

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT
on

OBJECT ORIENTED JAVA

Submitted by

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in partial fulfilment 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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Department of Computer Science and Engineering



CERTIFICATE

This is to certify that the Lab work entitled “**OBJECT ORIENTED JAVA**” carried out by **KAUSHIK POTLURI (1BM21CS089)**, who is bonafide student of **B. M. S. College of Engineering**. It is in partial fulfilment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2022-23. The Lab report has been approved as it satisfies the academic requirements in respect of Object oriented java Lab - **(21CS3PCOOJ)** work prescribed for the said degree.

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Index Sheet

Sl. No.	Experiment Title	Page No.
1	Quadratic Equation	4-7
2	Calculation of SGPA	8-11
3	Creating n Book Objects	12-15
4	Abstract class named shape	16-20
5	Bank Program	21-30
6	WrongAge exception	31-34
7	Threads program	35-36

Course Outcome

CO1	Apply the knowledge of Java concepts to find the solution for a given problem.
CO2	Analyse the given Java application for correctness/functionalities.
CO3	Develop Java programs / applications for a given requirement.
CO4	Conduct practical experiments for demonstrating features of Java.

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

```
import java.util.*;
import java.math.*;
class Dicriminant{
    double a,b,c;
    Dicriminant(double i,double j,double k)
    {
        a=i;
        b=j;
        c=k;
    }
    double Discr()
    {
        return ((b*b)-(4*a*c));
    }
}
class Quadratic {
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        double r1,r2,a,b,c;
        System.out.println("enter the value of a");
        a=sc.nextInt();
        System.out.println("enter the value of b");
```

```

b=sc.nextInt();
System.out.println("enter the value of c");
c=sc.nextInt();
if (a==0)
{
    System.out.println("entered equation is not quadratic");
}
else
{
    Dicriminant d=new Dicriminant(a,b,c);
    if(d.Discriminant()>0)
    {
        r1=(-b+Math.pow(d.Discriminant(),0.5))/(2*a);
        r2=(-b-Math.pow(d.Discriminant(),0.5))/(2*a);
        System.out.println("Roots are real and distinct:r1= "+r1+ " r2=" +r2);
    }
    else if(d.Discriminant()<0)
    {
        r1=-b/(2*a);
        r2=(Math.pow(Math.abs(d.Discriminant()),0.5))/(2*a);
        System.out.println("Roots are complex: r1= "+r1+"i"+r2+ " r2="+r1+"-i"+r2);
    }
    else
    {
        r1=-b/(2*a);
        System.out.println("Roots are real and equal : r1=r2= "+r1);
    }
}
}

```

OUTPUT:

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac Quadratic.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Quadratic
enter the value of a
1
enter the value of b
-2
enter the value of c
1
Roots are real and equal : r1=r2= 1.0
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Quadratic
enter the value of a
1
enter the value of b
1
enter the value of c
1
Roots are complex: r1= -0.5+i0.8660254037844386 r2=-0.5-i0.8660254037844386
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Quadratic
enter the value of a
1
enter the value of b
3
enter the value of c
2
Roots are real and distinct:r1= -1.0r2=-2.0
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

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.

```
import java.util.*;

class Student{

    String usn;

    String name;

    int credits[]=new int[20];

    int marks[]=new int[20];

    int gradepoints[]=new int[20];

    double nume=0;

    double denom=0;

    double SGPA;

    int i,n;

    void accept()

    {

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter Student Details");

        System.out.println("Enter Student USN");

        usn=sc.next();

        System.out.println("Enter Student Name");

        name=sc.next();

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

        n=sc.nextInt();

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

        {

            System.out.println("Enter Subject"+(i+1)+"\t"+"marks");
```



```

marks[i]=sc.nextInt();
System.out.println("Enter Subject"+(i+1)+"\t"+"credits");
credits[i]=sc.nextInt();
denom+=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]>=55 && marks[i]<60)
gradepoints[i]=6;
else if(marks[i]>=50 && marks[i]<55)
gradepoints[i]=5;
else if(marks[i]>=40 && marks[i]<50)
gradepoints[i]=4;
else
gradepoints[i]=4;
nume+=(credits[i]*gradepoints[i]);
}
}

