

B.M.S. COLLEGE OF ENGINEERING
Basavanagudi, Bengaluru- 560019
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



LAB REPORT

On

Object Oriented Java Programming
(23CS3PCOOJ)

Submitted By :

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1BM22CS010

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LAB-1

Sample Programs

1) a) Print an integer entered by user

```
import java.util.Scanner;

public class HelloWorld{

    public static void main(String args[]){

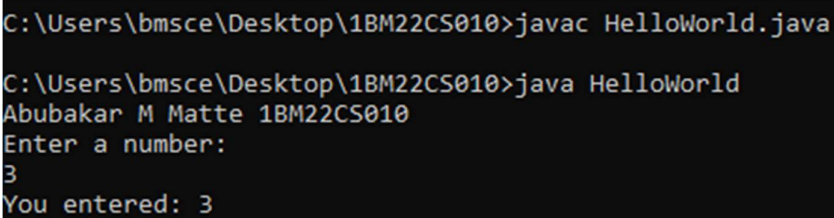
        System.out.println("Abubakar M Matte 1BM22CS010");

        Scanner reader = new Scanner(System.in);

        int number = reader.nextInt();

        System.out.println("You entered :"+number);}

    }
```



```
C:\Users\bmsce\Desktop\1BM22CS010>javac HelloWorld.java

C:\Users\bmsce\Desktop\1BM22CS010>java HelloWorld
Abubakar M Matte 1BM22CS010
Enter a number:
3
You entered: 3
```

b) Check whether a number is even or odd

```
import java.util.Scanner;

public class JavaExample{

    public static void main(String args[]){

        System.out.println("Abubakar M Matte");

        System.out.print(" 1BM22CS010");

        int num;

        System.out.println("Enter an Integer number");

        Scanner input = new Scanner(System.in);

        num = input.nextInt();

        if(num%2==0){

            System.out.println(num+"is even number");

        }

        else{

            System.out.println(num+"is odd number");

        }

    }

}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac EvenOdd.java

C:\Users\bmsce\Desktop\1BM22CS010>java EvenOdd
Abubakar M Matte 1BM22CS010
Enter an integer number:
6
6 is an even number
```

c)Print right star pattern

```
public class JavaExample {
    public static void main(String args[]){
        System.out.println("Abubakar M Matte");
        System.out.print(" 1BM22CS010");

        int row, column ,no_of_rows;

        for(row=0;row<no_of_rows;row++){
            for(column=0;column<rows;column++){
                System.out.println("*");}}}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac starPattern.java

C:\Users\bmsce\Desktop\1BM22CS010>java starPattern
Abubakar M Matte 1BM22CS010
*
* *
* * *
* * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

d)Find quotient and remainder

```
public class JavaExample{
    public static void main(String args[]){
        System.out.println("Abubakar M Matte");
        System.out.print(" 1BM22CS010");

        int num1=15,num2=2;

        int Quotient =num1/num2;

        int remainder=num1%num2;

        System.out.println("Qutoient is" +Quotient);
```

```
System.out.println("Remainder is" +remainder);}}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac quotientRemainder.java
```

```
C:\Users\bmsce\Desktop\1BM22CS010>java quotientRemainder
```

```
Abubakar M Matte 1BM22CS010
```

```
Quotient is: 7
```

```
Remainder is: 1
```

e)Multiply two numbers

```
public class demo{
```

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

```
System.out.println("Abubakar M Matte");
```

```
System.out.print(" 1BM22CS010");
```

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

```
System.out.println("Enter first number");
```

```
int num1=scan.nextInt();
```

```
System.out.println("Enter second number");
```

```
int num2=scan.nextInt();
```

```
scan.close();
```

```
int product=num1*num2;
```

```
System.out.println("Output:"+product);}}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac multiply.java
```

