CS 129 HW5
Changing Shapes

Write a program that draws 100 circles to the screen. Each circle should be:

- A random size (both width and height) between 20 and 60
- A random RGB color
- A unique id, which is displayed inside the circle
  - Hint: `g.setFont(new Font("serif", Font.PLAIN, 15));` for a more readable font
  - Hint: `g.drawString(String s, int x, int y);` draws a String
- A random position, but somewhere within the panel
  - Partially off-screen still counts, but some part of every circle must be visible on the panel. That is, you should all 100 circles somewhere on the display at any time

When a circle is clicked, it changes to a new random color.

When the ‘a’ key is pressed, the circles all become squares, with the same width and height. Pushing the ‘a’ key again turns the squares back into circles. The id, color, size, and position of the shapes **must not change** when the key is pressed!

When the ‘s’ key is pressed, the shapes all relocate to a new random position. The id, color, shape type (square or circle), and size of each shape **must not change**!

When the ‘d’ key is pressed, the shapes all get a new random size, again between 20 and 60. The id, color, shape type (square or circle), and position of each shape **must not change**!

Hint: For sharper text and other generally better image quality, add this to the top of your paintcomponent method, after creating g as a Graphics2D:

```
g.setRenderingHint(
      RenderingHints.KEY_ANTIALIASING,
      RenderingHints.VALUE_ANTIALIAS_ON);
```

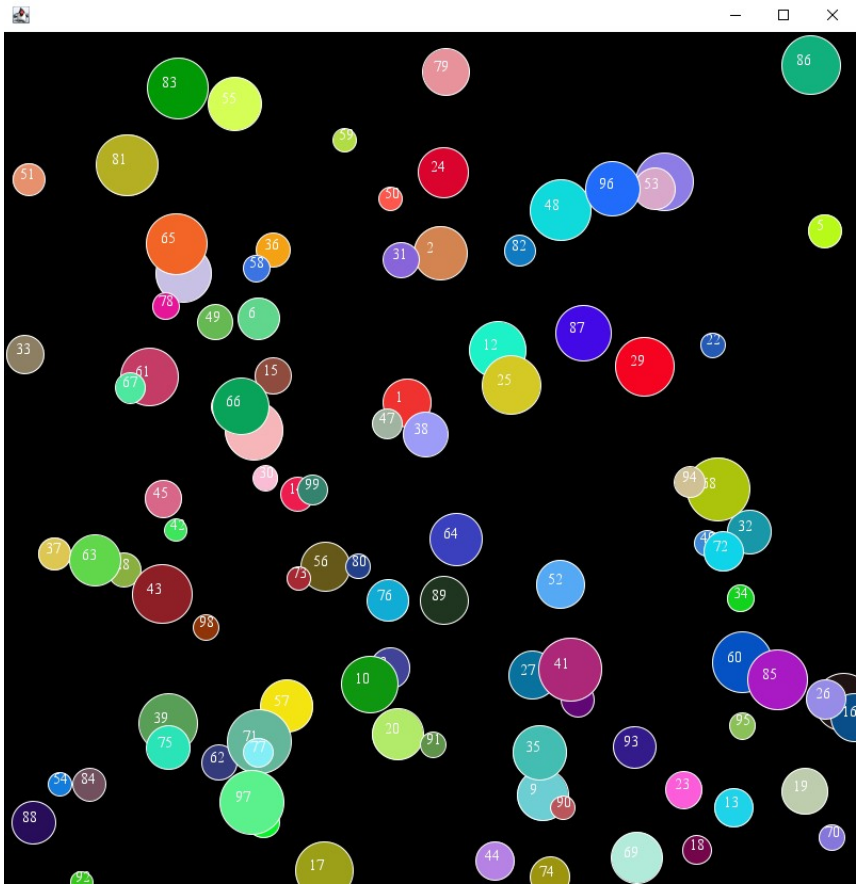
Extra credit (5%) if the id is perfectly centered inside the shape. It has to be perfectly centered, for both single and double-digit numbers. Hint: the FontMetrics class has utilities to measure the actual size of drawn text.

Extra credit (10%) if no two shapes can ever occupy the same space. If a shape is randomly placed, and it’s touching another shape, place it somewhere else. Hint: the “intersects” method returns true if two shapes are touching.