```

```

        }
        SGPA=(nume/denom);
    }
void display()
{
    System.out.println("The Student Details");
    System.out.println("Name:  "+name+"\n"+"USN:  "+usn);
    System.out.println("marks"+"\\t"+"credits");
    for(i=0;i<n;i++)
    {
        System.out.println(marks[i]+"\\t"+credits[i]);
    }
    System.out.println("SGPA:  "+SGPA);
}
}
class StudentDemo{
    public static void main(String args[])
    {
        Student s1 = new Student();
        Student s2 = new Student();
        s1.accept();
        s1.calculate();
        s1.display();
        s2.accept();
        s2.calculate();
        s2.display();
    }
}

```

OUTPUT:

```
Command Prompt - java Stuc x + v
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac StudentDemo.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java StudentDemo
Enter Student Details
Enter Student USN
1bm21cs071
Enter Student Name
ayra
Enter number of Subjects
3
Enter Subject1 marks
90
Enter Subject1 credits
3
Enter Subject2 marks
98
Enter Subject2 credits
4
Enter Subject3 marks
90
Enter Subject3 credits
2
The Student Details
Name: ayra
USN: 1bm21cs071
marks credits
90 3
98 4
90 2
SGPA: 10.0
Enter Student Details
Enter Student USN
|
```

```
Command Prompt - java Stuc x + v
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac StudentDemo.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java StudentDemo
Enter Student Details
Enter Student USN
1bm21cs091
Enter Student Name
deepak
Enter number of Subjects
2
Enter Subject1 marks
97
Enter Subject1 credits
3
Enter Subject2 marks
87
Enter Subject2 credits
4
The Student Details
Name: deepak
USN: 1bm21cs091
marks credits
97 3
87 4
SGPA: 9.428571428571429
Enter Student Details
Enter Student USN
|
```

LAB PROGRAM 3:

Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString() method that could display the complete details of the book. Develop a Java program to create n book objects.

```
import java.util.*;

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

    Book()
    {
        title="Default";
        author="Default";
        price=0.00;
        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\t"+author+"\t\t"+price+"\t\t"+numPages;
    }
}

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

```

```

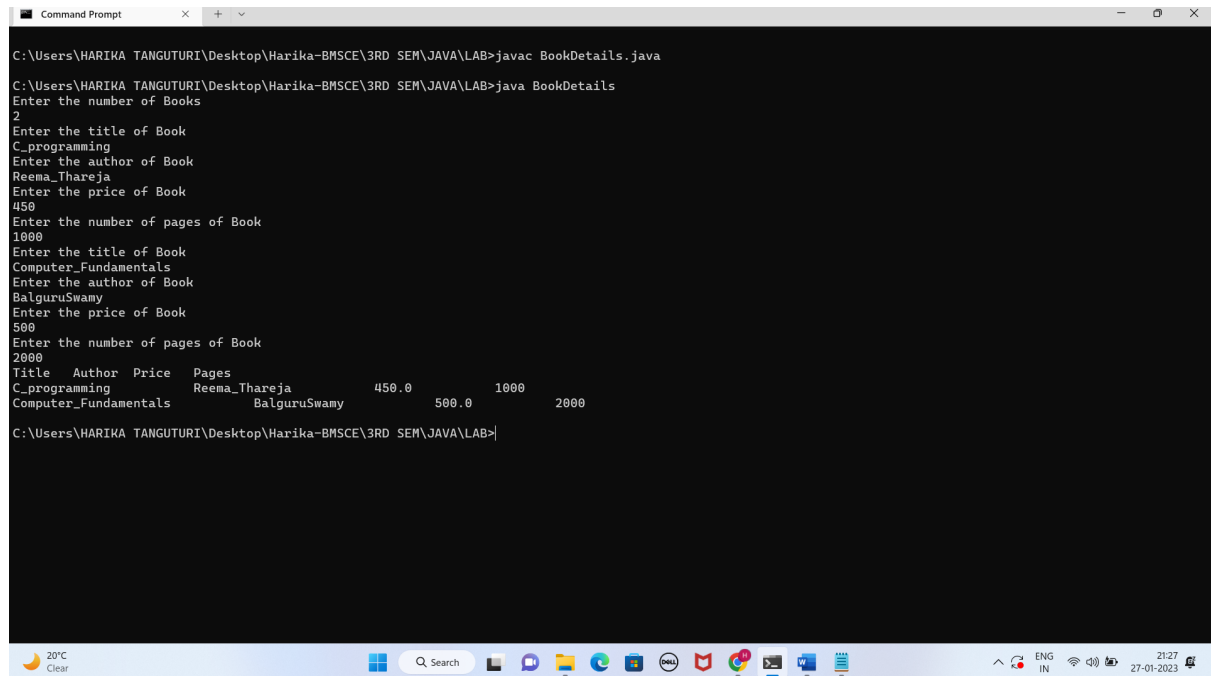
Scanner sc=new Scanner(System.in);
System.out.println("Enter the number of Books");
n=sc.nextInt();

Book b[]=new Book[n];
for(int i=0;i<n;i++)
{
    System.out.println("Enter the title of Book");
    t=sc.next();
    System.out.println("Enter the author of Book");
    a=sc.next();
    System.out.println("Enter the price of Book");
    p=sc.nextDouble();
    System.out.println("Enter the number of pages of Book");
    np=sc.
    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");
for(int i=0;i<n;i++)
{
    System.out.println(b[i]);
}
}
}

