Drawing pictures … It's not art, it's fun

Basic Processing …

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Announcements

- Slight adjustment to After Image Survey, check it out
- Late homework …

Review of Last Time

- Privacy -- *The right of people to choose freely under what circumstances and to what extent they will reveal themselves, their attitude, and their behavior to others*
- On the WWW we meet people from all over the world – tolerance and respect necessary
- Be cautious what you reveal about yourself on FB, Twitter and other social settings – there are risks
- LAB: What's FA in binary???

Processing …

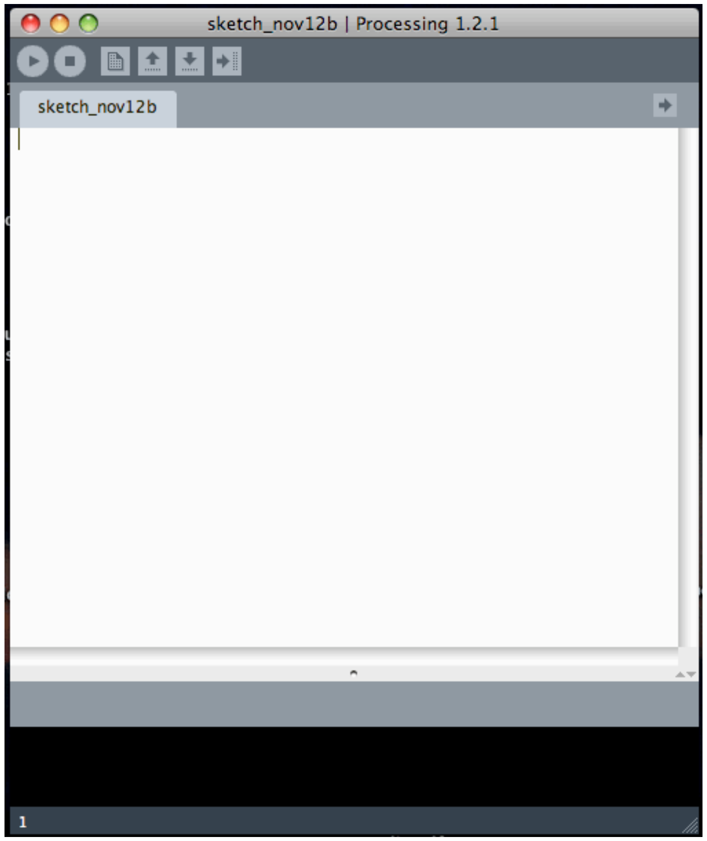
- Processing is kind of a dumb name, but it is a good (and fun) language
- It's a language for programming graphical and image-based computations
  - More fun than programming an operating system
  - Easier to do because we "see" what's happening

Short Interrupt: Grab Processing

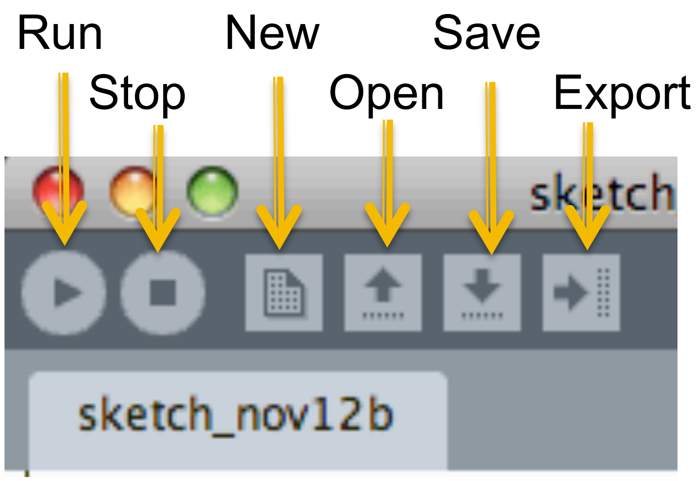
- If you have a personal computer that is convenient to do homework on, then grab a copy of the Processing system and put it on your machine … up you convenience!
- Grab it at: http://processing.org/download/
- You will want "Windows" or "Mac" versions
- Following installation instructions … it takes less than 5 minutes and then you can work on your own computer!

