

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
“JnanaSangama”, Belgaum -590014, Karnataka.



**LAB REPORT**  
**on**  
**object oriented java**

*Submitted by*

**JITHENTAR A (1BM18CS082)**

*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**  
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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” carried out by **JITHENTHAR A (1BM21CS082)**, 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 OBJECT ORIENTED JAVA - (22CS3PCOOJ) work prescribed for the said degree.

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PROGRAM 1

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

2 :

Date \_\_\_\_\_  
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Quadratic Equation and its roots :-

```
import java.util.Scanner;
public class Quadratic {
    public static void main (String [] strings) {
        Scanner input = new Scanner (System.in);
        System.out.print ("Enter the value of a: ");
        double a = input.nextDouble();
        System.out.print ("Enter the value of b: ");
        double b = input.nextDouble();
        double c = input.nextDouble();
        double d = b * b - 4.0 * a * c;
        if (d > 0) {
            double r1 = (-b + Math.sqrt (d)) / (2.0 * a);
            double r2 = (-b - Math.sqrt (d)) / (2.0 * a);
            System.out.println ("The roots are real and distinct and the root values are " + r1 + " and " + r2);
        } else if (d == 0.0) {
            double r1 = -b / (2.0 * a);
            System.out.println ("The roots are real and equal and the root value is " + r1);
        } else {
            System.out.print ("The roots are imaginary.");
        }
        input.close();
    }
}
```

### Output:-

Enter the value of a: 1

Enter the value of b: 0

Enter the value of c: 1

The roots are Imaginary.

~~Enter the value of a: 1~~

~~Enter the value of b: 2~~

~~Enter the value of c: 1~~

The roots are real and equal and the root value is -1.0

~~Enter the value of a: 1~~

~~Enter the value of b: 3~~

~~Enter the value of c: 1~~

~~The roots are real and distinct and the root values are -0.3819660112501051 and -2.618033988749895~~

## OUTPUT:

```
Microsoft Windows [Version 10.0 19043.1889]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Kirthan Kumar>cd C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA

C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA>javac quadratic.java

C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA>java quadratic
Enter the value of a: 1
Enter the value of b: 0
Enter the value of c: 1
The roots are Imaginary
C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA>java quadratic
Enter the value of a: 1
Enter the value of b: 2
Enter the value of c: 1
The roots are real and equal and the root value is -1.0
C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA>java quadratic
Enter the value of a: 1
Enter the value of b: 3
Enter the value of c: 1
The roots are real and distinct and the root values are -0.3819660112501051 and -2.618033988749895
C:\Users\Kirthan Kumar\Desktop\VS code\java\BMSCE JAVA>

import
java.util.Scanner;
```

```

public class quadratic {  public static void
main(String[] strings) {  Scanner input = new
Scanner(System.in);  System.out.print("Enter the
value of a: ");  double a = input.nextDouble();

System.out.print("Enter the value of b: ");
double b = input.nextDouble();

System.out.print("Enter the value of c: ");  double
c = input.nextDouble();  double d = b * b - 4.0 * a
* c;  if (d > 0) {  double r1 = (-b + Math.pow(d,
0.5)) / (2.0 * a);  double r2 = (-b - Math.pow(d,
0.5)) / (2.0 * a);

System.out.println("The roots are real and distinct and
the root values are" + r1 + " and" + r2);
} else if (d == 0) {  double r1
= -b / (2.0 * a);

System.out.println("The roots are real and equal and
the root value is " + r1);
} else {
System.out.print("The roots are Imaginary");
}

input.close();
}

}

