

## Chapter 12 - Packages

### Interpreter Vs Compiler

Interpreter translates one statement at a time into machine code.

Compiler scans the entire program and translates whole of it into machine code.

#### Interpreter



- \* One statement at a time
- \* Interpreter is needed everytime
- \* Partial execution if error
- \* Easy for programmers

#### Compiler



- \* Entire program at a time
- \* Once compiled it is not needed
- \* No execution if an error occurs
- \* Usually not as easy as Interpreted ones

Is Java Compiled or Interpreted?

Java is a hybrid language → both compiled as well as interpreted

**Java file**  
Harry.java

Compiled

→  
(using javac)

**Class file**  
Harry.class

↓  
bytecode

→ Can be used  
by Java interpreter

- A JVM can be used to Interpret this bytecode
- This bytecode can be taken to any platform (win/Mac/Linux) for execution
- Hence Java is platform independent (write once run everywhere)



## Executing a Java Program

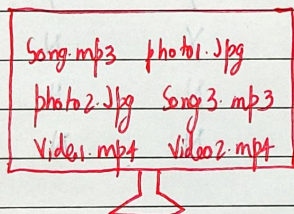
javac Harry.java → Compiled  
java Harry.class → Interpreted

So far the execution of our program was being managed by IntelliJ Idea.  
We can download a source code editor like VS Code to compile & execute our Java programs.

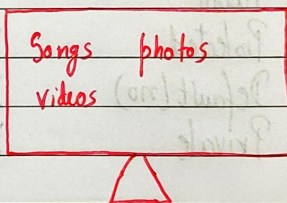
## Packages in Java

A package is used to group related classes.  
Packages help in avoiding name conflicts.  
There are two types of packages:

- \* Built in packages → Java API
- \* User defined packages → Custom packages



⇒  
organized  
as folders.



1. class this.java my.mp3 ⇒  
Song.java Harry.java organized  
as packages

## Using a Java package

import java.lang.\* → import everything from java.lang  
import java.lang.String → import String from java.lang  
s = new java.lang.String("Harry") → Use without importing



## Creating a package

`javac Harry.java` → creates Harry.class

`javac -d Harry.java` → creates a package folder

↳ We can keep adding classes to a package like this

We can also create inner packages by adding "package.inner" as package name  
 These packages once created can be used by other classes.

↓  
folder

↓  
subfolder

## Access Modifiers in Java

Access modifiers determine whether other classes can use a particular field or invoke a particular method  
 Can be public, private, protected or default (no modifier)

Modifier	Class	Package	Subclass	World
Public	Y	Y	Y	Y
Protected	Y	Y	Y	N
Default (no)	Y	Y	N	N
Private	Y	N	N	N