CSE 115/503

April 19-23, 2010

Announcements

- Lab 8 due Monday 4/26
- **Final exam review session: Wednesday 4/28 1pm-3pm, 216 NSC**
- Final exam Thursday 4/29 3:30-6:30, 201 NSC

Lab 8 Discussion

- Colliding Ships
  - Need to put all the positions that a ship occupies into a HashMap.
  - We know what position the first part of the ship occupies
  - How do we get the rest of the positions?
    - Ask the ships!

How do you ask the ships?

- Create a collection of positions that the ship occupies and write a method that returns that collection when you need the information.

Where are the ships?

- Create the following methods:
  - Position getPosition1()
  - Position getPosition2()
  - Position getPosition3()
  - Position getPosition4()
  - Position getPositions5()

Computer's Ships

- The computer player needs a board full of ships.
- So, create a HashMap for the computer and put in ships.
- Ships can be at the same place every time you play the game.

Primitive Types

- Other types that are built into Java.
- Since Java 5, primitive types are more easily wrapped by their "object" counterparts and virtually anything that could have been done with primitives can now be done by using those objects.

Can't use primitives

- If you are trying to make a collection, you need to use a class name as the name inside the generic type (the <>), so you can not use a primitive type there.

What good are classes?

- Take a look – for the primitive type wrapper classes, quite a few have methods defined that are useful when working with that particular type of data.

Numbers

- Integer numbers
  - Primitive types: byte, short, int, long
  - Classes: Byte, Short, Integer, Long
- Floating point numbers
  - Primitive types: float, double
  - Classes: Float, Double

Operations on Numbers

- Addition
- Subtraction
- Multiplication
- Division
- Modulus
- Math class defines other operations

Numbers

- The number
  345
- is considered by Java to be of type int, but because of autoboxing and autounboxing, the following is valid:
- Integer number = 345;

Characters

- A single letter, digit, or other character.
- Primitive type
  - char
- Class type
  - Character

Boolean

- A variable whose type is boolean (primitive type) or Boolean (class type) can only have the values true or false.
- Useful in logic
- A boolean value is also produced as a result of the relational operators

Loops Revisited

- We have seen the for-loop and the for-each loop.
- The for-loop can be classified as a definite loop because it can usually be easily determined how many times it will execute.

Loops Revisited

- What if you don't know exactly how many times you want to execute, but rather you want to loop until some event happens.
- That is where an indefinite loop comes in. Java has a while-loop for this purpose.

While loops

- Syntax:

  while (booleanExpression) {

   //code to be repeated

  }

- The while loop will continue to execute as long as the booleanExpression is true.

What we need to program:

- Boehm-Jacopini Theorem
  - Sequencing
    - Ability to specify the order things will be executed in.
  - Selection
    - Choice
  - Repetition
    - Looping

Sequencing

- Involves the order lines of code will get executed in, including method calls and returning from those method calls.

Selection

- Java supports three different types of selection:
  - if and if-else statements
  - switch/case statements (not part of this course)
  - polymorphism (selection based on type)

Repetition

- Java supports five different types of repetition
  - For-loops
  - For-each loops
  - While-loops
  - Do-while loops (not covered in class)
  - Recursion (not covered in class)

Code from this week

- Be sure to check out the NumbersToWords project in the lecture code repository.