```

## 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.**

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Week 2

CLASSMATE

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### Sgpa calculation program:-

```
import java.util.Scanner;
class Student {
    String name;
    String usn;
    int marks[] = new int[3];
    int credit[] = new int[3];
    int t(credit) {
        int t = 0, i;
        for (i = 0; i < 3; i++) {
            t = t + credit[i];
        }
        return t;
    }
    class Sgpa {
        public static void main (String args[]) {
            System.out.println ("Enter the student name,usn");
            int i;
            float sgpa = 0, t;
            Scanner sc = new Scanner (System.in);
            Student s1 = new Student();
            s1.name = sc.nextLine();
            s1.usn = sc.nextLine();
            System.out.println ("marks and credit of each subject are here \n");
            for (i = 0; i < 3; i++) {
                s1.marks[i] = sc.nextInt();
                if (s1.marks[i] == 100) {
                    s1.marks[i] = (s1.marks[i]/10)*7;
                } else {
                    s1.marks[i] = (s1.marks[i]/10) + 1;
                }
                s1.credit[i] = sc.nextInt();
            }
        }
    }
}
```

```

    sgpa = sgpa + s1.marks[i] * s1.credit[i];
    t = s1.totalcredit();
    SGPA = sgpa / t;
    System.out.println("SGPA of " + s1.name + " is " + sgpa);
}

Outputs
Enter the student name, usn :
Kiranthan IBM21CS176
Marks and Credit of each Subjects are :
80 78 3
80 95 3
80 80 4
SGPA of Kiranthan is 9.00

```

## OUTPUT:

```

Command Prompt
public class Sgpa {
^
1 error

C:\Users\samri\Desktop>java lab>javac sample.java

C:\Users\samri\Desktop>java lab>java Sgpa
Enter the Details of the student

Enter the usn of the student
345
Enter the Name of the Student
samrith
Enter the Marks of the 1 st Subject
98
Enter the Marks of the 2 st Subject
99
Enter the Marks of the 3 st Subject
78
Enter the Marks of the 4 st Subject
90
Enter the Marks of the 5 st Subject
97
The Name of the Student : samrith
The Usn of the Student : 345
The SGPA of the Student : 8.0

```

```

import
java.util.Scanner;

class Student{

```

```

    String name;  String usn;
    int marks[]={};int credit[];
    int credits()
    {
        int t=0,i;
        for(i=0;i<3;i++)
        {
            t=t+credit[i];
        }
        return t;
    }
}

class Sgpa{ public static void
main(String args[])
{
    System.out.println("enter the student name, usn\n");
    int i;float sgpa=0,t;

    Scanner sc=new Scanner (System.in);
    Student s1=new Student();
    s1.name=sc.nextLine();
    s1.usn=sc.nextLine();

    System.out.println("marks and credit of each
subjects  are\n");  for(i=0;i<3;i++)
    {
        s1.marks[i]=sc.nextInt();
        if(s1.marks[i]==100)
            s1.marks[i]=(s1.marks[i]/10) ;
    }
}
}

```

```
        else
            s1.marks[i]=(s1.marks[i]/10)+1;
            s1.credit[i]=sc.nextInt();
            sgpa=sgpa+s1.marks[i]*s1.credit[i];

    }
    t=s1.tcredits();
    sgpa=sgpa/(t);

    System.out.println("sgpa of "+s1.name+" is\n "+sgpa);
}
}
```

## 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

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

class Book {
    String title, author;
    double price;
    int numPages;

    Book() {
        title = "Default";
        author = "Default";
        price = 0.0;
        numPages = 0;
    }

    void setTitle (String t) {
        title = t;
    }

    void getAuthor (String a) {
        author = a;
    }

    void setPrice (double p) {
        price = p;
    }

    void setPages (int np) {
        numPages = np;
    }

    public String toString () {
        return title + " " + author + " " + price + " " + numPages + "\n";
    }
}

class BookDetails {
    public static void main (String args[]) {
        String t, a;
        double p;
```

```

int np, n;
Scanner sc = new Scanner(System.in);
System.out.println ("Enter the no. of Books");
n = sc.nextInt();
Book b[] = new Book[n];
for (int i=0; i<n; i++) {
    System.out.println ("Enter the Title");
    t = sc.next();
    System.out.println ("Enter the Author name");
    a = sc.next();
    System.out.println ("Enter the price of the book");
    p = sc.nextDouble();
    System.out.println ("Enter the No. of pages");
    np = sc.nextInt();
    b[i] = new Book();
    b[i].setTitle(t);
    b[i].setAuthor(a);
    b[i].setPrice(p);
    b[i].setPages(np);
}
System.out.println ("Title is Author is price is pages is");
for (int i=0; i<n; i++) {
    System.out.println (b[i]);
}

```

Enter the no. of Books 2

Enter the Title : The maze Runner

Enter the price of the Book : 1000

Enter the Author name : Christopher

Enter the No. of pages : 120

Enter the Title : DSA using C++  
 Enter the Author Name : Reema Thagreja  
 Enter the price of the books : 1200  
 Enter the No. of pages : 457

Output:-

Title	Author	price	pages
The maze Runner	Christopher	1000	120
DSA using C++	Reema Thagreja	1200	457

## OUTPUT :

