

CSE1007: Java Programming

SLOT: L53+L54

Faculty: JAISANKAR N

LAB Assessment- 3

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1. Create a package named Pack1, with a class 'Words'. Create another package Pack2 inside Pack1 with a class 'Length' in it.
 - a. In the 'Words' class, define a method countNumWords() that will count the number of words in the given text.
 - b. In the 'Length' class, define a method strLength() to find the length of the string without using length() function.
 - c. Define the main class and import the packages and call the methods under the classes Words, Length respectively.

Code:

Package1-Words class

```
package pack1;
public class Words
{
    public void countNumWords(String s)
    {
        int Count = 0;
        for(int i = 0; i < s.length()-1; i++)
        {
            if(s.charAt(i) == ' ' &&
Character.isLetter(s.charAt(i+1)) && (i > 0)) {
                Count++;
            }
        }
    }
}
```

```

        }
        Count++;
        System.out.println("no of words in the given
string: " + Count);
    }
}

```

Package2-Length class

```

package pack1.pack2;
public class Length
{
    public void strLength(String s)
    {
        int i = 0;
        for(char c: s.toCharArray()) {
            i++;
        }
        System.out.println("Length of given string is :
"+i);
    }
}

```

Program:

```

import pack1.Words;
import pack1.pack2.Length;
import java.util.*;
class prog
{
    public static void main(String args[])
    {
        String s;
        Scanner sc =new Scanner(System.in);
        System.out.println("enter a string :");
        s=sc.nextLine();
        Words obj = new Words();
    }
}

```

```

        obj.countNumWords(s);
        Length abc = new Length();
        abc.strLength(s);
    }
}

```

Sample Output:

```

C:\vit\kandra ksheeraj\AS-3>javac -d . Words.java

C:\vit\kandra ksheeraj\AS-3>javac -d . Length.java

C:\vit\kandra ksheeraj\AS-3>javac prog.java

C:\vit\kandra ksheeraj\AS-3>java prog
enter a string :
hi i am ksheeraj
no of words in the given string: 4
Length of given string is : 16

```

2. Write a Java program to demonstrate multiple inheritance with two interfaces and a class with main class to find sum of n numbers and factorial of a given number.

Code:

```

import java.util.*;
interface sum
{
    void sum(int n);
}
interface fact
{
    void comp(int n);
}
class Multinterface implements sum,fact
{
    public void sum(int n)
    {
        int s = 0;
        for (int i = 0; i<n; i++)
        {
            s = s+i;
        }
    }
}





```

```

        System.out.println("Sum of "+ n +" natural numbers:
"+s);
    }
    public void comp(int n)
    {
        int i,f=1;
        for(i=1;i<=n;i++)
        {
            f=f*i;
        }
        System.out.println("Factorial of "+n+": "+f);
    }
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        int n;
        System.out.println("Enter the number :");
        n=sc.nextInt();
        Multinterface obj = new Multinterface();
        obj.sum(n);
        obj.comp(n);
    }
}

```

Sample Output:

 Multinterface.class	29-04-2021 17:56	CLASS File
 fact.class	29-04-2021 17:56	CLASS File
 sum.class	29-04-2021 17:56	CLASS File
 Multinterface	29-04-2021 17:56	JAVA File

```

C:\vit\kandra ksheeraj\AS-3>javac Multinterface.java
C:\vit\kandra ksheeraj\AS-3>java Multinterface
Enter the number :
6
Sum of 6 natural numbers: 15
Factorial of 6: 720

```

3. Create an interface called Newspaper. In the interface, create a method called news ().
Implement interface Newspaper by class Magazine.

Implement interface Newspaper by class Brochure.

The method news () in each class display the following information.

In Magazine class : String title, integer ISBN, String editor

In Brochure class: String title, integer year, integer page_number.

