Intro to Computing

Lecture 2

Introduction to Processing

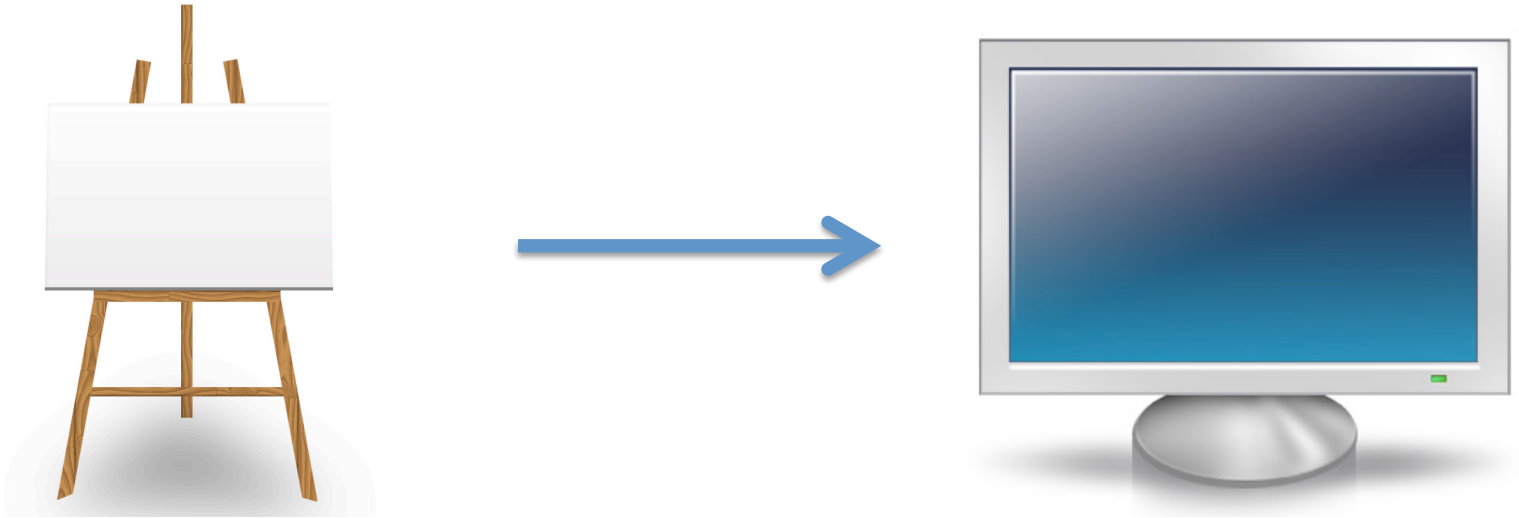
Class Lottery

- Make sure to sign the class roster.

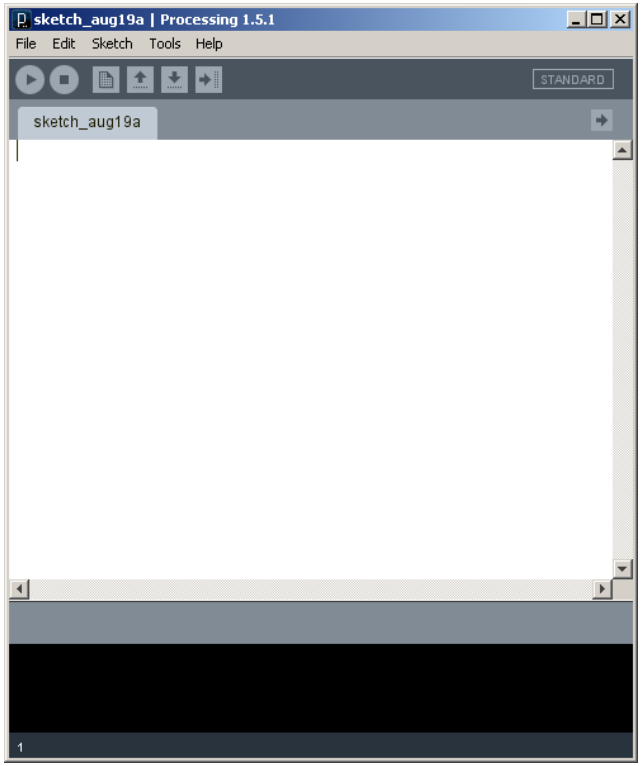
- If you are not “in” the lottery, indicate that. We will contact you by e-mail as soon as we have confirmation from other students.