```

Command Prompt
  at java.base/java.util.Scanner.nextDouble(Scanner.java:1598)
  at java.base/java.util.Scanner.nextDouble(Scanner.java:2569)
  at Bookdetails.main(sample.java:59)

C:\Users\samri\Desktop\java lab>java Bookdetails
Enter the no of Books
2
Enter the Details of the1th Book
Enter the Title of the Book
CodedTriangles
Enter the Author of the Book
Sreedharpriyan
Enter the Price of the Book
345
Enter the Pages of the Book
190
Enter the Details of the2th Book
Enter the Title of the Book
Annakaranina
Enter the Author of the Book
LeoToslitoy
Enter the Price of the Book
567
Enter the Pages of the Book
45
Title Author Price Numberofpages
CodedTriangles Sreedharpriyan 345.0 190
Annakaranina LeoToslitoy 567.0 45
Activate Windows
Go to Settings to activate Windows.

C:\Users\samri\Desktop\java lab>

```

```
import  java.io.*;  import  
  
java.util.*;  class Book {  
  
    String title, author;  
    double price;  int  
    numPages;  
  
    Book()  {  
  
        title="Default";  
        author="Default";  
        price=0.0;  
        numPages=0;  
  
    }  
    void setTitle(String t) {  
  
        title=t;  
  
    }  
    void setAuthor(String a) {  
  
        author=a;  
  
    }  
    void setPrice(double p) {
```

```
    price=p;

}

void setPages(int np)

{

    numPages=np;

}

public String toString() {

    return title+"\t"+author+"\t"+price+"\t"+numPages+"\n";

}

}

class BookDetails {

    public static void main(String args[])
    {
        String t, a;  double p;  int
        np,n;

        Scanner sc = new Scanner(System.in);

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

        n = sc.nextInt();  Book b[] = new Book[n];

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

            System.out.println("Enter the Title of the
Books");

            t= sc.next();
            System.out.println("Enter the Author of the
Author");
        }
    }
}
```

```

        Books");
        a= sc.next();
        System.out.println("Enter the Price of the
        Books");
        p= sc.nextDouble();
        System.out.println("Enter the Number of pages of
        the Books");
        np= sc.nextInt();

        b[i] = new Book();
        b[i].setTitle(t);
        b[i].setAuthor(a);
        b[i].setPrice(p);
        b[i].setPages(np);

    }

    System.out.println("Title \t Author \t Price \t
    Pages\n");
    for(int i=0; i<n;i++) {
        System.out.println(b[i]);
    }

}

```

## 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.

```

4:-  

import java.util.*;  

abstract class shape {  

    double a,b;  

    abstract void pointarea();  

}  

class triangle extends shape {  

    void getdata (double a, double b)  

    triangle (double x, double y) {  

        a=x;  

        b=y;  

    }  

    void pointarea () {  

        double area = 0.5 * a * b;  

        System.out.println ("Area of triangle : " + area);  

    }  

}  

class rectangle extends shape {  

    rectangle (double x, double y) {  

        a=x;  

        b=y;  

    }  

    void pointarea () {  

        double area = a * b;  

        System.out.println ("Area of rectangle : " + area);  

    }  

}  

class circle extends shape {  

    circle (double x) {  

        a=x;  

    }  

    void pointarea () {  

        double area = 3.142 * a * a;  

    }  

}

```

```
? System.out.println ("Area of Circle = " + area);
```

7

```
Class abstractt {
```

```
    public static void main (String args [] ) {  
        int ch;  
        boolean n = true;  
        Scanner sc = new Scanner (System.in);  
        while (n == true) {  
            System.out.println (  
                "1. Area of rectangle \n 2. Area of triangle \n  
                3. Area of circle \n 4. Exit \n  
                Enter your choice");  
            ch = sc.nextInt();
```

```
        switch (ch) {
```

```
            Case default 1 :
```

```
                System.out.println ("Enter length and breadth : ");  
                double l = sc.nextDouble();  
                double b = sc.nextDouble();  
                Rectangle r1 = new Rectangle (l,b);  
                r1.printarea();  
                break;
```

