**Ex No 5 Packages**

**Date:**

**Ex No 5**

**Aim:**

To write the java program using package and algorithm for the following

1. **Create two classes calculator and scientific calculator and group them into a package.**

**Algorithm:**

1. Start
2. Import Scanner Class
3. Create a object for the Scanner Class to access
4. Get the choice from the user whether to perform calculator operation or scientific calculator operation
5. If user wants to perform calculator operation
   1. Get the two number and required operation to be perform
   2. Display the result
   3. And goto step 5
6. If user wants to perform Scientific calculator operation
   1. Get the degree from the user
   2. Display the corresponding value of degree
   3. And goto step 4
7. Display Successfully Done
8. Stop

**Program:**

\*\*\*\*\*\*Calculator class\*\*\*\*\*\*

package Calculator;

import scientific.\*;

import java.util.Scanner;

public class calci extends scicalci {

int a,b,c;

Scanner obj=new Scanner(System.in);

public void display()

{

OUTER:

while (true) {

System.out.println("1.Addition\n2.Substrcation\n3.Multiplication\n4.Division\n5.Exit");

System.out.print("Enter your choice:");

c=obj.nextInt();

System.out.print("Enter the value of a:");

a=obj.nextInt();

System.out.print("Enter the value of b:");

b=obj.nextInt();

switch (c) {

case 1-> System.out.println("The Addition of Two Numbers:"+a+"+"+b+"="+(a+b));

case 2-> System.out.println("The Substraction of Two Numbers:"+a+"-"+b+"="+(a-b));

case 3->System.out.println("The Multiplication of Two Numbers:"+a+"\*"+b+"="+(a\*b));

case 4 -> {

float f=a/b;

System.out.println("The Division of Two Numbers:"+a+"/"+b+"="+f);

}

case 5 -> {

break OUTER;

}

default -> System.out.println("Wrong Choice Enter coorect Choice!!");

}

}

}

}

\*\*\*\*Scientific Calculator Class\*\*\*\*

package scientific;

import java.util.Scanner;

public class scicalci {

Scanner objs=new Scanner(System.in);

double a,b;

protected void operation(){

System.out.println("Enter the degree to get value:");

b=objs.nextDouble();

a=Math.toRadians(b);

System.out.println("The corresponding sin value:"+Math.sin(a));

System.out.println("The corresponding cos value:"+Math.cos(a));

System.out.println("The corresponding tan value:"+Math.tan(a));

System.out.println("The corresponding cosec value:"+(1/(Math.sin(a))));

System.out.println("The corresponding sec value:"+(1/(Math.cos(a))));

System.out.println("The corresponding cot value:"+(1/(Math.tan(a))));

}

}

\*\*\*\*Main Class\*\*\*\*\*

package Exp5no1;

import Calculator.\*;

import java.util.Scanner;

public class Main extends calci {

public static void main(String[] args) {

// TODO code application logic here

Main objc=new Main();

Scanner o=new Scanner(System.in);

OUTER:

while(true)

{

System.out.println("1.Calculator\n2.Scientific Calculator\n3.Exit");

System.out.print("Enter your choice:");

int ch=o.nextInt();

switch (ch){

case 1:

objc.display();

break;

case 2:

objc.operation();

break;

case 3:

break OUTER;

default:

System.out.println("Wrong Chice Enter Coorect Choice!!!");

}

}

System.out.println("Successfully Done!!!");