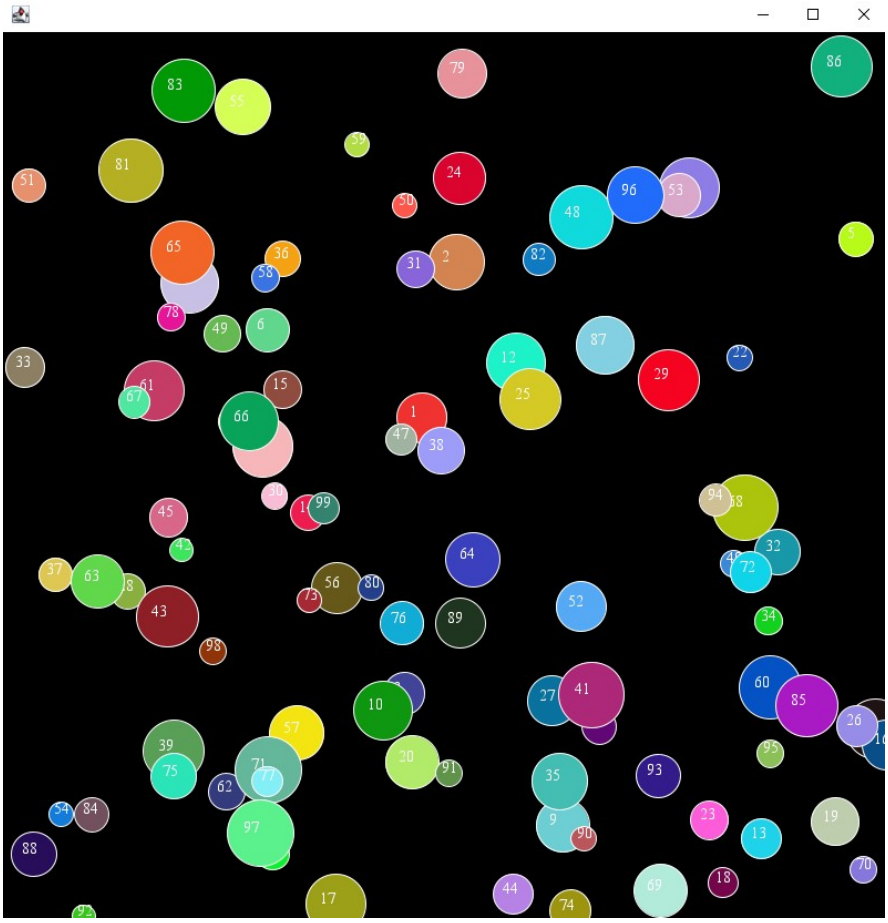
As always, up to 5% extra credit for exceptional documentation, especially method and class headers.

Application Start

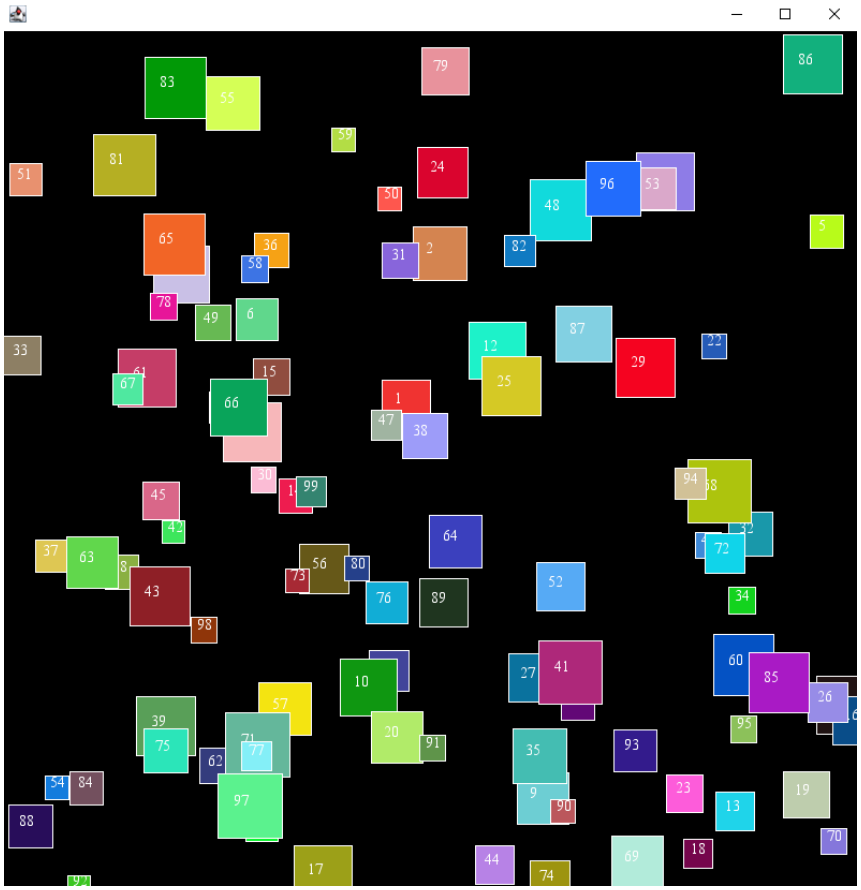
(Bonuses not pictured)



