VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.



LAB REPORT on

Object Oriented Java Programming

Submitted by

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in partial fulfillment for the award of the degree of BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING
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(Affiliated To Visvesvaraya Technological University, Belgaum)

Department of Computer Science and Engineering



CERTIFICATE

This is to certify that the Lab work entitled "Object Oriented Java Programming" carried out by SAMRITH SANJOO.S(1BM21CS185), 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 2022-23. The Lab report has been approved as it satisfies the academic requirements in respect of Data structures Lab - (21CS3PCOOJ) work prescribed for the said degree.

Name of the Lab-Incharge Designation Department of CSE BMSCE, Bengaluru **Dr. Jyothi S Nayak** Professor and Head Department of CSE BMSCE, Bengaluru

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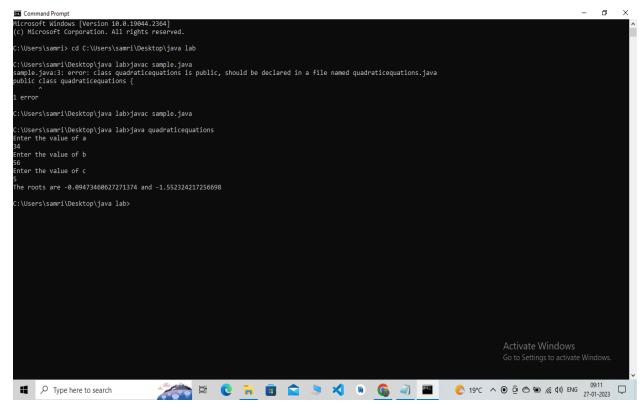
Course Outcome

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.

1) Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2 -4ac is negative, display a message stating that there are no real solutions.

```
QUADRATIC EQUATION.
Java-util. Scanner;
public
Class Quadric Equation &
Public Static Void main (String [] Strings) & Scanner Sc = New Scanner (System in) Scystem out printly ("Enter the Nalue of a");
     int a = sc. nextInt ();
 System. out. println (" Enter the Value of 6");
    Sugstam. out. println (" Enter the Value of 6"); int b = Sc. nent Int ();
  System out println ("Enter the Value of (");
     int C = Sc. nentInt();
  double d = b+b-A*a*c;
  2(0< b) 4i
  double 81 = (-5+ Moth-pow (d, 0.5)) (6.0 +a);
  double 72 = (-6+ Math. Pow(d, 0.5)) (2.0+a);
   System. out printer (" The roots are "+81 + "and"+82);
 else if (d==0.0) [
       double 81 = - 4/ (2.0* a),
     System-out. prixtn(" The most is"+ x2);
      System out printly ("Rosts are not Real");
```

OUTPUT:



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.

一一年多年 MEEK-2

Deletop a Java program to create a class Student with members USn, name, an array Credits and array marks. Include methods to accept and display details and a method to calculate 5GPA of a Student

impost java. util. Scanner

public class Student & public Class Static Void main (Stong args []) Scanner SC = mew Scanner (System. In);

int credit [] = new int [so]; int mark [] = new int[5];

int usn;

Staing name; int total credit = 0; double Sapa = 0;

System. out println ("Enter the details of the Student In"); System out prinths (" Enler the USW details of the Sholad la"); USn = Sc. nerd Int ()

tor (Nt C =0; (<5; i++){ System out println (" Faler the Marks of the "+ (i+1)+" St Subject (n");

Mark (i] = Sc. nent Int ();

Sgpa = Sgpa + (total (red); System out println ("The Name of the Student: "the System out println ("The VSN of the Student: "the System out println ("The SGPA of the Student: "the System out println ("The SGPA of the Student: "the Student: "the Student: "the Enley the Admile to the Student: "The Student: "The Enley the Admile to the Student: "The Enley the Student: "The Enley the Admile to the Student: "The Enley the Student: "The Student: "The