Recap of Last Time

We are going to learn about computing (and computer science) through creating interactive computer-based art.



Computing as a Medium for Art



Processing 1.5.1, available at processing.org

Processing Canvas

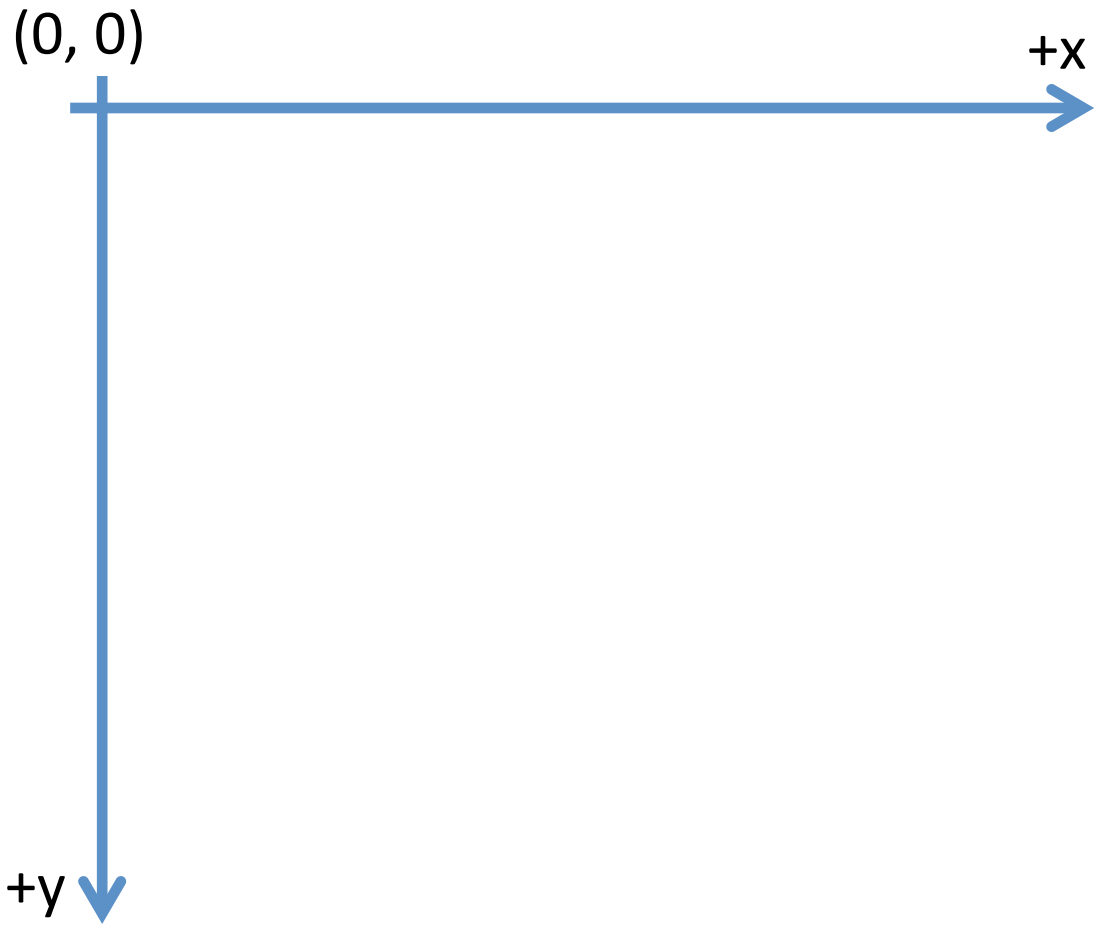
`size(` *`width, height`* **`);`**

Set the size of the canvas.

