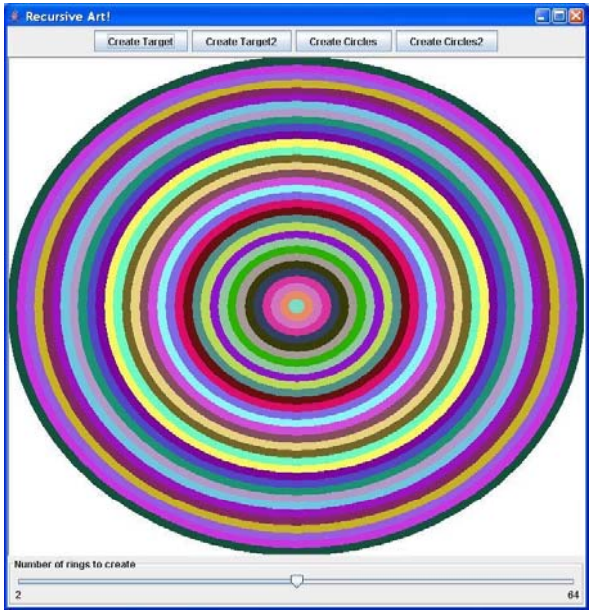
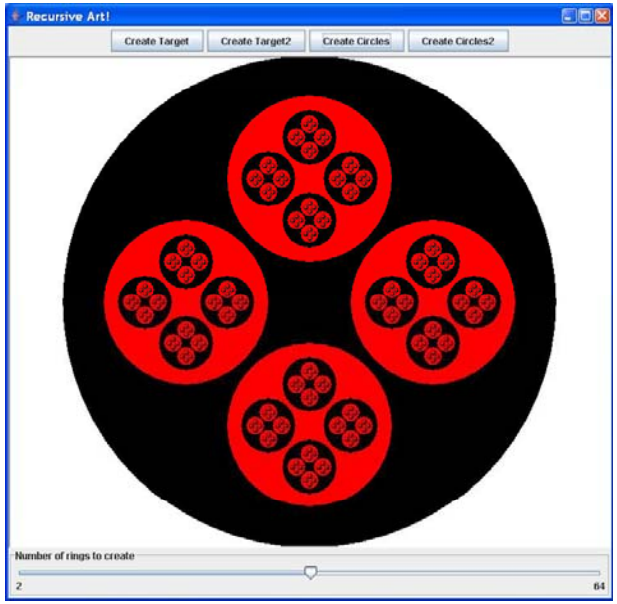
CompSci 6
Programming Design and Analysis



April 15, 2010

Prof. Rodger



Announcements

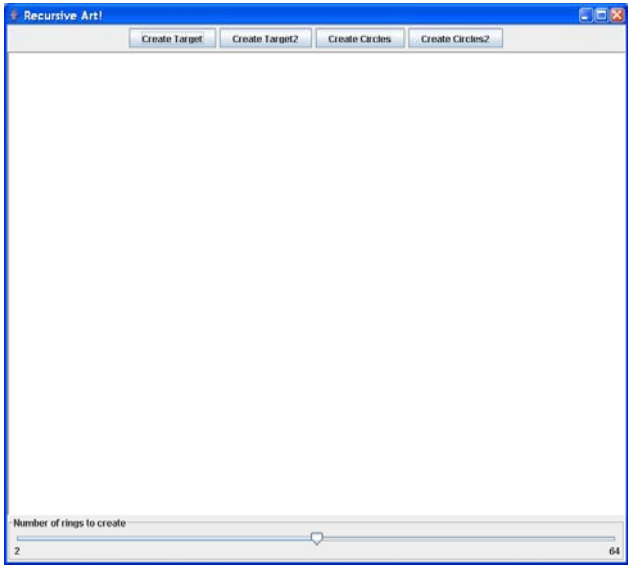
- Read for next class, Chap. 16.2
- Reading Quiz for next time
- Assignment 9 out
  - Do today's classwork BEFORE doing this
  - The assignment builds on this classwork

