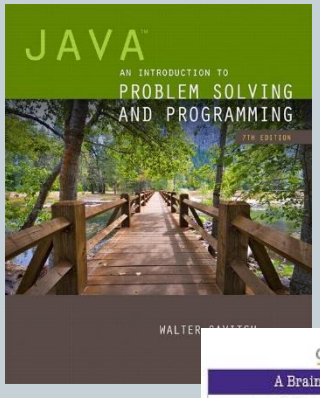
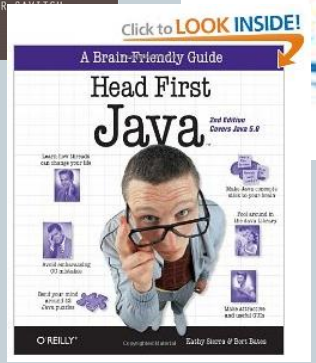
Course Overview, Java Library, API, javadoc





Method Summary

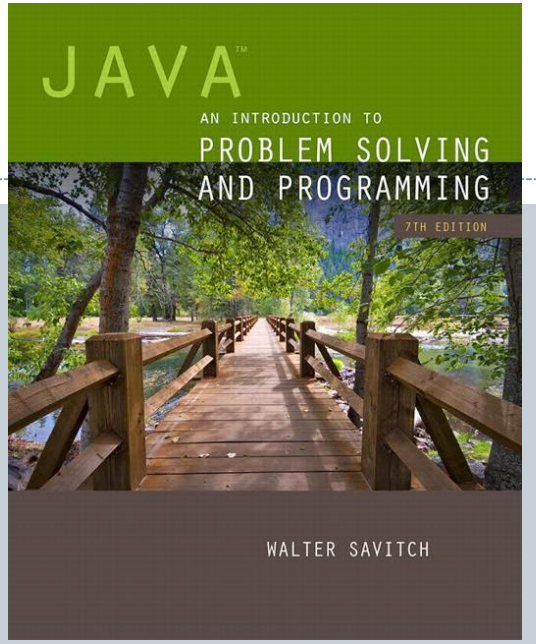
All Methods	Static Methods	Concrete Methods

Modifier and Type	Method and Description
static Object	**get**(Object array, int index) Returns the value of the indexed component in the specified array object.
static boolean	**getBoolean**(Object array, int index) Returns the value of the indexed component in the specified array object, as a boolean.
static byte	**getByte**(Object array, int index) Returns the value of the indexed component in the specified array object, as a byte.
static char	**getChar**(Object array, int index) Returns the value of the indexed component in the specified array object, as a char.
static double	**getDouble**(Object array, int index) Returns the value of the indexed component in the specified array object, as a double.

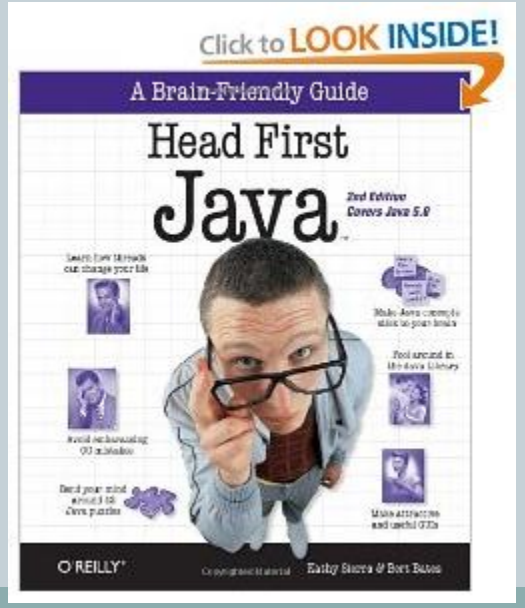
Outline

- Course Overview
  - Website
  - Syllabus
  - Assignments
    - New Late Policy!
  - Exams
- Java Library
- API
- javadoc

Textbook(s)