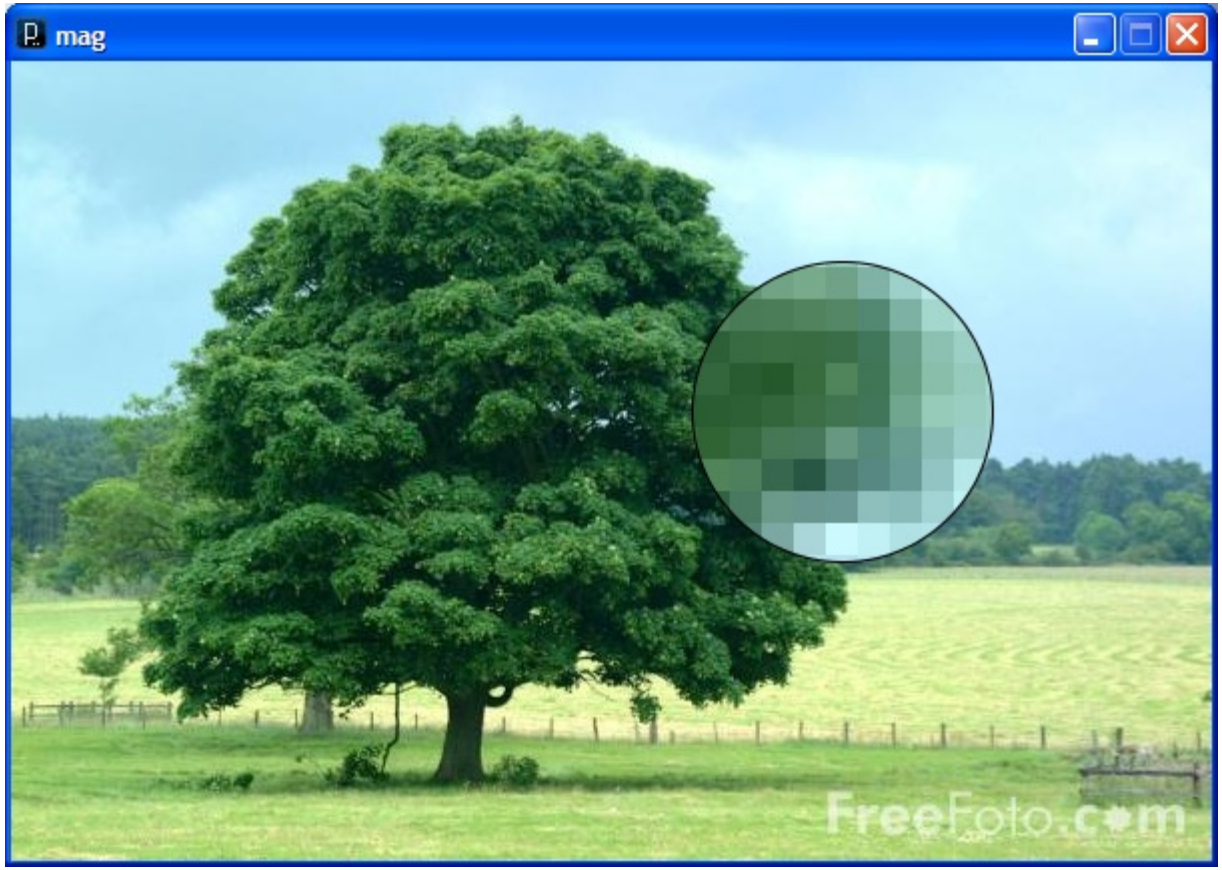
`background(` *`[0..255]`* **`);`**

Set the background grayscale color.

