string() method that displays the complete details of the book. Develop a Java program to create n book objects.

Java program to create n book objects

Allow user to enter : [ ] Books

import java.util.Scanner;

class Book {

String name;

String author;

int price;

int pages;

Book (String n, String a, int p, int p) {

Name = n;

Author = a;

Price = p;

Pages = p;

void getc()

{ System.out.println("book details are : " + name + " " + author);

+ author + " " + price + " " + price + " " + num-

number of pages);

+ pages + "\n");

}

public String to\_string()

{ return ("book details are " + name + " " + author + " " + author + " " + price + " " + price + " " + num-number of pages + " " + pages + "\n"); }

Class Week 4 {

Java Input

PSum (String args [ ])

{ int z, pr, p;

String n, a;

S.o.p ("enter the number of books\n");

Scanner sc = new Scanner (System.in);

z = sc.nextInt();

int i;

Book b[] = new Book[z];

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

{ S.o.p ("enter the name, author, price and  
pages of the book" + (i+1) + " respectively\n");

n = sc.nextInt();

a = sc.next();

pr = sc.nextInt();

p = sc.nextInt();

b[i] = new Book (n, a, pr, p);

}

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

{ ~~Print~~ (b[i]);

S.o.p (b[i]);

9

9

9.

Sample output :

Enter the number of books

2

Enter the name, author, price and pages of the book,

dhanush

chinmay

499

700

Enter the name, author, price and pages of the book

XYZ

abc

599

book details are

name : dhanush

author : chinmay

price : 499

number of pages : 700

book details are

name : XYZ

author : abc

price : 599

number of pages : 800

(After 2 books)

total price

total pages

```
enter the number of books
1
enter the name ,author ,price and pages of the book1 respectively
winter
virat
335
460
book details are
name: winter
author: virat
price:335
number of pages: 460
```

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 base shape. Each one of the classes contains only the method printArea() that prints the area of the given shape.

```
import java.util.*;  
abstract class Shape {  
    double a, b;  
    abstract void printArea();  
}
```

```
class Triangle extends Shape {  
    void getdata (double x, double y) {  
        a = x, b = y;  
    }  
    void printArea () {  
        double area = 0.5 * a * b;  
        System.out.println ("Area of triangle = " + area);  
    }  
}
```

```
class Rectangle extends Shape {  
    void getdata (double x, double y) {  
        a = x, b = y;  
    }  
    void printArea () {  
        double area = a * b;  
        System.out.println ("Area of rectangle = " + area);  
    }  
}
```

```
class Circle extends Shape {  
    void getdata (double x, double y) {  
        a = x, b = y;  
    }  
    void printArea () {  
        double area = 3.14 * a * b;  
        System.out.println ("Area of circle = " + area);  
    }  
}
```

class circle extends shape {

void getdata (double x)

{  
a = x; };

void printarea ()

{  
double area = 3.142 \* a \* a;

System.out.println ("Area of circle = " + area);

class abstarea { public static void main (String args)  
{ int ch;

Shape si;

Scanner sc = new Scanner (System.in);

rectangle r = new rectangle ();

triangle t = new triangle ();

circle c = new circle ();

System.out.println ("1. Area of rectangle\n2. Area of triangle\n3.

Area of circle\nEnter your choice");

if (sc.nextInt () == ch) {

switch (ch)

{

case 1: System.out.println ("Enter length and breadth:");

double l = sc.nextDouble ();

double b = sc.nextDouble ();

r.getdata (l, b);

r.printarea ();

break;

case 2 : System.out.println("Enter base and height : ");  
double b1 = sc.nextDouble();  
double h1 = sc.nextDouble();  
t.getdata(b1,h1);  
t.paintarea();  
break;

case 3 : S.O.P ("Enter radius : ");  
double r1 = sc.nextDouble();  
c.getdata(r1);  
c.paintarea();  
break;

default : System.S.O.P ("Invalid input");

9  
4  
5  
1.

### Output

1. Area of rectangle
2. Area of triangle.
3. Area of circle.

Enter your choice

1.

Enter length and breadth  
3 4

Area of rectangle = 12.0

Enter your choice

2.