```

OUTPUT:

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac BookDetails.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java BookDetails
Enter the number of Books
2
Enter the title of Book
C_programming
Enter the author of Book
Reema_Thareja
Enter the price of Book
450
Enter the number of pages of Book
1000
Enter the title of Book
Computer_Fundamentals
Enter the author of Book
BalguruSwamy
Enter the price of Book
500
Enter the number of pages of Book
2000
Title  Author  Price  Pages
C_programming  Reema_Thareja  450.0  1000
Computer_Fundamentals  BalguruSwamy  500.0  2000
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```



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.

```
import java.util.*;

abstract class shape
{
    int a,b;
    abstract void printArea();
}

class rectangle extends shape
{
    void getdata(int x,int y)
    {
        a=x;
        b=y;
    }

    void printArea()
    {
        double x=a*b;
        System.out.println("Area of rectangle is "+x);
    }
}

class triangle extends shape
{
    void getdata(int x,int y)
```



```

{
    a=x;
    b=y;
}
void printArea()
{
    double area=0.5*a*b;
    System.out.println("Area of Triangle is "+area);
}
}
class circle extends shape
{
    void getdata(int x)
    {
        a=x;
    }
    void printArea()
    {
        double area=3.14*a*a;
        System.out.println("Area of circle is "+area);
    }
}
class abstr{
    public static void main(String args[])
    {
        Scanner scan=new Scanner(System.in);
        int choice;
        rectangle r=new rectangle();
    }
}

```

```

triangle t=new triangle();
circle c=new circle();
System.out.println("1.Rectangle 2.Triangle 3.Circle");
System.out.println("Enter your choice");
choice=scan.nextInt();
switch(choice)
{
case 1:System.out.println("Enter value of length and breadth");
    int l=scan.nextInt();
    int b=scan.nextInt();
    r.getdata(l,b);
    r.printArea();
    break;
case 2:System.out.println("Enter value of base and height");
    int b1=scan.nextInt();
    int h=scan.nextInt();
    t.getdata(b1,h);
    t.printArea();
    break;
case 3:System.out.println("Enter value of radius");
    int r1=scan.nextInt();
    c.getdata(r1);
    c.printArea();
    break;
default:System.out.println("Invalid choice!!!");
}
}
}

```

OUTPUT:

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac abstr.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java abstr
1.Rectangle 2.Triangle 3.Circle
Enter your choice
1
Enter value of length and breadth
10
12
Area of rectangle is 120.0
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java abstr
1.Rectangle 2.Triangle 3.Circle
Enter your choice
2
Enter value of base and height
10
20
Area of Triangle is 100.0
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java abstr
1.Rectangle 2.Triangle 3.Circle
Enter your choice
3
Enter value of radius
2
Area of circle is 12.56
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

LAB PROGRAM 5:

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed.

Create a class Account that stores customer name, account number and type of account. From this derive the classes 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.

