| **Experiment No. 7** |
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| **Packages** |
| Date of Performance:13/09/24 |
| Date of Submission:20/09/24 |

**Aim :-**Implementation of the creation and use of packages in programming to organize and manage code modules efficiently.

**Objective :-** Create a user-defined package Calculate. This package must contain classes that calculate the area of square, triangle, rectangle, semicircle, and cylinder. Import the package and use these classes in another program that displays the areas of the above-mentioned shapes.

**Theory: -** A java package is a group of similar types of classes, interfaces and sub-packages. Packages are used in Java in order to prevent naming conflicts, to control access, to make searching/locating and usage of classes, interfaces, enumerations and annotations easier, etc.

There are two types of packages-

1. Built-in package: The already defined package like java.io.\*, java.lang.\* etc are known as built-in packages.
2. User defined package: The package we create for is called user-defined package.

Programmers can define their own packages to bundle group of classes/interfaces, etc. While creating a package, the user should choose a name for the package and include a package statement along with that name at the top of every source file that contains the classes, interfaces, enumerations, and annotation types that you want to include in the package. If a package statement is not used then the class, interfaces, enumerations, and annotation types will be placed in the current default package.

**Code:-**

**Shapes file code:**

package geometry;

public class Shapes {

public static double triangleArea(double base, double height) {

return 0.5 \* base \* height;

}

public static double squareArea(double side) {

return side \* side;

}

public static double circleArea(double radius) {

return Math.PI \* radius \* radius;

}

public static double rectangleArea(double length, double width) {

return length \* width;

}

public static double cylinderSurfaceArea(double radius, double height) {

return 2 \* Math.PI \* radius \* (radius + height);

}

}

**Main file code:-**

import geometry.Shapes;

public class Main {

public static void main(String[] args) {

System.out.println("Area of Triangle: " + Shapes.triangleArea(5, 10));

System.out.println("Area of Square: " + Shapes.squareArea(4));

System.out.println("Area of Circle: " + Shapes.circleArea(7));

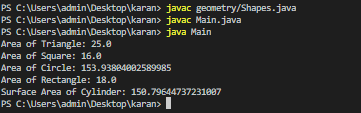
System.out.println("Area of Rectangle: " + Shapes.rectangleArea(6, 3));

System.out.println("Surface Area of Cylinder: " + Shapes.cylinderSurfaceArea(3, 5));

}

}

**Output:-**

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**Conclusion:-**

java.lang: Core classes like strings, math, and threading.

java.util: Data structures, date/time functions, and utility classes.

java.io: Input and output operations for data handling.

java.net: Networking capabilities for URLs and sockets.

java.awt: GUI components and graphics.