- Java: An Introduction to Problem Solving and Programming
  - Continuing where we left off last semester
  - Additional online chapters will be posted on our website
- (Optional) Head First Java
  - First 5 chapters are review
    - But worth reading anyway
  - Also covers more advanced topics
  - Has a totally different approach to learning Java than most texts



Course Website and Other Important Info

Michele Van Dyne
Museum 204B
Office Hours: MWF 1:00-2:00 or by appt.
mvandyne@mtech.edu
http://katie.mtech.edu/classes/csci136

The Java Library

- The Java Library
  - Many handy classes and methods
  - Importing a package
  - Only the most important are automatically available without excessive typing:
    - Things like String, System.out, etc.
  - URL: https://docs.oracle.com/javase/8/docs/api/

Java Packages

- A collection of classes under one namespace
  - Avoids problems if multiple classes have same name
- Common stuff in java.lang package

```
// Two ways to declare a String
String s = "hello world!";
java.lang.String s2 = "hello world!";
```

- The String class lives in a package called java.lang
- Qualifying it is optional for this package
- We will be using other java packages this semester
  - For today I want you to pay attention to the API format

API: Example – Some Methods for Array

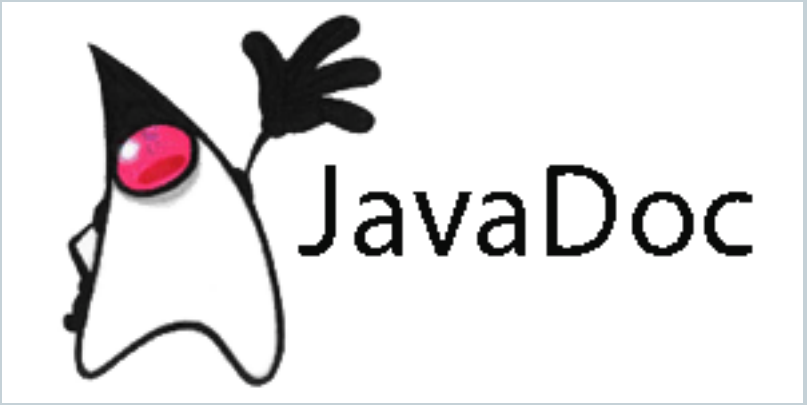
Method Summary

All Methods | **Static Methods** | **Concrete Methods**

Modifier and Type	Method and Description
static `Object`	**`get`**`(Object array, int index)` Returns the value of the indexed component in the specified array object.
static boolean	**`getBoolean`**`(Object array, int index)` Returns the value of the indexed component in the specified array object, as a `boolean`.
static byte	**`getByte`**`(Object array, int index)` Returns the value of the indexed component in the specified array object, as a `byte`.
static char	**`getChar`**`(Object array, int index)` Returns the value of the indexed component in the specified array object, as a `char`.
static double	**`getDouble`**`(Object array, int index)` Returns the value of the indexed component in the specified array object, as a `double`.

javadoc

- General
- Tags
- Generating Documentation
- Running javadoc



javadoc: General

- Software Documentation
  - Ubiquitous problems
  - Writing API documentation for a system is one of the most unpleasant jobs a developer will ever face
    - The kind of job that could drive you to despair
  - No documentation = no code
  - “Informal” documentation isn’t standard
  - As software evolves, “informal” and/or external documentation and code become out of sync
  - Eventually (often very quickly), documentation becomes unusable making code hard to understand and update!

javadoc

- javadoc utility makes writing and maintaining code documentation easier!
  - Ships with JDK
  - Defines a set of specially formatted comments
  - Can be added to document each
    - package,
    - class (& interfaces),
    - method, and
    - field (variable)
- Used to generate HTML documentation of classes or packages after parsing the comments
- HTML documentation of the API

javadoc Comment Format

- IMMEDIATELY precedes the item it describes
- Consists of:
  - Description of the feature
    - Copied as is to the documentation page
  - List of tags
    - Formatted by javadoc in a consistent style