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

```
class Account
```

```
{
```

```
    String customer_name;
```

```
    long acc_no;
```

```
    float bal;
```

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

```
    public void input()
```

```
    {
```

```
        System.out.print("\nEnter the Customer Name: ");
```

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

```
        System.out.print("\nEnter the Account Number: ");
```

```
        acc_no = s.nextLong();
```

```
        System.out.print("\nEnter the Starting Amount (Minimum Amount = 5000): ");
```

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

```

        if(bal<5000f)
        {
            System.out.println("\nAccount Balance cannot be less than 5000.0 \n");
            System.exit(0);
        }
    }
    public void display()
    {
        System.out.println("\nCustomer Name: "+customer_name);
        System.out.println("Account Number: "+acc_no);
        System.out.println("Amount: "+bal);
    }
}

class Savings extends Account
{
    Scanner s = new Scanner(System.in);
    float deposit,withdraw,interest;
    public void deposit()
    {
        System.out.print("\nEnter the amount to be deposited: ");
        deposit = s.nextFloat();
        bal+=deposit;
        System.out.println("\nBalance: "+bal);
    }
    public void withdraw()
    {
        System.out.print("\nEnter the amount to be withdrawn: ");
        withdraw = s.nextFloat();
    }
}

```

```

        if(bal<5000)
        {
            System.out.println("\nInsufficient Balance");
        }
        else
        {
            bal-=withdraw;
            System.out.println("\nAmount Withdrawn: "+withdraw+"\nBalance: "+bal);
        }
    }
    public void check_Bal()
    {
        if(bal<5000)
        {
            System.out.println("\nInsufficient Balance!!\nBalance: "+bal);
        }
        else
        {
            System.out.println("\nBalance: "+bal);
        }
    }
    public void interest()
    {
        interest=(bal*6)/100;
        bal+=interest;
        System.out.println("\nInterest Credited: "+interest+"\nBalance :"+bal) ;
    }
}

```

```

class Current extends Account
{
    float deposit, withdraw, penalty;

    public void deposit()
    {
        System.out.print("\nEnter Amount to be deposited: ");
        deposit = s.nextFloat();
        bal += deposit;
        System.out.println("Balance: " + bal);
    }
    public void check_Bal()
    {
        if (bal < 5000)
        {
            penalty = (0.1f * bal);
            System.out.println("\nInitial Account Balance: "+bal);
            bal = bal-penalty;
            System.out.println("\nLow balance!\nPenalty Amount: " + penalty + "\nAccount
balance: " + bal);
        }
        else
        {
            System.out.println("\n Balance: " + bal);
        }
    }

    public boolean check_Bal_part_2()

```



```

    {
        if (bal < 5000)
        {
            penalty = (0.1f * bal);
            System.out.println("\nInitial Account Balance: "+bal);
            bal = bal-penalty;
            System.out.println("\nLow Balance!\nPenalty Amount: " + penalty + "\nAccount
balance: " + bal);
            return false;
        }
        return true;
    }

    public void withdraw()
    {
        System.out.print("\nEnter Amount to withdraw: ");
        withdraw = s.nextFloat();
        if(check_Bal_part_2())
        {
            bal-=withdraw;
            System.out.println("\nAmount Withdrawn: "+withdraw+"\nBalance: "+bal);
        }
    }

    public void chequebook()
    {
        System.out.println("\nCheque Book has been Issued!");
    }
}

```

```

public class Bank
{
    public static void main(String[] args)
    {
        Scanner s = new Scanner(System.in);
        String ch;
        int n;
        Current c = new Current();
        Savings sa = new Savings();
        System.out.print("\nEnter the Account Type (S for Savings , C for Current) : ");
        ch = s.next();
        switch(ch.toLowerCase())
        {
            case "s" : sa.input();
                        do
                        {
                            System.out.print("\n1. Deposit \n2. Withdrawal \n3. Check Balance \n4.
Check Interest"
                            +"\n5. Show Account Details \n6. Exit Transaction\n\nEnter your
choice: ");
                            n = s.nextInt();
                            switch(n)
                            {
                                case 1 : sa.deposit();
                                            break;
                                case 2 : sa.withdraw();
                                            break;
                                case 3 : sa.check_Bal();
                                            break;

```

```

        case 4 : sa.interest();
            break;
        case 5 : sa.display();
            break;
        case 6 : System.out.println("\nExiting Transaction!");
            System.exit(0);
            break;
        default : System.out.println("\nInvalid Operation");
    }
} while(true);
case "c" : c.input();
do {
    System.out.print("\n1. Deposit \n2. Withdrawal \n3. Check Balance \n4.
Issue Cheque Book"
    + "\n5. Show Account Details \n6. Exit Transaction\n\nEnter your
choice: ");

    n = s.nextInt();
    switch (n) {
        case 1:
            c.deposit();
            break;
        case 2:
            c.withdraw();
            break;
        case 3:
            c.check_Bal();
            break;
        case 4:
            c.chequebook();