Classwork Today – Recursive Art

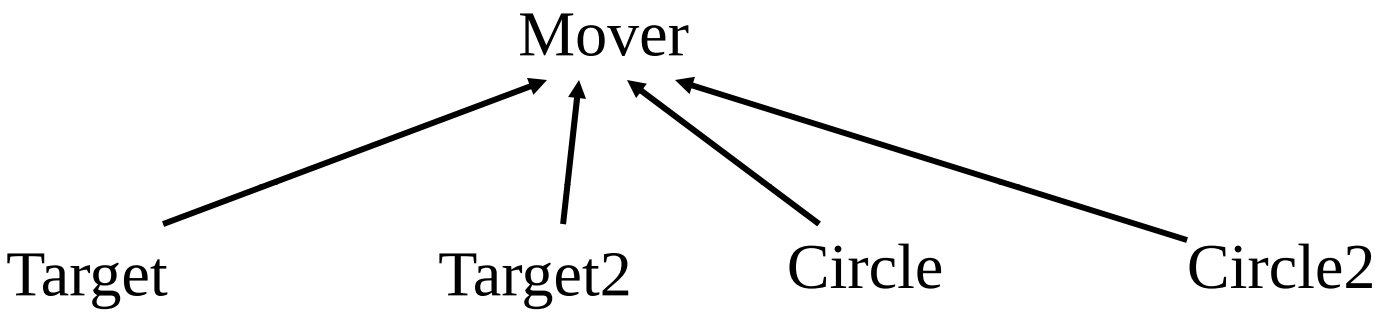
- Two ways to draw art recursively
  - One object
    - Repeatedly draw the same object smaller
  - Multiple objects
    - Each object is “linked” to a smaller object
    - Each object draws itself
    - See the myNext variable