Coordinate System



Pixels



Computing as a Medium for Art

Choosing Stroke Width

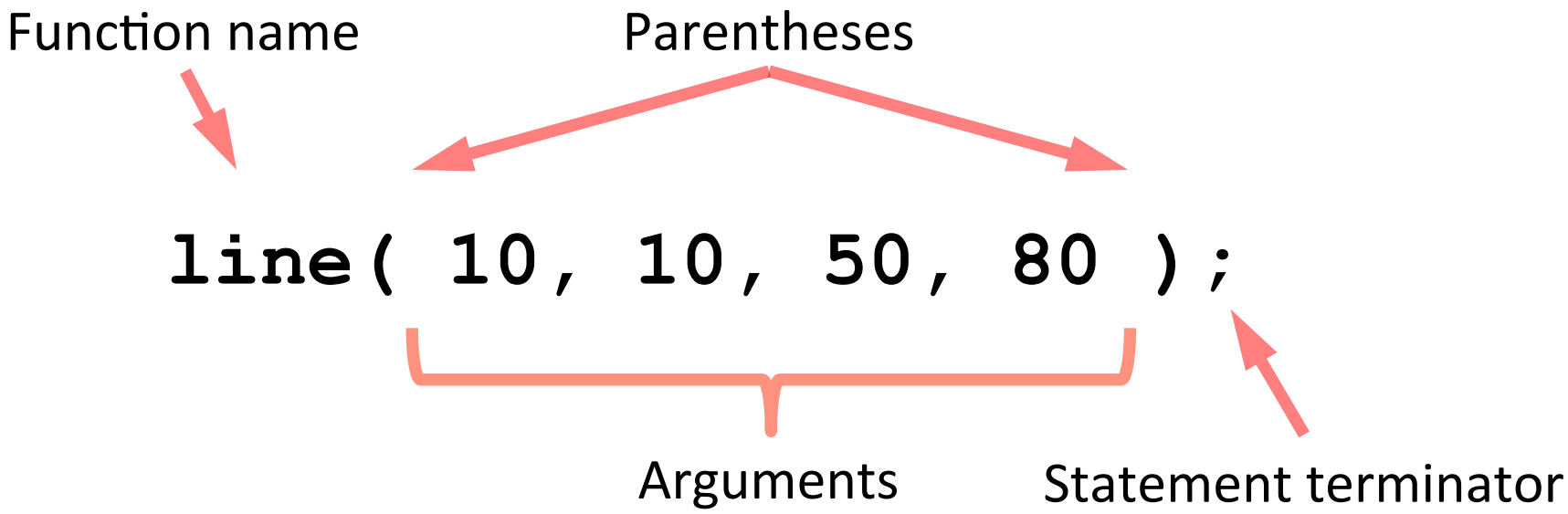
```
strokeWeight(1);
strokeWeight(2);
strokeWeight(3);
strokeWeight(4);
strokeWeight(5);
```

How do we choose the shade (or color) of the stroke?

Processing Documentation

http://processing.org/reference/

Anatomy of a Function Call

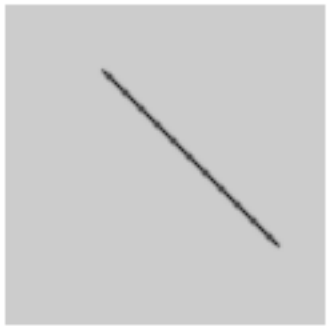


Drawing a Line

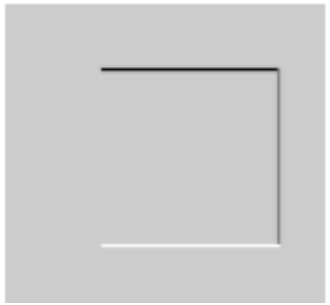
Name

line()

