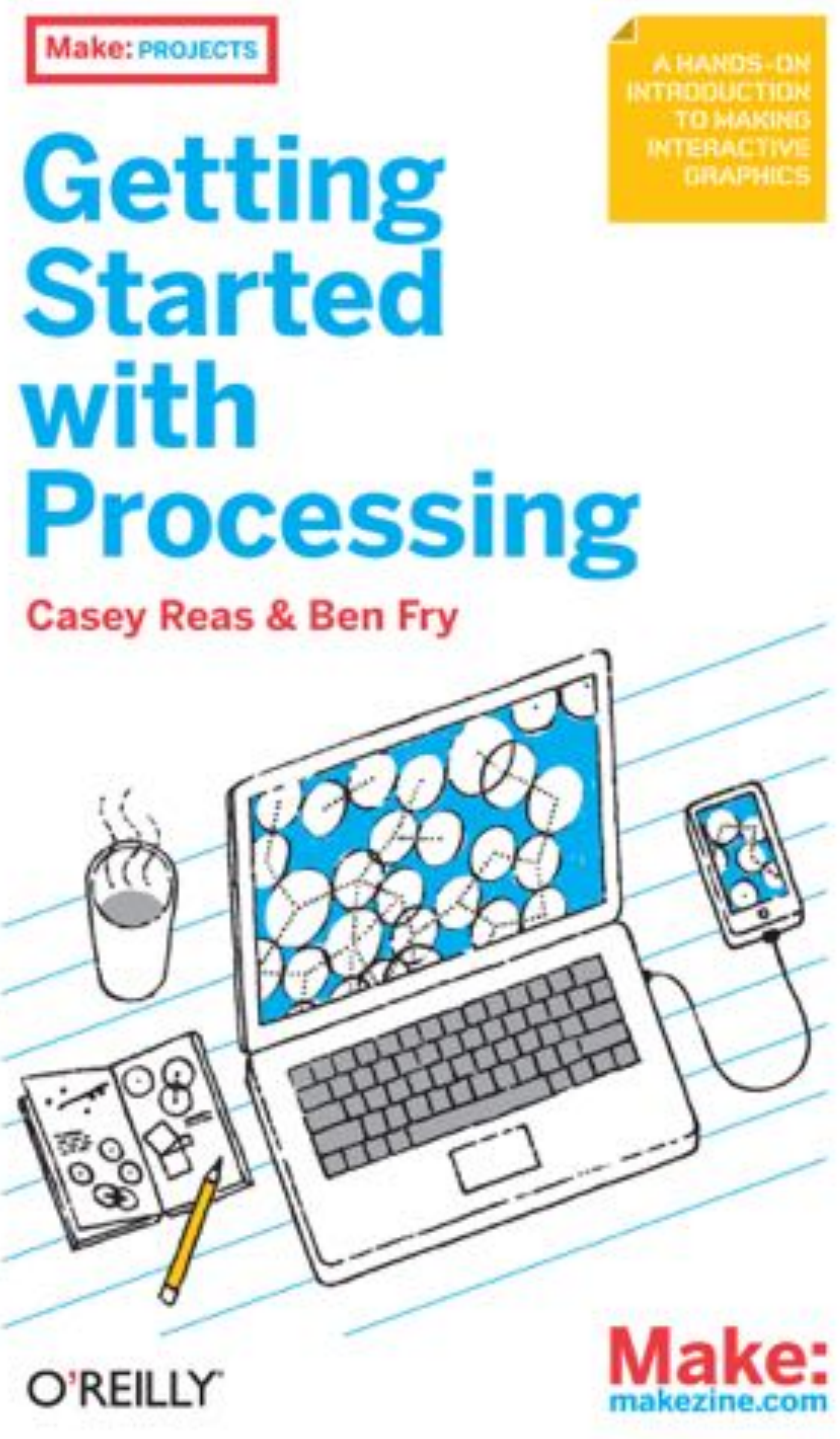
