

CS212

Packages

<http://java.sun.com/docs/books/tutorial/java/interpack/packages.html>

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Motivation

- Programming as language
 - alphabet, words, sentences, paragraphs, ...
 - what's next?
- Some software principles:
 - abstraction
 - modularization
- Examples:
 - functions, classes
 - MATLAB tool box
 - "include" files

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The Gist

- Java?
 - **packages**: <http://java.sun.com/docs/books/tutorial/java/interpack/packages.html>
 - "A package is a **collection of related classes and interfaces** providing access protection and **namespace** management."
 - What's namespace? (coming up)
- Examples:
 - Java API:
 - So, what does it mean to import **java.util.***?

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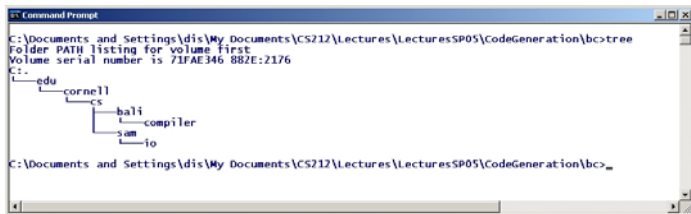
Names

- Namespace:
 - set of names in which each name has a unique meaning
 - related to context...context determines meaning
 - example:
 - in the context of the Internet, a link is a connection to another URL
 - in the context of a chain, a link is one ring that connects to at least one other link
- Some related concepts:
 - **Visibility**: can a name be accessed?
 - **Scope**: location in code where name is visible
 - more on scope next lecture

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Package Naming

- **another view of a package:** directory that contains bytecode of classes and interfaces
- naming:
 - **dir1.dir2...**
 - example) **java.lang.Math**
 - Package **java** contains package **lang** contains class **Math**
- each dir must be an *actual* dir:
 - example) see package **edu.cornell.cs.sam.io**:



Accessing Package Members

- Fullname for accessing a particular class:
 - before class definitions: **import package;**
 - example) **import java.lang.Math;**
 - can actually use fullname through code to avoid import statement
- Can import all package members:
example) **import java.util.*;**

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Putting Things in Packages

- All classes and interfaces go in a package
 - what about all work you've done so far?
 - if you have **classpath** set to **.**, the current directory is your default package
- Use package statement(s) at top of Java class/interface:
 - **package packagename;**
 - **packagename** includes the directory path

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Visibility Modifiers

- **protected:**
 - member is visible by all classes in same package and all subclasses of member's class
 - subclass can be in different packages
- default visibility ("blank" modifier):
 - we "fake" **public** access with it
 - actually more restrictive than **protected!**
 - cannot access member from outside package

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