

CS106 W2019 - Lab 01

Due: Wednesday, January 9, 11:59 PM

1. Complete these exercises to practice using objects. All sketches use the default 100 x 100 canvas unless noted otherwise.

SAVE each sketch as “L01_1a”, “L01_1b”, “L01_1c”, etc.

- a. Type the code below into a blank sketch:

```
Circle circle = new Circle();

void draw() {
    background(200);

    circle.display();
}

class Circle {

    float x;
    float y;

    void display() {
        ellipse(x, y, 30, 30);
    }
}
```

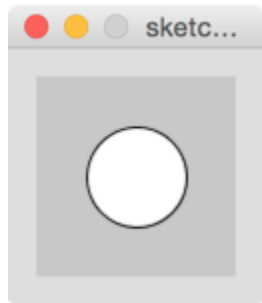
When you run this code you should see this:



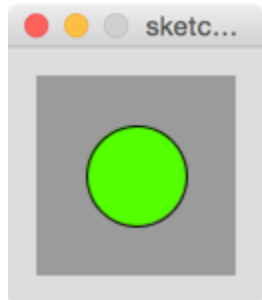
- b. Edit the code in the previous part so that the circle is located in the middle of the canvas. Do this by assigning 50 to the x and y fields of the circle object in your setup() function.



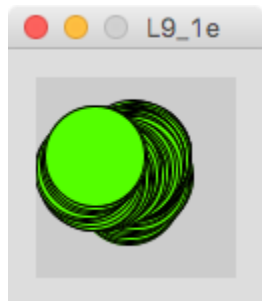
- c. Add a field called 's' to the Circle class for the size of the circle (the ellipse's width and height). Now, edit the code to assign 50 to the circle's 's' field in your setup() function.



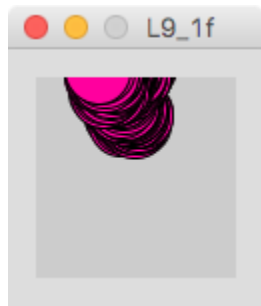
- d. Add a field called 'hue' to the Circle class for the hue of the circle (you'll need to change to the HSB colorMode). Assign 100 to the circle's hue in setup().



- e. Add a method to the Circle task called 'update'. In update, add random(-2, 2) to x and y. Call the circle object's update method in draw. Stop calling background each frame and you should see the circle wiggle around.



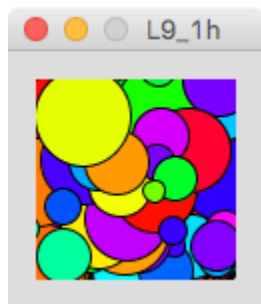
- f. Instead of setting the circle's position and size in `setup`, create a "constructor" in the circle class and set `x`, `y`, `s`, and `hue` to random values (choose reasonable ranges). Remove the statements in `setup()` where you were setting the fields in circle directly.



- g. So far, you are getting practice using objects, but the code doesn't seem to be much better than plain old functions and variables. To show the benefit for using objects, declare and create 3 circle objects and call each of their update and display methods in `draw()`. You should see 3 circles wiggling around leaving a trail behind them. Note that you didn't need to create multiple copies of the `x`, `y`, `s`, and `hue` variable for each circle.

