VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

OBJECT ORIENTED JAVA

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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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 **ADVITHI D (1BM21CS009),** 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 work prescribed for the said degree.

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LAB 1

import java.util.Scanner;

```
class QuadraticEquation

{

public static void main(String xx[])

{

Scanner input=new Scanner(System.in);

System.out.println("enter the value of a:");

double a=input.nextDouble();

System.out.println("enter the value of b:");

double b=input.nextDouble();

System.out.println("enter the value of c:");

double c=input.nextDouble();

if(a==0.0) { System.out.println("the value of a cannot be 0");

{

else

{

if(d>0.0)

{

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 are
"+r1+" and "+r2);
```

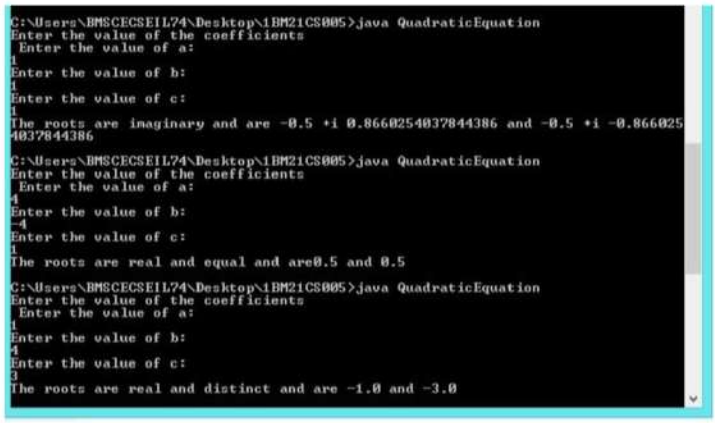
```
}

else if(d==0.0)

{

double r1=-b/(2.0*a);

System.out.println("the roots are real and equal and are "+r1+"
and "+r1);
}


else

{

double r1=-b/(2.0*a);

double r2=(+Math.sqrt(Math.abs(d))/(2.0*a));

double r4=(+Math.sqrt(Math.abs(d))/(2.0*a));

System.out.println("the roots are real and imaginary and are
"+r1+" +i "+r2+" and "+r1+" +i "+r4);}
  }
 }
}
```

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 there are no real solutions.

```
import java.util.Scanner;
public class Quadraticequation
{
public static void main(String xx[])
 {
Scanner input = new Scanner(System.in);
System.out.println("Enter the value of a:");
double a= input.nextDouble();
if (a==0.0)
system.out.println("The value of a cannot be 0");
system.out.println("Enter the value of b:");
double b= input.nextDouble();
System.out.println("Enter the value of c:");
double c = input.nextDouble();
double d = b*b-4.0*a*c;
if(d>0.0)
{
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 "+r1+" and "+r2);
}
else if(d==0.0)
```

```
{
double r1 = -b/(2.0*a);
system.out.println("The roots are equal and "+r1);
}
else
{
if (d<0.0)
{
r1 = (-b+Math.abs(Math.sqrt(d))/(2*a));
System.out.println("The roots are :"+" "+r1+"and"
+"i"+r2);
r3 = (-b-Math.abs(Math.sqrt(d))/(2*a));
System.out.println("The roots are imaginary and
"+" "+r3+"and"+"i"+r4);
}
}
}
```


C:\Users\BMSCECSEIL74\Desktop\iBM21CS005>java QuadraticEquation
Enter the value of the coefficients
Enter the value of a:
1
Enter the value of b:
1
Enter the value of c:
1
The roots are imaginary and are -0.5 +i 0.8660254037844386 and -0.5 +i -0.866025
4037844386
C:\Users\BMSCECSEIL74\Desktop\iBM21CS005>java QuadraticEquation
Enter the value of the coefficients
Enter the value of a:
4
Enter the value of b:
-4
Enter the value of c:
1
The roots are real and equal and are0.5 and 0.5
C:\Users\BMSCECSEIL74\Desktop\iBM21CS005>java QuadraticEquation
Enter the value of the coefficients
Enter the value of a:
1
Enter the value of b:
4
Enter the value of c:
3
The roots are real and distinct and are -1.0 and -3.0

LAB2

import java .util.Scanner;

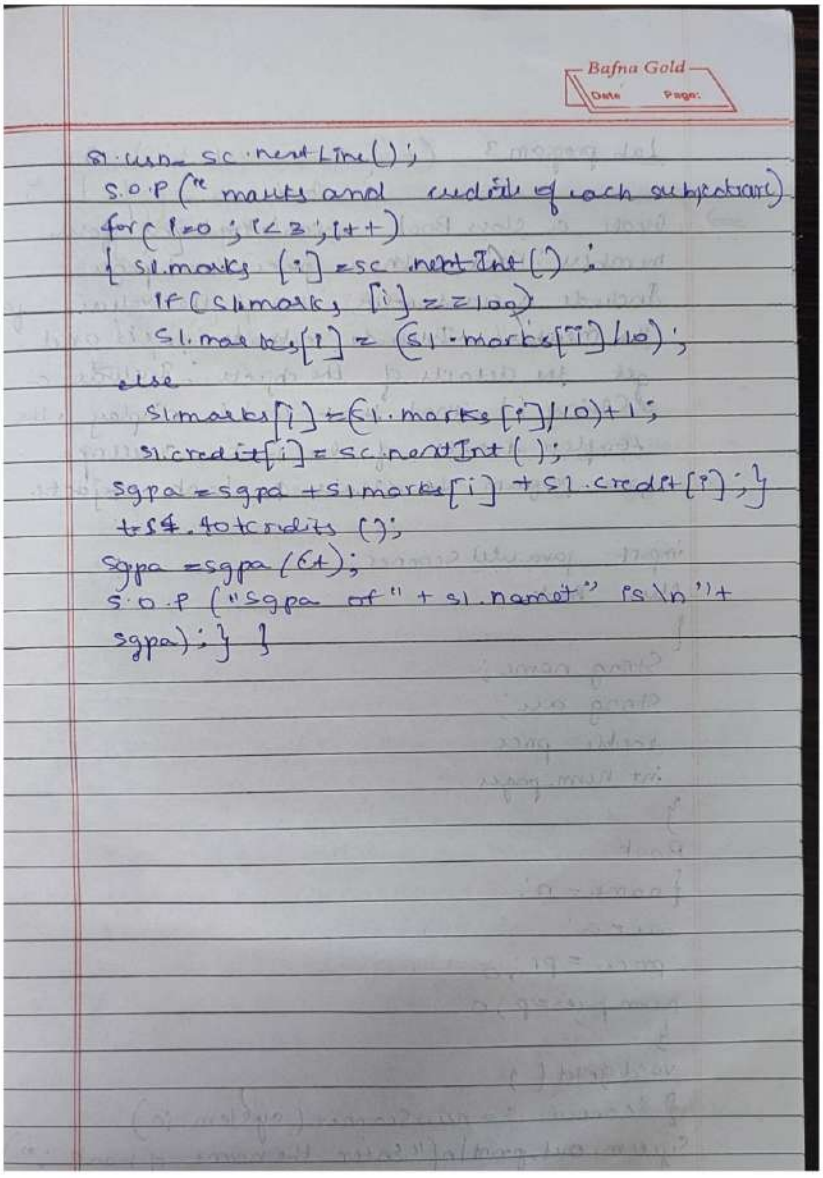
```
String name;

String usn;

int marks[]=new int[3];

int credit[]=new int[3];

int totcredits()

{

int t=0,i;

for(i=0;i<3;i++)

{

t=t+credit[i];

}

return t;

}

}

class cs009{

public static void main(String args[])

{

System.out.println("enter the student name ,usn\n");

int i,t;

float sgpa=0;
```

```
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.totcredits();

sgpa=sgpa/(t);

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

}

}
```