```
C:\Users\bmsce\Desktop\1BM22CS010>java multiply
```

```
Abubakar M Matte 1BM22CS010
```

```
Enter first number: 3
```

```
Enter second number: 4
```

```
Output: 12
```

f)Swap two numbers using temporary variable

```
public class swapnumbers{
```

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

```
System.out.println("Abubakar M Matte");
```

```
System.out.print(" 1BM22CS010");
```

```
float first =1.20f,second=2.45f;
```

```
System.out.println("—Before Swap—");
```

```
System.out.println("First number"+first);  
System.out.println("Second number"+second);  
  
Float temp=first;  
first=second;  
second=temp;  
  
System.out.println("--After Swap--");  
System.out.println("First number"+first);  
System.out.println("Second number"+second);}}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac swap.java  
  
C:\Users\bmsce\Desktop\1BM22CS010>java swap  
Abubakar M Matte 1BM22CS010  
--Before Swap--  
First number = 1.2  
Second number = 2.45  
--After Swap--  
First number = 2.45  
Second number = 1.2
```

LAB-2

/*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

```
import java.util.Scanner;
import static java.lang.Math.sqrt;
import static java.lang.Math.abs;

public class quad{
    public static void main(String[] args){
        System.out.println("Name: Abubakar Mohammedshafee Matte");
        System.out.println("USN: 1BM22CS010");
        Scanner in = new Scanner(System.in);
        System.out.println("Enter coefficients: ");
        int a = in.nextInt();
        int b = in.nextInt();
        int c = in.nextInt();
        if(a==0){
            System.out.println("Invalid Input.");
        }
        else{
            int d = b*b-4*a*c;
            if(d>0){
                System.out.println("Roots are real: ");
                float r1 =(float)(-b+sqrt(d))/(2*a);
                float r2 =(float)(-b-sqrt(d))/(2*a);
                System.out.println(r1);
                System.out.println(r2);
            }
            else if(d<0){
                System.out.println("Roots are imaginary. There are no real solutions. Complex solutions: ");
                float r1 = (float)-b/(2*a);
                float r2 = (float)sqrt(abs(d))/(2*a);
                System.out.println(r1+"+i"+r2);
                System.out.println(r1+"-i"+r2);
            }
            else{
                System.out.println("Roots are equal:");
                float r = (float)-b/(2*a);
                System.out.println(r);
            }
        }
    }
}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>java quad
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter coefficients:
0 1 1
Invalid Input.

C:\Users\bmsce\Desktop\1BM22CS010>javac quad.java

C:\Users\bmsce\Desktop\1BM22CS010>java quad
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter coefficients:
1 2 1
Roots are equal:
-1.0

C:\Users\bmsce\Desktop\1BM22CS010>javac quad.java

C:\Users\bmsce\Desktop\1BM22CS010>java quad
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter coefficients:
1 -6 5
Roots are real:
5.0
1.0

C:\Users\bmsce\Desktop\1BM22CS010>javac quad.java

C:\Users\bmsce\Desktop\1BM22CS010>java quad
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter coefficients:
5 1 5
Roots are imaginary. There are no real solutions. Complex solutions:
-0.1+i0.99498737
-0.1-i0.99498737
```


LAB-3

/*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. */

3)

```
import java.util.Scanner;

public class Student {
    String usn;
    String name;
    private static int[] credits = new int[]{4, 4, 4, 3, 3, 2, 1, 1};
    int noOfSub = 8;
    private int[] marks;
    Scanner sc;