Enter base and height.  
4 6

Area of triangle = 12.0.

```
Command Prompt
Current balance : 25000.0
Enter the rate of interest
3
Enter the number of times interest applied per time period
2
Enter the time elapsed
2
Compound interest is 5.0625E20
Enter the amount to be withdrawn
25000
Withdrawn : 25000.0
Current balance : 50000.0
C:\Users\student\Desktop\ibm21cs052>javac shape.java
C:\Users\student\Desktop\ibm21cs052>java abstarea
Error: Could not find or load main class abstarea
Caused by: java.lang.ClassNotFoundException: abstarea
C:\Users\student\Desktop\ibm21cs052>java abstarea
1. Area of rectangle
2. Area of triangle
3.Area of circle
Enter your choice
1
Enter length and breadth:
4 3
Area of rectangle= 12.0
C:\Users\student\Desktop\ibm21cs052>java abstarea
1. Area of rectangle
2. Area of triangle
3.Area of circle
Enter your choice
2
Enter base and height:
4 3
Area of triangle= 6.0
C:\Users\student\Desktop\ibm21cs052>java abstarea
1. Area of rectangle
2. Area of triangle
3.Area of circle
Enter your choice
3
Enter radius:
4
Area of circle= 50.272
C:\Users\student\Desktop\ibm21cs052>
```

Name	Date modified	Type	Size
abstarea.class	09/12/2022 13:07	CLASS File	2 KB
account.class	09/12/2022 12:58	CLASS File	2 KB
bank.class	09/12/2022 12:58	CLASS File	2 KB
bank.java	09/12/2022 12:33	Java Source File	3 KB
circle.class	09/12/2022 13:07	CLASS File	1 KB
current.class	09/12/2022 12:58	CLASS File	2 KB
rectangle.class	09/12/2022 13:07	CLASS File	1 KB
savings.class	09/12/2022 12:58	CLASS File	2 KB
shape.class	09/12/2022 13:07	CLASS File	1 KB
shape.java	09/12/2022 11:47	Java Source File	2 KB
triangle.class	09/12/2022 13:07	CLASS File	1 KB



3) Develop a Java program to create a bank system which maintains two kinds of accounts for its customers called savings account and the other current account. Savings account provides compound interest and facilities but no cheque book facility.

```
if("savings") {  
    if("deposit") {  
        withdrawal = 5000;  
        balance = 5000 + withdrawal;  
        System.out.println("Your balance is " + balance);  
    } else if("withdrawal") {  
        withdrawal = 5000;  
        balance = balance - withdrawal;  
        System.out.println("Your balance is " + balance);  
    } else if("interest") {  
        interest = 5000 * 0.05;  
        balance = balance + interest;  
        System.out.println("Your balance is " + balance);  
    } else if("cheque") {  
        System.out.println("Cheque facility not available");  
    } else {  
        System.out.println("Enter valid choice");  
    }  
}  
else if("current") {  
    if("deposit") {  
        withdrawal = 5000;  
        balance = 5000 + withdrawal;  
        System.out.println("Your balance is " + balance);  
    } else if("withdrawal") {  
        withdrawal = 5000;  
        balance = balance - withdrawal;  
        System.out.println("Your balance is " + balance);  
    } else if("interest") {  
        interest = 5000 * 0.05;  
        balance = balance + interest;  
        System.out.println("Your balance is " + balance);  
    } else if("cheque") {  
        withdrawal = 5000;  
        balance = balance - withdrawal;  
        System.out.println("Your balance is " + balance);  
    } else {  
        System.out.println("Enter valid choice");  
    }  
}
```

```
import java.util.*;
import java.lang.Math;
class bank {
    Scanner sc; // new Scanner (System.in);
    String name;
    int acc_no;
    float bal, si;
    void accept () {
        System.out.print ("Enter your name");
        name = sc.nextLine();
        System.out.print ("Enter the balance amount");
        bal = sc.nextFloat();
    }
    void display () {
        System.out.println ("Name: " + name);
    }
    void deposit () {
        float amount;
        int choice;
        System.out.print ("Do you want to deposit (1 for yes, 0 for no)");
        choice = sc.nextInt();
        if (choice == 1) {
            System.out.print ("Enter the amount to be deposited");
            amount = sc.nextFloat();
            if (amount > bal) {
                System.out.print ("Amount in bank insufficient");
            }
        }
    }
}
```

```
else {
    bal = bal + amount;
}
S. O. P ("current balance : " + bal);
}
}
```