What You See

- When you start up the Processing system…



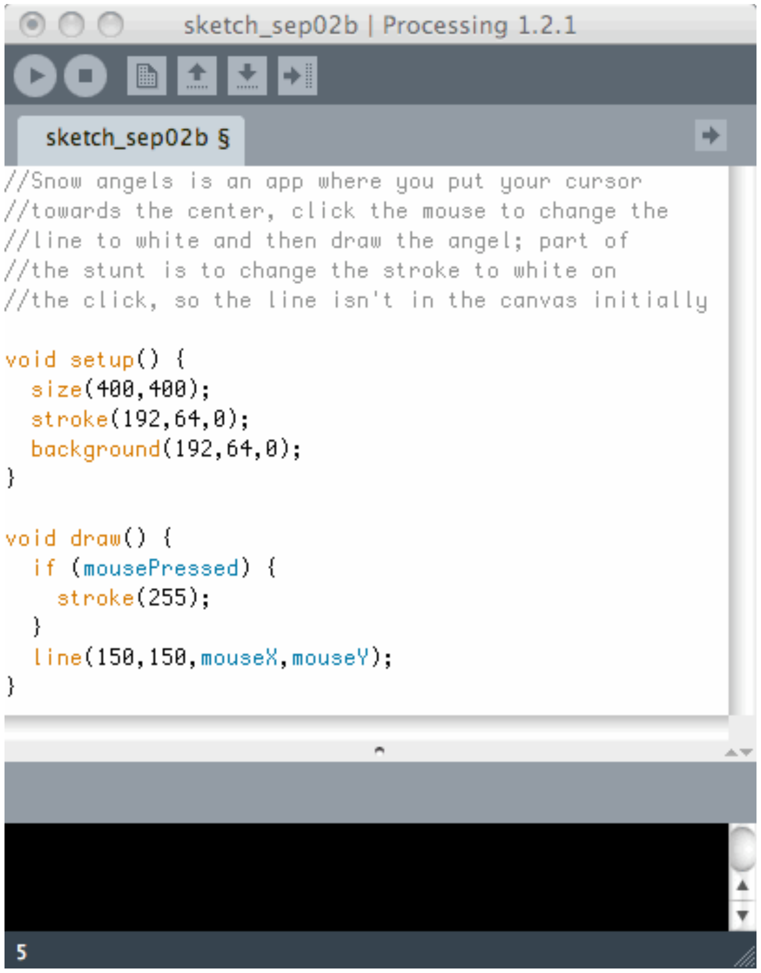
programming window



file name

Add Some Code

- Type in instructions that you will learn shortly

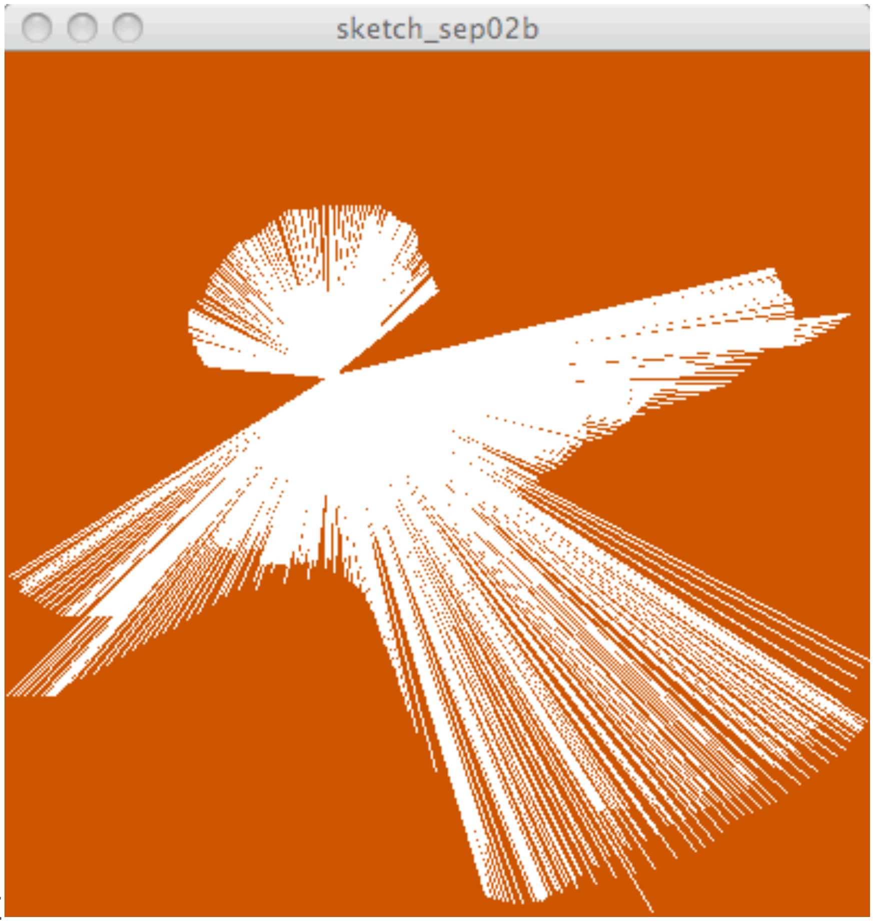


```
//Snow angels is an app where you put your cursor
//towards the center, click the mouse to change the
//line to white and then draw the angel; part of
//the stunt is to change the stroke to white on
//the click, so the line isn't in the canvas initially

void setup() {
  size(400,400);
  stroke(192,64,0);
  background(192,64,0);
}

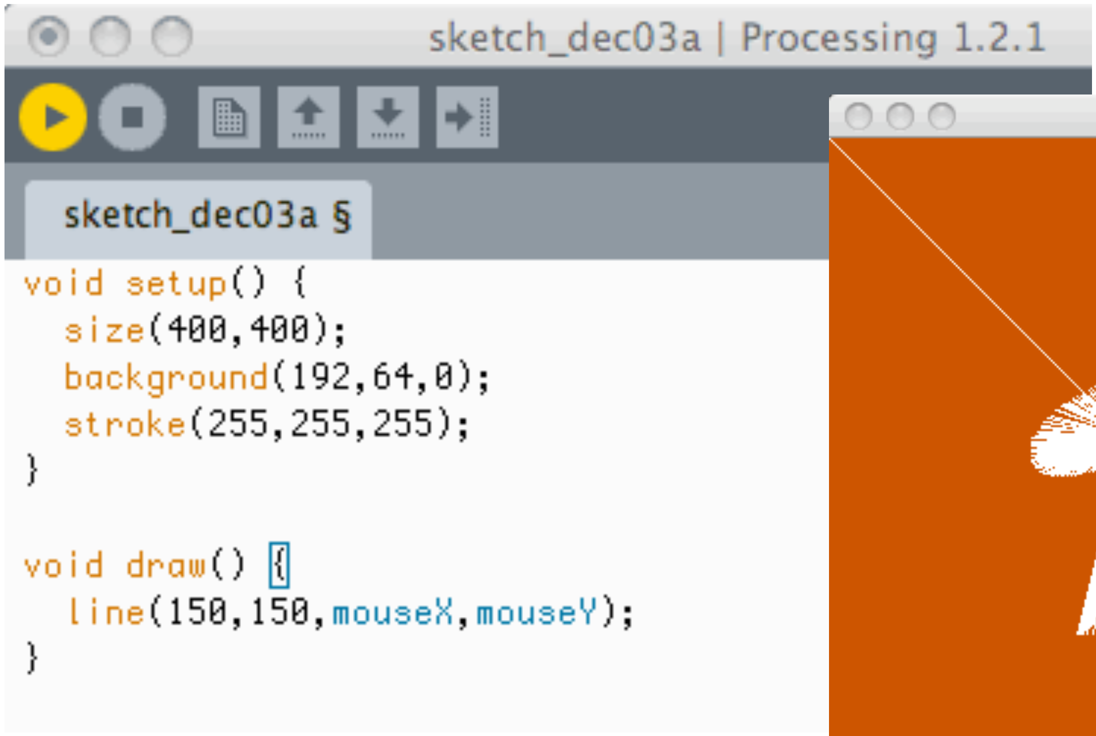
void draw() {
  if (mousePressed) {
    stroke(255);
  }
  line(150,150,mouseX,mouseY);
}
```