    Student() {
        this.marks = new int[this.noOfSub];
        this.sc = new Scanner(System.in);
        System.out.println("Enter your details: ");
        this.details();
        this.get_marks();
        this.display();
    }

    public void details() {
        System.out.println("Abubakar Mohammedshafee Matte 1BM22CS010");
        System.out.println("Enter your USN: ");
        this.usn = this.sc.next();
        System.out.println("Enter your name: ");
        this.name = this.sc.next();
    }

    public void get_marks() {
        System.out.println("Enter your marks according to credits-4,4,4,3,3,2,1,1: ");

        for(int var1 = 0; var1 < this.noOfSub; ++var1) {
            this.marks[var1] = this.sc.nextInt();
        }
    }

    double sgpa() {
        double var1 = 0.0;
        double var3 = 0.0;

        for(int var5 = 0; var5 < this.noOfSub; ++var5) {
            if (this.marks[var5] >= 40) {
                if (this.marks[var5] == 100) {
                    var3 += (double)(credits[var5] * (this.marks[var5] / 10));
                } else if (this.marks[var5] < 100) {
                    var3 += (double)(credits[var5] * (this.marks[var5] / 10 + 1));
                } else {
                    var3 += 0.0;
                }
            } else {
                var3 += 0.0;
            }
        }
    }
}
```

```

        var1 = var3 / 22.0;
        return var1;
    }

    void display() {
        System.out.println("USN: " + this.usn);
        System.out.println("Name: " + this.name);
        System.out.println("SGPA is: " + this.sgpa());
    }

    public static void main(String[] var0) {
        new Student();
    }
}

```

```

C:\Users\bmsce\Desktop\1BM22CS010>javac Student.java

C:\Users\bmsce\Desktop\1BM22CS010>java Student
Enter your details:
Abubakar Mohammedshafee Matte 1BM22CS010
Enter your USN:
1BM22CS010
Enter your name:
Abubakar
Enter your marks accoring to credits-4,4,4,3,3,2,1,1:
99
94
92
87
83
96
83
90
USN: 1BM22CS010
Name: Abubakar
SGPA is: 9.6818181818182

```

LAB-4

/*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.*/

4)

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

```
class book
```

```
{
```

```
    String name;
```

```
    String author;
```

```
    float price;
```

```
    int num_pages;
```

```
    book(){
```

```
}
```

```
    book(String name, String author, int num_pages, float price){
```

```
        this.name=name;
```

```
        this.author=author;
```

```
        this.num_pages=num_pages;
```

```
        this.price=price;
```

```
}
```

```
void set_details()
```

```
{
```

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

```
    System.out.println("enter bookname,author,price,num_pages");
```

```
    name=sc.next();
```

```
    author=sc.next();
```

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

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

```
}
```

```
void get_details()
```

```
{
```

```
    String details=toString();
```

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

```
}
```

```
public String toString()
```

```
{
```

```
    return "the book "+name+" was written by "+author+" it consists of "+num_pages+" pages and costs "+price+"rupees.";
```

```
}
```

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

```
{
```

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

```
    System.out.println("Abubakar Mohammedshafee Matte 1BM22CS010 ");
```

```
    book b[]=new book[3];
```

```
    b[0]=new book("Java","Strange",9857,243);
```

```
    b[1]=new book();
```

```
    b[2]=new book();
```

```
    b[1].set_details();
```

```
    b[2].set_details();
```

```
    b[0].get_details();
```

```
b[1].get_details();  
b[2].get_details();  
  
}  
}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>javac book.java  
  
C:\Users\bmsce\Desktop\1BM22CS010>java book  
Abubakar Mohammedshafee Matte 1BM22CS010  
enter bookname,author,price,num_pages  
ABC  
XYZ  
100  
100  
enter bookname,author,price,num_pages  
PQR  
LMN  
200  
200  
the book Java was written by Strange it consists of 9857 pages and costs 243.0rupees.  
the book ABC was written by XYZ it consists of 100 pages and costs 100.0rupees.  
the book PQR was written by LMN it consists of 200 pages and costs 200.0rupees.
```

LAB-5

/*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*/