The Enlev the details of the Student Enlev the USN of the Student

Enter the Name of the Student Samrith

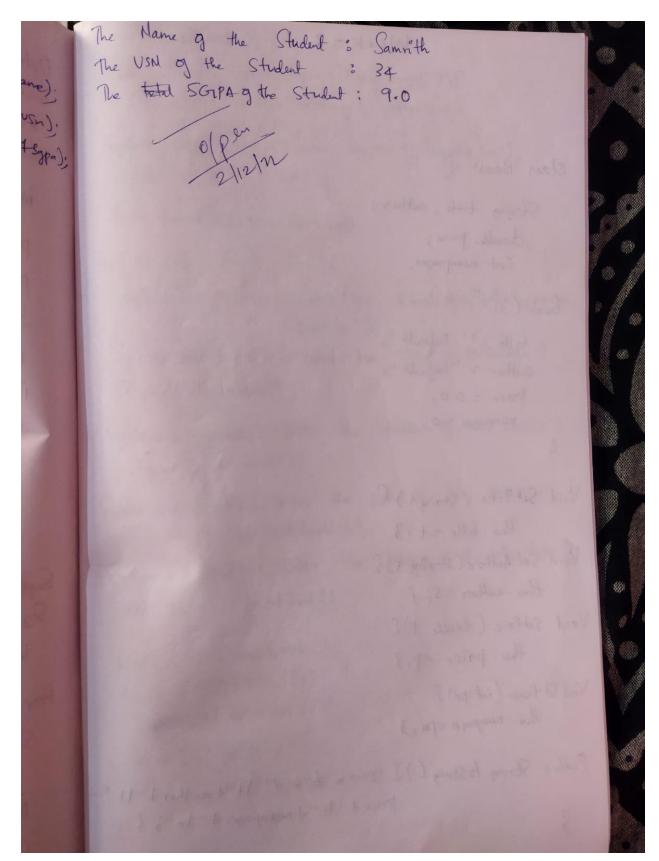
Enter the Marks of the 2st Subject

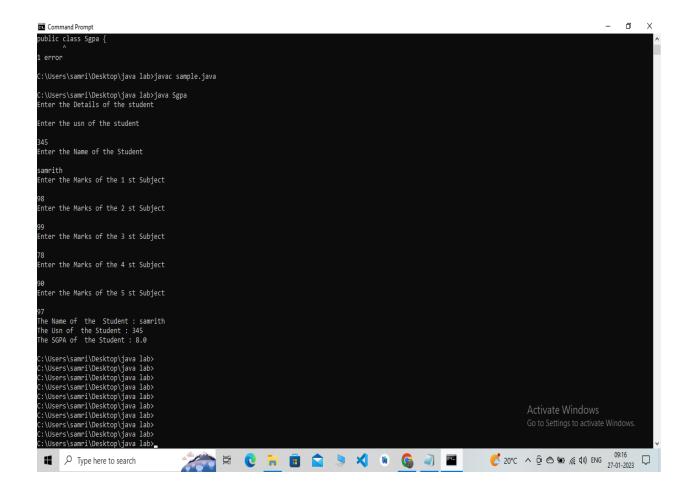
98
Enter the Marks of the 3rd Subject

92
Enter the Marks of the 4rd Subject

Enter the Marks of the 4rd Subject

99
Marks of the 5rd Subject

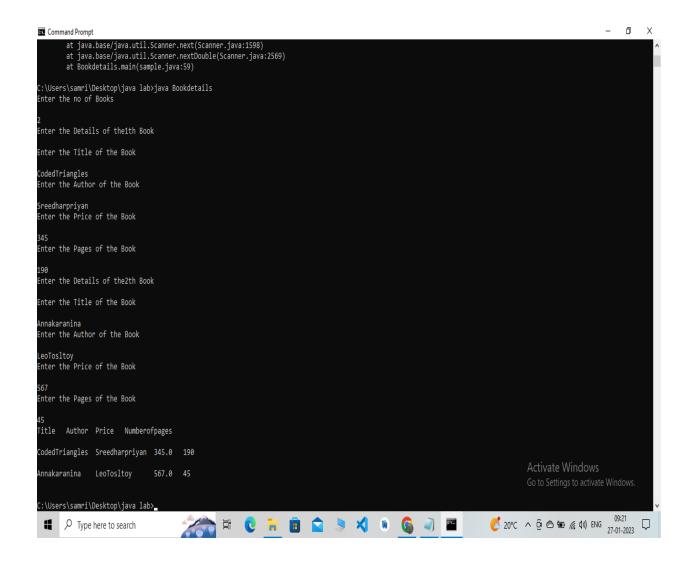




Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString() method that could display the complete details of the book. Develop a Java program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

```
dan Book {
       String title, author;
       double price;
         int numpages;
   Book () [
       tilte = " Default ";
       author = "Default ";
       price =0.0;
        humpages = 0;
 Void Set Title (String + ) &
        this . title = ti3
 Void Set Author (String 5) &
     this author = S; }
Void SetPrice (double P) &
        this. price = p; 3
Void & Pages (int pa) &
      this numpay or = (20; 3
Public String to String () & relum tille +" It "+ author+" It"
                          price +" It" + numpages +" (n"; 5
```

```
dan Book delails S
             Public Static Void main (String args[ ]) [
              Scarner Sc = new Scarmer (System. in);
            System out printer ("Enter the no of Books In");
               int n = Sc next Int();
            Book book[]= new Book[n];
           Ax (id i=0; ( x n', i++) [
             System out print to ("Enter the delads of the + "( e+1) +"th
                                 Book In")
            System out println ("Enter the Title of the Bookla");
            String t=sc.nent();
           System. out printh (" Enter the Author of the Bookin");
             String S = & neut ();
           System out print ("Ther the price of the Book (a);
               double 12= Sc. next Double ();
           System-out print lu ("Enter the pages of the Booklu");
             ind ph = Scinest Int ();
            hook[i] - new Book();
             hook[i]. Set Title (t);
             book[i]. Set Author(S);
             book [i] Botpice (p);
11/4 1/7
              book[i] · Set Pages (pa);
```



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.

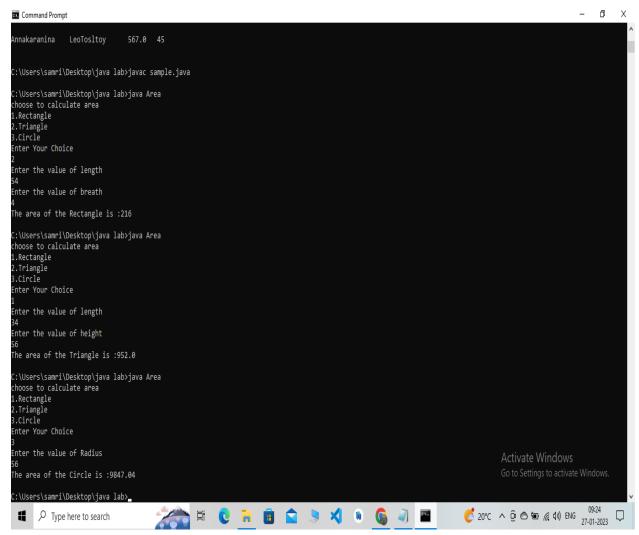
