

6) 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.

lab 6> Student.java

```
package java CIE;
import java.util.Scanner;
public class Student
{
    public String usn;
    public String name;
    public int sem;
    Scanner s = new Scanner(System.in);
    public void accept()
    {
        System.out.println("Enter usn:");
        usn = s.nextLine();
        System.out.println("Enter name:");
        name = s.nextLine();
        System.out.println("Enter the semestex:");
        Sem = s.nextInt();
    }
    public void display()
    {
    }
}
```

System.out.println("Usn : " + usn);  
System.out.println("Name : " + name);  
System.out.println("Semester : " + sem);

Internals.java -

package CIF;  
import java.util.Scanner;  
public class Internals extends Student

Scanners s=new Scanner(System.in);  
public int[] cie\_marks = new int[5];  
public int i;  
public void accept\_cie()  
{  
 System.out.println("Enter the cie marks  
for five subjects");  
 for (i=0; i<5; i++)  
 {  
 cie\_marks[i] = s.nextInt();  
 }  
}

External.java -

package SEE;  
import CIF.\*;  
import java.util.Scanner;  
public class External extends CIF.Student

public int[] see\_marks = new int[5];  
public int i;

Scanner S=new Scanner(System.in);

public void accept\_see()

{  
 System.out.println("Enter the see  
marks for five subjects : ");  
 for (i=0; i<5; i++)  
 {

see-marks[i] = s.nextInt();

Final.java -

```
import CIE.*;  
import SEE.*;  
import java.util.Scanner;  
public class Final
```

```
{ public static void main(String[] args)  
Scanner s = new Scanner(System.in);  
int i, j;  
System.out.println("Enter the number of  
students : ");  
n = s.nextInt();  
CIE.InternalS[] in = new CIE.Internal[n];  
SEE.External[] ex = new SEE.External[n];  
for (i=0; i<n; i++)  
{
```

```
    in[i] = new CIE.Internal();  
    ex[i] = new SEE.External();  
    in[i].accept();  
    in[i].accept(ciec);  
    ex[i].accept(seec);
```

```
> for (i=0; i<n; i++)  
{
```

```
    in[i].display();
```

```
    for (j=0; j<5; j++)
```

```
        System.out.print("Final marks in  
Subject " + (j+1) + " : " + (in[i].cie-  
marks[j] + (ex[i].see-marks[j]) / 2.0))
```

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

→ Procedure-

- 1) Create a folder named myPacks
- 2) Inside <sup>myPacks</sup> folder creates another two folders CIE and SEE which are the names of the two packages.
- 3) Inside myPacks folder gave the Student.java file, Internals.java file, External.java file and the driver class in a file named Final.java
- 4) First compile Student class using the command  
javac Student.java
- 5) Then move the generated Student.class file inside the folder CIE.
- 6) Then compile Internals class using the command  
javac Internals.java
- 7) Compile External file using the command  
javac External.java
- 8) Then move the Internals.class file inside the CIE folder and External.class file inside the SEE folder.
- 9) Now, compile the Final class using the command  
javac Final.java
- 10) Now, run the drivers class Final using the command—  
java Final to get the output.

```
Command Prompt  
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>javac Student.java  
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>javac Internals.java  
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>javac External.java
```

```
Command Prompt  
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>javac Final.java  
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>java Final  
Enter the number of students:  
2  
Enter usn:  
bm65  
Enter name:  
Jahnavi  
Enter the semester:  
3  
Enter the cie marks for five subjects  
50  
50  
50  
50  
50  
Enter the see marks for five subjects  
100  
100  
100  
100  
100  
Enter usn:  
bm03  
Enter name:  
Vaishnavi  
Enter the semester:  
3  
Enter the cie marks for five subjects  
49  
49  
49  
49  
49  
Enter the see marks for five subjects  
98  
98  
98  
98  
98  
Usn:bm65  
Name:Jahnavi  
Semester:3
```

```
Usn:bm65
Name:Jahnavi
Semester:3
Final marks in subject1 : 100.0
Final marks in subject2 : 100.0
Final marks in subject3 : 100.0
Final marks in subject4 : 100.0
Final marks in subject5 : 100.0
```

```
Usn:bm03
Name:Vaishnavi
Semester:3
Final marks in subject1 : 98.0
Final marks in subject2 : 98.0
Final marks in subject3 : 98.0
Final marks in subject4 : 98.0
Final marks in subject5 : 98.0
```

```
C:\Users\HP-PC\Desktop\JAVA_PROGRAMS\myPacks>_
```

7) Write a program to demonstrate generics with multiple object parameters.

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Date / /

```
Job-7
class Generica<O1,O2>
{
    O1 a;
    O2 b;
    Generica(O1 a,O2 b)
    {
        this.a=a;
        this.b=b;
    }
    O1 get-object1()
    {
        return a;
    }
    O2 get-object2()
    {
        return b;
    }
    void ShowTypes()
    {
        System.out.println("Type of O1 is :" + a
                           .getClass().getName());
        System.out.println("Type of O2 is :" + b
                           .getClass().getName());
    }
}
public class Lab7
{
    public static void main(String[] args)
    {
        Generica<Integer, String> object = new
        Generica<Integer, String>(40, "Jahnavi");
        object.ShowTypes();
        int m = object.get-object1();
        String n = object.get-object2();
        System.out.println("Value of first parameter: " + m);
        System.out.println("Value of second parameter: " + n);
        System.out.println("Value of ");
    }
}
```

```
"C:\Program Files\Java\jdk1.8.0_261\bin\java.exe" ...
Type of O1 is:java.lang.Integer
Type of O2 is:java.lang.String
Value of first parameter:40
Value of second parameter:Jahnavi

Process finished with exit code 0
```