Then run your program



Looking At Simpler Code

- Drawing a snow angel is straightforward …



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}
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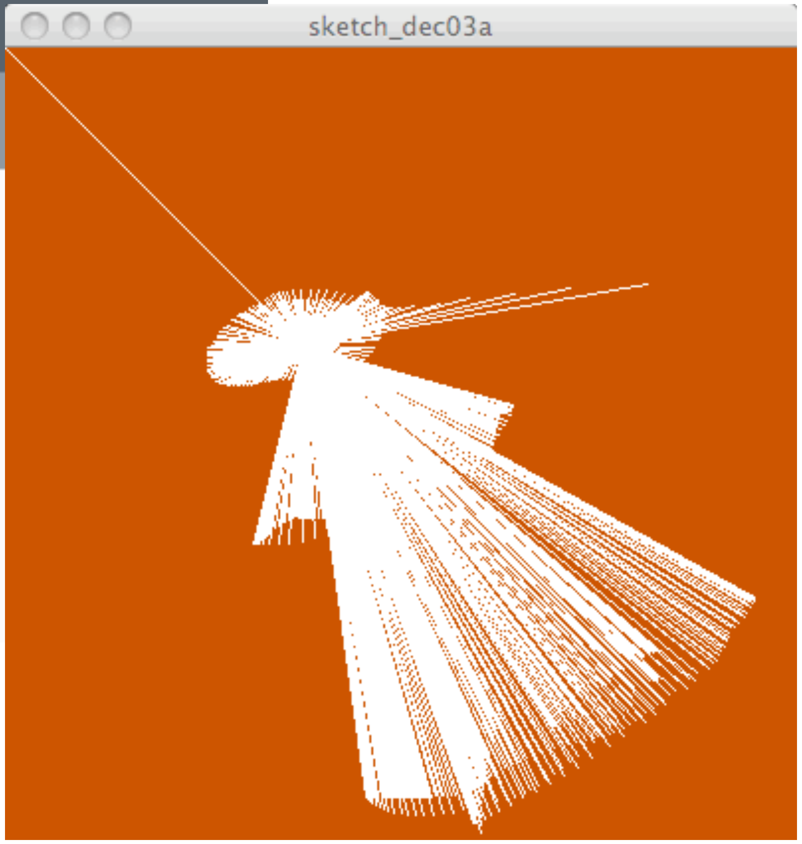

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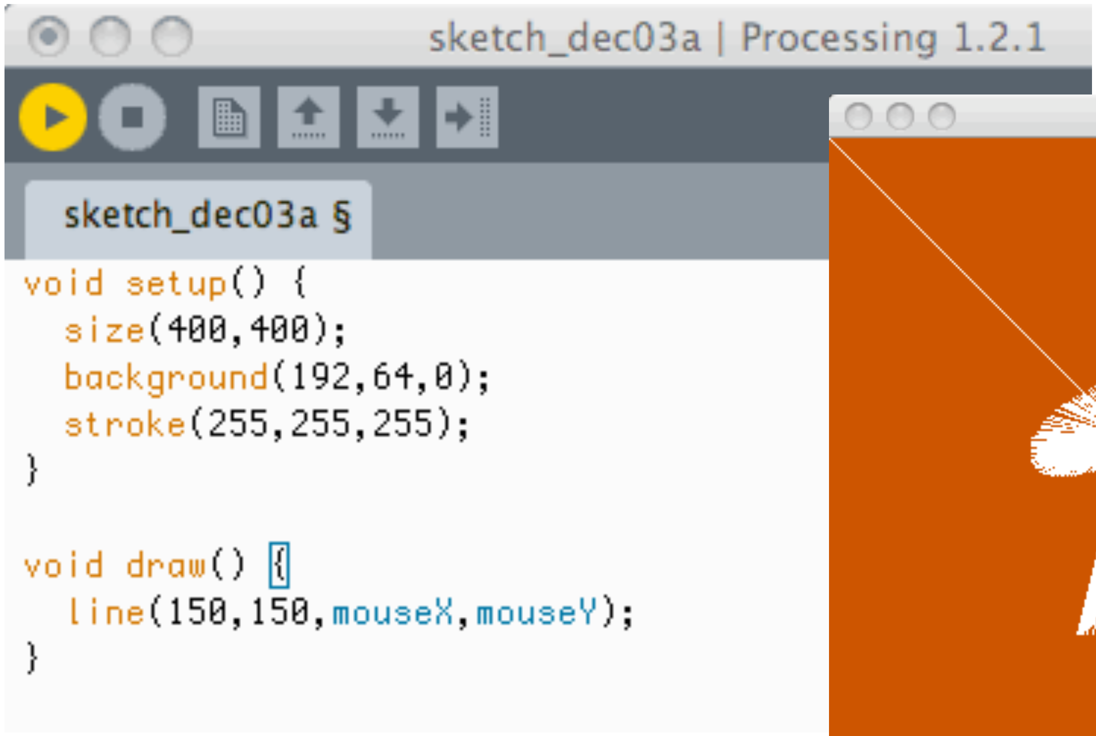