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

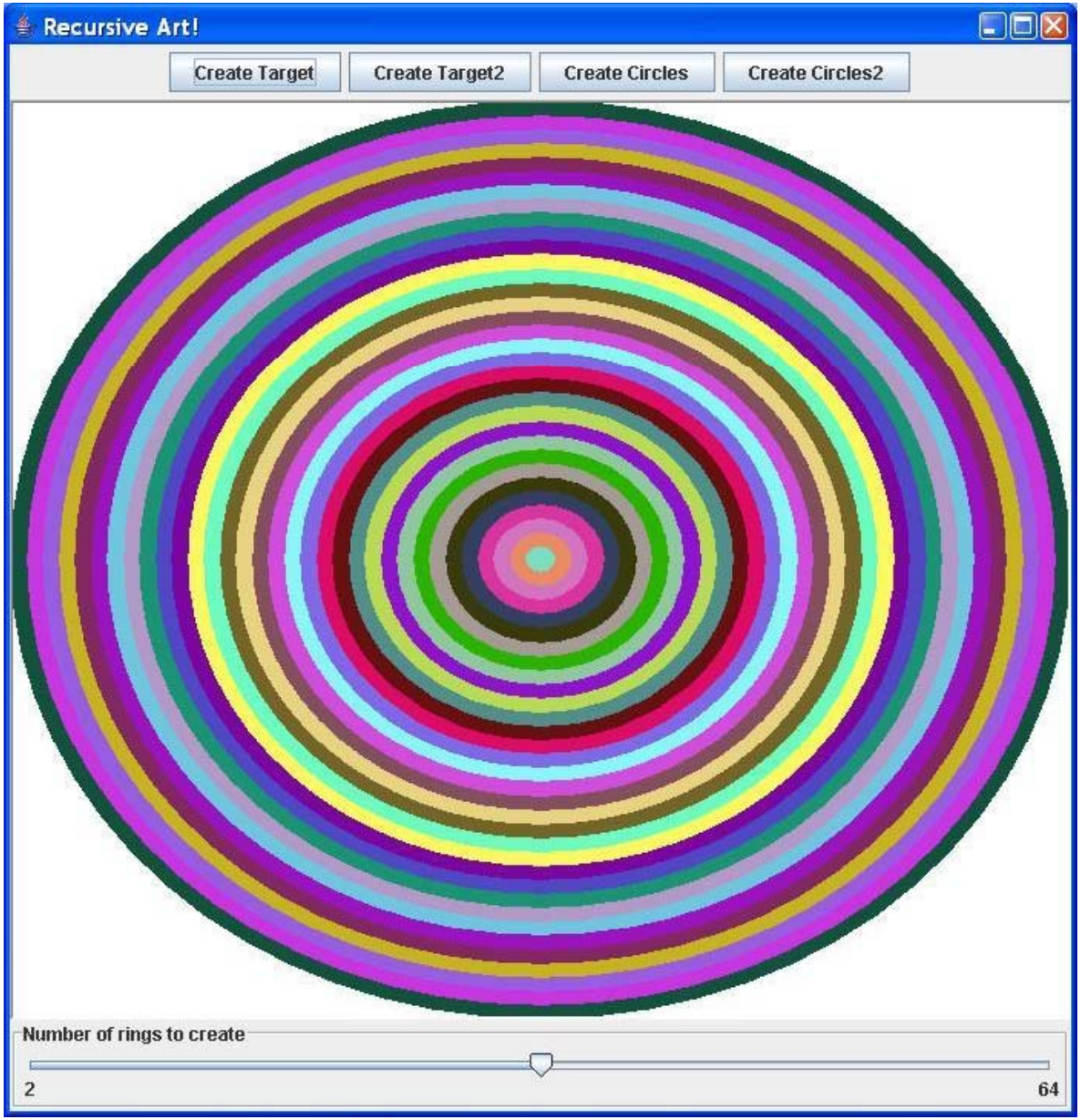


- All can use Mover commands….

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

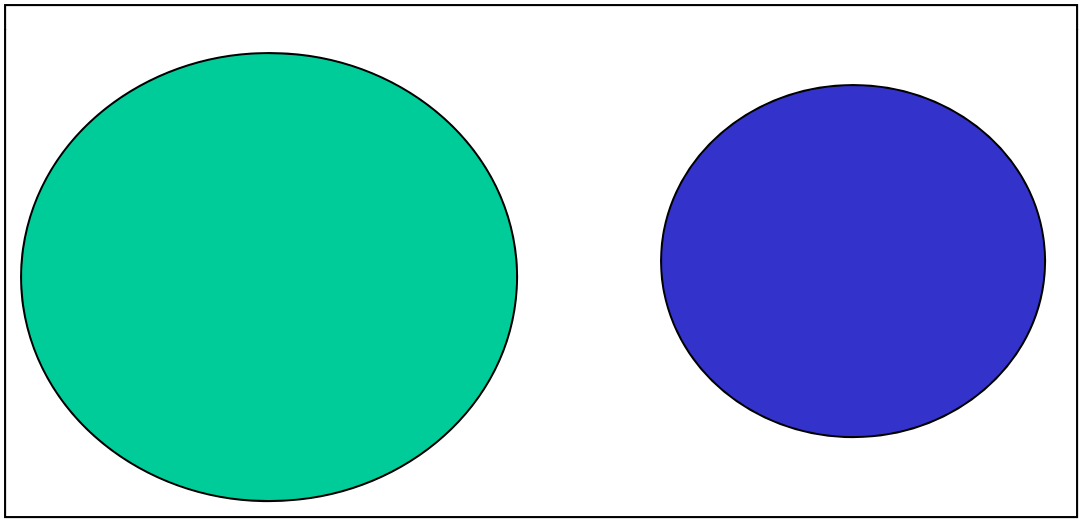
Picture for Target and Target2



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;