alstrad class Shape & abstract void print Amea(); 3 (10 31 dell' solo man at 1) allege down Rechangle extends Stape of public Void print Anea () E Scanner Sc = new Scanner (System. in); System out privation ("Inter the Value of length") a = Sc nend Int(): Systam. ord. printle ("Inder the Value of bredh"); b= sc.nextIn(); ind (=axb; System out print he 14 The area of the Redagle is: "+c); Clan triangle extends Shape I Public void printArea () [Scanner Sc= now Scanner (System.in); System out printh (" Falu the Value of Ergth"), System and printer (to Enter the Value of breight) clouble C = (a 6 b) + 0.5; System.out. printly ("The areary Transfirst" to) b = Sc. hent Int ();

```
Class Circle extends Shape S
        public void So privAneu() [
    Stanner Sc = new Stanner ( System . in);
      System. out-prish ("Enter the Value of Radian");
        a = sc. nentsot();
                                                              Odprid ?
      double c = (3.14 * a * a);
       System out printn ("The area of the Circle is: "tc);
                                                                 Choos
Clan Anea S
                                                                  3. C
     Public States vaid main (string argn[ ]) [
                                                                 Enlev
              Scarner Sc = new Scarner (Sydn. in); -
            triangle ( - new Triangle ();
                                                                 (Inler
                                                                  23
                Redaugh Y = new le changle ();
                                                                 Enter
                Circle c = new arde();
                                                                    A
   System and printh (" Choose to Calculate area ");
                                                                  The
      System.od. printler ("I. trectargle ");
      System out printer (12. Triangle ");
        Sydem of printh (13. arch 1);
        System. out brinth ( 4 Enlar Your Choice: 4 to.
          int Choice = Scined Int();
     if ( choice = = 1) 8
         (Choice = = 1) E

t. frintAnea();
     One if ( Choice == 2) 2
           J. prist Ara();
    ( 1 1 ( choice 7 23) ( c print Anca (); 3
```

