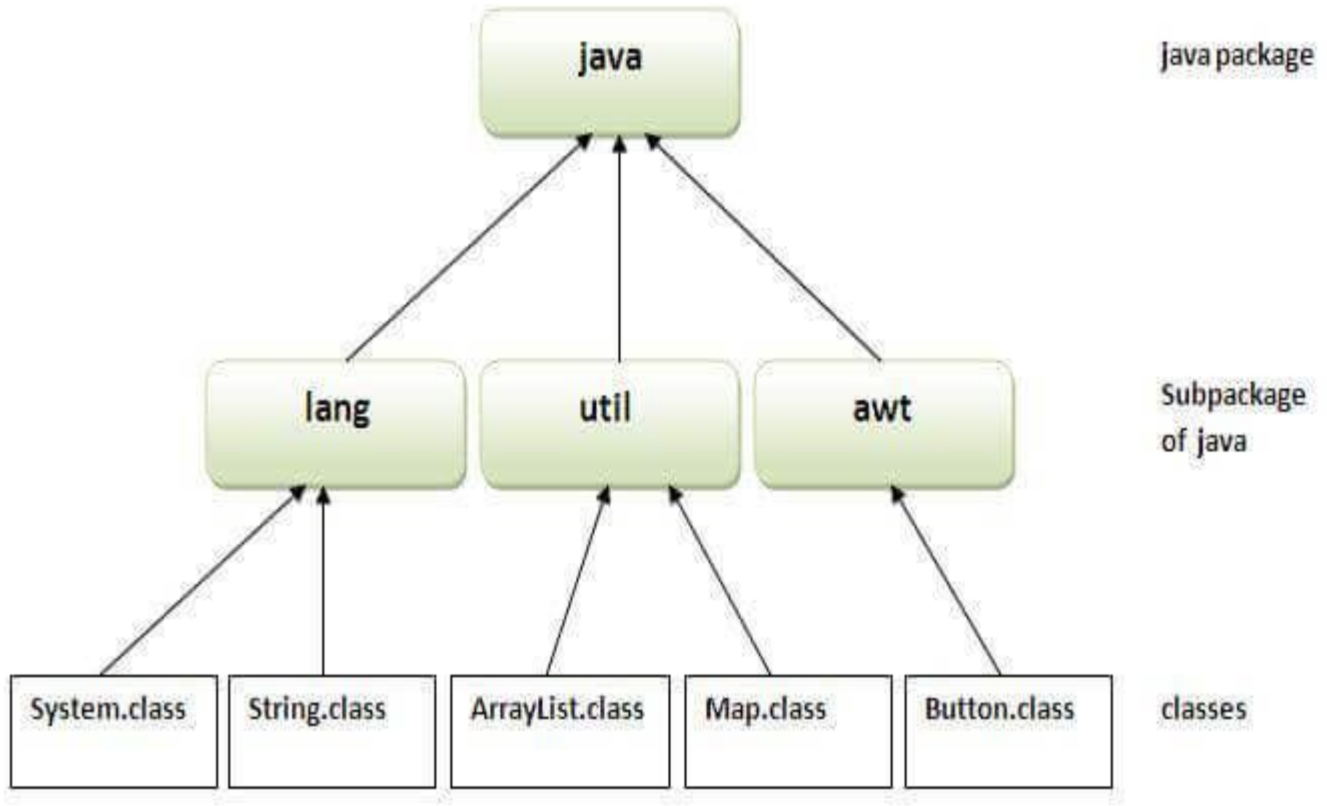
Unit - 2 Package

Java Package

- A java package is a group of similar types of classes, interfaces and sub-packages.
- Package in java can be categorized in two form, built-in package and user-defined package.
- There are many built-in packages such as java, lang, awt, javax, swing, net, io, util, sql etc.
- Here, we will have the detailed learning of creating and using user-defined packages.

Advantage of Java Package

- Java package is used to categorize the classes and interfaces so that they can be easily maintained.
- Java package provides access protection.
- Java package removes naming collision.



Simple example of java package

- The package keyword is used to create a package in java.

```
//save as Simple.java
package mypack;
public class Simple{
 public static void main(String args[]){
    System.out.println("Welcome to package");
   }
}
```

How to compile java package: javac -d directory javafilename

To Compile: javac -d . Simple.java

The -d switch specifies the destination where to put the generated class file. You can use any directory name like /home (in case of Linux), d:/abc (in case of windows) etc. If you want to keep the package within the same directory, you can use . (dot).

To Run: java mypack.Simple

Output:Welcome to package

How to access package from another package?

- There are three ways to access the package from outside the package.

  - import package.*;
  - import package.classname;
  - fully qualified name.

1) Using packagename.*

- If you use package.* then all the classes and interfaces of this package will be accessible but not subpackages.
- The import keyword is used to make the classes and interface of another package accessible to the current package.