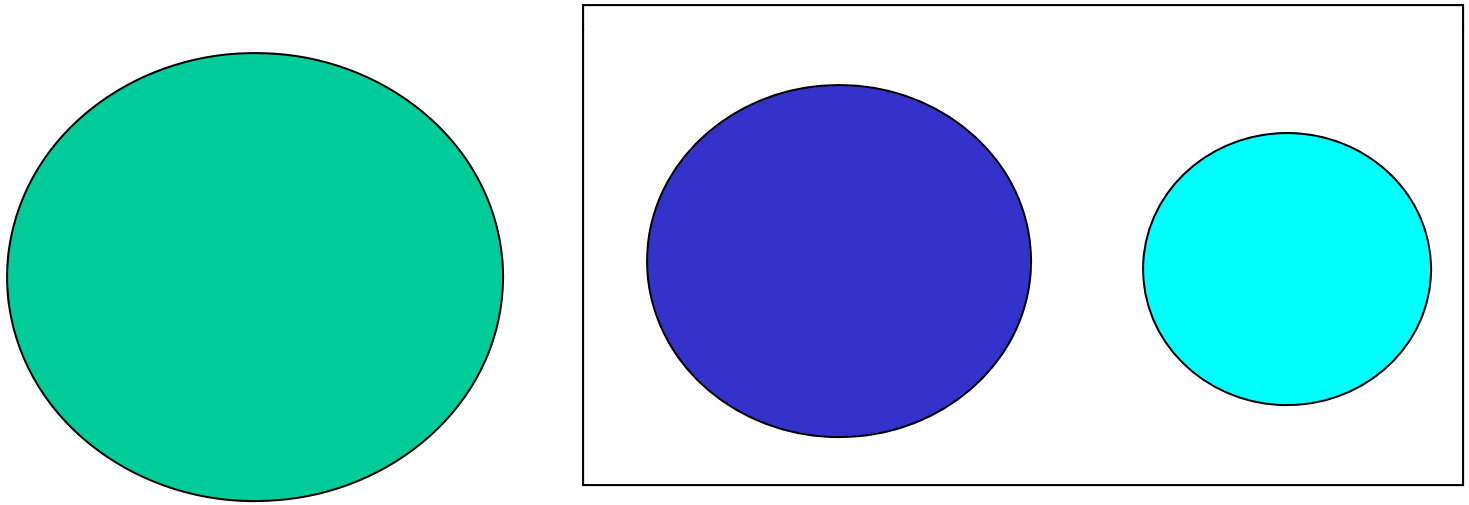
Target2 Idea – not the picture



Create myself

Start creating next Target2

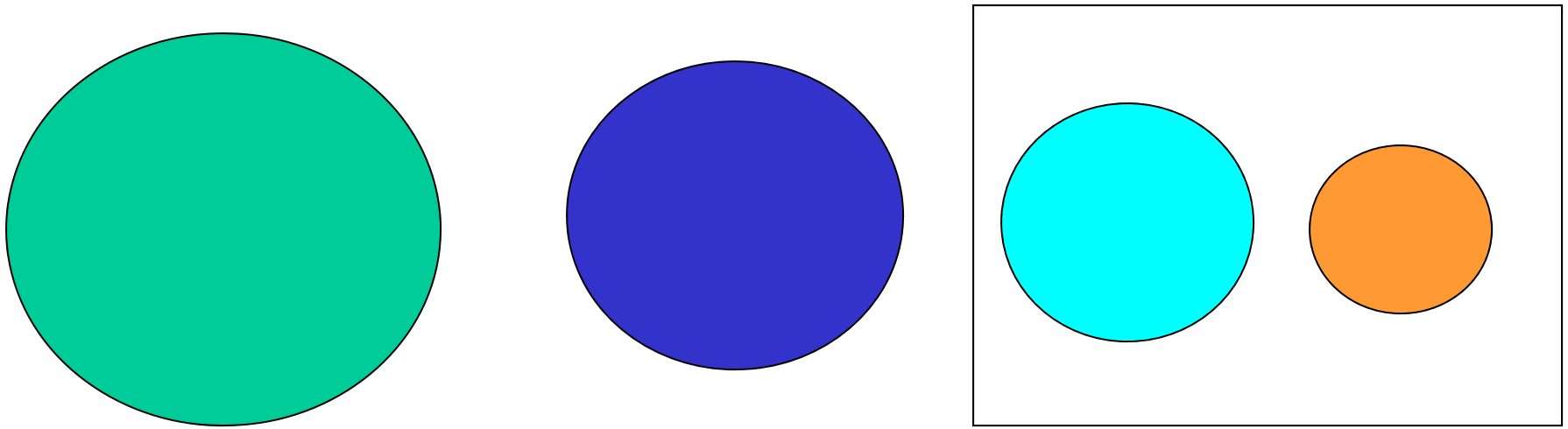
Target2 Idea – not the picture



Create myself

Start creating
Next Target2

