Exp 6. Packages

**Packages**

1. **Creating and Using a Simple Package**

* Create a package named mathoperations containing a class Addition with a method add(int a, int b) that returns the sum of two numbers.
* Write another class TestAddition in a different package to import and use the Addition class.

package mathoperations;

public class Addition {

public int add(int a, int b){

return a+b;

}

}

package mathoperations;

public class Multiplication {

public int mult(int a, int b){

return a\*b;

}

}

package mathoperations;

public class Subtraction {

public int subtract(int a, int b){

return a-b;

}

}

package main;

import mathoperations.Addition;

import mathoperations.Subtraction;

import mathoperations.Multiplication;

public class TestAddition {

public static void main(String[] args) {

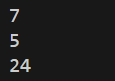
System.out.println(new Addition().add(3, 4));

System.out.println(new Subtraction().subtract(10,5));

System.out.println(new Multiplication().mult(4,6));

}

}



1. **Using Multiple Classes in a Package**

* Create a package named geometry that contains two classes:
  + Circle: A class with a method area(double radius) to calculate the area of a circle.
  + Rectangle: A class with a method area(double length, double breadth) to calculate the area of a rectangle.
* Write a TestGeometry class in another package to use both classes.

package geometry;

public class Circle {

public double area(double radius){

return 3.14\*radius\*radius;

}

}

package geometry;

public class Rectangle {

public double area(double length, double breadth){

return length\*breadth;

}

}

package main;

import geometry.\*;

public class TestGeometry {

public static void main(String[] args) {

System.out.println("Circle area: "+new Circle().area(6));

System.out.println("Rectangle area: "+new Rectangle().area(10,35));

}

}



1. **Package with Default and Parameterized Constructors**

* Create a package library containing a class Book with:
  + A default constructor that initializes a book's title as "Unknown".
  + A parameterized constructor to initialize a specific title.
* Add a method displayBook() to print the title.
* Test this package in another class by creating objects using both constructors.

package library;

public class Book {

String title;

public Book(){

title = "Unknown";

}

public Book(String title) {

this.title = title;

}

public void displayBook(){

System.out.println("Title : "+ title);

}

}

package main;

import library.Book;

public class TestBook {

public static void main(String[] args) {

Book bk1 = new Book();

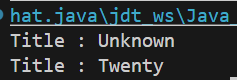
bk1.displayBook();

Book bk2 = new Book("Twenty");

bk2.displayBook();

}

}



1. **Student Management System**

* Create a package studentmanagement with two classes:
  + Student: Contains details like name, rollNumber, and grade.
  + StudentOperations: Contains methods to add, delete, and display students.
* Write a main program to test the functionality by importing the package.

package studentmanagement;

public class Student {

String name;

int rollNumber;

String grade;

public Student(String name, int rollNumber, String grade) {

this.name = name;

this.rollNumber = rollNumber;

this.grade = grade;

}

@Override

public String toString() {

return "{ name = " + name + ", rollNumber = " + rollNumber + ", grade = " + grade + " }";

}

}

package studentmanagement;

import java.util.ArrayList;

import java.util.List;

public class StudentOperations {

List<Student> ls = new ArrayList<>();

public void add(Student st){

ls.add(st);

}

public void delete(){

ls.remove(ls.size()-1);

}

public void display(){

System.out.println(ls);

}

}

package main;

import studentmanagement.Student;

import studentmanagement.StudentOperations;

public class TestStudents {

public static void main(String[] args) {

StudentOperations so = new StudentOperations();

so.add(new Student("Arjun", 4, "B"));

so.add(new Student("Robert", 41, "A"));

so.add(new Student("Alan", 10, "A"));

so.display();

so.delete();

so.display();

}

}