olx [
System. o wt. printle ("wrong choia "); Edput o Choose to Calculate Area 1. Pectangle 2. Triangle 3. Circle Enler Your Choice Ender the Value of leight Enter She value of height 45 The oner of the Triagle is: 517.5.

OUTPUT:



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

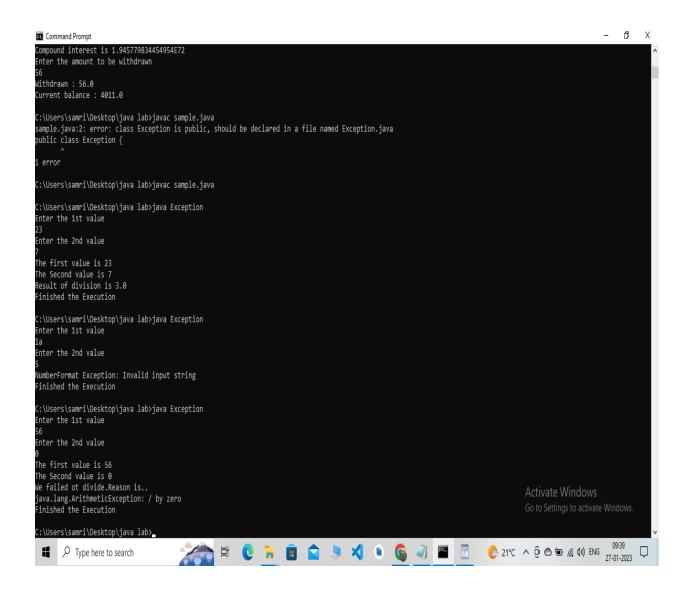
following tasks: a) Accept deposit from customer and update the balance. b) Display the balance. c) Compute and deposit interest d) Permit withdrawal and update the balance Check for the minimum balance, impose penalty if necessary and update the balance.

Bank problem import java. To. +; Import favor util +; Import Jam. lang. Multi; Class Account [Scarner Sc = new Scanner (System. in) String nam; Int accomo; Couble acc-no; Louble bad, Si; int noofdeposits 0; Suga int noofwithout or, Void (neation () { System. out , printle (" Enter your name"); Name = Sc. nent (); System.out. printh (" Enter the initial Armout "); hal = Sc, new Hort (); Void deposit () { floot amount; noot deposits++; System . out printle ("Folor the amount to be deposited"), amount = Sc new Hout (); bal = bul+amout; Sigstem.out. printh (" Current bolance: "+ but);

```
Class Terment Askout entends Account [
   public Void CheeneSook ()[
        bul = bal ~50;
 Sistem out printh (" sons has been beduded from the bulance
                  to the Cheane book tuting");
 System out print ("No of Deposits: "thot Deposits);
 System out printh (" No of withdrawd: &" noof with);
  System out . printly ("Balance: "It noot-deposits);
pullic Void withhand () (
   Sheat and;
System. and . prith ("Frier the amount to be withdrawn"):
   and = Sc. next Haut ();
   1f (and >but)
       System out prish ("Balance timpficet"),
    dus
     bal-bal-and)
   1f(bd <1000) {
    System out profit ("sons is taken as Service fee")
    System. out . protter (" withdrawn: " tout);
    System out. pritter (" Current bulance: +" but);
```