```

```
        break;
    case 5:
        c.display();
        break;
    case 6:
        System.out.println("\nExiting Transaction!");
        System.exit(0);
        break;
    default:
        System.out.println("\nInvalid Operation");
    }
} while(true);
default : System.out.println("\nInvalid Choice");
break;
}
}
}
```

OUTPUT:

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac Bank.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Bank

Enter the Account Type (S for Savings , C for Current) : s
Enter the Customer Name: harika
Enter the Account Number: 12345
Enter the Starting Amount (Minimum Amount = 5000): 6000

1. Deposit
2. Withdrawal
3. Check Balance
4. Check Interest
5. Show Account Details
6. Exit Transaction

Enter your choice: 1
Enter the amount to be deposited: 1000
Balance: 7000.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Check Interest
5. Show Account Details
6. Exit Transaction

Enter your choice: 3
Balance: 7000.0

1. Deposit
2. Withdrawal
3. Check Balance
```

```
Command Prompt
4. Check Interest
5. Show Account Details
6. Exit Transaction

Enter your choice: 2
Enter the amount to be withdrawn: 400
Amount Withdrawn: 400.0
Balance: 6600.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Check Interest
5. Show Account Details
6. Exit Transaction

Enter your choice: 4
Interest Credited: 396.0
Balance :6996.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Check Interest
5. Show Account Details
6. Exit Transaction

Enter your choice: 5
Customer Name: harika
Account Number: 12345
Amount: 6996.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Check Interest
```

```
Command Prompt - java Ban x + v
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac Bank.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Bank

Enter the Account Type (S for Savings , C for Current) : c
Enter the Customer Name: harika
Enter the Account Number: 12344
Enter the Starting Amount (Minimum Amount = 5000): 60000

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 1

Enter Amount to be deposited: 2356
Balance: 62356.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 3

Balance: 62356.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
```

```
Command Prompt - java Ban x + v
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 4

Cheque Book has been Issued!

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 5

Customer Name: harika
Account Number: 12344
Amount: 62356.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 2

Enter Amount to withdraw: 234

Amount Withdrawn: 234.0
Balance: 62122.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
```

```
Command Prompt - java Ban x + v
Customer Name: harika
Account Number: 12344
Amount: 62356.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 2

Enter Amount to withdraw: 234

Amount Withdrawn: 234.0
Balance: 62122.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your choice: 5