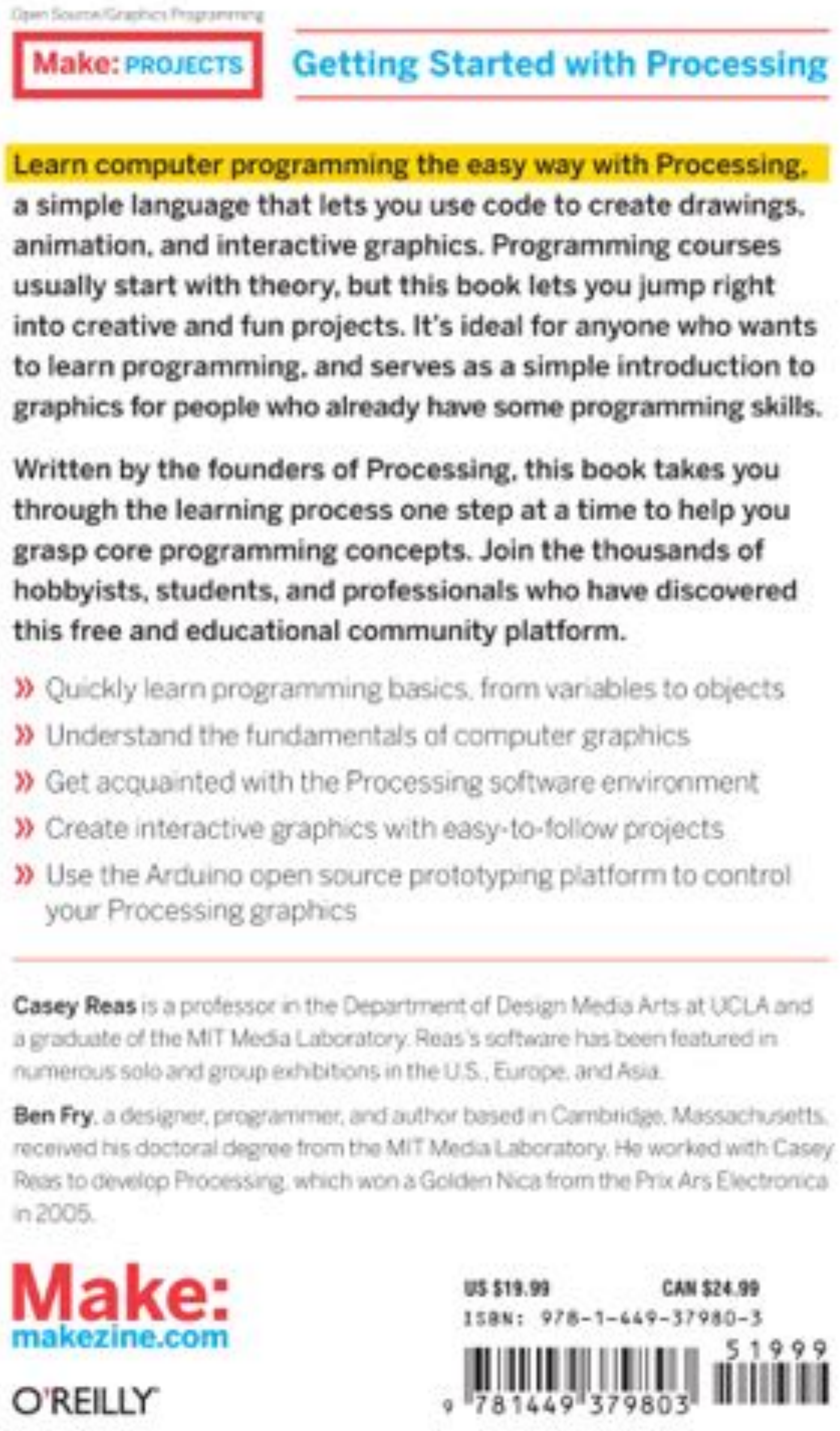
USC IML 288 __ 2018.11.12