javadoc Comment Format

- Has the following format:

```
/**
 * Summary sentence.
 * More general information about the  program, class, method or
 * variable which follows the comment, using as many lines  as
 * necessary.
 * <SPACE>
 * zero or more tags to specify more specific kinds  of
 * information, such as  parameters and return values for a
 * method
 */
```

javadoc Guidelines

- For this class, must be provided for:
  - **Every public class or interface**
  - **Each public method (including constructors)**

javadoc Tags: @author

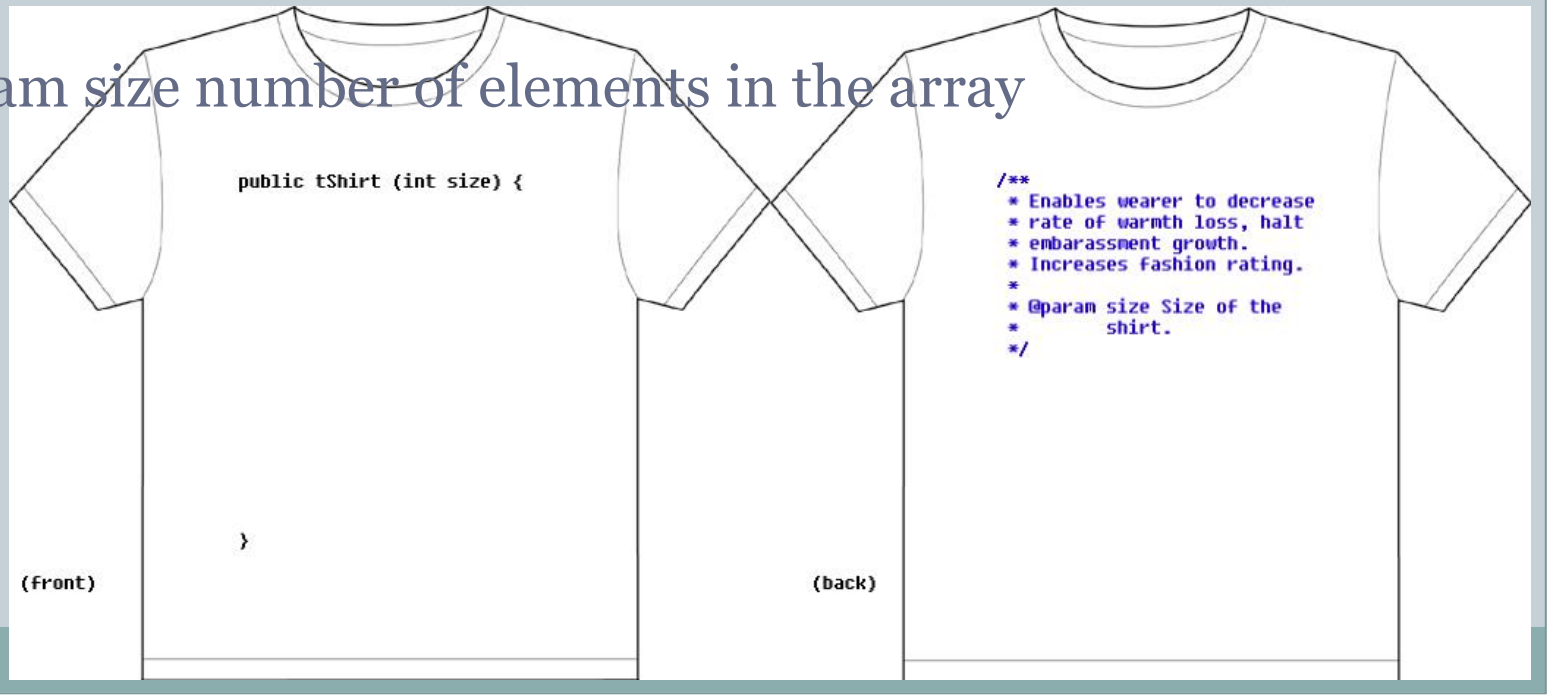
- @author name
  - Name one of the authors of this class
  - Use multiple tags if there are multiple authors
  - Used in: Class, Interface, Method
  - E.g.

