**Assignment: (Core Java)**

**11 : Packages and Access Modifiers**

**Que.1 Java Packages: Built-in and User-Defined Packages**

**Ans.1** A package in Java is used to group related classes. Think of it as a folder in a file directory. We use packages to avoid name conflicts, and to write a better maintainable code. Packages are divided into two categories:

* Built-in Packages
* User-defined Packages

**Built-in Packages:** Built-in packages are part of the Java Standard Edition (SE) API and are readily available for use in any Java program. They provide a wide range of functionalities, from fundamental language support to specialized utilities. Examples include:

* java.lang: Core classes (String, Math, Object, Wrapper classes, etc.)
* java.util: Collections (ArrayList, HashMap, Scanner, Date, etc.)
* java.io: Input/Output (BufferedReader, File, InputStream, etc.)

**User-Defined Packages:** User-defined packages are created by developers to organize their own classes and interfaces within a project. They are crucial for managing larger applications, promoting modularity, and avoiding naming conflicts when multiple developers work on a project or when integrating external libraries.

**Que.2 Access Modifiers: Private, Default, Protected, Public**

**Ans.2** Access Modifiers in Java define the visibility (scope) of classes, methods, variables, and constructors. There are four access levels:

**1.Private**

* Scope → Accessible only within the same class.
* Not accessible in other classes, not even in subclasses.

**2. Default (No Modifier)**

* If no modifier is specified, it’s default.
* Scope → Accessible only within the same package.
* Cannot be accessed outside the package.

**3. Protected**

Scope → Accessible:

* Within the same package.
* In different package subclasses (via inheritance).

**4. Public**

* Scope → Accessible everywhere (any class, any package).
* Most permissive modifier.

**Que.3 Importing Packages and Classpath**

**Ans.3 Importing Packages:** When you want to use a class from a package, you must import it into your program. There are three ways to do this:

1. **Import a Single Class**

import java.util.Scanner;

public class Test {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter name: ");

String name = sc.nextLine();

System.out.println("Hello " + name);

}

}

1. **Import All Classes from a Package**

import java.util.\*; // imports all classes from java.util

public class Test {

public static void main(String[] args) {

ArrayList<String> list = new ArrayList<>();

list.add("English");

list.add("Gujarati");

System.out.println(list);

}

}

1. **Fully Qualified Name**

public class Test {

public static void main(String[] args) {

java.util.Scanner sc = new java.util.Scanner(System.in);

System.out.println("Enter age: ");

int age = sc.nextInt();

System.out.println("Age: " + age);

}

}