

Implementation of Packages in Java

Aim:

Write a Java program to implement built-in, user-defined packages and accessing all classes in a package.

PRE LAB EXERCISE

QUESTIONS

1. What is java.util package and what collection framework does it contain?
 - The java.util package provides utility classes for data structures and other helper functions.
 - It contains the **Java Collections Framework**, which includes interfaces like **List, Set, Queue, and Map** (e.g., ArrayList, HashSet, HashMap) to store and manage data efficiently.

2. What are the two types of packages in Java?
 - **Built-in Packages** – Provided by Java (e.g., java.lang, java.util).
 - **User-defined Packages** – Created by programmers using the package keyword.

IN LAB EXERCISE

Objective

To understand and implement the concepts of built-in, user-defined packages and accessing all classes in a package in Java.

Built-in Packages comprise a large number of classes that are part of the Java API. Some of the commonly used built-in packages are:

- **java.lang**: Contains language support classes(e.g, classes that define primitive data types, math operations). This package is automatically imported.
- **java.io**: Contains classes for supporting input/output operations.
- **java.util**: Contains utility classes that implement data structures such as Linked Lists and Dictionaries, as well as support for date and time operations.
- **java.applet**: Contains classes for creating Applets.

- `java.awt`: Contains classes for implementing the components for graphical user interfaces (like buttons, menus, etc).

Source Code

```
import java.util.Random; // built-in package

public class Sample{

    public static void main(String[] args) {
        // using Random class
        Random rand = new Random();
        // generates a number between 0–99
        int number = rand.nextInt(100);
        System.out.println("Random number: " + number);

    }
}
```

Output

Random number: 88

User-defined Packages are the packages that are defined by the user.

Source code

```
package com.myapp;

public class Helper {

    public static void show() {
        System.out.println("Hello from Helper!");
    }
}
```

==To use this in another class==

```
import com.myapp.Helper;

public class Test {

    public static void main(String[] args) {
        Helper.show();
    }
}
```

Output:

```
Hello from Helper!
```

//Importing all classes from a package.

Source code

```
import java.util.Vector;  
  
public class Coders {  
    public Coders() {  
        // java.util.Vector is imported, We are able to access it directly in our code.  
        Vector v = new Vector();  
        java.util.ArrayList l = new java.util.ArrayList();  
        l.add(3);  
        l.add(5);  
        l.add(7);  
        System.out.println(l);  
    }  
  
    public static void main(String[] args) {  
        new Coders();  
    }  
}
```

Output

```
[3, 5, 7]
```

POST LAB EXERCISE

1. What will happen if two classes in different packages have the same name and are imported in a Java file?

If two classes with the same name from different packages are imported, it causes a **compile-time ambiguity error**.

To resolve this, you must use the **fully qualified class name** (package name + class name).

2. What is the purpose of using packages in Java?

Packages are used to:

- Organize related classes and interfaces
- Avoid naming conflicts
- Improve code reusability and maintainability
- Provide access protection

3. Which built-in Java package would you use if you want to create a GUI window and display a message?

- A. java.util
- B. java.sql
- C. java.awt
- D. java.net

Answer: C. `java.awt`

It contains classes for creating graphical user interface components like windows, buttons, and labels.

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	5	
In Lab Exercise	10	
Post Lab Exercise	5	
Viva	10	
Total	30	
Faculty Signature		