

Today's topics

Java

Review

Just a bunch of headings meant to trigger questions

A contraction of previous notes

Upcoming

Midterm Exam

Reading

Great Ideas, Chapters 1-4

Review Topics

- **HyperText Markup Language (HTML)**
 - **Linked Property Makes WWW What it is Today**
 - **HTML Structures**
 - **Tags (Note: The tags are case insensitive)**
 - **Ordered Lists; Unordered Lists**
 - **Tables**
 - **Links (Anchors)**
 - **Text Formatting**
 - **Carriage Returns**
 - **Images**

Review Topics

- **An Introduction to Programming: Coding Decision Trees**
 - **Object Oriented Programming**
 - **Treats everything as an Object**
 - **Object has Data and Functions (Methods)**
 - **Class Describes an Object in Java**
 - **Two Ways of Using Java**
 - **Stand Alone (like most traditional programs)**
 - **Using Web with an Applet (for this class)**
 - **Example: "Hello World", Things to Note:**
 - **Program is a class**
 - **Class contains data and methods**
 - **Method `init()` always started for applets**
 - **add statements (layout)**
 - **Applet invoked through HTML file**
 - **Program tested with Web Browser or appletviewer**

Review Topics

- **Demonstrate Use of Buttons; Important Pieces:**
 - `actionPerformed` method
 - events, cause
 - if statements
- **String Variables**
- **Reading Data Into Your Program: *Input***
 - The `TextField` Class
 - Example: Read In and Duplicate Demo `.getText`
- **IF Statements; IF - ELSE Statements**
 - Logical Expression
- **Assignment Statement**
- **Method Invocation**
- **Using Decisions to Solve Problems**
- **Example: A Number Guessing Game**
 - Binary Search

Review Topics

- **Decision Trees**
- **Example: Text Selection Problem: Decision Tree**
 - Review Code Noting `myLocation` Variable
- **Using Primitive Data Types: Integers**
- **Example: Doing Multiple Tallies**
- **Strings and String Manipulation**
 - **The String Class**
 - Declaration: `String message;`
 - String Constant: `"Good Morning World!"`
 - String Assignment: `message = "It's Friday";`
 - String Class Has Many Methods for Manipulation
 - `int length()`
 - `int indexOf(String st)`
 - `String substring(int start, int end)`

Review Topics

- More About Syntax

1. **<name>** -> *any string of alphanumeric symbols that begins with a letter*
2. **<statement>** -> **<name> = <expression> ;**
3. **<statement>** -> **<name> = new <class>(<arguments>) ;**
4. **<statement>** ->
<name>.<method>(<arguments>) | <method>(<arguments>);
5. **<arguments>** -> *possibly empty list of <expression>s separated by commas*
6. **<expression>** -> **<string-expression> | <int-expression> | <oth-expression>**
7. **<string-expression>** -> **<string-expression> + <string-expression>**
8. **<string-expression>** -> **<string>**
9. **<string>** -> *" any sequence of characters "*
10. **<string>** -> **<name>**

Review Topics

- **Numerical Computation & Study of Functions**
 - **New Classes for Numbers**
 - `public IntField(int size);`
 - `public void setInt(int number);`
 - `public int getInt();`
 - `public DoubleField(int size);`
 - `public void setDouble(double num);`
 - `public Double getDouble();`
 - **Iteration by Button Pushing**
 - **The while Loop**
 - **Example: Redesign of Diamond Program**
 - **Arrays**
 - **Have Multiple Elements or Cells**
 - **Use *Subscript* or *Index* to Identify Element**
 - Subscripts are usually integers in brackets

Review Topics

- **Often Use Arrays in a Loop**
- **Setting Up an Array**
 - `double weights[];`
 - `weights = new double[50];`
 - `double weights[] = new double[50];`
- **Subscript Range Errors**
- **Example: Simple Statistics Program Design**
 - **Get Data Into Array**
 - **Display Data**
 - **Compute**
 - **Display**
- **Algorithms for Extrema**
- **Algorithm for Mean**

Review Topics

- **Top-Down Programming, Subroutines, and a Database Application**
 - **Functions using Functions**
 - **Getting Information In and Out of Functions**
 - **Class Data: known within class.**
 - **Formal Parameters/Arguments**
 - **Syntax: Using a Function**
 - **Functions that Return Values**
 - **Syntax: Defining a Function**
 - **Larger Problems: How to Deal with the Complexity**
 - **Divide and Conquer**
 - **"Parallel" Arrays or "Corresponding" Arrays**
 - **Model Phone Book Capability**
 - **Typical Access by Name**
 - **Access by other Fields (other arrays)**

Review Topics

- **Extend Idea to Database**
 - **Basic Data Base Functions**
 - **Wild Card Retrieval**
 - **Used Car Database**
 - **Relational Data Bases**
- **Recursion**
 - **Dictionary example**
 - **Base/Halting case**
 - **Clone model**
 - **Factorial (N!)**
 - Iterative Approach for Factorial
 - **Exponentiation (X^N)**
- **Church-Markov-Turing Thesis**
 - **This part of Java lets you solve all kinds of algorithms**