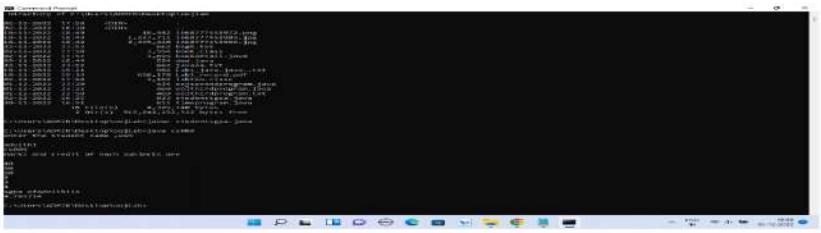
Lab program-2:

⇒ 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.Scanner;
class student
{
 String name;
 String usn;
 int marks[] = new int[3];
 int credit[] = new int[3];
int totcredits()
{ int t=0, i;
  for(i=0; i<3; i++)
  {
   t=t+credit[i];
 }
return t; }}
class cs044 {
public static void main(String args[])
{ system.out.println("enter the Student name, usn \n");
 int i, t;
 float sgpa=0;
Scanner sc= new Scanner(System.in);
student s1 = new student();
s1.name = sc.nextLine();
```




```
s.nextLine();
S.O.P("marks and credits of each subjectare)
for(i=0;i<3;i++)
{ sl.marks[i]=sc.nextInt();
  if(sl.marks[i]==100)
    sl.marks[i]=(sl.marks[i]/10);
  else
    sl.marks[i]=(sl.marks[i]/10)+1;
    sl.credit[i]=sc.nextInt();
sgpa=sgpa+sl.marks[i]+sl.credit[i];}
+sl.totcredits();
sgpa=sgpa/6+;
S.O.P("sgpa of"+sl.name+" is\n"+
sgpa);}}
```



LAB 3

```
import java.util.Scanner;

	Class book

	{

	String name;

	String au;

	double price;

	int num_pages;

	book(){}

	book(String n,String a,double pr,int p)

	{

	name=n;

	au=a;

	price= 0;

	num_pages=0;

	}

	void getd()

	{

	Scanner s=new Scanner(System.in);

	System.out.println("enter the name of the book:");

	name=s.next();

	System.out.println("enter the name of the author");
```

```
au=s.next();

System.out.println("enter the price of book:");

price=s.nextDouble();

System.out.println("enter the number of pages");

num_pages=s.nextInt();

}

public String toString()

{

String SSS="name of the book is"+name+" name of the author is"+au+"
price of the book is"+price+" number of pages in the book
is"+num_pages;

return SSS;

}

}

class main_book

{

public static void main(String args[])

{

Scanner s1=new Scanner(System.in);

System.out.println("enter the number of books");

int n=s1.nextInt();

book b[]=new book[n];

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

{ b[i]=new book();
```

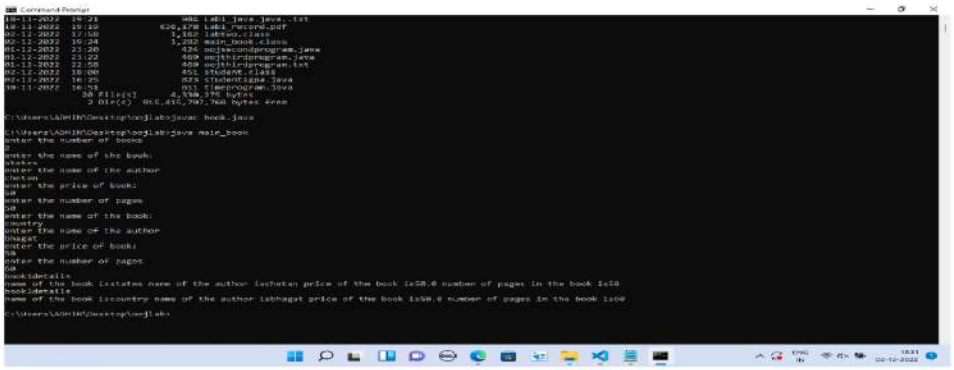
```
b[i].getd();

}

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

{

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

System.out.println(b[i]);

   }

  }

}
```

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. Write a java program to create n book objects.

```
import java.util.Scanner;
class Book
{
 String name;
 String au;
 double price
 int num_pages
}
Book
{name = n;
 au = a;
 price = pr;
num_pages = p;
}
void getd()
{ Scanner s = new Scanner(system.in)
System.out.println("Enter the name of book :")
 name = s.next();
System.out.println("Enter the name of author)
 au = s.next();
System.out.println("Enter the price of book :")
```