```
            Case 2 :
```

```
                System.out.println ("Enter base and height : ");  
                double b1 = sc.nextDouble();  
                double h = sc.nextDouble();  
                Triangle t = new triangle (b1,h);  
                t.printarea();  
                break;
```

```
            Case 3 :
```

```
                System.out.println ("Enter radius : ");  
                double r1 = sc.nextDouble();  
                Circle c = new Circle (r1);  
                c.printarea();  
                break;
```

```
case 4:  
    n = false;  
    break;  
  
default:  
    System.out.println ("Invalid input");
```

Pam

### **OUTPUT :**

```
Command Prompt
use --help for a list of possible options
C:\Users\STUDENT\1BM21CS176>javac abstracttt.java
C:\Users\STUDENT\1BM21CS176>java abstracttt
1. Area of rectangle
2. Area of triangle
3. Area of circle
4. Exit
Enter your choice
1
Enter length and breadth:
12
3
Area of rectangle= 36.0
1. Area of rectangle
2. Area of triangle
3. Area of circle
4. Exit
Enter your choice
2
Enter base and height:
3
4
Area of triangle= 46.0
1. Area of rectangle
2. Area of triangle
3. Area of circle
4. Exit
Enter your choice
3
Enter radius:
3
Area of circle= 28.278
1. Area of rectangle
2. Area of triangle
3. Area of circle
4. Exit
Enter your choice
4

C:\Users\STUDENT\1BM21CS176>
```

```
import
java.util.*

;

abstract class shape
{ double a, b;

abstract void printarea();
}

class triangle extends shape
{ triangle(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
{ rectangle(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
{
    circle(double x) { a =
        x;

    }

void printarea() { double area
    = 3.142 * a * a;

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

}

class abstracttt { public static void
main(String args[]) { int ch; boolean x
= true;

Scanner sc = new Scanner(System.in);
while (x == true) {

    System.out.println(
        "1. Area of rectangle\n2. Area of triangle\n3.Area
of circle\n4.Exit\nEnter your choice");
    ch = sc.nextInt();
    switch (ch)
    { case 1:

        System.out.println("Enter length and breadth: ");
        double l = sc.nextDouble(); double b =
        sc.nextDouble();

```

```

        rectangle r = new rectangle(l, b);

        r.printarea();

        break; case 2:

        System.out.println("Enter base and height: ");

        double b1 = sc.nextDouble(); double h =
        sc.nextDouble(); triangle t = new triangle(b1,
        h);

        t.printarea();

        break; case 3:

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

        double r1 = sc.nextDouble(); circle
        c = new circle(r1);

        c.printarea();

        break; case 4: x
        = false; break;
        default:

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

    }

}

sc.close();
}
}

```

## 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 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 user to member and update the balance.
- b) Display to 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.

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classmate

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Page \_\_\_\_\_

import java.util.\*;

class Account {

Scanner sc = new Scanner(System.in);

String customerName; int accountNumber;

float balance = 5000; double si;

void inputData() {

System.out.print("Enter Customer Name :");

customerName = sc.nextLine();

System.out.print("Enter account Number :");

accountNumber = sc.nextInt();

}

void display() {

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

System.out.println("Account Number : " + accountNumber);

}

void deposit() {

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

float amount = sc.nextFloat();

balance += amount;

System.out.println("The account balance : " + balance);

}

class Current Account extends Account {

int serviceFee = 50;

void cheque() { System.out.print("Cheque service available"); }

void withdrawal() {

float amount;

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

amount = sc.nextFloat();

if (amount > balance) { System.out.println("Insufficient bal"); }

else { balance = balance - amount; }

if (balance < 500) {

balance = balance - serviceFee;

```
System.out.println ("50 rs is deducted as service fee");
System.out.println ("Withdrawn : " + amount);
System.out.println ("Current balance : " + balance); ??
```

class SavingsAccount extends Account {

```
void cheque() {
```

```
System.out.println ("Cheque service not available");
```

```
void withdrawal () {
```

```
float amount;
```

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

```
amount = sc.nextFloat();
```

```
if (amount > balance) {
```

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

```
else { balance = balance - amount; }
```

```
System.out.println ("Withdrawn : " + amount);
```

```
System.out.println ("Current balance : " + balance); }
```

```
void interest () {
```

```
double si = 0.06;
```

```
System.out.println ("Enter the time period of deposit");
```

```
int t = sc.nextInt();
```

```
si = balance * t * (1 + si);
```

```
System.out.println ("Simple interest is " + si); ??
```

Public class Bank {

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

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