Flocking

all code illustrations taken from the processing.org website +





Robert Hodgin / flight404 : murmuration+fox movies / https://vimeo.com/flight404

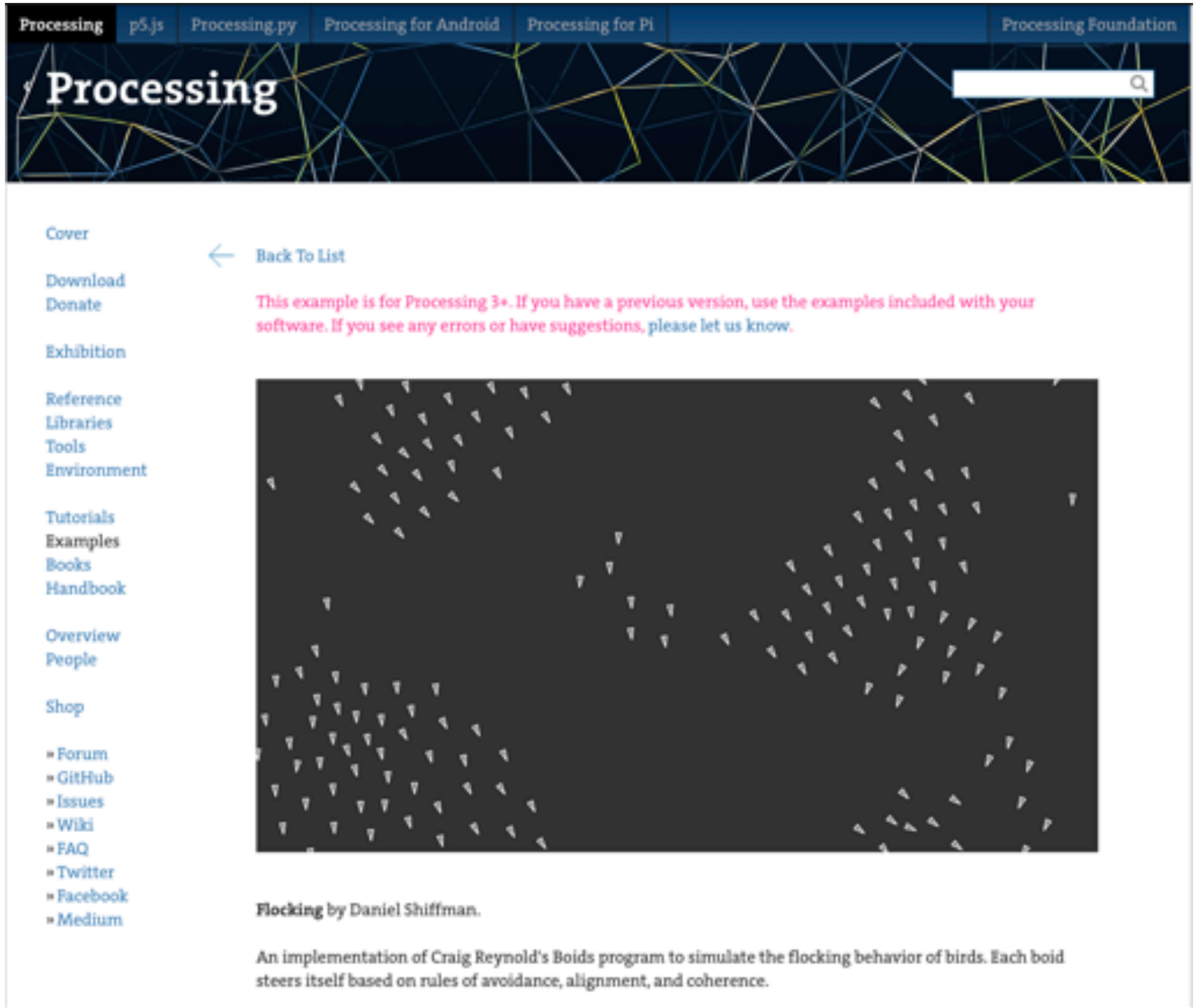
Robert Hodgin / flight404 : murmuration / https://vimeo.com/132161478