Class current extends bank {

int service - fee = 50;

void cheque () {

S. O. P ("cheque service available"); }

void withdrawal () {

float amt;

S. O. P ("Enter the amount to be withdrawn");

amt = S. C. nextFloat();

if (amt > bal)

S. O. P ("Balance insufficient");

else {

bal = bal - amt;

if (bal < 1000) {

bal = bal - Service - fee;

S. O. P ("50rs is taken as service fee");

}

S. O. P ("withdrawn : " + amt);

S. O. P ("current balance : " + bal);

}

}

class saving extends bank {

void cheque() {  
S. O. P ("cheque service not available");  
q  
if (amount > bal) throw new Exception("Insufficient balance");  
else  
System.out.println("Cheque cashed with profit");

void withdrawl() {  
System.out.println("Enter amount to withdraw");

float amt; // amount (pounds, etc.)  
System.out.print("Enter the amount to be withdrawn");

amt = sc.nextfloat();

if (amt > bal)

System.out.println("Balance insufficient");

else

bal = bal - amt;

S. O. P ("withdrawn : " + amt);

S. O. P ("current balance : " + bal);

q

void interest() {

S. O. P ("Enter the rate of interest");

int r = sc.nextInt();

S. O. P ("Enter the number of times interest applied per time period");

int n = sc.nextInt();

S. O. P ("Enter the time elapsed");

int t = sc.nextInt();

si = bal \* (1 + (r / n));

S. O. P ("compound interest is " + (Math.pow(si, n \* t)));

Class account {

    Public static void main (String args [ ] ) {

        Scanner Sc = new Scanner (System.in);

        Saving obj1 = new Savings();

        Current obj2 = new Current();

        S. o. p ("Inl. Savings account / Inl. Current ac-

        count choice : > Sc. nextInt();

    Switch (choice) {

        Case 1 :

            obj1 . accept ();

            obj2 . display ();

            obj1 . cheque ();

            obj1 . deposit ();

            obj1 . interest ();

            obj1 . withdrawal ();

            break ;

        Case 2 :

            obj2 . accept ();

            obj2 . display ();

            obj2 . cheque ();

            obj2 . deposit ();

            obj2 . withdrawal ();

            break ;

        default : S. o. p ("Invalid choice");

    }

    }

    }

```
23456
Name : tg
Cheque service not available
Do you want to deposit(1 for yes ,2 for no)
1
Enter the amount to be deposited
1234
Current balance : 24690.0
Enter the rate of interest
13
Enter the number of times interest applied per time period
2
Enter the time elapsed
20
Compound interest is 3.1971660882987766E209
Enter the amount to be withdrawn
20000
Withdrawn : 20000.0
Current balance : 4690.0
C:\Users\student\Desktop\ibm21cs052>javac bank.java
C:\Users\student\Desktop\ibm21cs052>java account
1.Savings account
2.Current account
1
Enter your name
dhanush
Enter the balance amount
50000
Name : dhanush
Cheque service not available
Do you want to deposit(1 for yes ,2 for no)
1
Enter the amount to be deposited
25000
Current balance : 25000.0
Enter the rate of interest
3
Enter the number of times interest applied per time period
2
Enter the time elapsed
2
Compound interest is 5.0625E20
Enter the amount to be withdrawn
25000
Withdrawn : 25000.0
Current balance : 50000.0
C:\Users\student\Desktop\ibm21cs052>
```

Ln 101, Col 62

b) Write a program that demonstrates handling of exception, inheritance tree. Create a base class called "Father" and derive 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 calls father's constructor and throw exception if son's age is  $\geq$  father's age.