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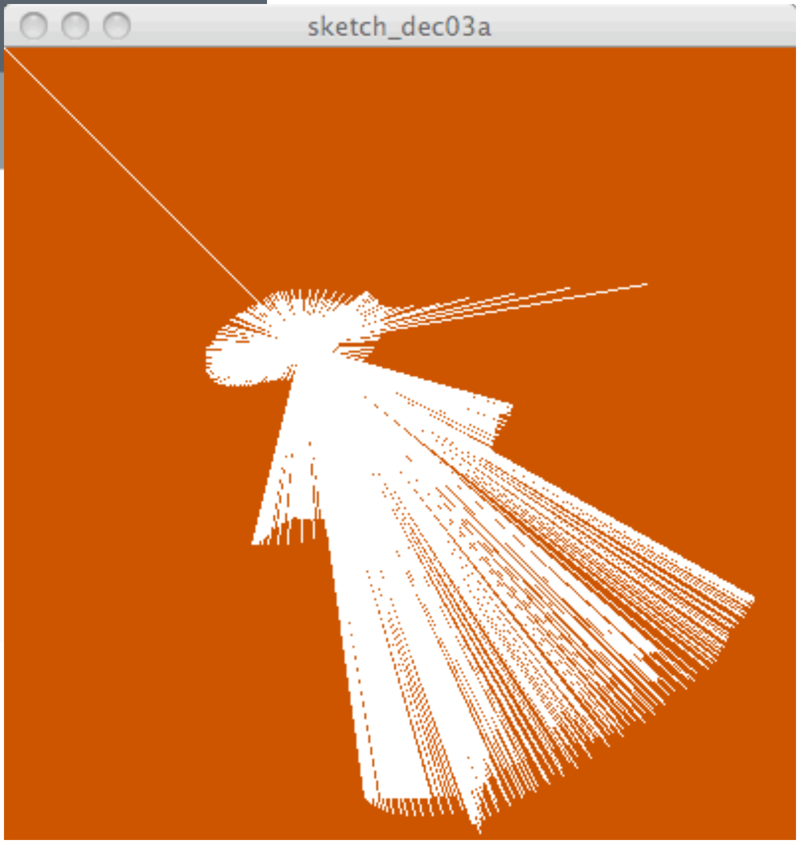
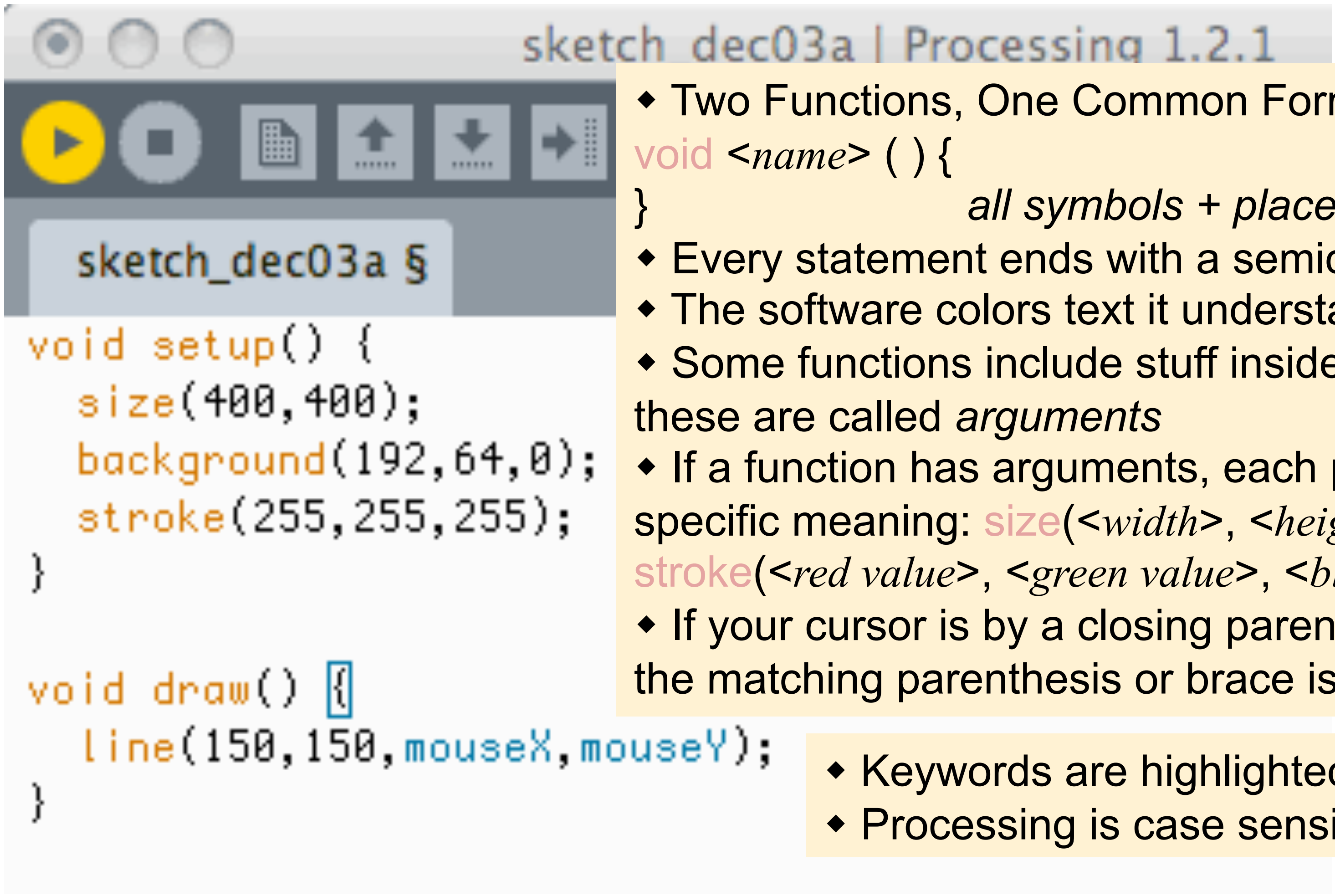


Just Do It!