Code:

```
import java.util.*;
interface Newspaper
{
    public void news();
}
class Magazine implements Newspaper
{
    String title;
    int ISBN;
    String editor;
    public void news()
    {
        System.out.println("Title of Magazine : "+ this.title
+"\\nISBN of Magazine : "+ this.ISBN +"\\nEditor of Magazine
: "+ this.editor);
    }
    public void get()
    {
        Scanner sc=new Scanner(System.in);
        System.out.print("\\nEnter title of Magazine : ");
        this.title=sc.nextLine();
        System.out.print("\\nEnter ISBN  of Magazine : ");
        this.ISBN=sc.nextInt();
        sc.nextLine();
        System.out.print("\\nEnter Editor of Magazine : ");
        this.editor=sc.nextLine();
    }
}
class Brochure implements Newspaper
{
    String title;
```

```

        int year;
        int page_number;
    public void news()
    {
        System.out.println("Title of Brochure : " + this.title
+"\\nYear of Brochure : "+ this.year +"\\nPage number of
Brochure : "+ this.page_number);
    }
    void getc()
    {
        Scanner sc=new Scanner(System.in);
        System.out.print("\\nEnter title of Brochure : ");
        this.title=sc.nextLine();
        System.out.print("\\nEnter year of Brochure : ");
        this.year=sc.nextInt();
        System.out.print("\\nEnter page number of Brochure :
");
        this.page_number=sc.nextInt();
    }
}
class Newspapers
{
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        Magazine obj = new Magazine();
        Brochure abc = new Brochure();
        obj.get();
        abc.getc();
        obj.news();
        abc.news();
    }
}

```

Sample Output:

```
C:\vit\kandra ksheeraj\AS-3>javac Newspapers.java
C:\vit\kandra ksheeraj\AS-3>java Newspapers

Enter title of Magazine : THE HINDU

Enter ISBN of Magazine : 1100456

Enter Editor of Magazine : Ravi

Enter title of Brochure : India Today

Enter year of Brochure : 2019

Enter page number of Brochure : 374
Title of Magazine : THE HINDU
ISBN of Magazine : 1100456
Editor of Magazine : Ravi
Title of Brochure : India Today
Year of Brochure : 2019
Page number of Brochure : 374
```

4. Create an abstract class called Student which includes the following for each student:

Name

Status (full time, part time)

Telephone

Then implement an abstract method which determines the amount paid by the student which varies between full time and part time students. (Tuition fees- full-time students paying a flat fee of \$2,000 and part-time students paying \$200 per credit hour.). Create two child classes and call them FullTimeStudent and PartTimeStudent. Write a Java program by creating objects of the two child classes and display the data fields for each object.

Code:

```
import java.util.*;
abstract class Student2
{
    String name;
    String status;
    long telephone;
    String fees;
    abstract void amount();
}
```

```

void get()
{
    Scanner sc=new Scanner(System.in);
    System.out.print("Name : ");
    this.name=sc.nextLine();
    System.out.print("Telephone: ");
    this.telephone=sc.nextLong();
}
}
class FullTimeStudent2 extends Student2
{
    void amount()
    {
        System.out.println("Name : "+ this.name +"\nStatus : "+
this.status +"\nTelephone: "+ this.telephone + "\nTution
fees: "+this.fees );
    }
}
class PartTimeStudent2 extends Student2
{
    void amount()
    {
        System.out.println("Name : "+ this.name +"\nStatus : "+
this.status +"\nTelephone: "+ this.telephone +"\nTution
fees: "+this.fees);
    }
}
class AbstractClass
{

    public static void main(String args[])
    {
        System.out.println("1.Full   time   student\n2.Part   time
student\nselect your status :");
        int ch;
        Scanner sc=new Scanner(System.in);
        ch=sc.nextInt();
    }
}

```



```
Student2 fc =new FullTimeStudent2();
Student2 tc =new PartTimeStudent2();
switch(ch)
{
    case 1:
        fc.status="Full time student";
        fc.fees="$2000.00";
        fc.get();
        break;
    case 2:
        tc.status="Part time student";
        tc.fees="$200.00";
        fc.get();
        break;
}
System.out.println("-----");
System.out.println("FullTimeStudent:");
fc.amount();
System.out.println("-----");
System.out.println("PartTimeStudent:");
tc.amount();
}
}
```

Sample Output:

```
C:\vit\kandra ksheeraj\AS-3>javac AbstractClass.java

C:\vit\kandra ksheeraj\AS-3>java AbstractClass
1.Full time student
2.Part time student
select your status :
2
Name : ksheeraj
Telephone: 8500050911
-----
FullTimeStudent:
Name : ksheeraj
Status : null
Telephone: 8500050911
Tution fees: null
-----
PartTimeStudent:
Name : null
Status : Part time student
Telephone: 0
Tution fees: $200.00
```

5. A travel agency offers executive travel package for a month by giving 15% off on rate for male above 65 years of age and 20% off for female above 60 years of age and 10% off to couples if female is above 18 years and male is above 21years . Create a User defined Exception class so that if the age and gender of the person is not matching with the norms of the agency it throws an exception else it offers the concession to the customer.