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

```
class WrongAgeException extends Exception {
```

```
String msg = new String();
```

```
WrongAgeException (String x)
```

```
{ msg = x; }
```

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

```
return msg; }
```

```
}
```

```
class Father {
```

```
int f_age;
```

```
Father () throws WrongAgeException {
```

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

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

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

```
if (f_age < 0)
```

```
{ throws new WrongAgeException ("Father age < 0"); }
```

```
}
```

```
void display () { System.out.println ("Father age: " + f_age); }
```

```
}
```

Class Son extends Father {

int s-age;

Son() throws WrongAgeException;

Scanner S = new Scanner (System.in);

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

s-age = S.nextInt();

: if (s-age < 0) {

    throw new WrongAgeException ("Son age < 0"); }

else if (s-age > f-age)

    { throw new WrongAgeException ("Not possible. How can be Son's age greater than father's age!"); }

else if (s-age == f-age)

    { throw new WrongAgeException ("Not possible. How can be Son's age equal to Father's age!"); }

}

void display ()

{ System.out.println ("Father age: " + f-age);  
    S.o.p ("Son age: " + s-age); }

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

{ try {

Father f = new Father();

f.display();

Son S = new Son();

S.display(); }

Catch (WrongAgeException wae)

{ S.o.p (wae); }

}

Command Prompt  
Microsoft Windows [Version 10.0.19045.2251]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\DHANUSH>cd C:\1bm21cs052  
C:\1bm21cs052>javac wrongage.java  
C:\1bm21cs052>java Except  
Enter father's age:  
52  
Father age: 52  
Enter father's age:  
52  
Enter son's age:  
22  
Father age: 52  
Son age: 22  
C:\1bm21cs052>java Except  
Enter father's age:  
52  
Father age: 52  
Enter father's age:  
52  
Enter son's age:  
53  
Not possible.How can be Son's age greater than father's age !  
C:\1bm21cs052>

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.

Class bms implements Runnable {

Thread t1; (this is a global variable) implements Runnable after class bms();

t1 = new Thread(this, "bms"); (t1 is a local variable) after t1.start();

public void run() {

try { (try part of the code) if InterruptedException was caught {

for (int i=5; i>0; i--) {

System.out.println("BMS College of Engineering");

Thread.sleep(1000); (1000 ms) in sleep. t1.sleep();

}

Catch (InterruptedException) { (else part of the code) if InterruptedException was caught {

System.out.println("BMS interrupted\n"); } }

System.out.println("Existing: " + i);

}

class cse implements Runnable {

Thread t2; (this is a global variable) implements Runnable after class cse();

t2 = new Thread(this, "cse");

}

public void run() {

try { (try part of the code) if InterruptedException was caught {

for (int i=5; i>0; i--) {

```
System.out.println("CSE");
Thread.sleep(2000);
```

```
{  
}  
catch (InterruptedException e){  
    System.out.println("CSE interrupted in");  
}  
System.out.println("Exiting : " + t2);  
}  
}
```

```
class ThreadPrg {
    public static void main (String args[]){
        bms obj1 = new bms();
        cse obj2 = new cse();
        obj1.t1.start();
        obj2.t2.start();
    }
}
```

Output :

BMS College of Engineering

CSE

CSE

CSE

CSE

BMS College of Engineering

Exiting : Thread [E5B, 5, main]

BMS College of Engineering

BMS College of Engineering

BMS College of Engineering

Exiting : Thread [bms, 5, main]

Command Prompt

```
C:\Users\STUDENT>cd C:\Users\STUDENT\Desktop\ibm21cs052
C:\Users\STUDENT\Desktop\ibm21cs052>javac lab7.java
lab7.java:21: error: cannot find symbol
    Thread t2;
           ^
symbol:   class Thread
location: class cse
lab7.java:40: error: cannot find symbol
public static void main(String args[]){
           ^
symbol:   class String
location: class threadprg
2 errors

C:\Users\STUDENT\Desktop\ibm21cs052>javac lab7.java
lab7.java:40: error: cannot find symbol
public static void main(String args[]){
           ^
symbol:   class String
location: class threadprg
1 error

C:\Users\STUDENT\Desktop\ibm21cs052>javac lab7.java
C:\Users\STUDENT\Desktop\ibm21cs052>java threadprg
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
Exiting:Thread[cse,5,main]
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
Existing:Thread[bms,5,main]

C:\Users\STUDENT\Desktop\ibm21cs052>
```