```
price = S.nextDouble();
System.out.println("Enter the number of
pages");
num_pages = S.nextInt();
}
public String toString()
{
String S = "Name of the book is" + name + "
Name of the author is" + aut + " Price of
the book is" + price + " Number of pages in
the book is" + num_pages;

return S;

class main_book
{
public static void main(String args[])
{
Scanner S1 = new Scanner(System.in)
System.out.println("Enter the number of books");
int n = S1.nextInt();
Book b[] = new Book[n];
for (int i=0; i<n; i++)
{ b[i] = new book();
b[i].getd();
for (int i=0; i<n; i++) {
System.out.println("Book" + (i+1) + "details");
System.out.println(b[i]);
}
}
```


Command Prompt
02-12-2022 19:24 1,292 main_book.class
02-12-2022 18:00 451 student.class
02-12-2022 16:25 873 studentops.java
10-11-2022 16:53 931 tiemprogram.java
30 File(s) 4,598,375 bytes
3 Dir(s) 816,416,797,760 bytes free
C:\Users\ADMIN\Desktop\oop1lab>javac book.java
C:\Users\ADMIN\Desktop\oop1lab>java main_book
enter the number of books
2
enter the name of the book
chetan
enter the name of the author
chetan
enter the price of book:
58
enter the number of pages
58
enter the name of the book
country
enter the name of the author
bhagat
enter the price of book:
59
enter the number of pages
59
bookidetails
name of the book is chetan name of the author is chetan price of the book is58.0 number of pages in the book is58
bookidetails
name of the book is country name of the author is bhagat price of the book is59.0 number of pages in the book is59
C:\Users\ADMIN\Desktop\oop1lab>

LAB 4

```
import java.util.Scanner;
abstract class shape
{
int x,y;


abstract void printArea();
void set()
{Scanner ss=new Scanner(System.in);
System.out.println("enter the height and breadth:");
x=ss.nextInt();
y=ss.nextInt();
}
}
class rectangle extends shape
{void printArea()
{System.out.println("the area of rectangle is:"+(x*y));}}
class triangle extends shape
{void printArea(){
System.out.println("the area of triangle is:"+(x*y*0.5));}}
```

```
class circle extends shape

{void printArea()

{Scanner ss=new Scanner(System.in);

System.out.println("enter the radius:");

x=ss.nextInt();

System.out.println("the area of circle is:"+(3.14*x*x));

}}

class area

{

public static void main(String xx[])

{

rectangle rec=new rectangle();

rec.set();

rec.printArea();

triangle tri=new triangle();

tri.printArea();

tri.set();

circle cir=new circle();

cir.set();

cir.printArea();}

   }
```

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.Scanner;
abstract class shape
{
```

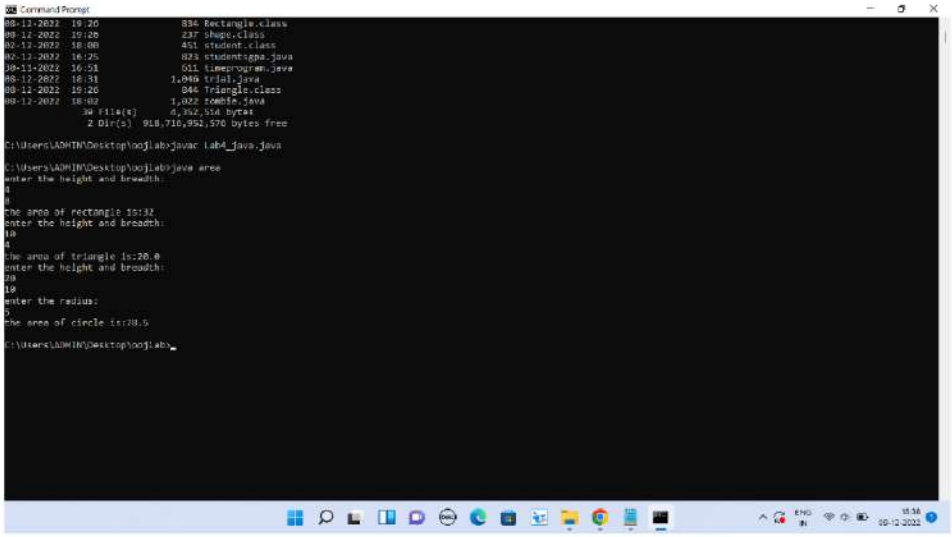
```
abstract class shape
{   int a, b;
    abstract void printArea();
    void set ()
    { Scanner ss = new Scanner(System.in);
      System.out.println("enter the height and
      breath:");
      a = ss.nextInt();
      b = ss.nextInt();
    }
}
Class Rectangle extends shape
{ void printArea(){
    System.out.println("the area of rectangle
  " + (a * b)}
Class Triangle extends shape
 { void printArea(){
   system.out.println("The area of Triangle is:"
+ (a * b * 0.5) }
Class circle extends shape
{ void printArea()
{ Scanner ss = new Scanner(System.in);
   System.out.println("Enter the radius:");
     a = ss.nextInt();
System.Out.println("the area of circle is:" +
    (3.14 * a * a));
} }
class main-Abstract
{ public static void main (String xx[])
{   Rectangle Rec = new Rectangle();
   rec.set();
   Rec.printArea();
```

S1 Pro

Triangle tri = new Triangle();
tri.set();
tri.printArea();
Circle ci = new circle();
ci.printArea();
}
}

output:

enter the height and breath:
10
5
the area of rectangle is: 50
enter the height and breath:
5
8
area of triangle is: 20.0
enter the radius:
5
the area of circle is: 78.5


Command Prompt
08-12-2022 19:26 834 Rectangle.class
08-12-2022 19:26 237 shape.class
02-12-2022 18:08 451 student.class
02-12-2022 16:25 823 studentgpa.java
30-11-2022 16:51 611 timeprogram.java
08-12-2022 18:31 1,046 trial.java
08-12-2022 19:26 844 Triangle.class
08-12-2022 18:02 1,023 tomato.java
34 File(s) 4,362,514 bytes
2 Dir(s) 918,716,952,576 bytes free
C:\Users\ADMIN\Desktop\oojLab>javac Lab4_java.java
C:\Users\ADMIN\Desktop\oojLab>java aree
enter the height and breadth:
4
8
the area of rectangle is:32
enter the height and breadth:
10
4
the area of triangle is:20.0
enter the height and breadth:
20
10
enter the radius:
5
the area of circle is:78.5
C:\Users\ADMIN\Desktop\oojLab>