Code:

```
import java.util.*;
class TravelException extends Exception
{
    TravelException(String s)
    {
        super(s);
    }
}
class HandlingExceptions
{
    int ch;
    int age;
```

```

String gender;
void n() throws TravelException
{
    throw new TravelException ("The age and gender of the
person is not matching with the norms of the agency to
give concession");
};
public void m()
{
    Scanner sc=new Scanner(System.in);
    System.out.print("\n1.Solo travel\n2.Couples\n");
    ch=sc.nextInt();
    switch(ch)
    {
        case 1:
            System.out.print("\nEnter details of solo
passenger\n");
            sc.nextLine();
            System.out.print("Enter gender of passenger :
");
            this.gender=sc.nextLine();
            System.out.print("\nEnter age of passenger :");
            this.age=sc.nextInt();
            if(this.gender.equals("male") && this.age>=65)
            {
                System.out.println("Travel agency offers 15% off
on travel");
            }
            else if(this.gender.equals("female") &&
this.age>=60)
            {
                System.out.println("Travel agency offers 20% off
on travel");
            }
            else
            {
                try

```

```

        {
            n();
        }
        catch(Exception e)
        {
            System.out.println(e);
        }
    }
    break;
case 2:
    System.out.println("Enter details of Couples");
    HandlingExceptions obm=new
HandlingExceptions(),obf=new HandlingExceptions();
    System.out.println("Enter age of male passanger
:");
    obm.gender="male";
    obm.age=sc.nextInt();
    System.out.println("Enter age of female passanger
:");
    obf.gender="female";
    obf.age=sc.nextInt();
    if(obf.age>=19 && obm.age>21)
    {
        System.out.println("Travel agency  offers 10%
off on travel");
    }
    else
    {
        try
        {
            n();
        }
        catch(Exception e)
        {
            System.out.println(e);
        }
    }
}

```

```

        break;
    }
}
public static void main(String args[])
{
    HandlingExceptions ob =new HandlingExceptions();
    ob.m();
}
}

```

Sample Output:

```

C:\vit\kandra ksheeraj\AS-3>java HandlingExceptions
1.Solo travel
2.Couples
1
Enter details of solo passenger
Enter gender of passenger :   male
Enter age of passenger :75
Travel agency offers 15% off on travel

```

```

C:\vit\kandra ksheeraj\AS-3>java HandlingExceptions
1.Solo travel
2.Couples
2
Enter details of Couples
Enter age of male passanger :
45
Enter age of female passanger :
85
Travel agency  offers 10% off on travel

```

6. Create a class *MyCalculator* which consists of a single method long power(int, int). This method takes two integers, n and p, as parameters and finds n^p . If either n or p is negative, then the method must throw an exception which says "n and p should not be negative". Also, if both n and p are zero, then the method must throw an exception which says " n and p should not be be zero" For example, -4 and -5 would result in java.lang.Exception: n and p should not be negative. Write a Java program

for the function power in class *MyCalculator* and return the appropriate result after the power operation or an appropriate exception as detailed above.

Code:

```
import java.util.*;
class MyCalculator
{
    public long power(int n, int p)throws Exception
    {
        long pow;
        if(n<0 || p<0)
        {
            try
            {
                throw new Exception("n and p should not be
negative");
            }
            catch(Exception e)
            {
                throw e;
            }
        }
        else if(n==0 || p==0)
        {
            try
            {
                throw new Exception("n and p should not be be
zero");
            }
            catch(Exception e)
            {
                throw e;
            }
        }
        else
```

```

        {
            return((long)Math.pow(n,p));
        }
    }
    public static void main(String args[])
    {
        long temp;
        int p,n;
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter value of n");
        n=sc.nextInt();
        System.out.println("Enter value of p");
        p=sc.nextInt();
        MyCalculator obj =new MyCalculator();
        try
        {
            temp=obj.power(n,p);
            System.out.println(n+" to the power of "+ p + " =
"+ temp);
        }
        catch(Exception e)
        {
            System.out.println(e);
        }
    }
}

```

Sample Output:

```

C:\vit\kandra ksheeraj\AS-3>javac MyCalculator.java

C:\vit\kandra ksheeraj\AS-3>java MyCalculator
Enter value of n
4
Enter value of p
2
4 to the power of 2 = 16

```