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Unit-3 package ,inheritance and interface

Package

PACKAGE in Java is a collection of classes, sub-packages, and interfaces.

It helps organize your classes into a folder structure and make it easy to locate and use them. More importantly, it helps improve code reusability.

- **Types of Packages in Java**
1. Built-in Packages
2. User Defined Packages

Built-in Packages

Built-in packages or predefined packages are those that come along as a part of JDK (Java Development Kit) to simplify the task of Java programmer. They consist of a huge number of predefined classes and interfaces that are a part of Java API's

- Some of the commonly used built-in packages are

1. **java.awt** : Contains classes for creating user interfaces and for painting graphics and images. Classes like Button, Color, Event, Font, Graphics, Image etc are part of this package.

2. **java.io** : Provides classes for system input/output operations. Classes like BufferedReader, BufferedWriter, File, InputStream, OutputStream, PrintStream, Serializable etc are part of this package.

3. **java.lang** : Contains classes and interfaces that are fundamental to the design of Java programming language. Classes like String, StringBuffer, System, Math, Integer etc are part of this package.

4   **java.net** : Provides classes for implementing networking applications. Classes like Authenticator, HttpCookie, Socket, URL, URLConnection, URLEncoder, URLDecoder etc are part of this package.

5   **java.sql** : Provides the classes for accessing and processing data stored in a database. Classes like Connection, DriverManager, PreparedStatement, ResultSet, Statement etc are part of this package.

6   **java.util** : Contains the collections framework, some internationalization support classes, properties, random number generation classes. Classes like ArrayList, LinkedList, HashMap, Calendar, Date, TimeZone etc are part of this package.

7   java. applet- it is useful for creating and implementing applet programming

8   java. text-this package has two important classes ,dateFormat to format date and time and numberFormat which is useful to numeric values

The package **java.lang** is automatically imported to every program

e.g import java.util.Scanner;

Here:
   → **java** is a top level package
   → **util** is a sub package
   → and **Scanner** is a class which is present in the sub package **util**.

User defined package

- User-defined packages are those which are developed by users in order to group related classes, interfaces and sub packages.

- **Creating a Package in Java**

- The programmer can also create the package. To create a package, you have to use the **package** keyword.

- Syntax

- **package** *packageName*;

- example

- **package** *myPackage*;

Stucture of package file

```
package packagename;
public class classname
{
Body of class;
}
e.g
package mypackage;
public class simple
{
public Void display()
{
System.out.println("my package program");
}
}
```

- Compilation of package
- syntax
- javac -d directory javafilename
- javac -d . simple.java
- The -d is a switch that tells the compiler where to put the class file i.e. it represents destination. The .(dot) represents the current folder.
- **To Compile:** javac -d . simple.java
- **To Run:** java mypackage.simple

- How to access package from another package?
- There are two ways to access the package from outside the package.

1. import package.*;

   If you use package.* then all the classes and interfaces of this package will be accessible but not subpackages.

   e.g import mypackage.*;

2 . import package.classname;

If you import package.classname then only declared class of this package will be accessible.

   e.g   import mypackage.simple;

Program to implement package concept

```
package mypackage;
public class simple
{
public Void display()
{
System.out.println("I m in vck ");
}
}
```

- Save this file as   simple.java
- Compile as   javac -d . simple.java

- Use above package in another file as

```
import mypackage.simple;
class packdemo
{
public static void main (String args[])
{
simple  s =  new simple();
s.display();
}
}
```

Save this file as packdemo.java

Compile as javac packdemo.java

Run as java packdemo

```java
package dd;
 public class Demo
{
public int getSum(int num1, int num2)
{
int result;
 result=num1+num2;
return result;
}
}
```

```java
import  dd.Demo;
class Tester
{
 void disp()
{
System.out.println("Beep Beep");
}
public static void main(String[] args)
{
 Tester obj=new Tester();
 obj.disp();
demo ob=new demo();
 int receive=ob.getSum(10,20);
    System.out.println("The Result is
    "+receive);
}
}
```