Customer Name: harika
Account Number: 12344
Amount: 62122.0

1. Deposit
2. Withdrawal
3. Check Balance
4. Issue Cheque Book
5. Show Account Details
6. Exit Transaction

Enter your 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.

```
import java.util.Scanner;

class WrongAge extends Exception{

    public String detail;

    WrongAge(String a){
        detail=a;
    }

    public String toString(){
        return "WrongAge["+detail+"]";
    }
}
```

```
class Father{

    int father_age;

    Father(int x)

    {
        father_age=x;
    }
}
```

```
class Son extends Father{
```



```

int son_age;

Son(int x,int y)
{
    super(x);
    son_age=y;

try{
    if(son_age<=0 || father_age<=0)
        {
            throw new WrongAge("Son's age or Father's age is less than or equal to zero");
        }
    if(father_age<=son_age)
        {
            throw new WrongAge("Son's age is greater than or equal to Father's age");
        }
        else
        {
            System.out.println("Entered Age is Valid!!!");
        }
    }

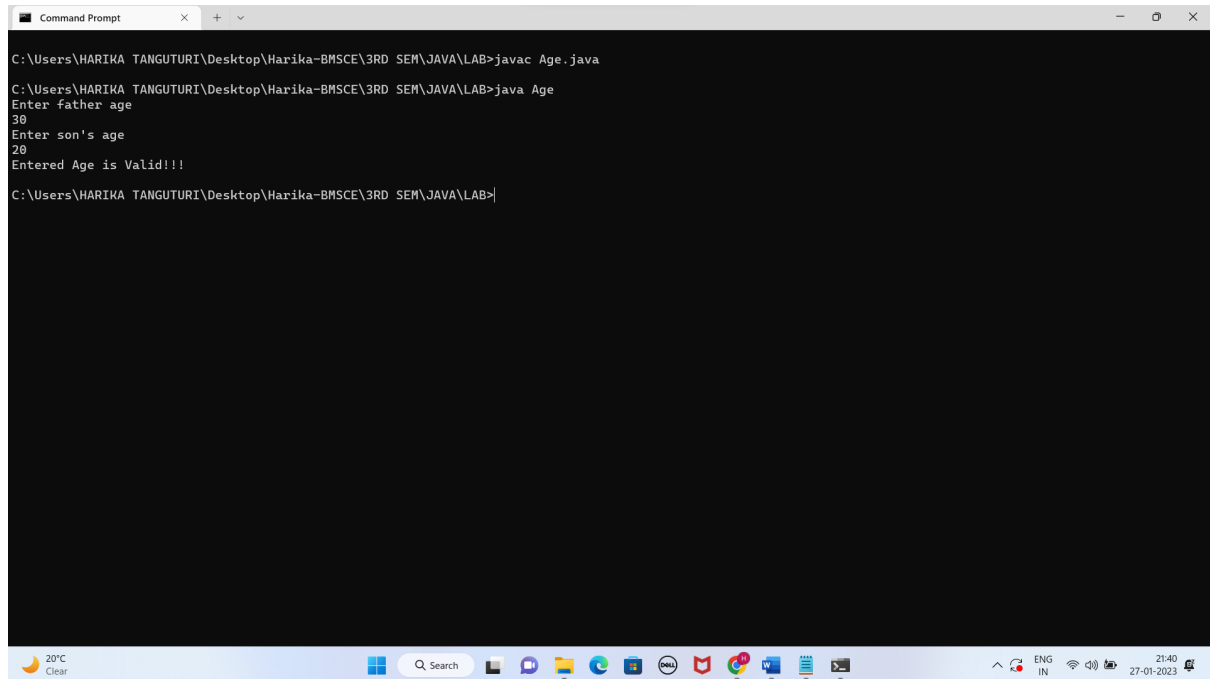
catch(WrongAge e){
    System.out.println("caught"+e);
    }
}

class Age{

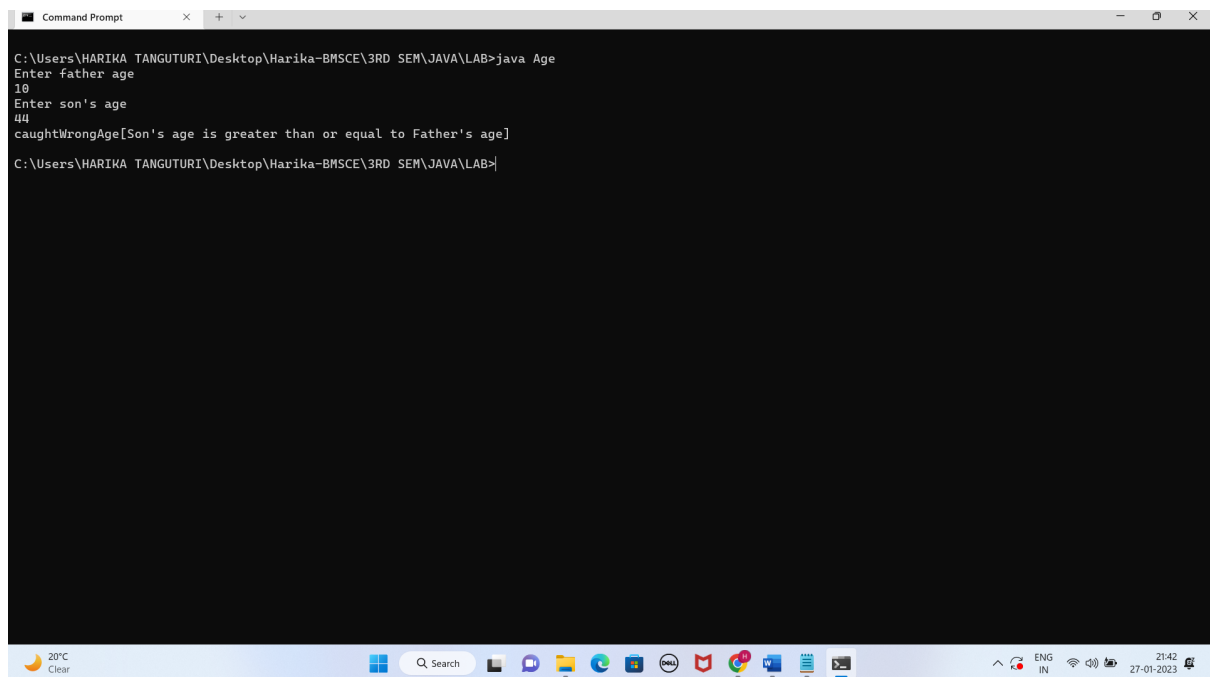
```

```
public static void main(String args[]){  
    Scanner sc=new Scanner(System.in);  
    int father_age,son_age;  
    System.out.println("Enter father age");  
    father_age=sc.nextInt();  
    System.out.println("Enter son's age");  
    son_age=sc.nextInt();  
    Son s=new Son(father_age,son_age);  
}  
}
```

