**Experiment Number : 8** **Date: 20.02.2026**

## 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?**

   Java.util is a built-in Java package that provides utility classes and data structures.

   It contains the Collection Framework, which includes:

- **List** (ArrayList, LinkedList)
- **Set** (HashSet, TreeSet)
- **Queue** (PriorityQueue)
- **Map** (HashMap, TreeMap)

2. **What are the two types of packages in Java?**

   The two types of packages in Java are:

   - **Built-in (Predefined) packages** – Provided by Java (example: java.util, java.io).
   - **User-defined packages** – Created by the programmer.

**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: 16
```

**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 are imported, Java gives a **compile-time error (ambiguity error)**.
   To solve it, we must use the **fully qualified class name**.

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

   Packages are used to:

- Organize related classes together
- Avoid name conflicts
- Improve code reusability
- Provide access protection (security)
- Make large projects manageable

In short:
Packages help in **organization, security, and avoiding naming conflicts**.

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

   Correct answer:

   **C. java.awt**

   java.awt is used to create GUI 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** | | |