Examples

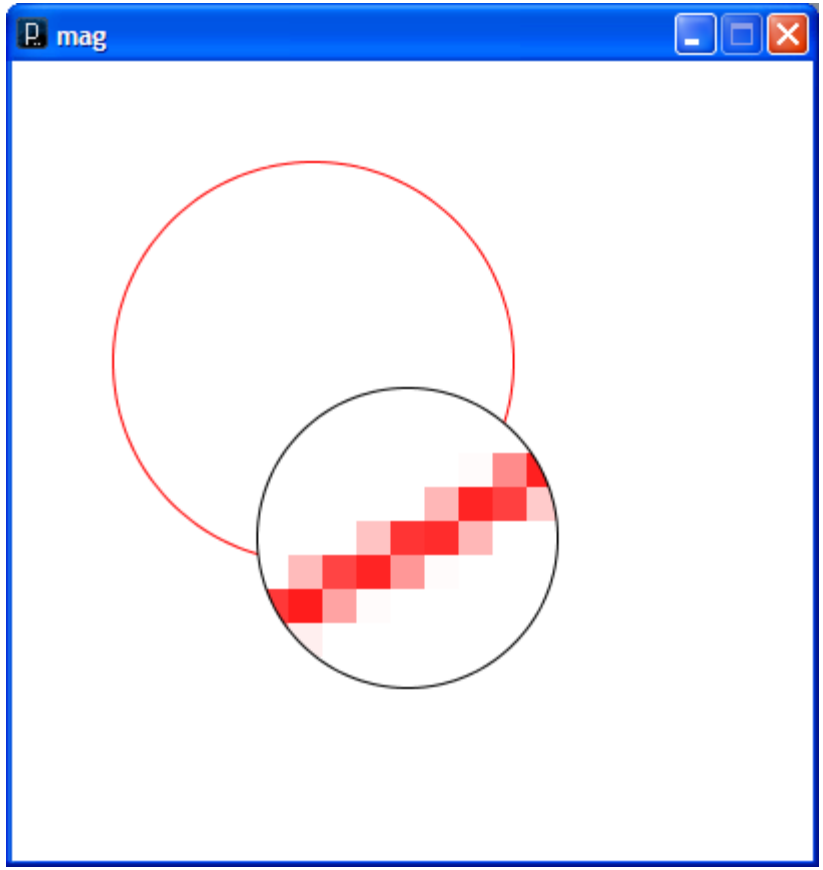


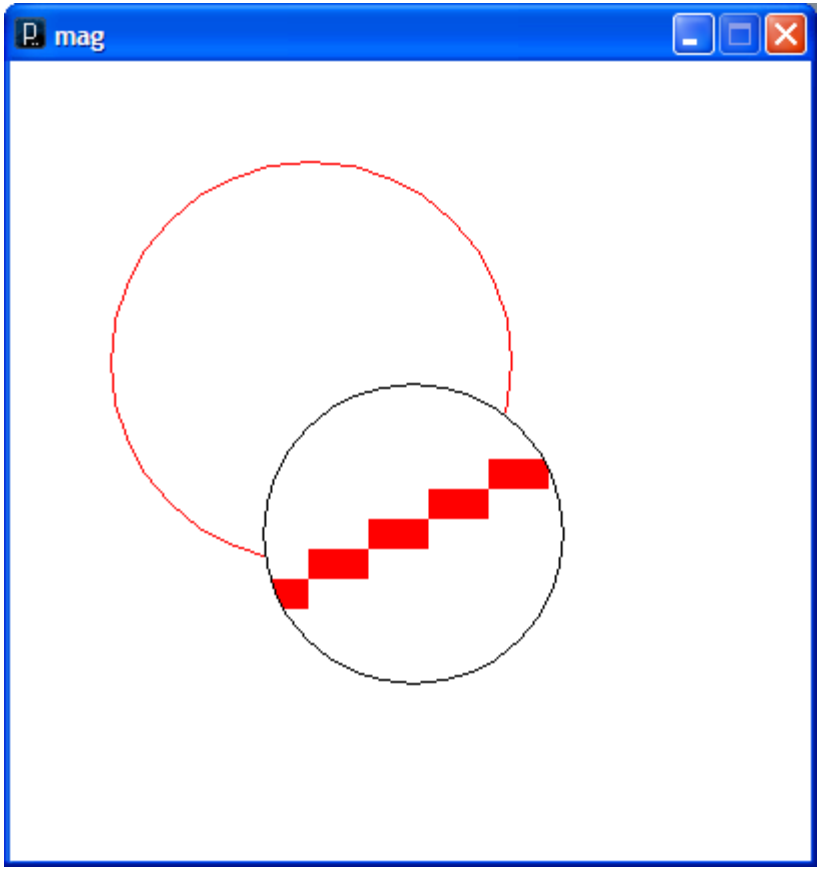
```
line(30, 20, 85, 75);
```



```
line(30, 20, 85, 20);
stroke(126);
line(85, 20, 85, 75);
stroke(255);
line(85, 75, 30, 75);
```

smooth() vs. noSmooth()





Colors

Composed of four elements:

1. Red
2. Green
3. Blue
4. Alpha (Transparency)

Choosing a Color

For instance:

http://www.daviddurman.com/flexi-color-picker/

Why 0 … 255?