Savings Accord enlands Account [dan public vaid withdrawd OC Dulli floot and; System out printh (" Finder the amount to be withdrawn). amt = Senent Float (); "if (ant >bal) System ent pint in ("Balance insufficient"); else bol = bal - and; System out printin (" withdrawn: " + and); System. out println (" Current bulance ? "+bul) public levil intreset() [System and printh (" Enter the rate of intreset"); double 8=0.06; System. out. println ("toler the number of times intrest applied applied per time period") 1 N + Sc. new tw (); I was a long of the System. out. println (" Enler the time clayed") fint t= Sc. new In(); S1: bal (+ (1/n)) System. out . println (" Compant Extrest is "+ (Math. pow (Si, 14))

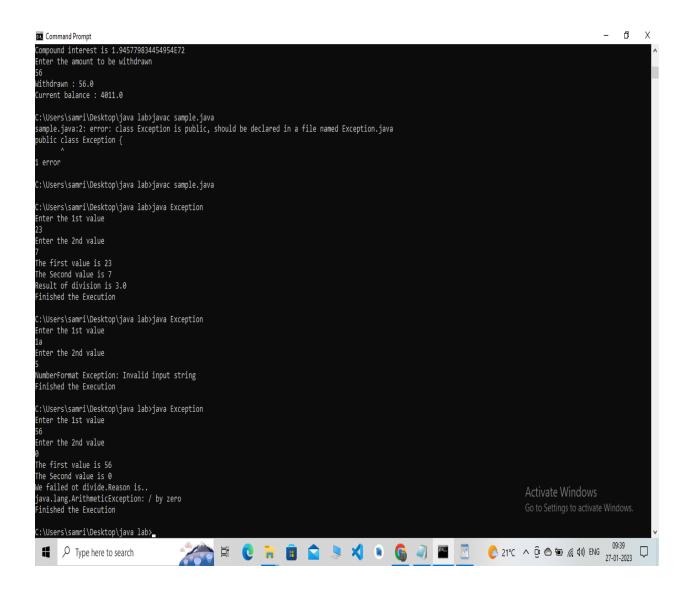
Output: 1. Savings account 2. Cernent account Emp Enter your Name Samith. Erler the Initial Amount 6000. Nane: Samuith Balance: 6000.0 Erler the amount to be dyorited 100 Cerrent balance: 6100.6 Erler the rate of Introst Erler the Number of times Intrest applied for line period 1. Enter the line clayed. Conjound intrest is A. 1809156ET Enter the amount to be withdrawn Current balance: 5600.0.



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.

```
Exception
mpost java. util. Scanner;
Public dans Exceptions
           Static Void main (System in ) L
  Scanner Sc = new Scanner (Systemin);
   System out printly ("Enter the 1st Vale");
    String S1 = Sc. next ();
   System: out print(" Enter the 2nd Value");
      Storing Sa = Sc. rent ();
   try 2
       int a = Integer parse Jut (52)
        int L= Julean parseInt (sa);
       System - out . pridth ("The First Value is "ta);
      System - out . pille (" The Scood Value is "L);
    try & double c=a/L's
        System out proble (" result of division & 140);
     Coulch (java. lang-Exception e) L
         System oud printly (" We failed othe division. leason is .. "?
         Cysten out print (e),
    Cotals (Number Format Exception e) &
       System out printh (" Naurba Format Exception: Imabid injust
                          Storing 41);
               System and printle ("Finished the Eneutron
```