```
5) import java.util.Scanner;
abstract class Shape{
    int x,y;
    abstract void area();
}
class Circle extends Shape{
    Circle(){
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the radius of the circle");
        x=sc.nextInt();
        y=x;}
    void area()
    {
        System.out.println("area of circle is "+3.14*x*y);
    }
}
class Rectangle extends Shape{
    Rectangle(){
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the length and breadth of the rectangle");
        x=sc.nextInt();
        y=sc.nextInt();}
    void area()
    {
        System.out.println("area of rectangle is "+x*y);
    }
}
class Triangle extends Shape{
    Triangle(){
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the base and hieght of the triangle");
        x=sc.nextInt();
        y=sc.nextInt();}
    void area()
    {
        System.out.println("area of triangle is "+0.5*x*y);
    }
}

class Area{
    public static void main(String args[])
    {
        System.out.println("Abubakar 1BM22CS010 ");
        Circle obj1=new Circle();
        obj1.area();
        Rectangle obj2=new Rectangle();
        obj2.area();
        Triangle obj3=new Triangle();
        obj3.area();
    }
}
```

```
}  
}
```

```
C:\Users\bmsce\Desktop\1BM22CS010>java Area  
Abubakar 1BM22CS010  
enter the radius of the circle  
1  
area of circle is 3.14  
enter the length and breadth of the rectangle  
2  
2  
area of rectangle is 4  
enter the base and hieght of the triangle  
2  
2  
area of triangle is 2.0  
}
```

LAB-6

/*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. */

6)

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

```
class Account {
    String customerName;
    long accno;
    String accountType;
    double balance;
    public Account(String customerName, long accno, String accountType) {
        this.customerName = customerName;
        this.accno = accno;
        this.accountType = accountType;
        this.balance = 0.0;
    }
    public void displayBalance() {
        System.out.println("Account Number: " + accno);
        System.out.println("Customer Name: " + customerName);
        System.out.println("Account Type: " + accountType);
        System.out.println("Balance: $" + balance);
    }
}
class CurAcct extends Account {
    double minBalance;
    double serviceCharge;
    public CurAcct(String customerName, long accno) {
        super(customerName, accno, "Current");
```

```

        this.minBalance = 500.0; // Set minimum balance
        this.serviceCharge = 50.0; // Set service charge
    }
    public void withdraw(double amount) {
        if (balance - amount >= minBalance) {
            balance -= amount;
            System.out.println("Withdrawal successful. Current Balance: $" + balance);
        } else {
            System.out.println("Insufficient funds. Withdrawal not allowed.");
        }
    }
    public void imposeServiceCharge() {
        if (balance < minBalance) {
            balance -= serviceCharge;
            System.out.println("Service charge imposed. Current Balance: Rs." + balance);
        }
    }
}
class SavAcct extends Account {
    double interestRate;

    public SavAcct(String customerName, long accno) {
        super(customerName, accno, "Savings");
        this.interestRate = 0.05;
    }

    public void depositInterest() {
        double interest = balance * interestRate;
        balance += interest;
        System.out.println("Interest deposited. Current Balance: $" + balance);
    }

    public void compoundInterest(double initialAmount, int term) {
        double compoundInterest = initialAmount * Math.pow((1 + interestRate), term) - initialAmount;
        balance += compoundInterest;
        System.out.println("Compound Interest deposited. Current Balance: Rs." + balance);
    }
}
public class Bank {
    public static void main(String[] args) {
        System.out.println("Abubakar Matte 1BM22CS010");
        Scanner scanner = new Scanner(System.in);
        System.out.println("Choose account type:");
        System.out.println("1. Current");
        System.out.println("2. Savings");
        System.out.print("Enter choice (1 or 2): ");
        int choice = scanner.nextInt();
        System.out.print("Enter customer name: ");
        String customerName = scanner.next();
        System.out.print("Enter account number: ");
        long accno = scanner.nextLong();
        if (choice == 1) {
            CurAcct curAccount = new CurAcct(customerName, accno);
            System.out.print("Enter initial balance: $");
            double initialBalance = scanner.nextDouble();
            curAccount.balance = initialBalance;
            System.out.print("Enter withdrawal amount: $");
            double withdrawalAmount = scanner.nextDouble();
            curAccount.withdraw(withdrawalAmount);
            curAccount.imposeServiceCharge();
            curAccount.displayBalance();
        } else if (choice == 2) {
            SavAcct savAccount = new SavAcct(customerName, accno);
            System.out.print("Enter initial balance: $");
            double initialBalance = scanner.nextDouble();
            savAccount.balance = initialBalance;

```