Coding Is ALL Detail

- Notice everything!



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  stroke(255,255,255);
}

void draw() {
  line(150,150,mouseX,mouseY);
}
```

◆ Two Functions, One Common Form:
void <*name*> ( ) {
} *all symbols + placement, matter*
◆ Every statement ends with a semicolon (;)
◆ The software colors text it understands – helpful
◆ Some functions include stuff inside parentheses; these are called *arguments*
◆ If a function has arguments, each position has a specific meaning: size(<*width*>, <*height*>); stroke(<*red value*>, <*green value*>, <*blue value*>);
◆ If your cursor is by a closing parenthesis or brace, the matching parenthesis or brace is highlighted

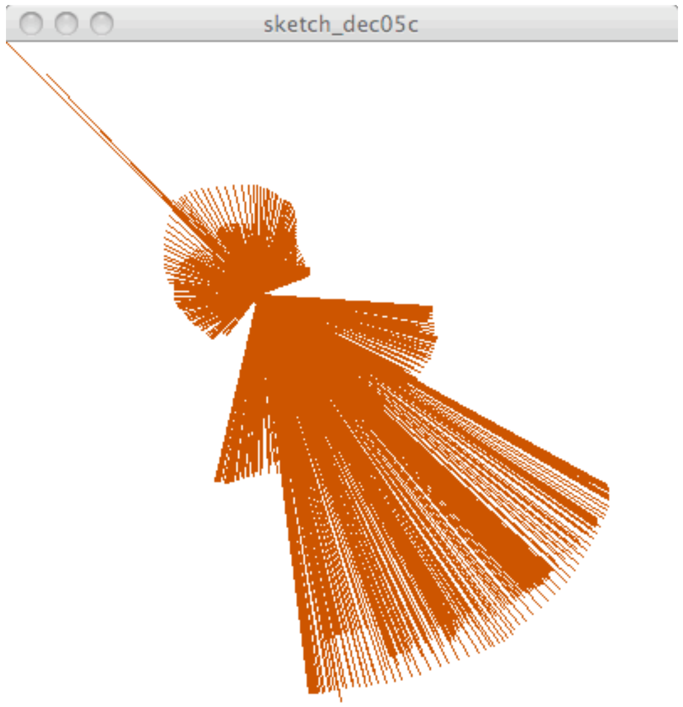
◆ Keywords are highlighted in blue
◆ Processing is case sensitive; notice!

The Color Purple

