CSSE 220 Day 7

Graphics and Unit Testing

Check out BiggestFan and UnitTesting projects from SVN

Announcement

- Exam is Wed Sept. 23 at 7:00 PM
- More details to follow

Outline

- Java Graphics: BiggestFan Example
- Console Input and GUI input
- Unit testing code with JUnit

Transformation hints for BiggestFan

- Translate and rotate to adjust the "state" of the drawing pen
- It is usually easier to move the pen, then draw blades in a fixed configuration around (0,0), then move the pen back
- Make (0,0) your center of rotation
  - can change the point of origin using translate() so you can rotate different portions of the component

Work on the biggest fan code

- We'll walk through it together to explain how the classes work
- Then you should modify the fan to print one blade vertically – use transform to move (0,0) to the **center** of the fan and then draw from there

Reading keyboard input from the console

CONSOLE INPUT WITH JAVA.UTIL.SCANNER

Console input with Scanner

- Creating a Scanner object
  - import java.util.Scanner;
  - Scanner inputScanner = new Scanner(System.in);
- Defines methods to read from keyboard
  - inputScanner.nextInt();
  - inputScanner.nextDouble();
  - inputScanner.nextLine();
  - inputScanner.next();
- Exercise: Look at UnitTesting/src/ConsoleWorker.java. Add missing methods to read from console

Test-driven Development,
unit testing and JUnit

WRITING CODE TO TEST YOUR CODE

Unit Testing

- Using code that you write to test other code
  - Focused on testing individual pieces of code (units) in isolation
    - Individual methods
    - Individual classes

- Why would software engineers do unit testing?

Unit Testing With JUnit

- JUnit is a unit testing *framework*
  - A *framework* is a collection of classes to be used in another program.
  - Does much of the work for us!
- JUnit was written by
  - Erich Gamma
  - Kent Beck
- Open-source software
- Now used by **millions** of Java developers

JUnit Example

- `BankAccountTester` in Big Java shows how to write tests in plain Java (pg. 103)
- Look at `JUnitMoveTester` in today's repository
  - Shows the same test in JUnit
  - Let's look at the comments and code together…

Interesting Tests

Important Slide: Use this as a reference!

- Test “boundary conditions”
  - Intersection points: -40°C == -40°F
  - Zero values: 0°C == 32°F
  - Empty strings
- Test known values: 100°C == 212°F
  - But not too many
- Tests things that might go wrong
  - Unexpected user input: “zero” when 0 is expected
- Vary things that are “important” to the code
  - String length if method depends on it
  - String case if method manipulates that

Unit test *shout*, *whisper*, and *holleWerld* using “interesting” test cases

EXERCISE