LAB 5

import java.util.Scanner;

```
import java.lang.Math;

class account

{

String name=new String();

int accno;

double bal;

Scanner s=new Scanner(System.in);

void set()

{

System.out.println("Enter customer name");

name=s.nextLine();

System.out.println("Enter "+name+"'s account number");

accno=s.nextInt();

System.out.println("Enter balance amount ");

bal=s.nextDouble();

}

void display()

{

System.out.println("Customer Name:"+name);

System.out.println("Your account number:"+accno);

System.out.println("Your Account Balance:"+bal);
```

```
}
account(){}
}
class savacct extends account
{
Scanner s=new Scanner(System.in);
savacct()
{
System.out.println("Cheque Facility not available ");
}
void deposit()
{
int ch;
double amt;
System.out.println("Press 1 to deposit ");
ch=s.nextInt();
if(ch==1)
{
System.out.println("Enter amount to be deposited ");
amt=s.nextDouble();
bal=bal+amt;
}
else
```

```
System.out.println("Invalid Input");

}

void in()

{

System.out.println("Enter rate of interest ");

double r=s.nextDouble();

System.out.println("Enter number of times interest applied per time period");

int n=s.nextInt();

System.out.println("Enter number of time periods");

int t=s.nextInt();

double x=bal*(1+(r/n));

double ci=Math.pow(x,n*t);

System.out.println("Interest amount="+ci+" \nBalance amount without interest
is"+bal);

bal=bal+ci;

System.out.println("Available balance after updating is"+bal);

}

void wd()

{

System.out.println("Press 1 to withdraw ammount");

int ch=s.nextInt();

if(ch==1)

{
```

```
  System.out.println("Enter the amount to be withdrawn ");
  double wdraw=s.nextDouble();
  bal=bal-wdraw;
  System.out.println("Available Balance:"+bal);}
  else System.out.println("Invalid input");
  }
  }
  class curacct extends account
  {
  Scanner s=new Scanner(System.in);
  curacct()
{System.out.println("Cheque Facility available ");}
  void deposit()
  {
  int ch;
  double amt;
  System.out.println("Press 1 to deposit ");
  ch=s.nextInt();
  if(ch==1)
  {
  System.out.println("Enter amount to be deposited ");
  amt=s.nextDouble();
  bal=bal+amt;
```

```
}
else
System.out.println("Invalid Input");
}
void wd()
{
System.out.println("Press 1 to withdraw ammount");
int ch=s.nextInt();
if(ch==1)
{
System.out.println("Enter the amount to be withdrawn ");
double wdraw=s.nextDouble();
bal=bal-wdraw;
System.out.println("Available Balance:"+bal);}
else System.out.println("Invalid input");
if(bal<1000)
{
System.out.println("You are running out of minimum balance \nAmount of rs 50 has
been credited as service charge for having low balance");
bal=bal-50;
System.out.println("Your Available Balance:"+bal);
}
}
```

```
}



public class Lab5

{

public static void main(String xx[])

{

Scanner s=new Scanner(System.in);

int ch;

System.out.println("\n\nPress\n1. if your account is savings account \n2. if
your account is current account");

ch=s.nextInt();

switch(ch)

{

case 1:

savacct s1=new savacct();

s1.set();

s1.display();

s1.deposit();

s1.in();

s1.wd();

break;

case 2:
```

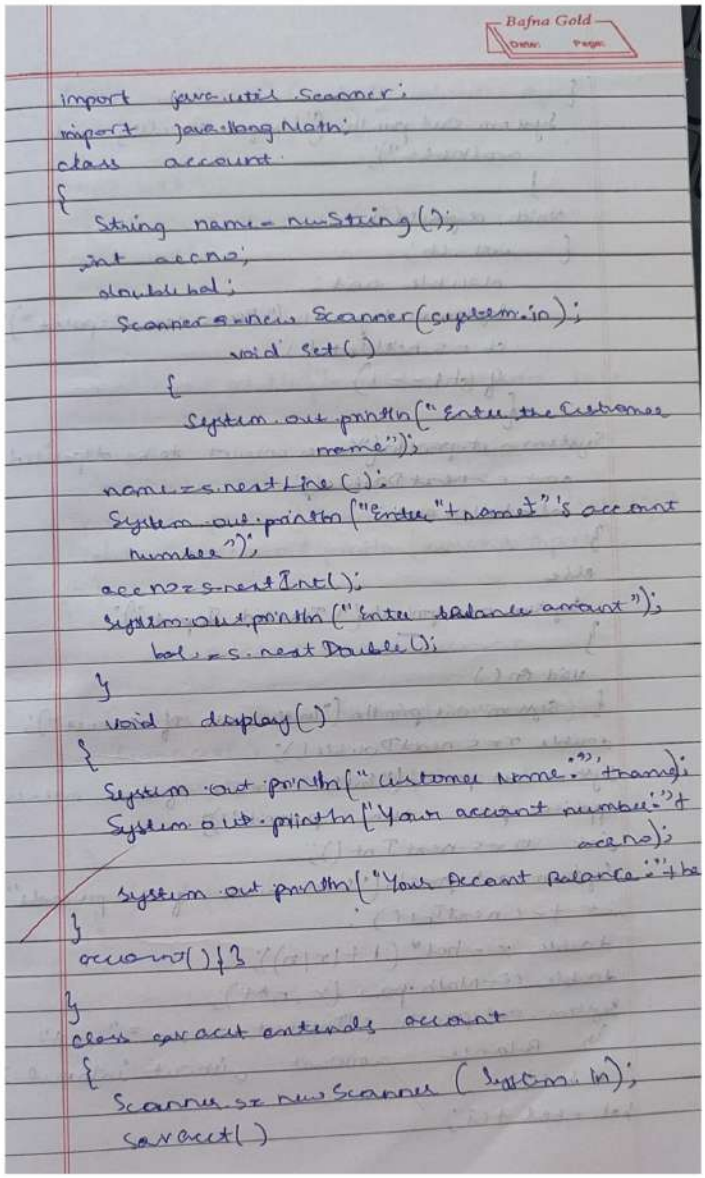
```
curacct c1=new curacct();

c1.set();

c1.display();

c1.deposit();

c1.wd();

break;

default : System.exit(0);

}

}

}
```

5. Develop a java program to create Bank that maintains two kinds of account for its customers, one savings and 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 necessary methods to achieve following tasks:

a) Accept deposit from customer and update the balance.
b) Display the balance.
c) Compute the deposit interest.
d) Permit withdrawal and update the balance.