- Colors in most Web programming are given as three values: RGB, for red, green, blue
- The Color Purple, for example, is: **128,0,128**
- These positions are the intensity of the little lights that make up a pixel on the screen
  - The least intensity is 0, that is, off
  - The greatest intensity is 255, maximum brightness
  - Amazingly, the three max RGB colors make **white**
  - So, purple is ½ intensity of Red, no Green, and ½ intensity of Blue … makes sense

Questions about "Iron Rich Snow"

- The angel is on an rust-colored background specified by: `background(192, 64, 0);` … which means?
- Stroke sets line color: `stroke(255,255,255);`
- Suppose the angel is "iron rich" and the snow white
- Fill sets color of object: `fill(128, 0, 128);`

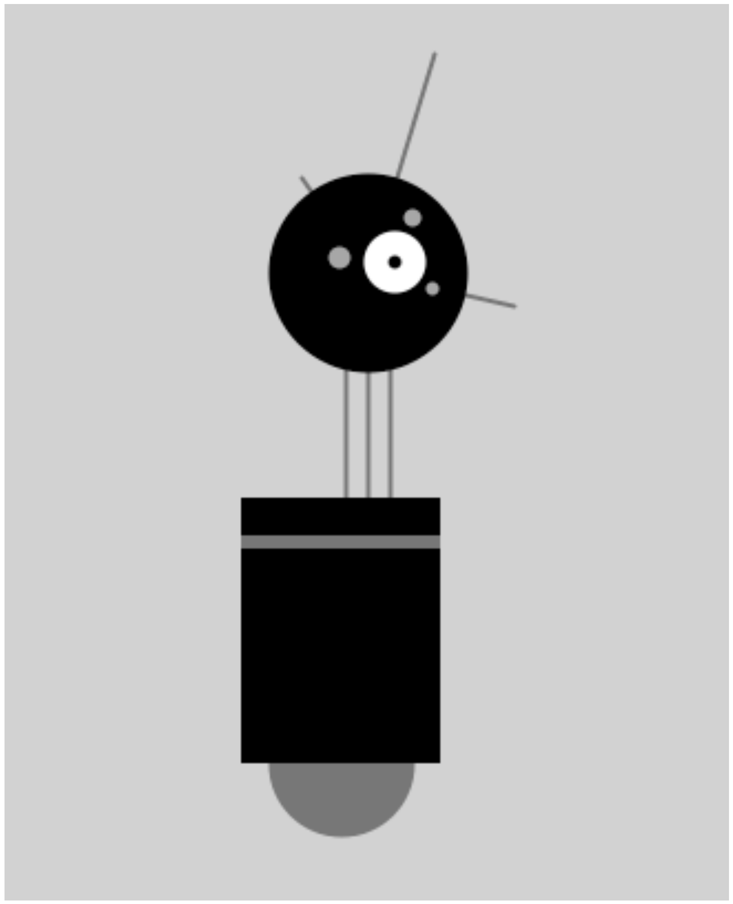


It’s All The Same

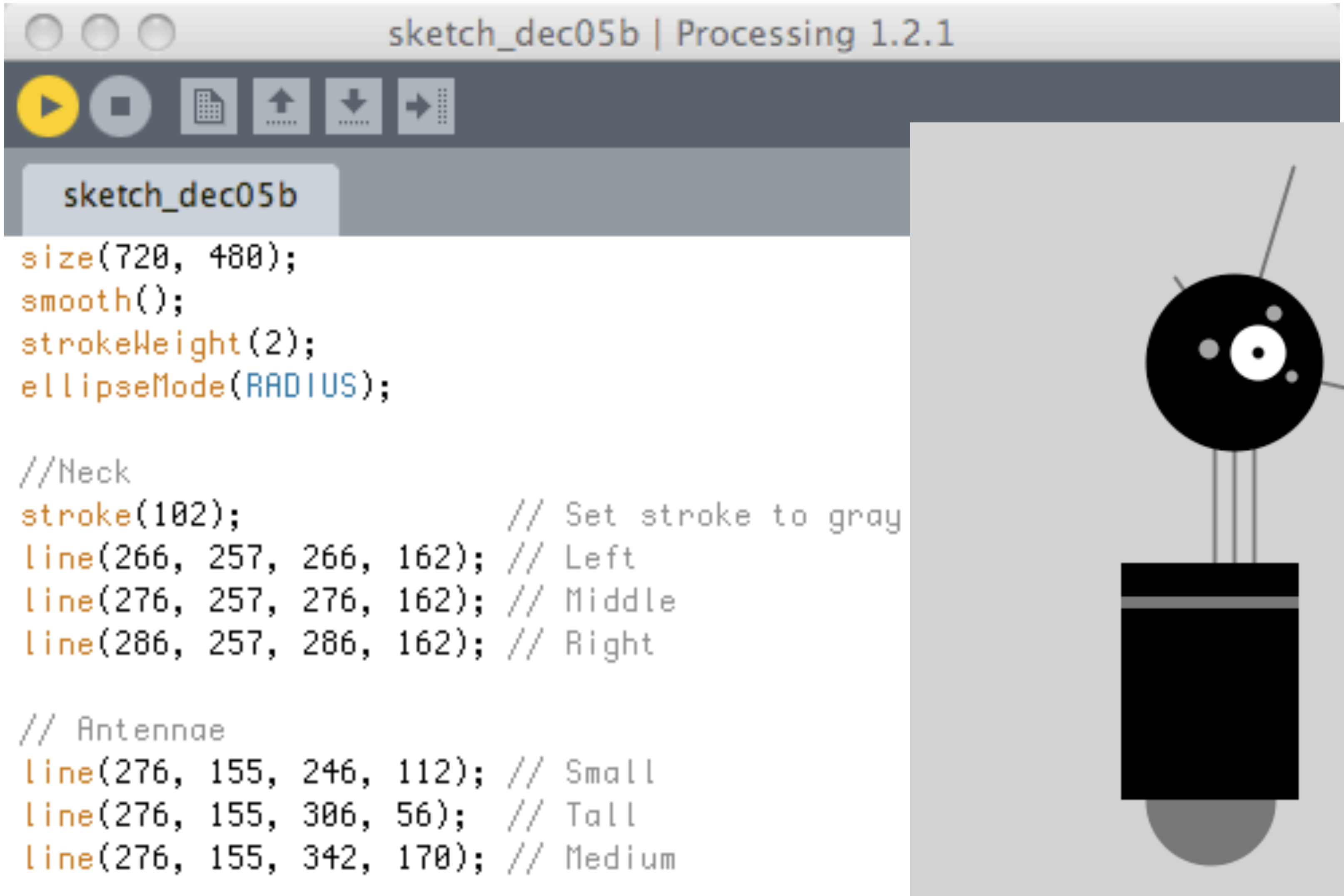