Example of package that import the packagename.*

```
//save by A.java
package pack;
public class A{
  public void msg(){System.out.println("Hello");}
}

//save by B.java
package mypack;
import pack.*;

class B{
  public static void main(String args[]){
   A obj = new A();
   obj.msg();
  }
}
Output:Hello
```

Using packagename.classname

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

```
//save by A.java
package pack;
public class A{
  public void msg(){System.out.println("Hello");}
}
//save by B.java
package mypack;
import pack.A;
class B{
  public static void main(String args[]){
   A obj = new A();
   obj.msg();
  }
}
Output:Hello
```

Using fully qualified name

- If you use fully qualified name then only declared class of this package will be accessible. Now there is no need to import. But you need to use fully qualified name every time when you are accessing the class or interface.
- It is generally used when two packages have same class name e.g. java.util and java.sql packages contain Date class.
- Example of package by import fully qualified name

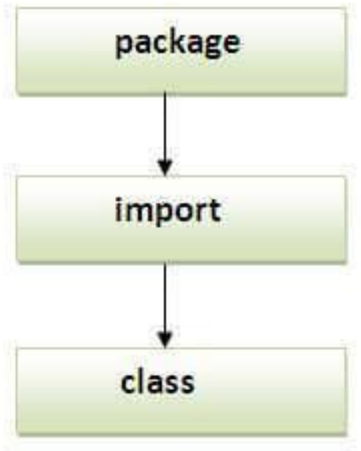
```
//save by A.java
package pack;
public class A{
  public void msg(){System.out.println("Hello");}
}
//save by B.java
package mypack;
class B{
  public static void main(String args[]){
   pack.A obj = new pack.A();//using fully qualified name
   obj.msg();
  }
}
Output:Hello
```

Using fully qualified name

- **Note: If you import a package, subpackages will not be imported.**

- If you import a package, all the classes and interface of that package will be imported excluding the classes and interfaces of the subpackages. Hence, you need to import the subpackage as well.

- **Note: Sequence of the program must be package then import then class.**



Subpackage in java

- Package inside the package is called the subpackage. It should be created to categorize the package further.
- Let's take an example, Sun Microsystem has definded a package named java that contains many classes like System, String, Reader, Writer, Socket etc.
- These classes represent a particular group e.g. Reader and Writer classes are for Input/Output operation, Socket and ServerSocket classes are for networking etc and so on.
- So, Sun has subcategorized the java package into subpackages such as lang, net, io etc. and put the Input/Output related classes in io package, Server and ServerSocket classes in net packages and so on.

Example of Subpackage

```
package com.javafolder.core;
class Simple{
  public static void main(String args[]){
   System.out.println("Hello subpackage");
  }
}
```

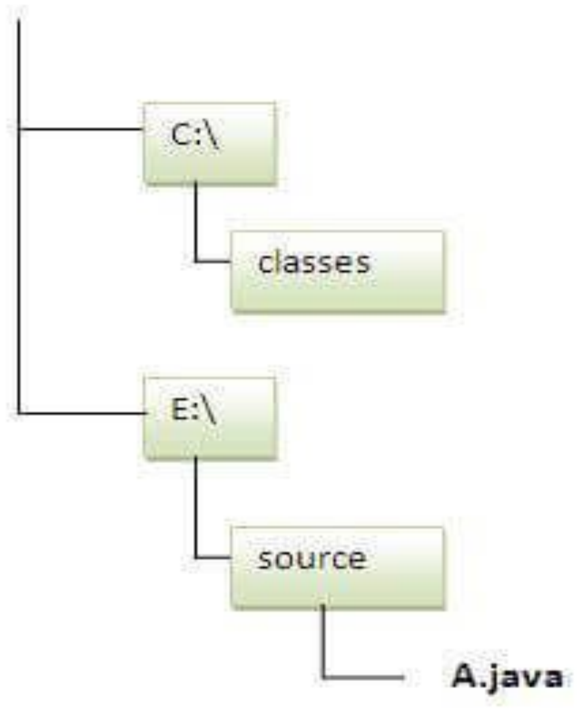
To Compile: `javac -d . Simple.java`

To Run: `java com.javafolder.core.Simple`

Output:Hello subpackage

How to send the class file to another directory or drive?

- There is a scenario, I want to put the class file of A.java source file in classes folder of c: drive.
- For example:



Example

```
//save as Simple.java
package mypack;
public class Simple{
 public static void main(String args[]){
    System.out.println("Welcome to package");
   }
}
```

To Compile:

```
e:\sources> javac -d c:\classes Simple.java
```

To Run:

To run this program from e:\source directory, you need to set classpath of the directory where the class file resides.

```
e:\sources> set classpath=c:\classes;.;
e:\sources> java mypack.Simple
```