```
        System.out.print("Enter withdrawal amount: $");
        double withdrawalAmount = scanner.nextDouble();
        savAccount.balance -= withdrawalAmount;
        System.out.println("Withdrawal successful. Current Balance: $" + savAccount.balance);
        System.out.print("Enter interest rate: ");
        double interestRate = scanner.nextDouble();
        savAccount.interestRate = interestRate;
        savAccount.displayBalance();
        System.out.print("Enter term (in years) for compound interest calculation: ");
        int term = scanner.nextInt();
        savAccount.compoundInterest(initialBalance, term);
        savAccount.displayBalance();
    } else {
        System.out.println("Invalid choice");
    }
}
}
```

```

}
C:\Users\bmsce\Desktop\1BM22CS010>javac Bank.java

C:\Users\bmsce\Desktop\1BM22CS010>java Bank
Abubakar Matte 1BM22CS010
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 1
Enter customer name: Abubakar
Enter account number: 3625245
Enter initial balance: $400
Enter withdrawal amount: $100
Insufficient funds. Withdrawal not allowed.
Service charge imposed. Current Balance: Rs.350.0
Account Number: 3625245
Customer Name: Abubakar
Account Type: Current
Balance: $350.0

C:\Users\bmsce\Desktop\1BM22CS010>javac Bank.java

C:\Users\bmsce\Desktop\1BM22CS010>java Bank
Abubakar Matte 1BM22CS010
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 1
Enter customer name: Abubakar
Enter account number: 9857932
Enter initial balance: $10000
Enter withdrawal amount: $1000
Withdrawal successful. Current Balance: $9000.0
Account Number: 9857932
Customer Name: Abubakar
Account Type: Current
Balance: $9000.0

C:\Users\bmsce\Desktop\1BM22CS010>javac Bank.java

C:\Users\bmsce\Desktop\1BM22CS010>java Bank
Abubakar Matte 1BM22CS010
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 2
Enter customer name: Abubakar
Enter account number: 12345678
Enter initial balance: $8000
Enter withdrawal amount: $1500
Withdrawal successful. Current Balance: $6500.0
Enter interest rate: 0.08
Account Number: 12345678
Customer Name: Abubakar
Account Type: Savings
Balance: $6500.0
Enter term (in years) for compound interest calculation: 3
Compound Interest deposited. Current Balance: Rs.8577.696000000002
Account Number: 12345678
Customer Name: Abubakar
Account Type: Savings
Balance: $8577.696000000002

```

LAB-7

/* Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses. */

```
7)package CIE;

import java.util.*;

public class Student
{
    public int sem;
    public String usn;
    public String name;

    public void accept()
    {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter U, N, S:\n");
        usn=scan.nextLine();
        name=scan.nextLine();
        sem=scan.nextInt();
    }
}

package CIE;

public class Internals
{
    public int im[]=new int[5];
}

package SEE;
import CIE.Student;

public class External extends Student
{
    public int sm[]=new int[5];
}

import java.util.*;
```

```

import SEE.*;
import CIE.*;
public class FinalMarks
{
    public static void main(String args[])
    {
        int fm[]=new int[5];

        Scanner sc= new Scanner(System.in);

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

        int n=sc.nextInt();

        SEE.External st[]=new SEE.External[n];
        CIE.Internals s[]=new CIE.Internals[n];

        for(int i=0; i<n; i++)
        {
            st[i]=new SEE.External();

            s[i]=new CIE.Internals();