```
SavingsAccount sa = new SavingsAccount ();
```

```
CurrentAccount ca = new CurrentAccount ();
```

```
System.out.println ("1. Savings account 2. Current account");
```

```
int choice = sc.nextInt();
```

```
Switch (choice) {
```

```
Case 1 : break;
```

## **OUTPUT :**

```
sa. inputData();
sa. display();
sa. cheam();
sa. deposit();
sa. interest();
sa. withdrawal;
break;
Case 2: ca. inputData();
ca. display();
ca. cheam();
ca. deposit();
ca. withdrawal();
break;
default: system.out.println ("Enter other value");
break; }

SC C108C(1) 93
```

## Output

1. Savings Account      2. Current Account

Enter Customer Name: Krishnan, Enter account number: 20190816995

Cheque service not available.

Enter the amount to be deposited: 50000

The amount balance : 55000

Enter the time period of deposit : 3

Simple interest is 159 000.0

Enter the amount to be withdrawn : 15000

Withdrawal : 15000

Credit balance : 40 000.0.

John 11/12/23  
27

```
Command Prompt - java Bank
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
C:\Users\STUDENT\1BM21CS176>java Bank
1.Savings account
2.Current account
5000.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Withdraw Amount
6.Exit
3
Cheque service available
5000.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Withdraw Amount
6.Exit
4
Enter the amount to be deposited: 15000
The account balance is: 20000.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Withdraw Amount
6.Exit
5
Enter the amount to be withdrawn
12000
Withdrawn : 12000.0
Current balance : 8000.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Withdraw Amount
6.Exit
5
Enter the amount to be withdrawn
5000
50 rs is deducted as service fee
Withdrawn : 5000.0
```

```
Command Prompt - java Bank
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
1
Enter customer name: Kirthan
Enter account number: 78643
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
2
Name: Kirthan
Account Number: 78643
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
4
Enter the amount to be deposited: 5000
The account balance is: 10000.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
5
Enter the time period of deposit:
2
Total amount after adding Compound interest is 11236.0
1.Input Details
2.Display Details
3.Cheque Available?
4.Deposit
5.Calculate Interest
6.Withdraw Amount
7.Exit
6
Enter the amount to be withdrawn
6000
Withdrawn : 6000.0
Current balance : 5236.0
```

```
import
java.ut
il.*;
```

```
class Account {  
  
    Scanner sc = new Scanner(System.in);  
  
    String customerName;  int  
    accountNumber;  double balance =  
    5000;  double TotalAmount;  
  
  
  
  
    void inputData() {  
  
        System.out.print("Enter customer name: ");  
        customerName = sc.nextLine();  
  
        System.out.print("Enter account number: ");  
        accountNumber = sc.nextInt();  
  
    }  
  
  
  
  
    void display() {  
  
        System.out.println("Name: " + customerName);  
        System.out.println("Account Number: " + accountNumber);  
    }  
  
  
  
  
    void deposit() {  
  
        System.out.print("Enter the amount to be deposited: ");  
        float amount = sc.nextFloat();  balance += amount;  
  
        System.out.println("The account balance is: " + balance);  
    }  
}  
class CurrentAccount extends Account  
{  double serviceFee = balance * (0.05);  
  
    CurrentAccount(){  
        System.out.println(balance);  
    }  
}
```

```
}

void cheque() {

    System.out.println("Cheque service
available");System.out.println(balance);

}

void withdrawal()

{   float amount;

    System.out.println("Enter the amount to be withdrawn");
    amount = sc.nextFloat();  if (amount > balance)

        System.out.println("Balance insufficient");
    else {  balance = balance - amount;  if (balance
< 5000) {  balance = balance - serviceFee;

        System.out.println("50 rs is deducted as service fee");

    }

    System.out.println("Withdrawn : " + amount);
    System.out.println("Current balance : " + balance);
}

}

class SavingsAccount extends Account

{  void cheque() {
```

```

        System.out.println("Cheque service not available");

    }

void withdrawal()
{
    float amount;

    System.out.println("Enter the amount to be withdrawn");
    amount = sc.nextFloat(); if (amount > balance)

        System.out.println("Balance insufficient");
    else balance = balance - amount;