Primitive 2D Shapes

- point
- line
- triangle
- rect (rectangle)
- quad (quadrilateral, four-sided polygon)
- ellipse
- arc (section of an ellipse)
- curve (Catmull-Rom spline)
- bezier(Bezier curve)

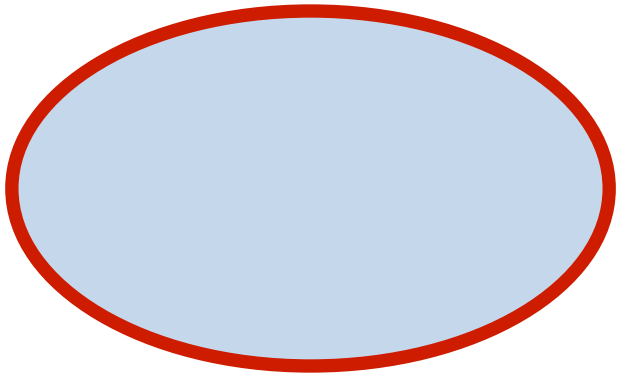
Let's Write a Program to Draw Some Shapes

- ….

- We will also see how to save and open a processing sketch

Shape Formatting

1. Fill color
2. Line thickness
3. Line color



These are properties of your <u>paintbrush,</u> not of the object you are painting.

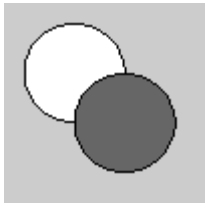
Fill Color

```
fill(gray);
fill(gray, alpha);
fill(red, green, blue);
fill(red, green, blue, alpha);

noFill();
```

Stroke (Line) Color

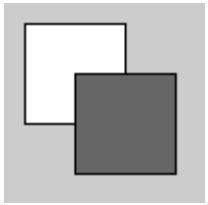
```
stroke(gray);
stroke(gray, alpha);
stroke(red, green, blue);
stroke(red, green, blue, alpha);

noStroke();
```

ellipseMode



```
ellipseMode(CENTER);
ellipse(35, 35, 50, 50);
ellipseMode(CORNER);
fill(102);
ellipse(35, 35, 50, 50);
```

rectMode

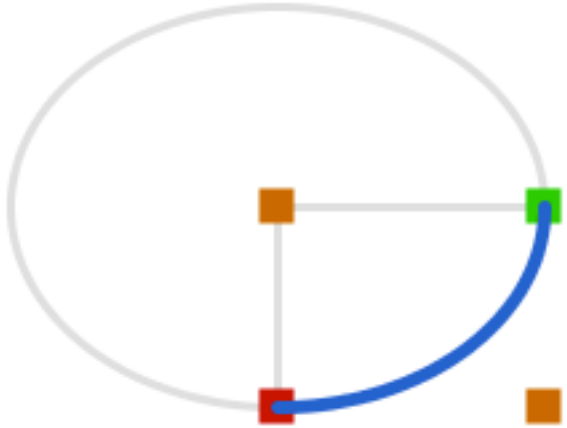


```
rectMode(CENTER);
rect(35, 35, 50, 50);
rectMode(CORNER);
fill(102);
rect(35, 35, 50, 50);
```

http://processing.org/reference/ellipseMode_.html
http://processing.org/reference/rectMode_.html

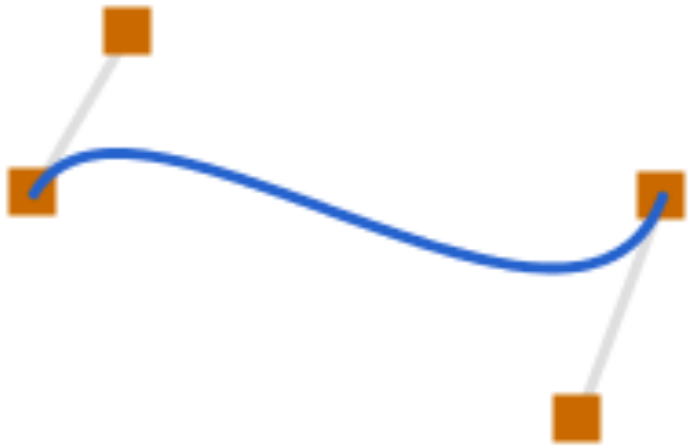
Drawing Curves (Arcs)

center : (300, 200)
width : 200
height : 150
angle 1 : 0.000 (0.0°)
angle 2 : 1.571 (90.0°)



Drawing Curves (Bezier)

start : (158, 169)
ctrl start : (184, 125)
ctrl end : (307, 231)
end : (330, 170)



Curve Generation Tools

- http://www.cs.brynmawr.edu/cs110-01/examples/tools/
- There is also another type of curve called curve() (no tool currently exists to make this easy to use, but you are welcome to use it if you'd like)

Examples

So, What's the Big Deal?