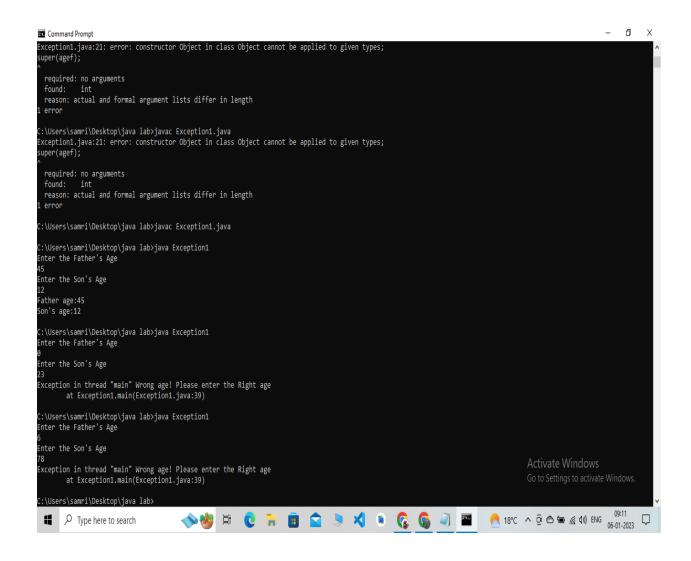
Dusput ? Enter the 154 Value impo Empo Ender the 2rd Value da The Frest Value is 45 The Second Value is 6 Result of division is 7 cle Enter the 157 Value 19 Enler the 2nd Value 55 Nubber Format Exception: Invalid upid string. Finished the Frecution. do Enh the 1st Value Enter the 2nd Value 0 First Value is 23 The Several Value is O We failed the Division Meanon 15 ... java- larg. Ay themelic Exception; / by Zen. Firsiled the Execution.



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.

```
WRONG AGE EXECEPTION
Empost Java. util- 4;
Emport jarea lang. Exception;
Class Wrong Age extends Exception L
  public String tostong () (
   return " wrong age! Please enter the Right age"; }
Class Father S.
    Ent age;
     Father (int aget) & age = aget;
  System.out. println ("Fatha age:" 1-ge);
dans Son extends Father S
 int age;
Son (int aget, int ages) L
     Super (aget);
    age = ages;
 System out . println ("Son's age " "Lage);
Clan Exception 1 S
 Jublic State void main (Strong args (3) throws Wrongtones
 Scanner Se = new Scarner (System. in);
  System out printle ("Finter the Father's Age")
   int aget = sc. newInt(1)
  System. out - pullin (" Enter the Son's Age");
      int agy = sc. next hat ();
```

Clan Enception 2 C public Static void wain (String arms () throws Wrongly Scamme Sc: new Scame (System:in); Class System and printh ("Enter the Father's Asse") String int aget = sc neutlntl); Threa System out public (" Enter the Son's Aage"); Sample Put ages - Sc-new (1) of (aget xollagers > aget) [How new Wrong Aage (); pullic else ? Son s=new Son (auget ages) if Output the output Father's Age Enke the Son's tage ?f (tathe age: 45 Son's age: 12 Forther age: 45 END The Father's Age tale he Con's Aage I plan Enforthe Fight Age



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

```
17 ulti the reading
Ared
                Sample thread implements Runnable L
            String message, trane;
            Thread + ;
          Sample thread (String msg, String hame) &
                 t = new Thread (this, name);
                 message - msg;
                  t. Start();
          Pullic void run () L
                trys
             Ab (int i=5; i>0; i--)2
            if (t.get Name (). equals Ignore (ase ("Thread 2")) &
                System out portan (message);
                    Thread . sleep (10000);
        if ( to get Name ()). equals gnore (an ("Thread 2")) (
              System. out proble (newsage);
               Thread . Sleep (2000);
          (atch (Interrupted Exceptione) [

System.out.pmth (. Thread was interrupted");

3
          System and problem ("Tri by threed " + t-get Name ())"
```

Class Display hread L public static read main (String [Jargs)[Sample thread SI: new Sample thread ("BMS LOLLEGE OF ENGINE KING", "Thread 24). Same thread 52 : new Sample thread ("CSE", "Thread?"). 6 whent COLLEGE OF ENGINEERING BMS CSE CSE CSE Exiting thread: Thread 2. BMS COLLEGE OF ENGFERMA BMS COLLEGE OF ENGENEERING BMS COLLEGE OF ENGENEERING. Exiting thread " Thread 1.