Notepad

Ln 35, Col 35



06:35  
ENG  
06-01-2023

8)

~~Class CIE~~

~~Package CIE;~~  
~~import java.util.\*;~~

Internal . Java

Package CIE;

import java.util.\*;

Public class Internal extends CIE.Student {

Scanner sc = new Scanner (System.in);

Public int cim[] = new int [5];

Public void accept() {

int i;

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

{ S.O.P ('Enter CIE marks of subject '+ (i+1));

cim[i] = sc.nextInt();

}

}

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.nextLine(); }

```
public void display() {
    System.out.println("Student Details");
    System.out.println("Name: " + name);
    System.out.println("USN: " + usn);
    System.out.println("Semester: " + sem);
```

### External.java

```
package SEE;
import CIE.*;
import java.util.*;
public class external extends CIE.Student {
    Scanner sc = new Scanner(System.in);
    public int sem[] = new int[5];
    public void accept() {
        for (int i=0; i<5; i++) {
            System.out.println("Enter marks of Subject " + (i+1));
            sem[i] = sc.nextInt();
        }
    }
}
```

### Packages.java

```
import CIE.*;
import SEE.*;
import java.util.*;
class total {
    public static void main(String args[]) {
        int i, n;
        Scanner sc = new Scanner(System.in);
        int total [] = new int[5];
        System.out.println("Enter number of students:");
        n = sc.nextInt();
    }
}
```

```

CIE. Student se[] = new CIE. Student[n];
CIE. internal i[] = new CIE. internal[n];
SEE. external se[] = new SEE. external[n];
for (i=0; i<n; i++)
{
    s.o. p ("In Enter student" + (i+1) + " details");
    se[i] = new CIE. Student();
    se[i]. accept();
    i[] = new CIE. internal();
    i[i]. accept();
    se[i] = new SEE. external();
    se[i]. accept();
}

for (i=0; i<n; i++)
{
    s.o. p ("In Details of student" + (i+1));
    se[i]. display();
    for (j=0; j<5; j++)
    {
        total [j] = i[i]. citem [j] + se[i]. score[j];
    }
    s.o. p ("Total marks in subject" + (i+1) + ":" + total[i]);
}
s.o. p();
}

```

Command Prompt

```
Enter USN, Name and Current semester:  
1bm21cs044  
chinmay  
3  
Enter CIE marks of subject 1  
38  
Enter CIE marks of subject 2  
37  
Enter CIE marks of subject 3  
39  
Enter CIE marks of subject 4  
40  
Enter CIE marks of subject 5  
39  
Enter SEE marks of subject 1  
99  
Enter SEE marks of subject 2  
98  
Enter SEE marks of subject 3  
97  
Enter SEE marks of subject 4  
96  
Enter SEE marks of subject 5  
99  
Details of student 1  
Student Details  
Name: dhanush  
USN: 1bm21cs052  
Semester: 3  
Total marks in subject 1: 122  
Total marks in subject 2: 112  
Total marks in subject 3: 110  
Total marks in subject 4: 112  
Total marks in subject 5: 109  
Details of student 2  
Student Details  
Name: chinmay  
USN: 1bm21cs044  
Semester: 3  
Total marks in subject 1: 137  
Total marks in subject 2: 135  
Total marks in subject 3: 136  
Total marks in subject 4: 136  
Total marks in subject 5: 138  
C:\Users\student\Desktop\1bm21cs052>
```