    @author Jane Smith, lab X

javadoc Tags: @param

- @param <name of parameter> short description of parameter
  - Describe the named parameter to this method
  - Skip this tag if the method has no parameters
  - Used in Method
  - E.g.

    @param size number of elements in the array



javadoc Tags: @return

- @return text
  - Describe the value returned by this method
  - Skip this tag if the method has no return value
  - Appears after @param tag(s)
  - Used in: Method
  - E.g.

    @return String a string representing the object's description

javadoc Example: Method

```
/**
 * Validates a chess move.
 *
 * @author John Doofus
 * @param theFromLoc Location of piece being moved
 * @param theRank Rank of piece being moved
 * @param theToLoc Location of destination square
 * @return true if a valid chess move or false if invalid
 */
boolean isValidMove(int theFromLoc, int theRank, int theToLoc)
{
...
}
```

Javadoc Tags: @throws

- @throws <name of exception> description of circumstances under which exception is thrown
  - Describes the named uncaught “checked” or explicitly thrown “checked”/”unchecked” exception
  - Skip this tag if the method throws no exceptions
  - Should follow @param and @return tags
  - If method throws more than one exception they should appear in alphabetical order by exception name
  - Used in Method
  - E.g.

@throws FileNotFoundException if the user does not specify a valid file name

javadoc Reference

- More than you ever wanted to know about javadoc:

http://docs.oracle.com/javase/1.5.0/docs/tooldocs/windows/javadoc.html

Required javadoc for this Course

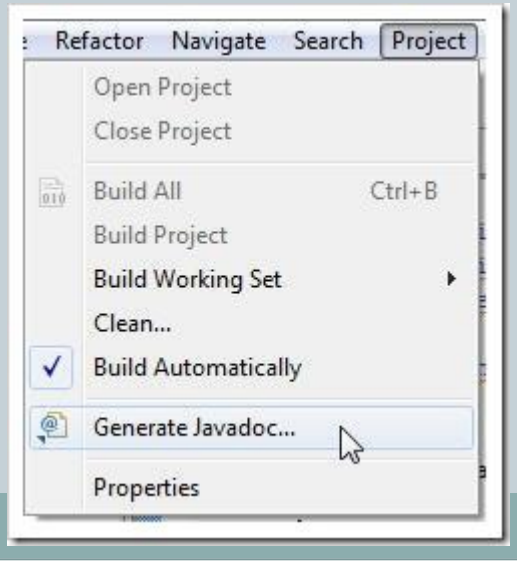
- Class or Interface:
  - @author

Required javadoc for this Course

- Method/Constructor
  - Description of method
  -
  - @param
  - @return
  - @throws

Running javadoc in Eclipse

- Go to Projects menu at top
- Choose Generate Javadoc from that menu
  - You can accept all the defaults and javadoc will run as you've seen
  - If you have not generated documentation for a project yet, it will ask if you want to create a "doc" directory
    - Yes, you do
  - Can go to doc directory (now listed in the projects)
    - Open index.html to see main javadoc document



Running javadoc from the Command Line

- javadoc [options] [packages] [filenames]
  - Can list one or packages
    - No wildcards (i.e. *)
  - Can list one or more java files
    - Can use wildcards
- Options:
  - -public
    - Only public classes, members and methods are documented
  - -protected
    - Public and protected
    - Most common (default)
  - -package
    - Public, protected and package
  - -private
    - For internal use
  - -version
    - Causes the @version tag to be included in the documentation
  - -d directory
    - Location of output HTML documentation
    - Same directory as source by default
  - -author
    - Causes the @author tag to be included in the documentation

Command Line Example

javadoc *.java

javadoc –version –author –private *.java

Hands On Exercise

- Open Moodle, go to CSCI 136, Section 11
- Open the dropbox for today
  - (NOTE: If you're reading this ahead of time, Moodle won't accept files until class time…)
- Drag and drop your TryJavadoc.java program file to the Moodle dropbox
- You get: 1 extra credit point if you turn in something, 2 extra credit points if you turn in something that is correct.

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