    System.out.println("Withdrawn : " + amount);
    System.out.println("Current balance : " + balance);
}

void interest()
{
    double r = 0.06;

    System.out.println("Enter the time period of deposit: ");
    int t = sc.nextInt();

    // double TotalAmount = balance + balance * t * r;
    for(int i=1; i<=t; i++){ balance = balance +
        balance * r;

    }

    // System.out.println("Total amount after adding Simple interest
    is " + TotalAmount);

    System.out.println("Total amount after adding Compound interest
    is " + balance);
}

public class Bank {
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);

```

```

System.out.println("\n1.Savings account\n2.Current account");

int choice = sc.nextInt(); switch (choice) { case 1:

    SavingsAccount sa = new SavingsAccount();

    boolean boo = true; while (boo) {

        System.out.println(
            "\n1.Input Details\n2.Display
Details\n3.Cheque Available?\n4.Deposit\n5.Calculate
Interest\n6.Withdraw Amount\n7.Exit");

        int choice2 = sc.nextInt();

        switch (choice2) { case 1:
            sa.inputData(); break;
            case 2: sa.display();
            break; case 3:
            sa.cheque(); break; case
            4: sa.deposit(); break;
            case 5: sa.interest();
            break; case 6:
            sa.withdrawal(); break;
            case 7:
            boo = false;
            break;
            default:

                System.out.print("Enter other choice");
                break;

        }

    }

}

break;
case 2:

    CurrentAccount ca = new CurrentAccount();

    boolean booo = true; while (booo) {

        System.out.println(
            "\n1.Input Details\n2.Display
Details\n3.Cheque Available?\n4.Deposit\n5.Withdraw Amount\n6.Exit");

```

```
        int choice2 = sc.nextInt();

        switch (choice2) { case 1:
            ca.inputData(); break;
        case 2: ca.display();
        break; case 3:
            ca.cheque(); break; case
        4: ca.deposit(); break;
        case 5:

            ca.withdrawal();
        break; case
        6: booo = false;
        break; default:
            System.out.print("Enter other choice");
        break;

    }
}

break;
}

sc.close();
}

}
```



## **PROGRAM 6**

**Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message**

dialog box.

## OUTPUT:

```
import java.util.Scanner;
public class Exception {
```

Week 6

Exception 1-

```
import java.util.Scanner;
public class Exception {
    public static void main (System.in) {
        Scanner sc = new Scanner (System.in);
        System.out.println ("Enter the 1st value");
        String s1 = sc.next();
        System.out.println ("Enter the 2nd value");
        String s2 = sc.next();
        try {
            int a = Integer.parseInt(s1);
            int b = Integer.parseInt(s2);
            a;
            + b;
            : 'f();
        }
    }
}
```

C:\Users\samri\Desktop>javac sample.java

sample.java:2: error: class Exception is public, should be declared in a file named Exception.java

public class Exception {

^

1 error

C:\Users\samri\Desktop>java lab>javac sample.java

C:\Users\samri\Desktop>java lab>java Exception

Enter the 1<sup>st</sup> value

23

Enter the 2<sup>nd</sup> value

7

The first value is 23

The Second value is 7

Result of division is 3.0

Finished the Execution

C:\Users\samri\Desktop>java lab>java Exception

Enter the 1<sup>st</sup> value

1a

Enter the 2<sup>nd</sup> value

5

NumberFormatException: Invalid input string

Finished the Execution

C:\Users\samri\Desktop>java lab>java Exception

Enter the 1<sup>st</sup> value

56

Enter the 2<sup>nd</sup> value

0

The first value is 56

The Second value is 0

We failed to divide.Reason is..

java.lang.ArithmaticException: / by zero

Finished the Execution

Activate Windows  
Go to Settings to activate Windows.