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 Wrong Age( ) when the input age=father’s age

```

Lab-8> class WrongAge extends Exception
      {
        public String toString()
        {
          return "Son's age cannot be equal to
          father's age.\n";
        }
      }

class Father<
      int fatherAge;
      Father(int fatherAge)
      {
        this.fatherAge = fatherAge;
      }
    }

class Son extends Father
{
  int sonAge;
  Son(int fatherAge, int sonAge)
  {
    super(fatherAge);
    this.sonAge = sonAge;
  }
}

void checkAge() throws WrongAge<
  if (fatherAge == sonAge)
  {
    throw new WrongAge();
  }
}

public class Lab8<
  public static void main(String[] args)
  {
    Son s1 = new Son(40, 10);
    Son s2 = new Son(30, 30);
    try<
      s1.checkAge();
      System.out.println("Acceptable ages.");
    }
    catch (WrongAge w)<
      System.out.println("Caught exception:");
      w;
    }
  }

```

```
try {
```

```
    s2.checkAge();
```

```
    System.out.println("Acceptable ages");
```

```
} catch (WrongAge w) {
```

```
    System.out.println("Caught exception: " +
```

```
w);
```

```
}
```

```
16  
20  
24  
28  
32
```

```
Lab8(1) ×  
"C:\Program Files\Java\jdk1.8.0_261\bin\java.exe" ...  
Acceptable ages  
Caught exception:Son's age cannot be equal to father's age.
```

```
Process finished with exit code 0
```

- 9) 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.

Labsoma) class Thread implements Runnable

```
    < Thread t;
      String name;
      int time;
      Thread (String name, int time)
        < this.name = name;
          this.time = time;
          t = new Thread (this, name);
          t.start();
        >
      public void run()
        < try
          < for (int n=5; n>0; n--)
            <   System.out.println (name);
              Thread.sleep (time);
            >
          >
        catch (InterruptedException ie)
          <   System.out.println ("Thread " + name
            " got interrupted");
          >
        System.out.println ("Thread " + name
          " quitting");
        >
```

```
public class Week11labProgram
{
    public static void main(String[] args)
    {
        Thread t1 = new Thread1("BMS College
                                of Engineering", 10000);
        Thread t2 = new Thread2("CSE", 2000);
    }
}
```

```
Week1LabProgram
"C:\Program Files\Java\jdk1.8.0_261\bin\java.exe" ...
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
Thread CSE quitting
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
Thread BMS College of Engineering quitting

Process finished with exit code 0
```

The screenshot shows a terminal window within a Java IDE. The title bar says "Week1LabProgram". The command line shows the path to the Java executable. The output consists of several lines of text, each starting with "BMS College of Engineering", followed by "CSE". There are five such entries. After these, there are two more lines starting with "BMS College of Engineering", followed by "Thread CSE quitting". Finally, there are three more lines starting with "BMS College of Engineering", followed by "Thread BMS College of Engineering quitting". At the bottom of the terminal window, it says "Process finished with exit code 0". Below the terminal window, there are tabs for "TODO", "Problems", "Terminal", and "Build".

10) 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.

```
Lab - 10
10 import java.awt.*;
10 import java.awt.event.*;
class DialogBox extends Dialog implements
ActionListener
<
    lab10 updated l;
15 DialogBox(Frame parent, String title)
{
    super(parent, title, false);
    l = (lab10-updated) parent;
    setLayout(new FlowLayout());
    setSize(380,100);
    add(new Label(l.msg));
    Button b = new Button("Okay");
    add(b);
    b.addActionListener(this);
}
25 >
    public void actionPerformed(ActionEvent ae)
{
    dispose();
}
30 >
public class lab10 updated extends Frame
implements ActionListener
{
    Textfield num1, num2, res;
    String num3;
}
```

Button div;

String msg = "";

public void actionPerformed()

< setLayout(new FlowLayout());

num1 = new JTextField(12);

num2 = new JTextField(10);

res = new JTextField(8);

label number1 = new Label("Num1:",

Label.RIGHT);

label number2 = new Label("Num2:",

Label.RIGHT);

TABLE

Label result = new Label("Result:",

Label.RIGHT);

div = new JButton("Divide");

add(number1);

add(num1);

add(number2);

add(num2);

add(div);

add(result);

add(res);

num1.addActionListener(this);

num2.addActionListener(this);

div.addActionListener(this);

res.addActionListener(this);

addWindowListener(new WindowAdapter()

< > public void windowClosing(WindowEvent e) {

System.exit(0);

)

)

```
public void actionPerformed(ActionEvent ae)
```

```
    String s = ae.getActionCommand();  
    if (s.equals("Divide"))
```

```
        res.setText("divide()");
```

```
>
```

```
String divide()
```

```
int n;
```

```
int n1, n2;
```

```
try
```

```
    n1 = Integer.parseInt(num1.getText());  
    n2 = Integer.parseInt(num2.getText());
```

```
    try
```

```
        n = n1 / n2;
```

```
        num3 = String.valueOf(n);
```

```
        return num3;
```

```
>
```

```
    catch (ArithmaticException e)
```

```
<
```

```
        msg = "Cannot divide num1 by zero";
```

```
        DialogBox d = new DialogBox
```

```
(this, "Exception message box");
```

```
d.setVisible(true);
```

```
        return " ";
```

```
>
```

```
Catch (NumberFormatException nf)
```

```
    msg = "The input numbers should be  
    integers";
```

5 DialogBox d = new DialogBox (this,  
"Exception message box");  
d.setVisible (true);  
return " ";

6 }  
7 public static void main (String [] args)  
8 {

9 Tablo-updated appwin = new Tablo-updated();  
10 appwin.setSize (new Dimension (380, 180));  
appwin.setTitle ("Division");  
appwin.setVisible (true);