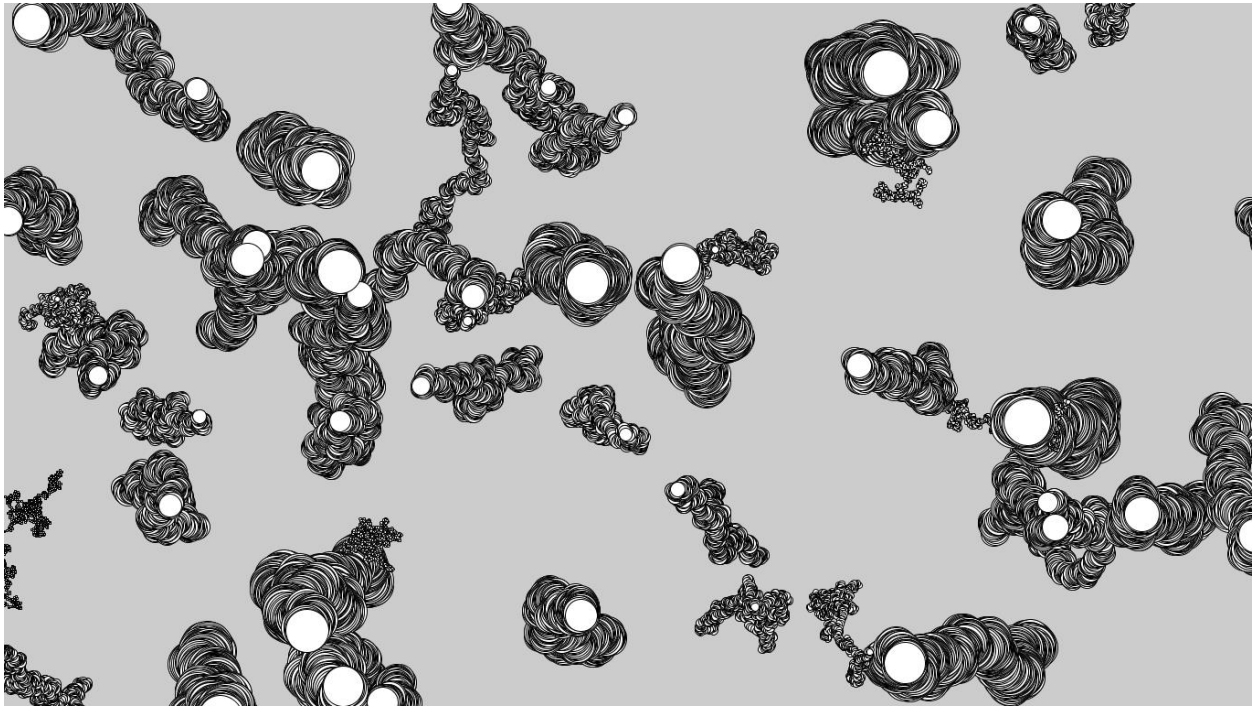


- h. To push the benefit of objects even more, create an array of 100 Circle objects. You will need to add an array operation in `setup()` to initialize all array elements to `new Circle()`. Then you'll need another array operation in `draw()` to call the update and display method for each circle object stored in the array elements.



2) In Assignment 01 (A01) we will be using the following code as starter code. This code is based on Chapter 10 "Objects" in the book "Make: Getting Started with Processing" by Reas and Fry (2nd edition, 2015).

- a) Either “cut and paste” or type the following code into Processing and ensure it runs correctly. Document the code using comments. After a minute or so your screen should look something like the following:



```

JitterBug[] bugs = new JitterBug[50];

void setup() {
  fullscreen();
  // Create object and pass in parameters
  for (int i=0; i<bugs.length; i++) {
    int s = i + 2;
    bugs[i] = new JitterBug(random(width), random(height), s);
  }
}

void draw() {
  for (int i=0; i<bugs.length; i++) {
    bugs[i].move();
    bugs[i].display();
  }
}

class JitterBug {
  float x;
  float y;
  int diameter;
  float speed = 2.5;

  JitterBug(float tempX, float tempY, int tempDiameter) {
    x = tempX;
    y = tempY;
    diameter = tempDiameter;
  }

  void move() {
    x += random(-speed, speed);
    y += random(-speed, speed);
  }

  void display() {
    ellipse(x, y, diameter, diameter);
  }
}

```

Submitting

Submit all sketch directories from this lab as one ZIP file **called L01.zip** to the lab dropbox (under Assessments on Learn). Consult “How to Submit: Handing in Code for Labs and Assignments” on Learn for more information how to create a ZIP.

It is your responsibility to submit to the correct dropbox with the correct files before the deadline. Otherwise you will receive a mark of 0.