- We could do any of these things by hand, why do we need a computer?

- Any ideas?

The Setup and Draw Loop

```
void setup()
{
  // Called once when program starts
}

void draw()
{
  /* Called repeatedly
     while program runs */
}
```

`random(high);`

`random(low, high);`

Generate a random number in the range *low* (or 0) to *high*

`mouseX`

`mouseY`

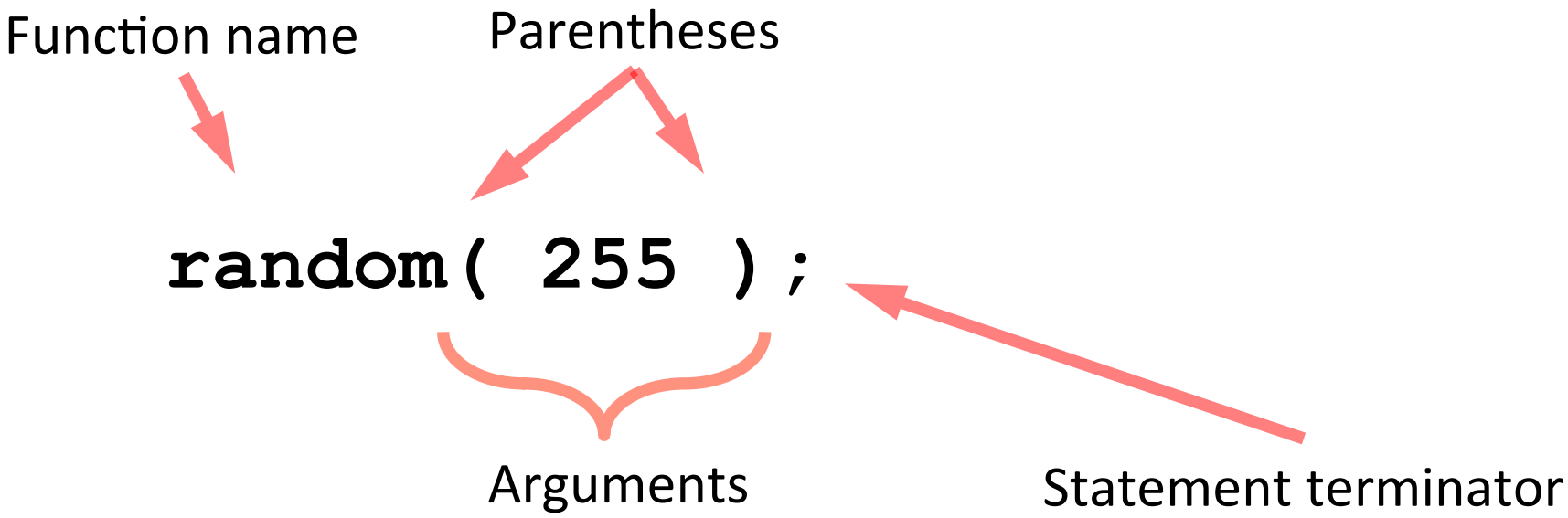
Built-in predefined variables that hold the current mouse X and Y locations

`print( something );`

`println( something );`

Print something to the Processing console.

Anatomy of a Function Call Revisited



Some function calls, like random, return a value that can be fed as input into another function call

randomEllipse

```
void setup()
{
  size(300, 300);
  smooth();
}

void draw()
{
  fill(random(255), random(255), random(255));
  ellipse(mouseX, mouseY, 30, 30);
}
```

Controlling draw()

`frameRate(`*`fps`*`);`

Sets number of frames displayed per second.

i.e. the number of times draw() is called per second. Default = 60.

`noLoop();`

Stops continuously calling draw().

