CompSci 6  
Programming Design and Analysis

April 8, 2008  
Prof. Rodger

Announcements

• Current classwork is 2-day classwork
• Read for next Tuesday Chap. 16.2
• Assignment 7 out
  – Do today’s classwork BEFORE doing this
• Reading Quiz for next Tuesday
• Office hours: No hours Tue, Wed hours shift to 2:30-4:30 this week
• In Friday 9-11:45, 1:30-2:15

Classwork Today – Recursive Art

• Two ways to draw art recursively
  – One object
    • Repeatedly draw the same object smaller
  – Multiple objects
    • Each object is “linked” to a smaller object
    • Each object draws itself
    • See the myNext variable

How the program is put Together

• Main
  – Creates Canvas – with ArrayList of myMovers
  – Creates ButtonPanel (4 buttons (commands))
    • Creates Button for new TargetFactory
      – When pressed creates new Target
    • Creates Button for new Target2Factory
      – When pressed creates new Target2
    • Creates Button for new CircleFactory
      – When pressed creates new Circle
    • Creates Button for new Circle2Factory
      – When pressed creates new Circle2
  • Target, Target2, Circle, Circle2 put into myMovers when created
  – Creates Slider bar (for target and target2)
Inheritance

- All can use Mover commands.

First Problem - Target

- Modify Target.class
  - One Target object is created
    - This object repeatedly draws the same shape (a circle) each time getting smaller
  - Draws via recursion (recurseDraw method)
  - Which parameter is changing?
    - fillOval must use this change somehow
  - What is the way out?
  - Look at private data - myNumRings

Second Problem – Target 2

- Draws same picture – recursion in different place
- Creates multiple objects – one new object with each recursive call
- Constructor – one place with recursion
  - Must create self and create a smaller object with a recursive call to the constructor
- Paint method – one place with recursion
  - Paint current object (fillOval) and then call next smaller object to paint itself if it exists
- Look at private data – one place with recursion
  - Private Target2 myNext;
Third problem - Circles

• Create only One object - Circles
  – Draws itself and recursively draws four smaller circles (call recurseDraw 4 times)
  – No private state
• Similar approach to Target
• You may want to add parameters to recurseDraw to help you draw the four circles in different places.
Picture for Circles and Circles2

- How to do Colors
- Note in Circle constructor, default color is Black
- You can add parameters to recurseDraw – add one that increments by 1 each time
- Then if that number is even draw one color, if odd then draw another color – pick colors of your choice.

Fourth Problem: Circles2

- Create multiple objects
- Private data – recursion here
  - Circles2[] myNext;
- Constructor – recursion here
  - Create one object
  - Recursively create an array of size 4 filled with 4 new Circles2
- Paint – recursion here
  - Paint me (the Circle2 object) and then recursively paint its four smaller circles in the array myNext

Circles2 Idea – not the picture

Create me and recursively create 4 smaller Circle2’s

For each of those 4 circles they will – create me and recursively Create 4 smaller circle2’s