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

            st[i].accept();

            for(int j=0; j<5; j++)
            {
                System.out.println("Enter internal and external marks of subject "+(j+1));

                s[i].im[j]=sc.nextInt();

                st[i].sm[j]=sc.nextInt();

                fm[j]=s[i].im[j]+st[i].sm[j];
            }

            System.out.println("Final marks of "+st[i].name);

            for(int k=0; k<5; k++)
            {
                System.out.println("Course "+(k+1)+" = "+fm[k]);
            }
        }
    }
}

```

```
C:\Users\bmsce\Desktop\1BM22CS010\CIE_SEE>javac -d . FinalMarks.java
```

```
C:\Users\bmsce\Desktop\1BM22CS010\CIE_SEE>java FinalMarks
```

```
Enter n:
```

```
2
```

```
Enter details 1
```

```
Enter USN, Name, Semester:
```

```
1BM22CS010
```

```
Abubakar
```

```
3
```

```
Enter internal and external marks of subject 1
```

```
49
```

```
48
```

```
Enter internal and external marks of subject 2
```

```
47
```

```
49
```

```
Enter internal and external marks of subject 3
```

```
50
```

```
49
```

```
Enter internal and external marks of subject 4
```

```
48
```

```
46
```

```
Enter internal and external marks of subject 5
```

```
45
```

```
49
```

```
Final marks of Abubakar
```

```
Course 1 = 97
```

```
Course 2 = 96
```

```
Course 3 = 99
```

```
Course 4 = 94
```

```
Course 5 = 94
```

```
Enter details 2
```

```
Enter USN, Name, Semester:
```

```
1BM22CS010
```

```
Abubakar
```

```
4
```

```
Enter internal and external marks of subject 1
```

```
50
```

```
50
```

```
Enter internal and external marks of subject 2
```

```
49
```

```
48
```

```
Enter internal and external marks of subject 3
```

```
47
```

```
49
```

```
Enter internal and external marks of subject 4
```

```
48
```

```
48
```

```
Enter internal and external marks of subject 5
```

```
49
```

```
50
```

```
Final marks of Abubakar
```

```
Course 1 = 100
```

```
Course 2 = 97
```

```
Course 3 = 96
```

```
Course 4 = 96
```

```
Course 5 = 99
```

LAB-8

/*Write a program that demonstrates handling of exceptions in inheritance tree.

Create a base class called “Father” and derived class called “Son” which extends the base class. In Father class, implement a constructor which takes the age and throws the exception 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. */

```
8)
import java.util.Scanner;
class WrongAge extends Exception {
    public WrongAge(String message) {
        super(message);
    }
}
class Father {
    int fatherAge;
    public Father(int fatherAge) throws WrongAge {
        if (fatherAge < 0) {
            throw new WrongAge("Age cannot be negative");
        }
        this.fatherAge = fatherAge;
    }
}
class Son extends Father {
    int sonAge;
    public Son(int fatherAge, int sonAge) throws WrongAge {
        super(fatherAge);
        if (sonAge >= fatherAge) {
            throw new WrongAge("Son's age must be less than Father's age");
        }
        this.sonAge = sonAge;
    }
}
public class fatherson {
    public static void main(String[] args) {
        System.out.println("Name: Abubakar Mohammedshafee Matte");
        System.out.println("USN: 1BM22CS010");
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter father's age and son's age: ");
        int fa=sc.nextInt();
        int sa=sc.nextInt();
        try {
            Son s = new Son(fa, sa);
            System.out.println("Father's age: " + s.fatherAge);
            System.out.println("Son's age: " + s.sonAge);
        } catch (WrongAge e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}
```