`loop();`

Resumes calling draw().

```
void mousePressed() {
   // Called when the mouse is pressed
}

void mouseReleased() {
   // Called when the mouse is released
}

void mouseClicked() {
   // Called when the mouse is pressed and released
   // at the same mouse position
}

void mouseMoved() {
   // Called while the mouse is being moved
   // with the mouse button released
}

void mouseDragged() {
   // Called while the mouse is being moved
   // with the mouse button pressed
}
```

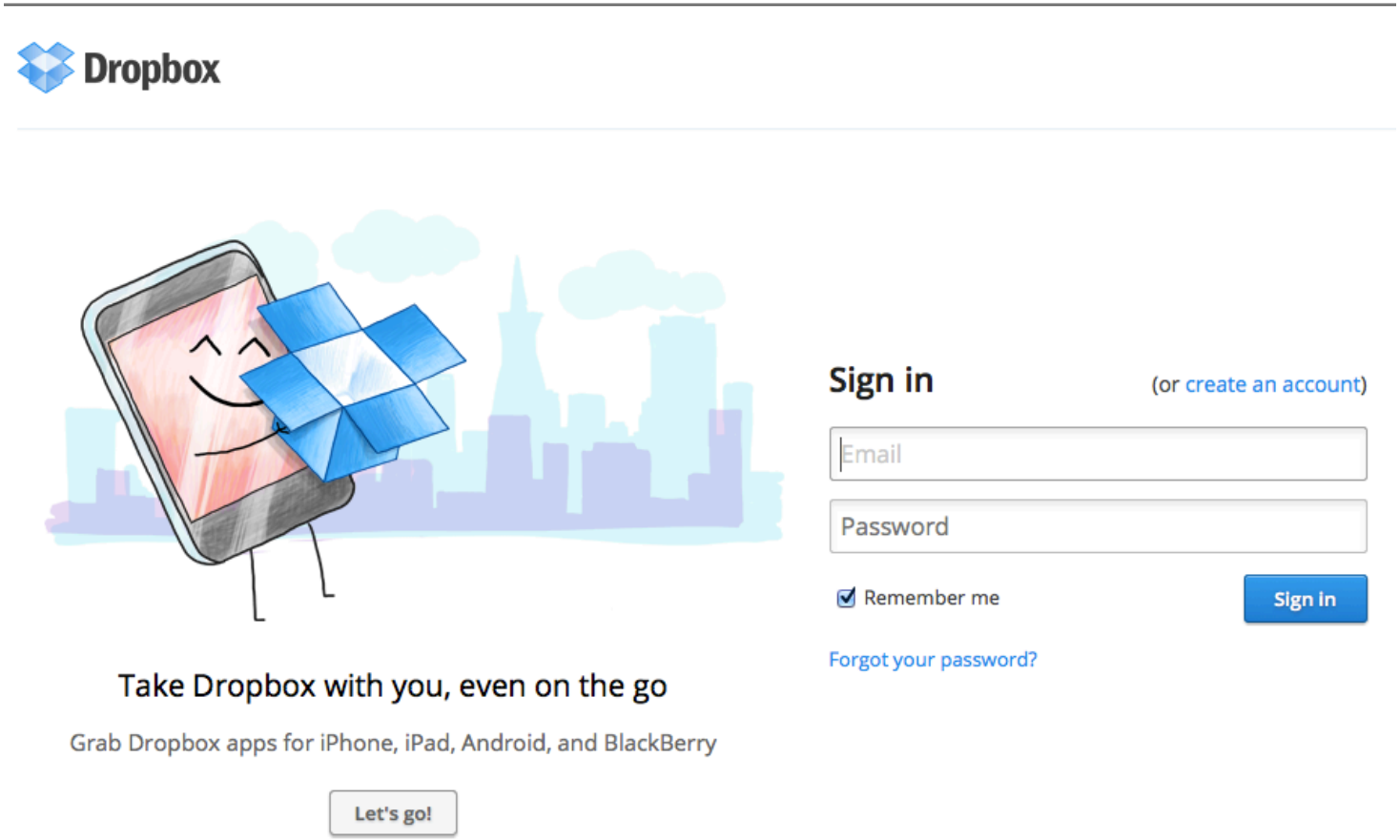
Assignment 1

http://cs.brynmawr.edu/Courses/cs110/spring2013/assignments/assignment1.html

Grading Policy and Code Formatting Standards

- Available on website…
- Let's check them out.

Electronic Submission Instructions



Use the same e-mail you put on the sign-up sheet

Electronic Submission Instructions

- I will invite you to a shared folder
- Please make a subdirectory for each of your assignments
- Inside each subdirectory place your processing sketch file as well as your hardcopy writeup

Example