- When the values for RGB are all the same, it’s some color of gray, or white, or black
- Since writing `background(255,255,255)` is kind of a drag, Processing allows us to give just one argument; so `background(255)` is equivalent to giving all three `255`s
- What colors are these backgrounds?
  - `background(255,0,0);`
  - `background(64);`
  - `background(0,0,64);`

Simple Shapes Make Robots

- Reas and Fry, in their book, show us a cute robot they programmed using simple shapes
- They give their code and we can see how they built it
- To make the point that all code must "make sense" – its not gibberish – lets look at it even though we don't know Processing yet



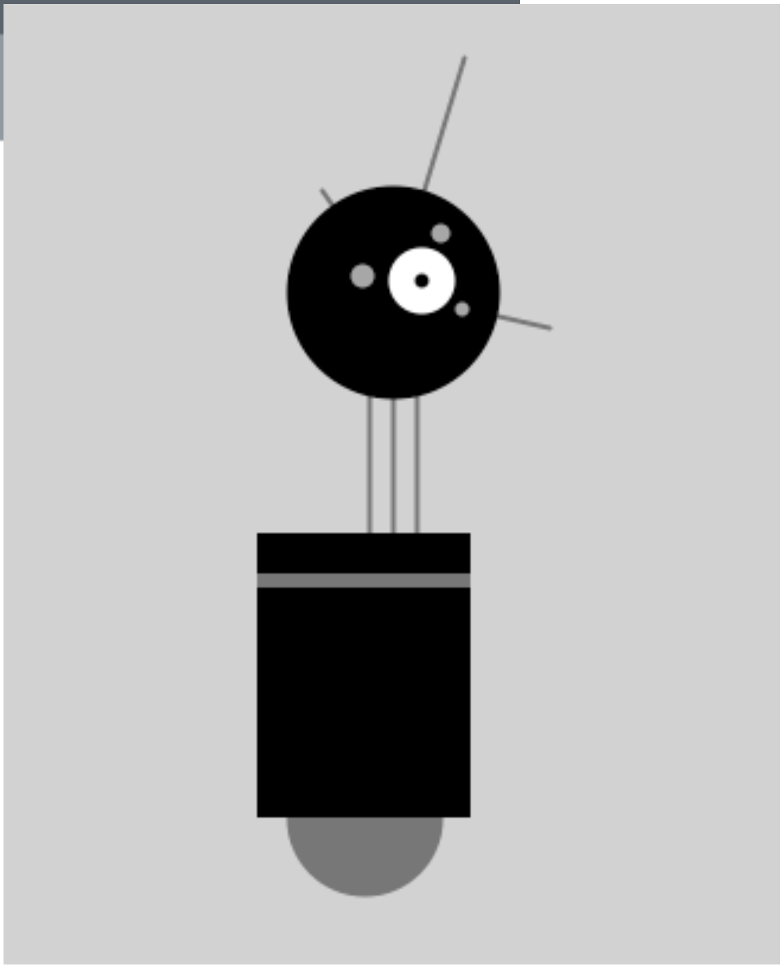
Robot Code, 1



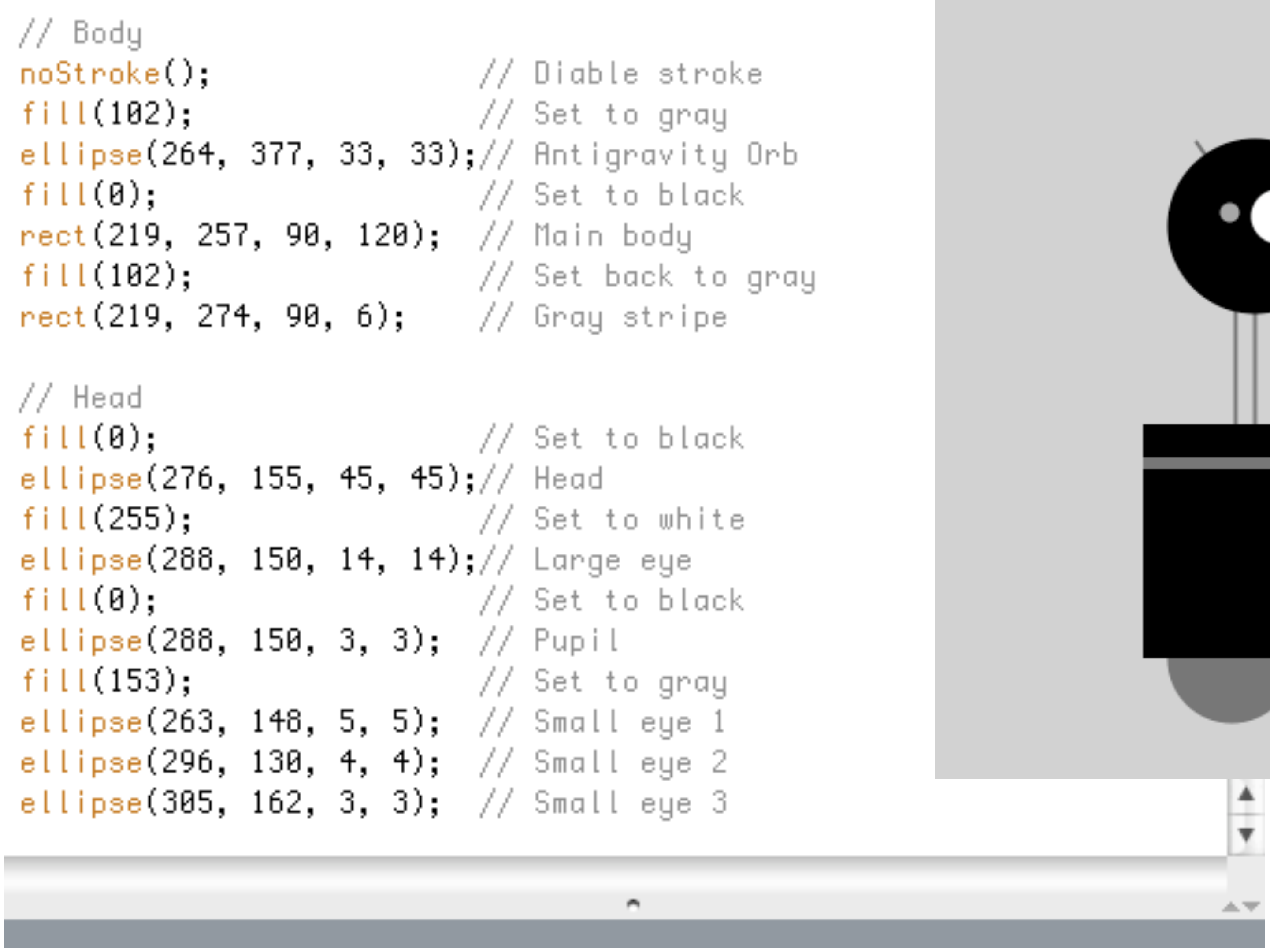
```
size(720, 480);
smooth();
strokeWeight(2);
ellipseMode(RADIUS);