```
public static void main(String args[])
{ Scanner sc=new Scanner(System.in);
System.out.println("Enter the 1st value");
String s1=sc.next();
System.out.println("Enter the 2nd value");
String s2=sc.next();

try {
    int a = Integer.parseInt(s1);
    int b = Integer.parseInt(s2);
    System.out.println("The first value is "+a);
    System.out.println("The Second value is "+b);

    try{
        double c=a/b;
        System.out.println("Result of division is "+c);

    }

    catch(java.lang.Exception e){
        System.out.println("We failed ot divide.Reason is..
");
        System.out.println(e);
    }

}

catch (NumberFormatException e) {
```

```
        System.out.println("NumberFormatException: Invalid  
input string");  
    }  
    System.out.println("Finished the Execution");  
}  
}
```

## PROGRAM 7

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.

7

06/01/2023

classmate

Date \_\_\_\_\_  
Page \_\_\_\_\_

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

```
class fatherAgeException extends Exception {
```

```
    public String testing() {
```

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

```
}
```

```
}
```

```
class sonAgeException extends Exception {
```

```
    int a;
```

```
    sonAgeException (int Age) {
```

```
        a = age;
```

```
}
```

```
    public String testing() {
```

```
        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.nextInt();
```

```
}
```

```
    void ex1() throws fatherAgeException {
```

```
        if (age < 0) {
```

```
            throw new fatherAgeException();
```

```
}
```

```
7
```

```

class Son extends Father {
    int age;
    Son() {
        System.out.println("Enter the son's age:");
        age = in.nextInt();
    }
    void ex2() 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.ex1();
        } catch (FatherAgeException e) {
            System.out.println(e);
        }
        try {
            s.ex2();
        } catch (SonAgeException e) {
            System.out.println(e);
        }
    }
}

```

Output :-

Enter the father's Age:

12

Enter the son's age:

76

son's age is more than Father's age.

**OUTPUT :**

The screenshot shows a Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** Except.java - 1BM21CS176 - Visual Studio Code.
- Explorer:** Shows a project named "1BM21CS176" containing various Java files like Factorial.java, Father.java, etc.
- Terminal:** Displays command-line output:

```
PS C:\Users\STUDENT\1BM21CS176> cd "c:\Users\STUDENT\1BM21CS176\" ; if ($?) { javac Except.java } ; if (?) { java Except }
Enter the father's age:
-1
Enter the son's age:
23
Father's age is less than 0
Son's age is more than Father's age
PS C:\Users\STUDENT\1BM21CS176>
```
- Status Bar:** Ln 1, Col 1 | Spaces:4 | UTF-8 | CRLF | Java | 09:54 | 06-01-2023

```
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");
}

}

class Father
{
    int age;

Scanner in = new Scanner(System.in);

Father() {
    System.out.println("Enter the father's age:");
    age = in.nextInt();

}

void ex1() throws fatherAgeException
{
    if (age < 0) throw new
fatherAgeException();
}

}

class Son extends Father
{
    int age;
```

```

Son()  {

    System.out.println("Enter the son's age:");
    age = in.nextInt();

}

void ex2() 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.ex1();
}

}

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

try {
    s.ex2();
}

catch (sonAgeException e) {
    System.out.println(e);
}
}

```

## PROGRAM 8

**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 Thread1 extends Thread {
    public void run () {
        int i = 0 ;
        while ( i < 100 ) {
            try {
                Thread . sleep ( 10000 );
                System . out . println ( "BMSCE" );
            } catch ( Exception e ) {
                System . out . println ( "Exception: " + e );
            }
            i++;
        }
    }
}

class Thread2 extends Thread {
    public void run () {
        int i = 0 ;
        while ( i < 100 ) {
            try {
                Thread . sleep ( 2000 );
                System . out . println ( "CSE" );
            } catch ( Exception e ) {
                System . out . println ( "Exception " + e );
            }
            i++;
        }
    }
}

public class Tryit {
    public static void main ( String [] args ) {
        Thread t1 = new Thread1 ();
        Thread t2 = new Thread2 ();
        t1 . start ();
        t2 . start ();
    }
}
```

class Thread1 extends Thread {

public void run() {

int i = 0;

while (i < 100) {

try {

Thread.sleep (millis: 10000);

System.out.println ("BMSCE");

catch (Exception e) {

System.out.println ("Exception: " + e);

i++; }

class Thread2 extends Thread {

public void run() {

int i = 0;

while (i < 100) {

try {

Thread.sleep (millis: 2000);

System.out.println ("CSE");

catch (Exception e) {

System.out.println ("Exception: " + e);

}

i++; }

public class Testit {

public static void main (String[] args) {

Thread t1 = new Thread1();

Thread t2 = new Thread2();

t1.start();

t2.start(); }

Output:

CSE

CSE

CSE

BMSCE

CSE

## **OUTPUT :**