Target2 Idea – not the picture

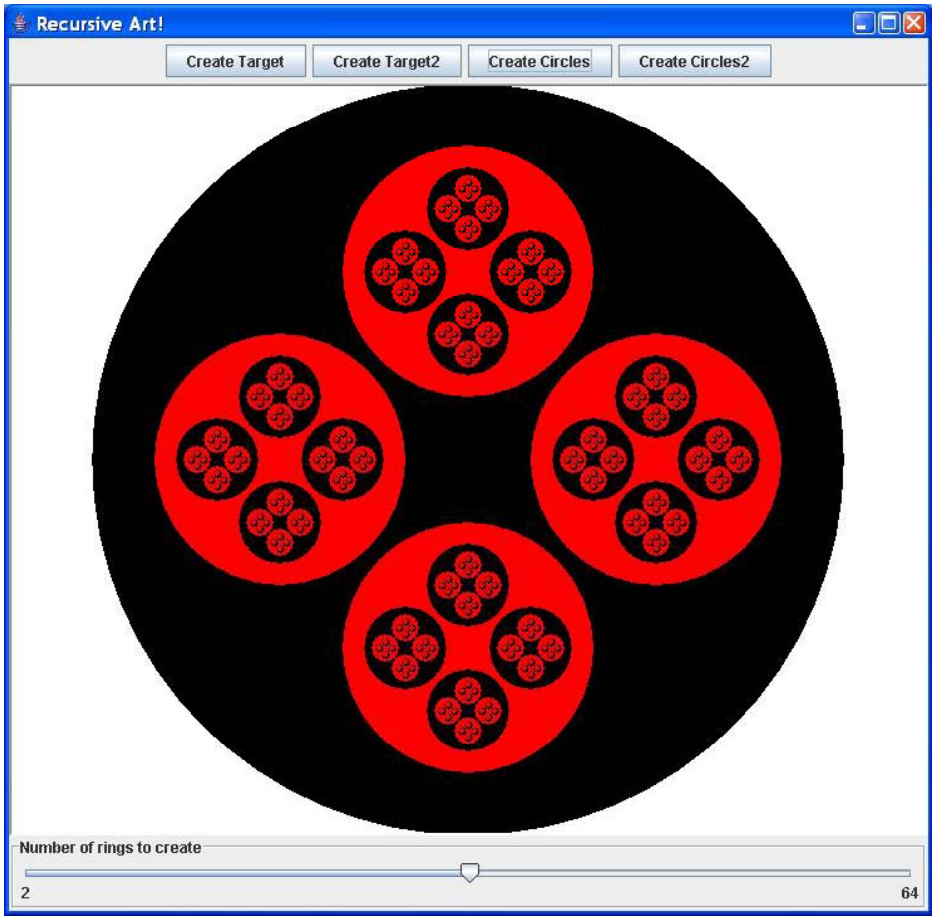


Another Problem - Circles

- 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

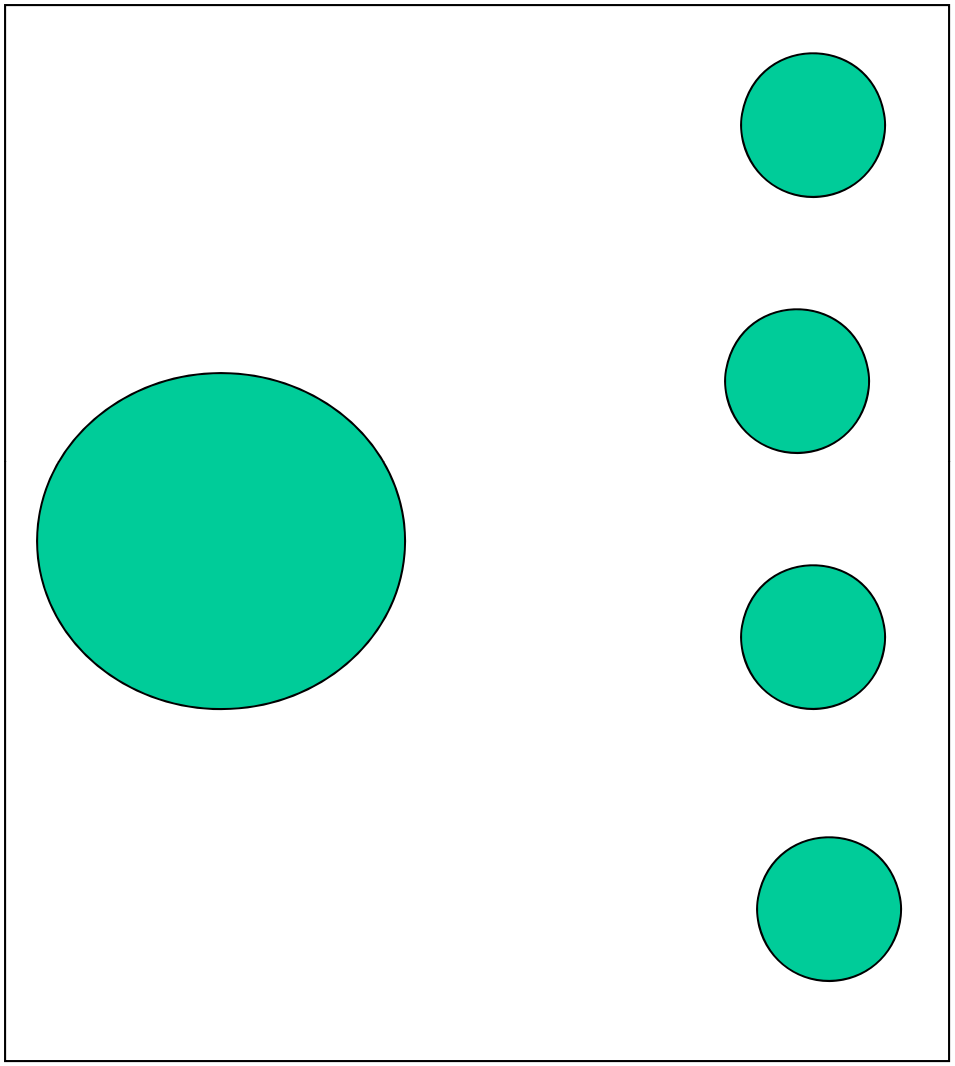
- How to do Colors
- Note in Circle constructor, default color is Black
- You can add parameters to recurseDraw – add one that increments by 1 each time
- Then if that number is even draw one color, if odd then draw another color – pick colors of your choice.