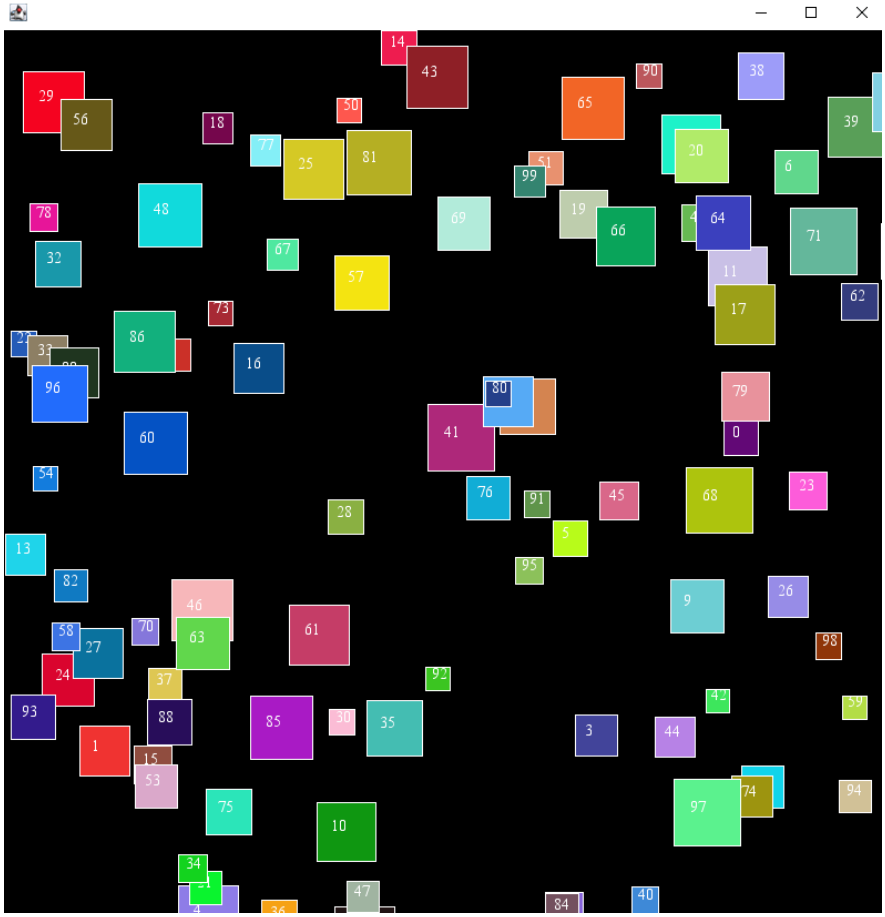
Clicked on 87 (in the top right part of the screen). It turned teal.



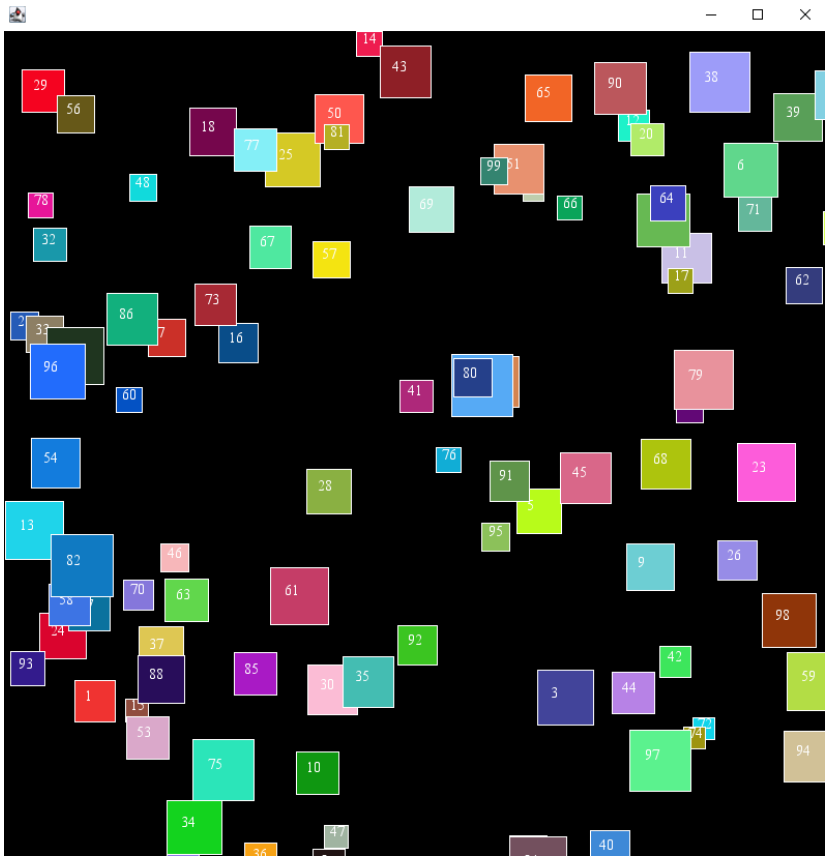
Pressed ‘a’. Note that all shapes are still the same id, color, position, and size



Pressed ‘s’. Note that all shapes are still the same id, color, and size. (see if you can find a few with the same id from the previous image)



Pressed ‘d’. Note that all shapes are still the same id, color, and position.



Pressed ‘a’ again.