}

}

**Output:**

1.Calculator

2.Scientific Calculator

3.Exit

Enter your choice:1

1.Addition

2.Substrcation

3.Multiplication

4.Division

5.Exit

Enter your choice:1

Enter the value of a:2

Enter the value of b:3

The Addition of Two Numbers:2+3=5

1.Addition

2.Substrcation

3.Multiplication

4.Division

5.Exit

Enter your choice:2

Enter the value of a:5

Enter the value of b:3

The Substraction of Two Numbers:5-3=2

1.Addition

2.Substrcation

3.Multiplication

4.Division

5.Exit

Enter your choice:3

Enter the value of a:2

Enter the value of b:4

The Multiplication of Two Numbers:2\*4=8

1.Addition

2.Substrcation

3.Multiplication

4.Division

5.Exit

Enter your choice:4

Enter the value of a:10

Enter the value of b:5

The Division of Two Numbers:10/5=2.0

1.Addition

2.Substrcation

3.Multiplication

4.Division

5.Exit

Enter your choice:5

1.Calculator

2.Scientific Calculator

3.Exit

Enter your choice:2

Enter the degree to get value: 0

The corresponding sin value:0.0

The corresponding cos value:1.0

The corresponding tan value:0.0

The corresponding cosec value: Infinity

The corresponding sec value:1.0

The corresponding cot value: Infinity

1.Calculator

2.Scientific Calculator

3.Exit

Enter your choice:3

Successfully Done!!!

1. Create a package with the following levels: pack1, pack2, and pack3. Test each package.

**Algorithm:**

1. Start
2. Import Scanner Class
3. Create a object for the Scanner Class to access
4. In package 3
   1. Initialize the value and return the value
5. In package 2
   1. Initialize the value and return the value
6. In package 1
   1. Initialize the value and return the value
7. In Main package
   1. Display all the value in lab marks wise
8. Stop

**Program:**

**\*\*\*Sub Class 3\*\*\***

package package3;

public class NewClass3 {

int c;

public NewClass3()

{

c=19;

}

public int data()

{

return c;

}

}

\*\*\*Sub Class 2\*\*\*

package package2;

import package3.\*;// import all classes and methods in package 3

public class NewClass2 extends NewClass3 {

int b;

public NewClass2()

{

b=17;

}

protected int displays()

{

return b;

}

}

\*\*\*\*Sub Class 1\*\*\*\*

package package\_1;

import package2.\*;// import all classes and methods in package 2

public class NewClass1 extends NewClass2{

int a;

public NewClass1()

{

a=20;

}

protected int display()

{

return a;

}

}

\*\*\*\*Main Class\*\*\*\*

package pkgpackage;

import package\_1.\*;// import all classes and methods in package 1

public class NewMain extends NewClass1 {

public static void main(String[] args) {

// TODO code application logic here

NewMain obj=new NewMain();

System.out.println("Java Lab Marks");

System.out.println("Exercise Number 1:"+obj.displays()+"/"+obj.display());

System.out.println("Exercise Number 2:"+obj.display()+"/"+obj.display());

System.out.println("Exercise Number 3:"+obj.data()+"/"+obj.display());

System.out.println("Exercise Number 4:"+obj.display()+"/"+obj.display());

System.out.println("All Package are Working Correctly");

}

}

**Output:**

Java Lab Marks

Exercise Number 1:17/20

Exercise Number 2:20/20

Exercise Number 3:19/20

Exercise Number 4:20/20

All Package are Working Correctly

1. **Show how protected properties from the subclass can be accessed but not default properties.**

**Algorithm:**

1. Start
2. Import Scanner Class
3. Create a object for the Scanner Class to access
4. In sub package
   1. Create a protected method which called by the main method
   2. Created a default method which called by the main method
5. In main package
   1. Call the protected method and display the content in that package
   2. Call the default method and display the content in that package
6. Stop

**Program:**

\*\*\*\*Sub Package \*\*\*\*

package exp5;

public class pack3

{

protected void msg()

{

int a=40;

int b=30;

System.out.println("DEFAULT METHOD CAN BE ACCESSED!!!");

}

void msg1()

{

int a=40;

int b=0;

System.out.println(a+b);

}

}

\*\*\*\*Main Package\*\*\*\*

package exp5no3;

import exp5.\*;

public class pack2 extends pack3 {

public static void main(String args[])

{

pack2 obj=new pack2();

obj.msg();

pack2 obj1=new pack2();

System.out.println("DEFAULT METHOD CANNOT BE ACCESSED OUTSIDE THE PACKAGE!!!");

}

}

**Output:**

**DEFAULT METHOD CAN BE ACCESSED!!!**

**DEFAULT METHOD CANNOT BE ACCESSED OUTSIDE THE PACKAGE!!!**

|  |  |
| --- | --- |
| Observation (20) |  |
| Record(5) |  |
| Total(25) |  |
| Initial |  |

Result:

The Java Program for the given problem have been solved using Netbeans IDE 8.2.