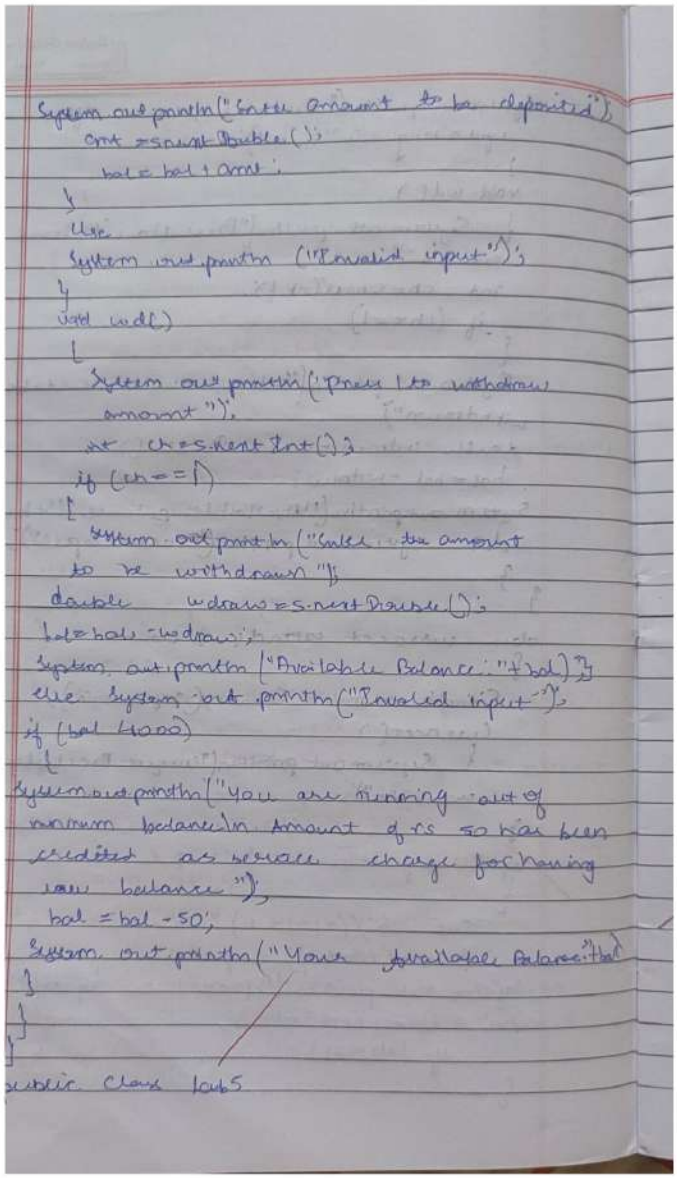
Check for minimum balance, impose penalty if necessary and update the balance.



```
import java.util.Scanner;
import java.lang.Math;
class account
{
  String name = new String();
  int accno;
  double bal;
  Scanner s = new Scanner(System.in);
        void set()
        {
          System.out.println("Enter the Customer name");
  name = s.nextLine();
  System.out.println("Enter "+name+"'s account number");
  accno = s.nextInt();
  System.out.println("Enter Balance amount");
     bal = s.nextDouble();
  }
  void display()
  {
  System.out.println("Customer Name:"+name);
  System.out.println("Your account number:"+accno);
  System.out.println("Your Account Balance:"+bal
  }
  account(){}
}
class saraccount extends account
{
  Scanner s = new Scanner(System.in);
  saraccount()
```

```
{
  System.out.println("Cheque facility not
    available");
  }
  void deposit()
  {  int ch;
     double amt;
     System.out.println("Press 1 to deposit");
     ch = s.nextInt();
     if (ch == 1)
     {
System.out.println("Enter amount to be deposited");
  amt = s.nextDouble();
  bal = bal + amt;
}
 else
  System.out.println("Invalid Input");
}
  void fn()
{  System.out.println("Enter rate of interest");
double r = s.nextDouble();
System.out.println("Enter number of time interest
applied per time period");
int n = s.nextInt();
System.out.println("Enter number of time periods");
int t = s.nextInt();
double x = bal*(1+(r/n));
double ci = Math.pow(x, n*t);
System.out.println("Interest amount = "+ci+"
 \n Balance amount without interest is"
  + bal);
bal = bal + ci;
```

```
System.out.println(" Available balance after
updating is " + bal);
}
void wdl()
{ System.out.println("Press 1 to withdraw
amount");
int ch = s.nextInt();
if (ch == 1)
{
System.out.println("enter the amount to be
withdrawn");
double wdraw = s.nextDouble();
bal = bal - wdraw;
System.out.println("Available Balance :" + bal);}
else System.out.println("Unable to withdraw");
}
}
class curracct extends account
{
Scanner s = new Scanner(System.in);
Curacct()
{ System.out.println("Cheque Facility
available.");
}
void deposit()
{
int ch;
double amt;
System.out.println("press 1 to deposit");
ch = s.nextInt();
if (ch == 1)
{
```



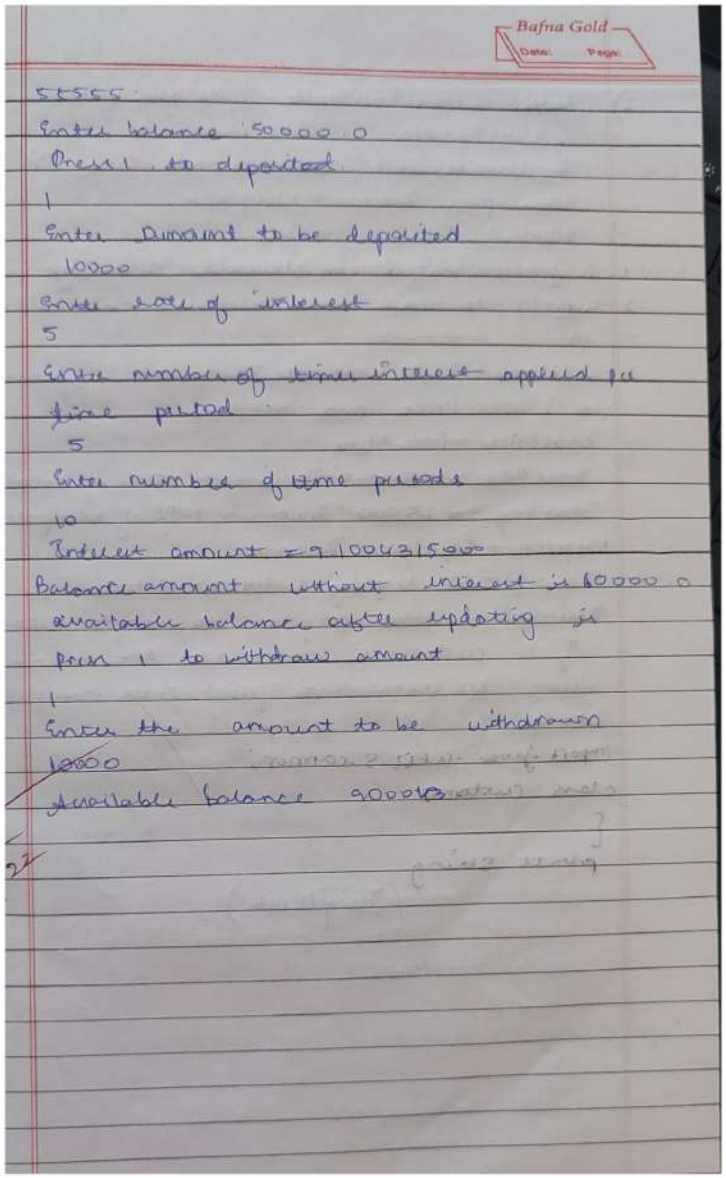
System.out.println("Enter Amount to be deposited");
amt = sc.nextDouble();
bal = bal + amt;
}
else
System.out.println("Invalid input");
}
void wd()
{
System.out.println("Press 1 to withdraw amount");
int ch = s.nextInt();
if (ch == 1)
{
System.out.println("Enter the amount to be withdrawn");
double wdraw = s.nextDouble();
bal = bal - wdraw;
System.out.println("Available Balance:"+bal);}
else System.out.println("Invalid input");
if (bal < 1000)
{
System.out.println("You are running out of minimum balance in Amount of rs 50 has been credited as service charge for having low balance");
bal = bal - 50;
System.out.println("Your Available Balance:"+bal
}
}
}
public class Lab5

```
}
public static void main (String xx[])
{
Scanner s=new Scanner (System.in);
int ch;
System.out.println("\n\n Press 1 if your account
is saving account \n2 if you account
is current account");
ch = s.nextInt();
switch(ch)
{
  case 1:
        SavAcct s1=new SavAcct();
        s1.set();
        s1.display();
        s1.dpoint();
        s1.int();
        s1.wd();
        break;
  case 2: CurAcct c1 = new CurAcct();
          c1.set();
          c1.display();
          c1.dpoint();
          c1.wd();
          break;
      default : System.exit(0);
  }}
}
```

