CSSE 220

2D Arrays and Maps

Check out 2DArraysAndMapsInClass from SVN

2D Arrays – What, When, Why, How?

What:

- Think of them as an array of arrays
- … or as a grid with rows & columns

When:

— Represent 2 dimensional data

- Game Boards
- Tables
- Multiple lists of items
- Etc.

2D Arrays – What, When, Why, How?

Why:

- Match your data representation as closely as possible to the real-world

How:

- char[][] ticTacToe = new char[3][3];
- Retrieving data
  - ticTacToe[0] → Gets the first char[]
  - ticTacToe[1][2] →Gets the second array's third item

2D Arrays

- Make groups of two (no more than 3, no one can work alone)
- Read through the 3 2D Array sample problems on the handout with your partner and make sure you both understand how they work
- Then use the code as an example to answer the 2D Array quiz questions
- Then do the 2D sample problems
- Call me over when you're finished

Maps – What, When, Why, How?

What:

- Collection of key-value pairs
  - Key is the identifier
    - i.e. A word in a dictionary, or a student ID number, something that uniquely identifies an item
  - Value is the data for that identifier
    - i.e. The definition of a word in a dictionary, a Student object for an ID, the value associated with an unique ID
- Think of this like a dictionary (in some programming languages they're even called dictionaries)
  - Key: word
  - Value: definition

Maps – What, When, Why, How?

When:

- We use maps when a unique piece of data is used to retrieve additional information

Why:

- Fast access to information based on a unique key

How:

```
HashMap<String, Student> usernameToStudent =
new HashMap<String, Student>();
```

Maps

- Sometimes, it's difficult to fully understand maps.
- Let's do an example together:
  - Implement an int array using a map.

Maps

- Make groups of two (no more than 3, no one can work alone)
- Read through the 3 Map sample problems with your partner and make sure you both understand how they work
- Then use the code as an example to answer the Map quiz questions
- Then solve the map problems in today's code
- Call me over when you're finished