File Explorer

Date modified	Type	Size
13/01/2023 06:48	File folder	
13/01/2023 06:48	File folder	
09/12/2022 15:26	CLASS File	2 KB
09/12/2022 15:26	Java Source File	2 KB
16/12/2022 15:44	CLASS File	2 KB
16/12/2022 15:44	Java Source File	4 KB
30/12/2022 09:23	CLASS File	2 KB
30/12/2022 09:42	Java Source File	4 KB
16/12/2022 15:44	CLASS File	2 KB
09/12/2022 12:33	Java Source File	3 KB
09/12/2022 15:26	CLASS File	1 KB
16/12/2022 15:44	CLASS File	2 KB
30/12/2022 09:23	CLASS File	1 KB
13/01/2023 06:24	Java Source File	2 KB
09/12/2022 15:26	CLASS File	1 KB
16/12/2022 15:44	CLASS File	2 KB
09/12/2022 15:26	CLASS File	1 KB
30/12/2022 09:41	CLASS File	1 KB
30/12/2022 09:23	CLASS File	2 KB
30/12/2022 09:41	Java Source File	1 KB
13/01/2023 06:53	CLASS File	2 KB



Command Prompt

```
26 Dir(s) 354,899,709,952 bytes free
C:\Users\student>cd Desktop
C:\Users\student\Desktop>cd 1bm21cs052
C:\Users\student\Desktop\1bm21cs052>javac packages.java
C:\Users\student\Desktop\1bm21cs052>java total
Enter number of students:
2
Enter student 1 details
Enter USN, Name and Current semester:
1bm21cs052
dhanush
3
Enter CIE marks of subject 1
33
Enter CIE marks of subject 2
34
Enter CIE marks of subject 3
32
Enter CIE marks of subject 4
23
Enter CIE marks of subject 5
32
Enter SEE marks of subject 1
89
Enter SEE marks of subject 2
78
Enter SEE marks of subject 3
78
Enter SEE marks of subject 4
89
Enter SEE marks of subject 5
77
Enter student 2 details
Enter USN, Name and Current semester:
1bm21cs044
chinmay
3
Enter CIE marks of subject 1
38
Enter CIE marks of subject 2
37
Enter CIE marks of subject 3
39
Enter CIE marks of subject 4
40
Enter CIE marks of subject 5
39
Enter SEE marks of subject 1
99
Enter SEE marks of subject 2
98
```

52

Date modified	Type	Size
13/01/2023 06:48	File folder	
13/01/2023 06:48	File folder	
09/12/2022 15:26	CLASS File	2 KB
09/12/2022 15:26	Java Source File	2 KB
16/12/2022 15:44	CLASS File	2 KB
16/12/2022 15:44	Java Source File	4 KB
30/12/2022 09:23	CLASS File	2 KB
30/12/2022 09:42	Java Source File	4 KB
16/12/2022 15:44	CLASS File	2 KB
09/12/2022 12:33	Java Source File	3 KB
09/12/2022 15:26	CLASS File	1 KB
16/12/2022 15:44	CLASS File	2 KB
30/12/2022 09:23	CLASS File	1 KB
13/01/2023 06:24	Java Source File	2 KB
09/12/2022 15:26	CLASS File	1 KB
16/12/2022 15:44	CLASS File	2 KB
09/12/2022 15:26	CLASS File	1 KB
30/12/2022 09:41	CLASS File	1 KB
30/12/2022 09:23	CLASS File	2 KB
30/12/2022 09:41	Java Source File	1 KB
13/01/2023 06:53	CLASS File	2 KB

06:58 ENG 13/01/2023

## 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+y);
}
}
class Subtract extends Calculate{
void calc(){
Scanner ss = new Scanner(System.in);
System.out.println("Enter the value of x and y");
x = ss.nextDouble(); Enter the value of x and y
y = ss.nextDouble(); 5
result = x-y;
System.out.println(x-y); Subtraction
}
}
class Multiply extends Calculate{
void calc(){
Scanner ss = new Scanner(System.in);
System.out.println("Enter the value of x and y");
x = ss.nextDouble(); Enter the value of x and y
y = ss.nextDouble(); 6
result = x*y;
System.out.println(x*y); 4.0 * 6.0 = 24.0
}
}
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();
}
}

```



```

/*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();
        }
    }
}

```