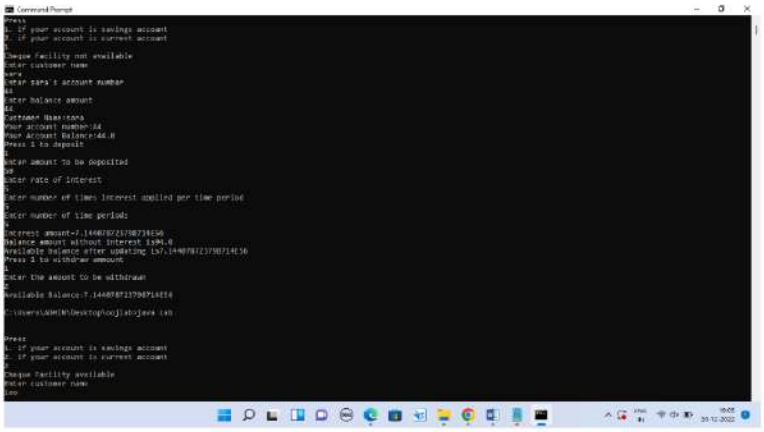
output:

*) Press
1. if your account is savings account.
2. if your account is current account.
2
cheque facility available
Enter customer name
sara
Enter sara's account number
22556
Enter balance amount
50000
Customer Name: Sara
Your account number: 22556
Your account Balance: 50000.0
Press 1 to deposit
1
Enter amount to be deposited
10000
Press 1 to withdraw amount
1
Enter the amount to be withdrawn
5000
Available Balance: 55000.0

*) Press
1 if your account is savings account
2 if your account is current account
1
cheque facility not available
Enter customer name
sam
Enter sam's account number



55555
Enter balance 50000.0
Press 1. to deposited
1
Enter Amount to be deposited
10000
Enter rate of interest
5
Enter number of time interest applied pa
time period
5
Enter number of time periods
10
Interest amount = 9.100431500e+08
Balance amount without interest is 60000.0
available balance after updating is
press 1 to withdraw amount
1
Enter the amount to be withdrawn
10000
Available balance 90000


Command Prompt
Press
1. if your account is savings account
2. if your account is current account
1
Cheque Facility not available
Enter customer name
sara
Enter sara's account number
44
Enter balance amount
46
Customer Name:sara
Your account number:44
Your Account Balance:46.0
Press 1 to deposit
1
Enter amount to be depositad
50
Enter rate of interest
5
Enter number of times Incovest applied per time period
5
Enter number of time period:
5
Incerest amount=7.144078721750714156
Balance amount without interest is96.0
Available balance after updating is7.144078721750714156
Press 1 to withdraw ammount
1
Enter the amount to be withdrawal
2
Available Balance:7.144078721750714156
C:\Users\ADMIN\Desktop\oojlab>java Lab
Press
1. if your account is savings account
2. if your account is current account
2
Cheque Facility available
Enter customer name
leo

LAB 6

```
import java.util.Scanner;
class Wrongage extends Exception
{String msg=new String();
Wrongage(String x)
{mag=x;
public String toString()
{return msg;}
}
class Lessage extends Exception{
String msg=new String();
lessage(String x)
{msg=x;}
public String toString()
{return msg;}
}
class father{
int fage;
father()throws wrongage
{Scanner s=new Scanner(System.in);
System.out.println("enter father's age:");
fage=s.nextint();
```

```
if(fage<0)
{throw new wrongage(“age cannot be negative”);
}
}
}
class son extends father
{int age;
son()throws Wrongage,Lessage
{system.out.println(‘enter the son’s age”);
sage=s.next int();
if (sage<0)
{throw new wrongage(“age cannot be negative”);}
else if(sage>=fage)
{throw new Lessage(“father’s age cannot be less than son’s
age”);
}
}
}
class main
{public static void main(String args[])
{try{son s1=new son();
father f1=new father();
catch(Wrongage wa)
```