OUTPUT:




```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac Age.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Age
Enter father age
30
Enter son's age
20
Entered Age is Valid!!!
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```



```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Age
Enter father age
10
Enter son's age
44
caughtWrongAge[Son's age is greater than or equal to Father's age]
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```

```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Age
Enter father age
30
Enter son's age
0
caughtWrongAge[Son's age or Father's age is less than or equal to zero]
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```



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.

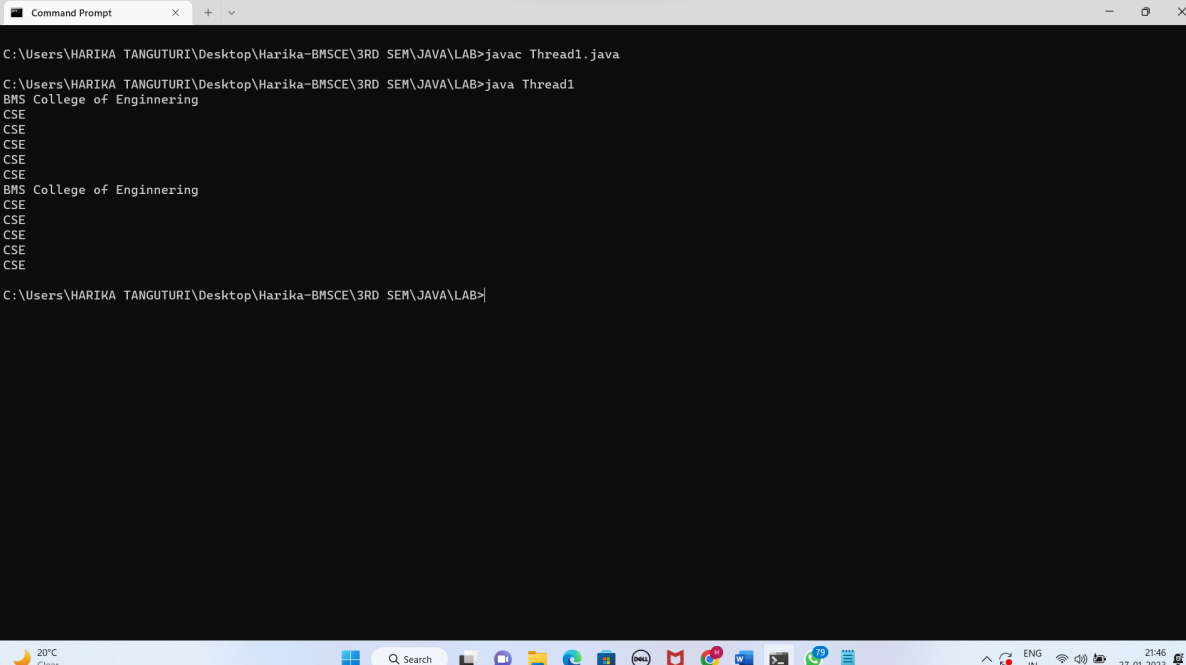
```
class Call implements Runnable
{
    String a;
    int x,time;
    Thread t;
    Call(String tn,int ti,int ex)
    {
        a=tn;
        x=ex;
        time=ti;
        t=new Thread(this,a);
        t.start();
    }
    public void run()
    {
        try{
            for(int i=0;i<x ;i++)
    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

```
    }  
    }  
}
```

```
class Thread1
```

```
{  
    public static void main(String xx[])  
    {  
        new Call("BMS College of Enginnering",10000,2);  
        new Call("CSE",2000,10);  
    }  
}
```

OUTPUT:



```
Command Prompt
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>javac Thread1.java
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>java Thread1
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
C:\Users\HARIKA TANGUTURI\Desktop\Harika-BMSCE\3RD SEM\JAVA\LAB>
```