Robert Hodgin / flight404 : murmuration with obstacles / https://vimeo.com/141463798

Robert Hodgin / flight404 / https://vimeo.com/flight404

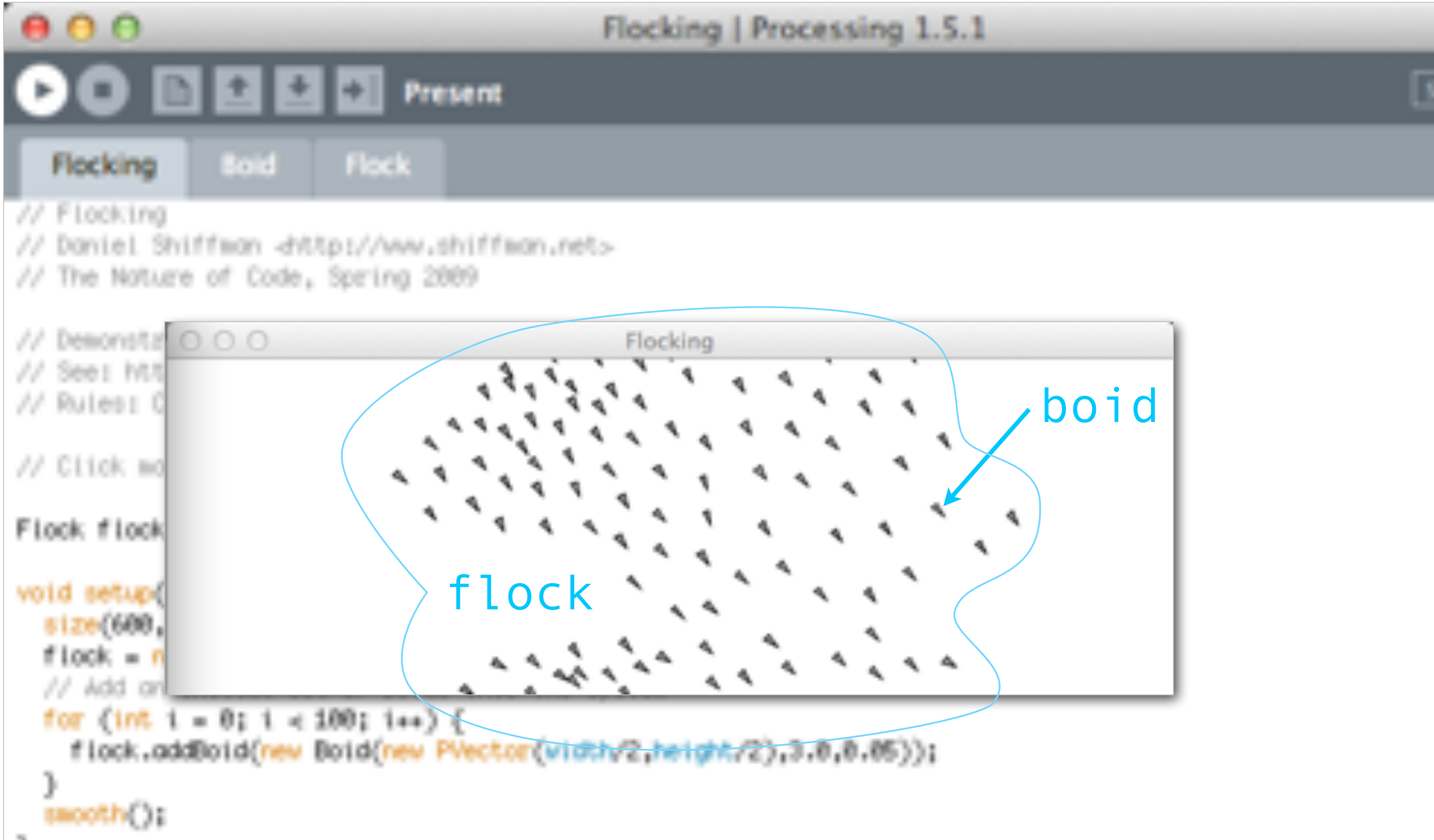
Robert Hodgin / flight404 : Fish Tornado, revisited / https://vimeo.com/132161782