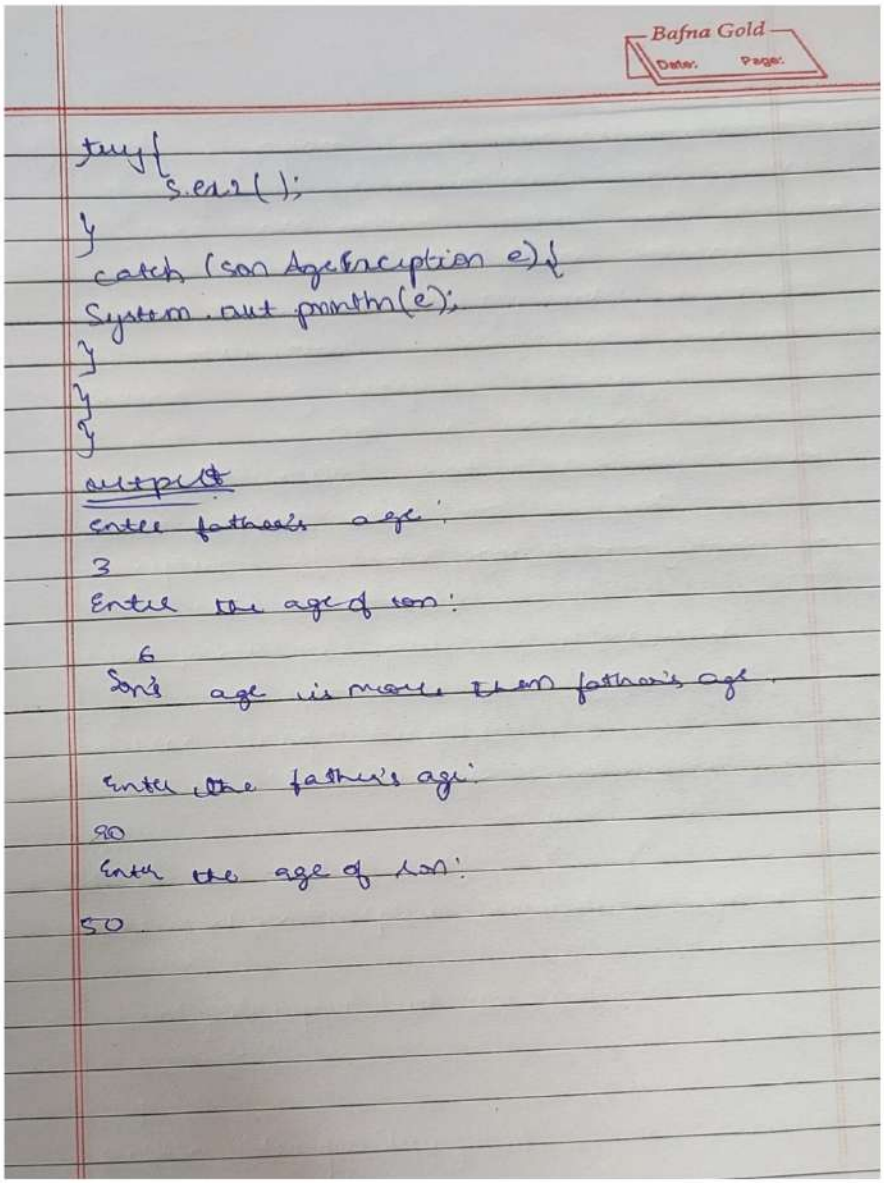
```
{
System.out.println(wa);
catch(lessage la)
{
System.out.println(la);
}
}
}
```

Bafna Gold
Date: Page:

a). 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 takes both father and son's age and throws an exception if son's age is >= father's age.

```
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 cal() throws fatherAgeException
{
  if (age<0)
  throw new FatherAgeException();
  }
}
class son extends Father{
int age;
Son(){
System.out.println("enter the age of son:");
age = in.nextInt();
}
void cal() 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.cal();
  }
  catch (fatherAgeException e){
  System.out.println(e);
  }
```

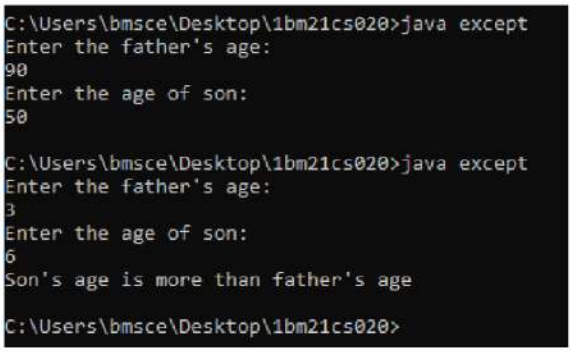



```
try{
    s.ex2();
}
catch (SonAgeException e){
System.out.println(e);
}
}
}
```

output

Enter father's age:
3
Enter the age of son:
6
Son's age is more than father's age.

Enter the father's age:
90
Enter the age of son:
50


C:\Users\bmsce\Desktop\1bm21cs020>java except
Enter the father's age:
90
Enter the age of son:
50
C:\Users\bmsce\Desktop\1bm21cs020>java except
Enter the father's age:
3
Enter the age of son:
6
Son's age is more than father's age
C:\Users\bmsce\Desktop\1bm21cs020>

LAB 7

```
import java.util.Scanner;
class Bms extends Thread
{
Synchronized public void run(){
try{
int i=0;
while(i<5){
sleep(10000);
System.out.println("BMS college of Engineering");
i++
}}
catch(Exception e){
}}}
class cse extends Thread
{
Synchronized public void run(){
try{
int i=0;
while(i<5){
sleep(2000);
System.out.println("Computer Science Engineering);
i++
```

```
}}
{catch(Exception e)
}}}
class main{
public static void main(String args[]){
Bms t1=new Bms();
Cse t2=new Cse();
t1.start();
t2.start();
}
}
```

6/1/23 Lab program

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.

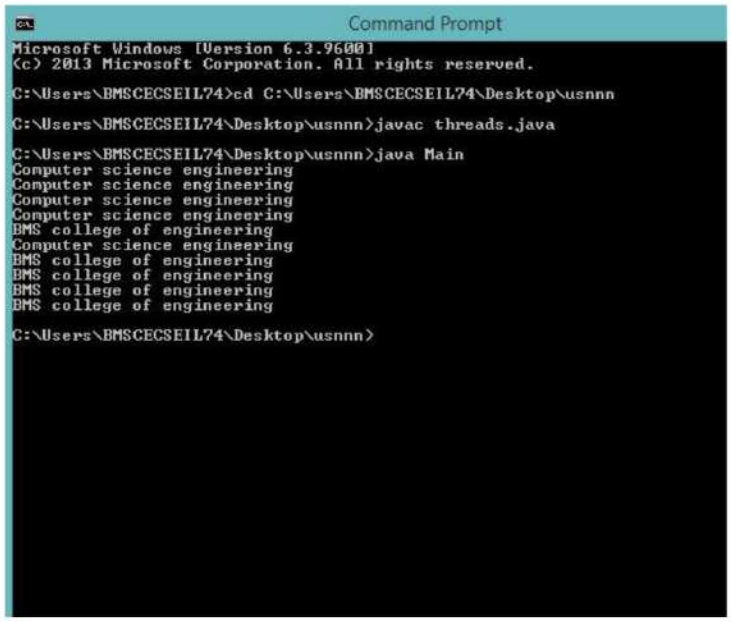
```
import java.util.Scanner;
class Bms extends Thread{
synchronized public void run(){
try{
int i=0;
while(i<5){
sleep(10000);
System.out.println("BMS college of engineering");
i++;
}
}catch(Exception e){
}
}
}
class Cse extends Thread{
synchronized public void run(){
try{
int i=0;
while(i<5){
sleep(2000);
System.out.println("Computer science engineering");
i++;
}
}catch(Exception e){
}
}}
```

```
class Main{
public static void main(String args[]){
BMS t1 = new BMS();
Cse t2 = new cse();
t1.start();
t2.start();
}
}
```

output

computer science engineering
computer science engineering
computer science engineering
computer science engineering
BMS college of engineering
Computer science engineering
BMS college of engineering
BMS college of engineering
BMS college of engineering
BMS college of engineering