//Neck
stroke(102);                   // Set stroke to gray
line(266, 257, 266, 162); // Left
line(276, 257, 276, 162); // Middle
line(286, 257, 286, 162); // Right

// Antennae
line(276, 155, 246, 112); // Small
line(276, 155, 306, 56);  // Tall
line(276, 155, 342, 170); // Medium
```

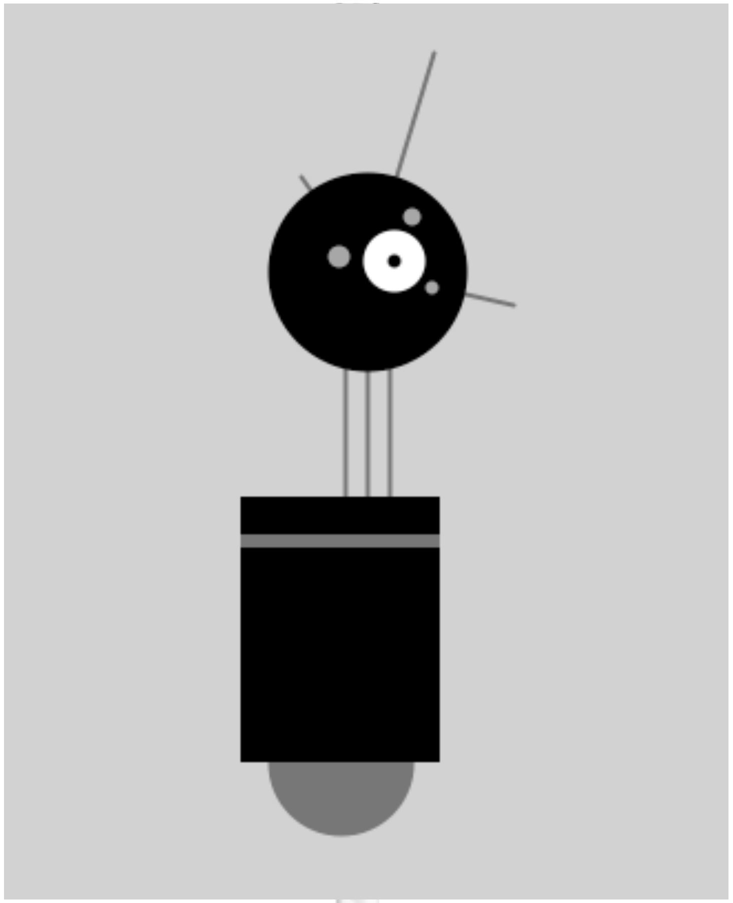


Robot Code, 2



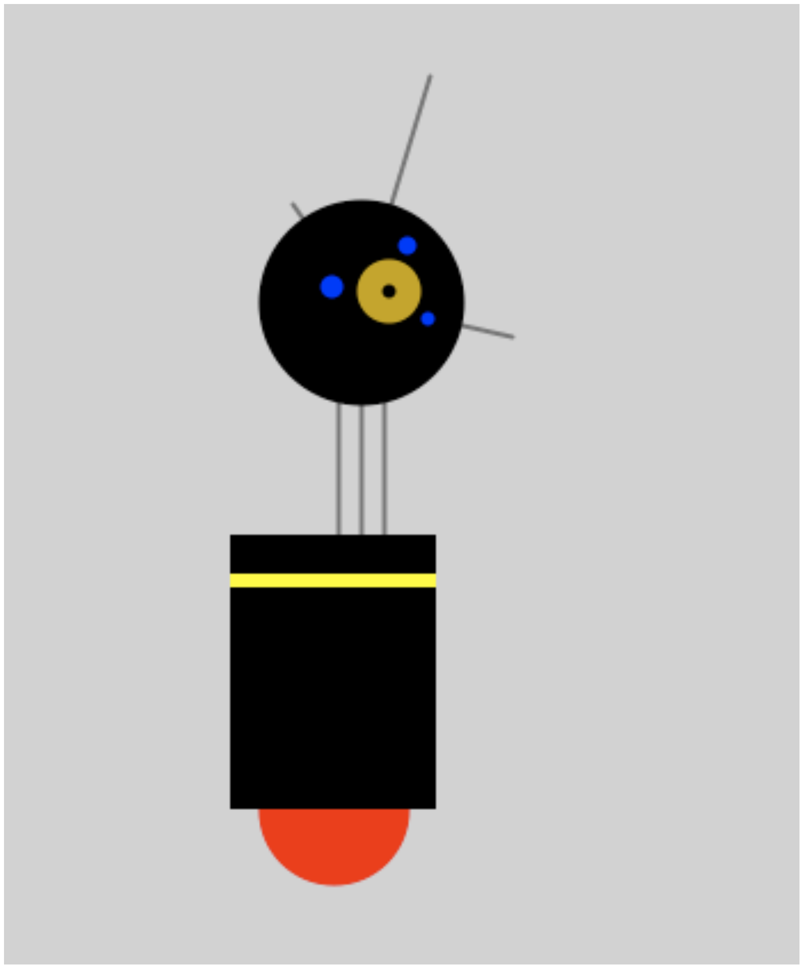
```
// Body
noStroke();                 // Diable stroke
fill(102);                  // Set to gray
ellipse(264, 377, 33, 33);// Antigravity Orb
fill(0);                    // Set to black
rect(219, 257, 90, 120);   // Main body
fill(102);                  // Set back to gray
rect(219, 274, 90, 6);     // Gray stripe

// Head
fill(0);                    // Set to black
ellipse(276, 155, 45, 45);// Head
fill(255);                  // Set to white
ellipse(288, 150, 14, 14);// Large eye
fill(0);                    // Set to black
ellipse(288, 150, 3, 3);   // Pupil
fill(153);                  // Set to gray
ellipse(263, 148, 5, 5);   // Small eye 1
ellipse(296, 130, 4, 4);   // Small eye 2
ellipse(305, 162, 3, 3);   // Small eye 3
```



Knowing Only About Color …

- We "improve" the robot by adding some color



Just Do It!