Robert Hodgin / flight404 : Dense bait ball, 5000 fish / https://vimeo.com/64937983



Start with the flocking code from:
https://processing.org/examples/flocking.html

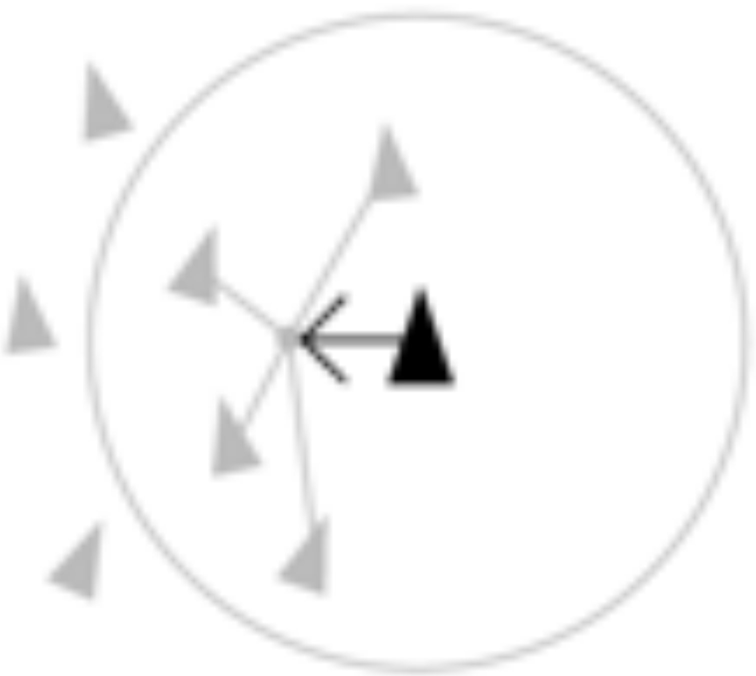
object oriented programming // classes



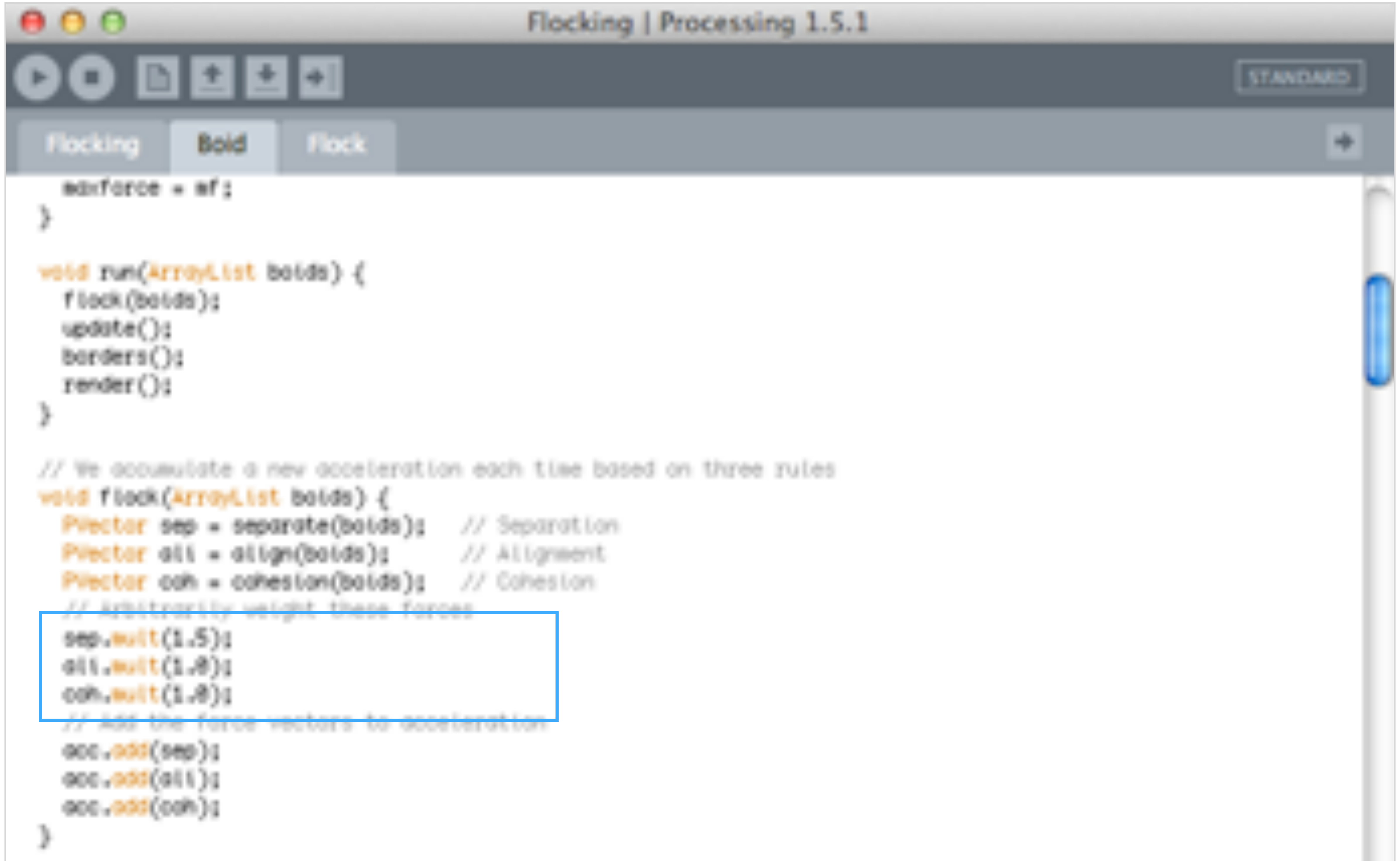
the flocking algorithm...