Another Problem: Circles2

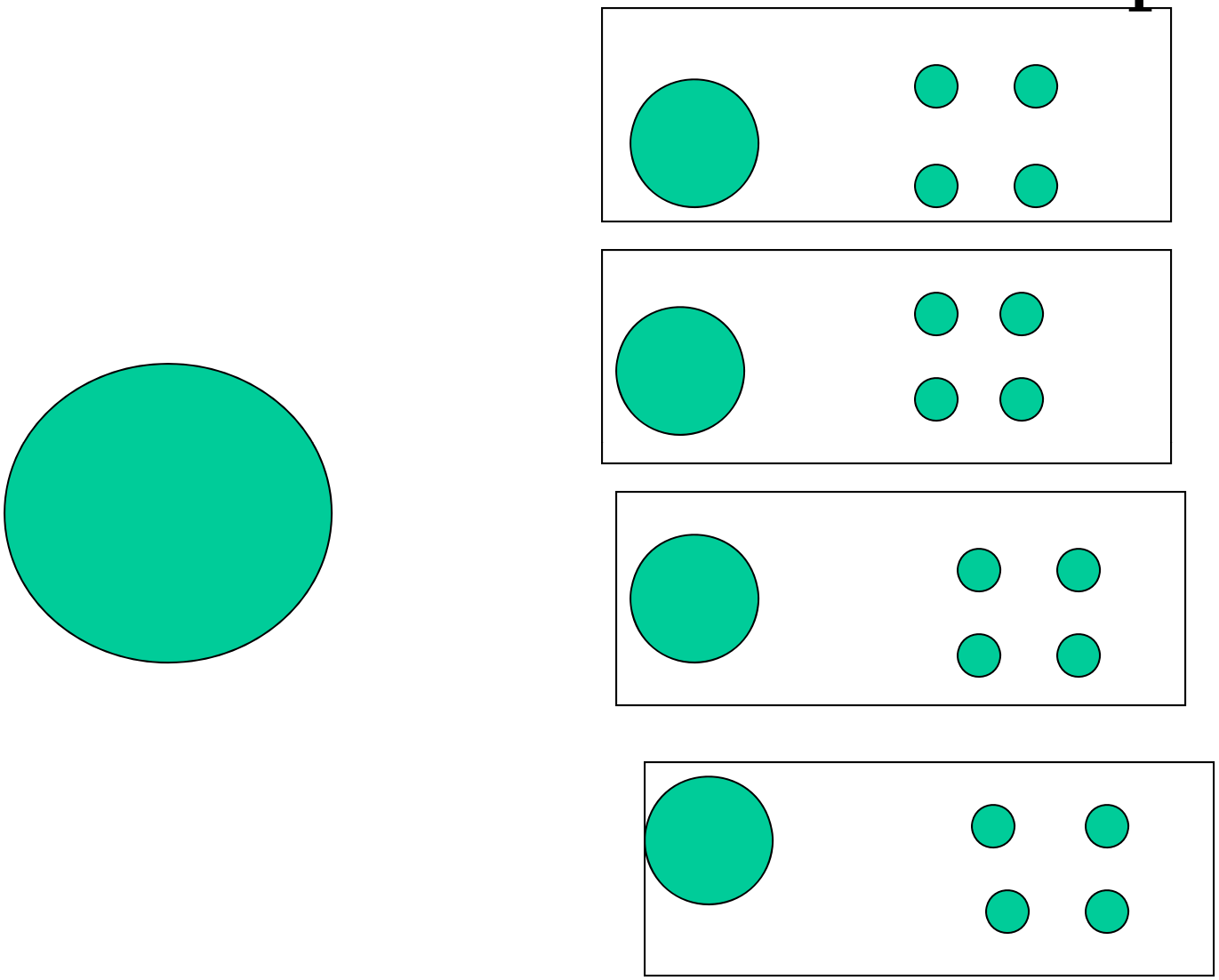
- Create multiple objects
- Private data – recursion here
  - Circles2[] myNext;
- Constructor – recursion here
  - Create one object
  - Recursively create an array of size 4 filled with 4 new Circles2
- Paint – recursion here
  - Paint me (the Circle2 object) and then recursively paint its four smaller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

Circles2 Idea – not the picture



Create me and recursively create 4 smaller Circle2’s

Circles2 Idea – not the picture



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