```

shop - Notepad
File Edit Format View Help
public void Input(){
    totalprice=price*qty;
    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("\nThe details of the customer:");
    System.out.println("Customer name:"+customerName);
    System.out.println("Customer number:"+customerNo);
    System.out.println("Quantity of item:"+qty);
    System.out.println("Price of item:"+price);
    System.out.println("Total price:"+totalprice);
    System.out.println("Net price:"+netprice);
}
class Shop{
    public static void main(String args[]){
        System.out.println("Enter the number of customer");
        Scanner sc = new Scanner(System.in);
        int n=sc.nextInt();
        Customer c[] = new Customer[n];
        for(int i=0;i<n;i++)
        {
            System.out.println("Enter customer name, customer number, quantity and price");
            String customerName=sc.next();
            int customerNo=sc.nextInt();
            int qty= sc.nextInt();
            double price=sc.nextDouble();
            c[i]=new Customer(customerNo,qty,price,0,0,customerName);
            c[i].Input();
        }
        for(int i=0;i<n;i++)
        {
            c[i].CalDiscount();
        }
        for(int i=0;i<n;i++)
        {
            c[i].Show();
        }
    }
}

Command Prompt
Enter the number of customer
2
Enter customer name, customer number, quantity and price
dhanush
9488
2142
223
Enter customer name, customer number, quantity and price
xyz
1242
112
The details of the customer:
Customer name:dhanush
Customer number:9488
Quantity of item:3
Price of item:223.0
Total price:669.0
Net price:669.0

The details of the customer:
Customer name:xyz
Customer number:2142
Quantity of item:1242
Price of item:112.0
Total price:139104.0
Net price:104328.0

```

/\*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);
}
//for(int i=0;i<n;i++)
//{
//System.out.println("Book "+(i+1)+" :");
//System.out.println(b[i]);
//}
}

}
}

```

The screenshot shows a Windows desktop environment. In the foreground, a Notepad window titled "patient - Notepad" displays Java code for a patient management system. In the background, a Command Prompt window titled "Command Prompt - java patient\_main" shows the execution of the Java program and its interaction with the user.

```
patient - Notepad
File Edit Format View Help
size = n;
}

void input(){
    Scanner s = new Scanner(System.in);
    System.out.println ("Enter patient id, name, age");
    this.p_id = s.nextInt();
    this.p_name = s.next();
    this.age = s.nextInt();
    this.doc = s.next();
}
public String toString(){
    return this.p_id+" "+this.p_name+" "+this.age+dhanush
}
class patient_main{
    public static void main(String[] args) {
        int x=0;
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the number of patient");
        int size=s.nextInt();
        Patient p[] = new Patient[size];
        for (int i=0; i<size; i++){
            p[i] = new Patient(size);
            p[i].input();
        }
    while (x==0){
        System.out.println("1:Enter patient ID");
        System.out.println("2:Enter Doctor name");
        System.out.println("3:Exit");
        int choice = s.nextInt();
        switch(choice){
            case 1: System.out.println("Enter patient ID:");
            int id = s.nextInt();
            for (int i=0;i<size; i++){
                if (p[i].p_id==id){
                    System.out.println(p[i]);
                    break;
                }
                if (i==size-1){
                    System.out.println("Patient does not exist!");
                }
            }
            break;
            case 2:System.out.println("Enter dooctor name:");
            String name = s.next();
        }
    }
}

class Patient{
    int p_id;
    String p_name;
    int age;
    String doc;
    void input(){
        Scanner s = new Scanner(System.in);
        System.out.println ("Enter patient id, name, age and doctor name");
        this.p_id = s.nextInt();
        this.p_name = s.next();
        this.age = s.nextInt();
        this.doc = s.next();
    }
}
```

D:\>java patient\_main  
Enter the number of patients:  
3  
Enter patient id, name, age and doctor name:  
001  
dhanush  
20  
xyz  
Enter patient id, name, age and doctor name:  
002  
chinmay  
20  
rty  
Enter patient id, name, age and doctor name:  
003  
manju  
20  
kvz  
1:Enter patient ID  
2:Enter Doctor name  
3:Exit  
1  
Enter patient ID:  
001  
1 dhanush 20 xyz  
1:Enter patient ID  
2:Enter Doctor name  
3:Exit

Ln 80, Col 2 100% Windows (CRLF) UTF-8  
25°C Partly sunny 12:29 18-12-2022