While loops in ArtLab

```
1. int counter;
2. g2.setPaint ( green );
3. width = 100;
4. height = 100;
5. counter = 0;
6. while (counter < 10)
7. { 
8.   newShape();
9.   x = 200;
10.  y = 20 + counter * 30;
11.  g2.drawOval(x, y, width, height);
12.  counter = counter + 1;
13. }
```

Exercises

What would happen if:
- Line 6 were changed to: `while (counter < 8)`
- Line 5 were changed to: `counter = 5;`

Ifs and whiles combined

Here is what happens if line 11 is replaced with:

```
11a. if (counter%2==0)
11b. { g2.setPaint(cyan); }
11c. else
11d. { g2.setPaint(magenta); }
11e. g2.drawOval(x, y, width, height);
```

More exercises

How might you:
- Arrange the circles in a horizontal line?
- Arrange the circles along a diagonal line?
- Arrange the circles to be nested in each other?

Nested shapes and more...
`sample code (top right picture)`

```java
counter = 0;
while (counter < 30)
{
    newShape();
x = 300 - counter * 5;
y = 280 - counter * 5;
width = counter * 3;
height = counter * 10;
g2.drawOval(x, y, width, height);
    counter = counter + 1;
}
```

`sample code (top right picture)`

```java
counter = -100;
while (counter < 100)
{
    newShape();
x = 150 + counter;
y = (int) Math.sqrt(10000 - (x-150)*(x-150));
width = 100;
height = 100;
if ( (counter % 2) == 0)  { g2.setColor (yellow); }
else
    { g2.setColor (black); }
g2.drawRect(x, 120 + y, width, height);
g2.drawRect(x, 120 - y, width, height);
    counter = counter + 3;
}
```

```java
int counter, counter2;
counter = 0;
while (counter < 8)
{
    counter2 = 0;
x = 50 + counter*150;
while (counter2 < 8)
{
    y = 50 + counter2*110;
g2.fillRect(x, y, 100, 100);
g2.fillRect(x+50, y, 100, 100);
g2.fillRect(x+100, y, 100, 100);
g2.fillRect(x+50, y+100, 100, 100);
g2.fillRect(x+100, y+100, 100, 100);
    counter2 = counter2 + 1;
}
counter = counter+1;
}
g2.setColor (orange);  counter = 0;
while (counter < 8)
{
    counter2 = 0;
x = 50 + counter*150;
while (counter2 < 8)
{
    y = 50 + counter2*110;
g2.drawOval(x-10, y, 120, 100);
g2.drawOval(x-12, y-2, 125, 105);
g2.drawOval(x-15, y-5, 130, 110);
g2.drawOval(x-17, y-7, 135, 115);
    counter2 = counter2 + 1;
}
counter = counter+1;
}
```

`resources`

- cs015 web page at Brown University
  - click on "lectures" to see course slides and draft of book by Kate Sanders and Andries van Dam

- java.sun.com
  - java compilers (free) and tutorials
  - 2D graphics tutorial at [http://java.sun.com/docs/books/tutorial/2d/](http://java.sun.com/docs/books/tutorial/2d/)
more resources

- note from class at Dartmouth on art and math:
  http://www.dartmouth.edu/~matc/math5.pattern/syllabus.html

- simple lessons on geometry in Islamic art:
  http://www.askasia.org/frclasrm/lessplan/l000030.htm

project idea

Using tools of the java ArtLab, figure out how to generate traditional geometric designs; explain your goals and approach.

resources

- programming environment designed by the MIT media lab for artists: http://processing.org/

- article about René Jodoin:
  http://www.awn.com/mag/issue5.07/5.07pages/robinsonjodoin.php3