6.2.23


Command Prompt
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\BMSCECSEIL74>cd C:\Users\BMSCECSEIL74\Desktop\usnnn
C:\Users\BMSCECSEIL74\Desktop\usnnn>javac threads.java
C:\Users\BMSCECSEIL74\Desktop\usnnn>java Main
Computer science engineering
Computer science engineering
Computer science engineering
Computer science engineering
BMS college of engineering
Computer science engineering
BMS college of engineering
BMS college of engineering
BMS college of engineering
BMS college of engineering
C:\Users\BMSCECSEIL74\Desktop\usnnn>

LAB 8

```
package CIE;

import java.util.*;

public class student{

    Scanner sc=new Scanner(System.in);

    public String usn,name;

    public int sem;


    public void accept(){

        System.out.println("Enter USN, Name and Current semester: ");

        usn=sc.nextLine();

        name=sc.nextLine();

        sem=sc.nextInt();

    }

    public void display(){

        System.out.println("\nStudent Details");

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

        System.out.println("USN: "+usn);

        System.out.println("Semester: "+sem);

    }

}
```

```
package CIE;

import java.util.*;

public class internals extends CIE.student {

    Scanner sc=new Scanner(System.in);

    public int ciem[]=new int[5];
```

```
    public void accept(){
        int i;
        for(i=0;i<5;i++)
        { System.out.println("Enter CIE marks of subject "+(i+1));
          ciem[i]=sc.nextInt();
        }
    }
}

package SEE;
import CIE.*;
import java.util.*;
public class externals extends CIE.student{
    Scanner sc=new Scanner(System.in);
    public int seem[]=new int[5];

    public void accept(){
        for(int i=0;i<5;i++)
        {
            System.out.println("Enter SEE marks of subject "+(i+1));
            seem[i]=sc.nextInt();
        }
    }
}
```

```
import CIE.*;
import SEE.*;
import java.util.*;
class total{
    public static void main(String args[]) {
        int i,j,n;
        Scanner sc=new Scanner(System.in);
        int total[]=new int[5];
        System.out.println("Enter number of students: ");
        n=sc.nextInt();
        CIE.student s[]=new CIE.student[n];
        CIE.internals ci[]=new CIE.internals[n];
        SEE.externals se[]=new SEE.externals[n];
        for(i=0;i<n;i++)
        {
            System.out.println("\nEnter student "+(i+1)+" details");
            s[i]=new CIE.student();
            s[i].accept();
            ci[i]=new CIE.internals();
            ci[i].accept();
            se[i]=new SEE.externals();
            se[i].accept();
        }
        for(i=0;i<n;i++)
        {
            System.out.println("\nDetails of student "+(i+1));
            s[i].display();
```

```
            for(j=0;j<5;j++)
            {
                total[j]=ci[i].ciem[j]+se[i].seem[j];
                System.out.println("Total marks in subject "+(j+1)+":
"+total[j]);
            }
            System.out.println();
        }
    }
}
```

```
Enter number of students:
2

Enter student 1 details
Enter USN, Name and Current semester:
1bm21cs020
amulya
3
Enter CIE marks of subject 1
25
Enter CIE marks of subject 2
35
Enter CIE marks of subject 3
36
Enter CIE marks of subject 4
26
Enter CIE marks of subject 5
37
Enter SEE marks of subject 1
28
Enter SEE marks of subject 2
27
Enter SEE marks of subject 3
35
Enter SEE marks of subject 4
35
Enter SEE marks of subject 5
35

Enter student 2 details
Enter USN, Name and Current semester:
1bm21cs021
anagha
3
Enter CIE marks of subject 1
35
```

```
Details of student 2

Student Details
Name: anagha
USN: 1bm21cs021
Semester: 3
Total marks in subject 1: 71
Total marks in subject 2: 70
Total marks in subject 3: 60
Total marks in subject 4: 64
Total marks in subject 5: 63


C:\Users\bmsce\Desktop\1bm21cs020>
```

```
Enter number of students:
2

Enter student 1 details
Enter USN, Name and Current semester:
1bm21cs020
amulya
3
Enter CIE marks of subject 1
25
Enter CIE marks of subject 2
35
Enter CIE marks of subject 3
36
Enter CIE marks of subject 4
26
Enter CIE marks of subject 5
37
Enter SEE marks of subject 1
28
Enter SEE marks of subject 2
27
Enter SEE marks of subject 3
35
Enter SEE marks of subject 4
35
Enter SEE marks of subject 5
35

Enter student 2 details
Enter USN, Name and Current semester:
1bm21cs021
anagha
3
Enter CIE marks of subject 1
35
```

Bafna Gold
Date: Page:

13/1/23 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 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

```
package CIE;
import java.util.*;
public class Student {
Scanner ss = new Scanner (System.in);
public String usn, name;
public int sem;
public void accept () {
System.out.println ("Enter USN, Name and Current Semester :");
usn = ss.nextLine();
name = ss.nextLine();
sem = ss.nextInt ();
}
public void display() {
System.out.println ("\n Student Details ");
System.out.println ("Name :" + name);
System.out.println ("USN :" + usn);
System.out.println ("Semester :" + sem);
}}
```

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

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

```
public static void main (String args[])
{ int i,j,n;
  Scanner sc=new Scanner(System.in);
  int total[]=new int[5];
  System.out.println("Enter the number of students :");
  n=sc.nextInt();
  CIE_Student s[]=new CIE_Student[n];
  CIE_internals ci[]=new CIE_internals[n];
  SEE_internals se[]=new SEE_internals[n];
  for(i=0;i<n;i++)
  { System.out.println("\n Enter student "+(i+1)+"
      details");
  s[i]=new CIE_student();
  s[i]=accept();
  ci[i]=new CIE_internals();
  ci[i]=accept();
  se[i]=new SEE_internals();
  se[i].accept();
  }
  for(i=0;i<n;i++)
  {
  System.out.println("\n Details of student "+(i+1));
  s[i].display();
  for(j=0;j<5;j++)
  {
  total[j]=ci[i].cim[j]+se[i].seem[j];
  System.out.println("Total marks in subject "+(j+1)+
      " : "+total[j]); }
  System.out.println(); }
  } } }
```