Menus and Packages

2 – 4 pm Thursday 8/21/2008 @JD2211

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Agenda

- Review
  - NetBeans, active objects
- Menus
- Packages

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Menus

- Menus
- NetBeans

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Package

- A Java program can use a large number of classes
- To structure a program, it is thus necessary to assemble the classes into packages
  - UML Package diagram

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Java API

- http://java.sun.com/j2se/1.5.0/docs/api/
- <JAVA_HOME>/java.awt
- <JAVA_HOME>/java.awt.swing
- <JAVA_HOME>/javax.swing

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Package Construction

- Design a package
  - In order to distinguish between package names and class names, generally package names starts with a lower-case letter
- Create a folder in the file system where the package is to go
  - Project folder

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Package Construction

- Design the classes that are to go into the package
  - In Java, we do not collect all the classes of a particular package into a single file. Instead, each class is usually separately; each one in its own file
  - On the first line in each such file, we should give a special package command, in front of any import commands

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Example

```
// the file C1.java

package myPackage;

import java.awt.*;
import javax.swing.*;

public class C1{
        ...
}
```

javac C1.java

C1.class is then generated in C:\C:\Documents and Settings\Taehyung\My Documents\NetBeansProjects\NumberAddition\src\myPackage

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Example (cont'd)

```
// the file C2.java

package myPackage;

class C2{

        ....
}
```

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Sub-Packages

- A package can contain other packages, this is, it can be said to contain sub-packages
- A sub-package must have a name consisting of the super-package's name followed by a dot and then sub-package's name
- myPackage.special
- The hierarchical construction of the package should be directly mirrored in the folders created in the file system

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Sub-Package (cont'd)

- A sub-package may in turn be a super-package and contain other packages
- myPackage.special.more
- Java's standard package also follow this model.
  - We start with a super-package called java, and then the different sub-packages, for example, java.awt, java.io and java.util will be included in this folder

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Archive Files

- In order to compress the size of the class files included in a package, and to make these files faster to download, they often compressed and put in a so-called archive file.
- This is done with a special program called, `jar`, which is included in J2SDK

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Archive Files (cont'd)

- jar –cf myPackage.jar myPackage*.class

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Archive Files (cont'd)

- All the standard packages in Java are distributed in the form of archives files
- Where are located all these standard packages???

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Import Command

- When a program wants to use one of the classes in a package, it must import the class
- The simplest thing is to import the entire package. For example, if we wish to use classes `C1` and `C2` in a program, we can write
  - `import myPackage.*;`
- If we wish to use class `C3` from package `myPackage.special`, we can write
  - `import myPackage.special.*;`

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The Environment Variable PATH

- A package can be put at any location in the file system.
- But we have to tell the Java interpreter where the package is, so that it can find the package
- This is done by setting an environment variable called PATH

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The Environment Variable PATH

- This should contain a list of names of folders and any archive files that should be searched

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Visibility

Visibility				
Visible in	private	package	protected	public
Another class in the same package	No	Yes	Yes	Yes
A subclass in another package	No	No	Yes	Yes
A class in another package	no	no	no	yes

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Lab Assignment

- http://www.csun.edu/~twang/Java/Lab/8-21-Lab.pdf

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Thank You and Q&A

- Topics you are interested in
  - Software engineering concepts and principles
  - Web trends and technologies
  - Software business
  - Open source software
  - Data warehousing and data mining

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