```
C:\Users\bmsce>cd C:\Users\bmsce\Desktop\1BM22CS010
C:\Users\bmsce\Desktop\1BM22CS010>javac fatherson.java
C:\Users\bmsce\Desktop\1BM22CS010>java fatherson
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter father's age and son's age:
45
15
Father's age: 45
Son's age: 15
C:\Users\bmsce\Desktop\1BM22CS010>javac fatherson.java
C:\Users\bmsce\Desktop\1BM22CS010>java fatherson
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter father's age and son's age:
30
31
Error: Son's age must be less than Father's age
C:\Users\bmsce\Desktop\1BM22CS010>java fatherson
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
Enter father's age and son's age:
-1
-46735
Error: Age cannot be negative
```

LAB-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.*/

```
9)class A extends Thread
{
    int t1,time;

    A(){
        t1=0;
        time=21000;
    }

    public void run()
    {
        while(t1<=time)
        {
            System.out.println("BMS COLLEGE OF ENGINEERING");

            try {
                sleep(10000);
            } catch(Exception e) {
                System.out.println("error");
            }

            t1+=10000;
        }
    }
}

class B extends Thread{
    int t2,time;

    B(){
        time=21000;
        t2=0;
    }

    public void run()
    {
        while(t2<=time)

        {
```



```

        System.out.println("CSE");

        try{

            sleep(2000);

        }

        catch(Exception e)

        {

            System.out.println("error");

        }

        t2+=2000;

    }}

}

class th

{

    public static void main(String args[])

    { System.out.println("Name: Abubakar Mohammedshafee Matte");

    System.out.println("USN: 1BM222CS010");

        A a=new A();

        B b=new B();

        a.start();

        b.start();

    }

```

```

C:\Users\bmsce\Desktop\1BM22CS010>javac MThread.java

C:\Users\bmsce\Desktop\1BM22CS010>java MThread
Name: Abubakar Mohammedshafee Matte
USN: 1BM22CS010
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
CSE
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
CSE
BMS COLLEGE OF ENGINEERING
CSE
}

```

LAB-9

```
/*Java awt class*/
```

```
10)import javax.swing.*;

import java.awt.*;

import java.awt.event.*;

class SwingDemo{

SwingDemo(){

JFrame jfrm = new JFrame("Divider App");

jfrm.setSize(275, 150);

jfrm.setLayout(new FlowLayout());

jfrm.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

JLabel jlab = new JLabel("Enter the divider and dividend:");

JTextField ajtf = new JTextField(8);

JTextField bjtf = new JTextField(8);

JButton button = new JButton("Calculate");

JLabel err = new JLabel();

JLabel alab = new JLabel();

JLabel blab = new JLabel();

JLabel anslab = new JLabel();

jfrm.add(err);

jfrm.add(jlab);

jfrm.add(ajtf);

jfrm.add(bjtf);

jfrm.add(button);

jfrm.add(alab);

jfrm.add(blab);

jfrm.add(anslab);

ActionListener l = new ActionListener() {

public void actionPerformed(ActionEvent evt) {

System.out.println("Action event from a text field");

}

};

ajtf.addActionListener(l);

bjtf.addActionListener(l);

button.addActionListener(new ActionListener() {
```

```

public void actionPerformed(ActionEvent evt) {

    try{

        int a = Integer.parseInt(ajtf.getText());

        int b = Integer.parseInt(bjtf.getText());

        int ans = a/b;

        alab.setText("\nA = " + a);

        blab.setText("\nB = " + b);

        anslab.setText("\nAns = "+ ans);

    }

    catch(NumberFormatException e){

        alab.setText("");

        blab.setText("");

        anslab.setText("");

        err.setText("Enter Only Integers!");

    }

    catch(ArithmeticException e){

        alab.setText("");

        blab.setText("");

        anslab.setText("");

        err.setText("B should be NON zero!");

    }

}

});

jfrm.setVisible(true);

}

public static void main(String args[]){

    SwingUtilities.invokeLater(new Runnable(){

        public void run(){

            new SwingDemo();

        }

    });

}

}

```