Separation:
Steer to avoid crowding
local flockmates

Alignment:
Steer toward the average
heading of local flockmates



Cohesion:
Steer to move toward the average
position of local flockmates



Typical Class Structure:

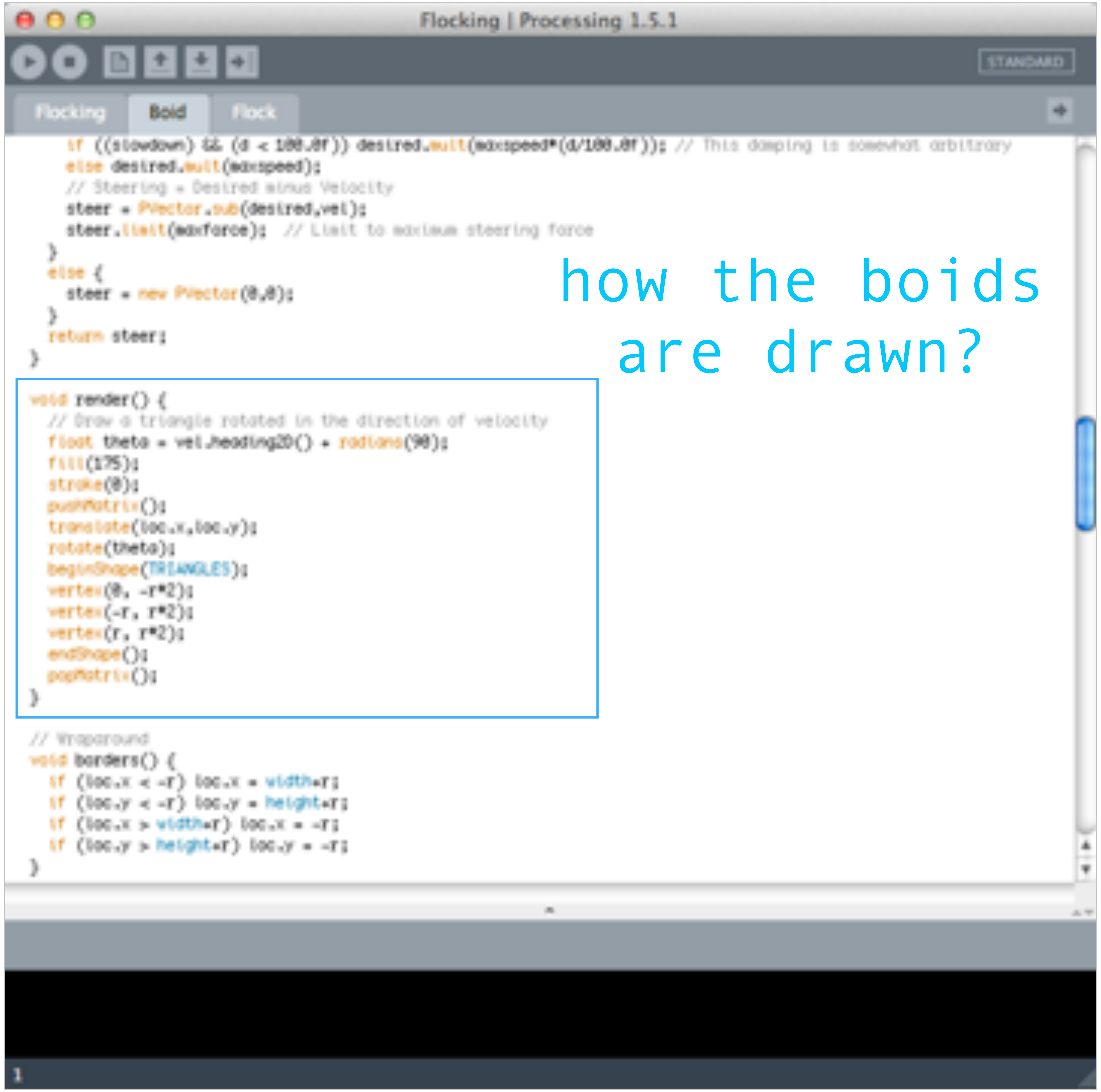
```
class JitterBug {

  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);
  }

}
```

Block

Fields

Constructor

Methods



how the boids are drawn?

Flocking | Processing 1.5.1

Flocking | Boid § | Flock

```
// Alignment
// For every nearby boid in the system, calculate the average velocity
PVector align (ArrayList boids) {
  float neighbordist = 50.0;
  PVector steer = new PVector(0,0,0);
  /*int count = 0;
  for (int i = 0 ; i < boids.size(); i++) {
    Boid other = (Boid) boids.get(i);
    float d = PVector.dist(loc,other.loc);
    if ((d > 0) && (d < neighbordist)) {
      steer.add(other.vel);
      count++;
    }
  }
  if (count > 0) {
    steer.div((float)count);
  }*/
  PVector mouseLoc = new PVector(mouseX, mouseY);
  PVector d = PVector.sub(mouseLoc, loc);
  steer.add(d);

  // As long as the vector is greater than 0
  if (steer.mag() > 0) {
    // Implement Reynolds: Steering = Desired - Velocity
    steer.normalize();
    steer.mult(maxspeed);
    steer.sub(vel);
    steer.limit(maxforce);
  }
  return steer;
}

// Cohesion
// For the average location (i.e. center) of all nearby boids, calculate steering vector towards that location
```

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can the flock
follow the mouse?

Have the boids follow the cursor.

Use the separation test to draw a connecting line between boids

Create a trail behind the boids.

Homework 11 // Due 2018.11.19

Develop a second draft of your final project in Processing. This could be 1 component of it in more detail, or a rougher overview of the whole project. If applicable (there's something new from last week) submit any notes, diagrams, inspiration references that are relevent to your final project in a folder inside the Processing sketch folder.

Size: 1280x720 pixels or 720x720 pixels

Continue to work on your own processing sketch based on Shiffman's implementation of the flocking algorithm. Make sure the visuals are sufficiently different from the starting example. Cite the code correctly.

Size: 1280x720 pixels or 720x720 pixels