today

Due: Real-Life Proposal

Array

Introduce Final Project

– team, brainstorm

Student Presentations

Reading Ch 9, 8

Wednesday, Feb 24

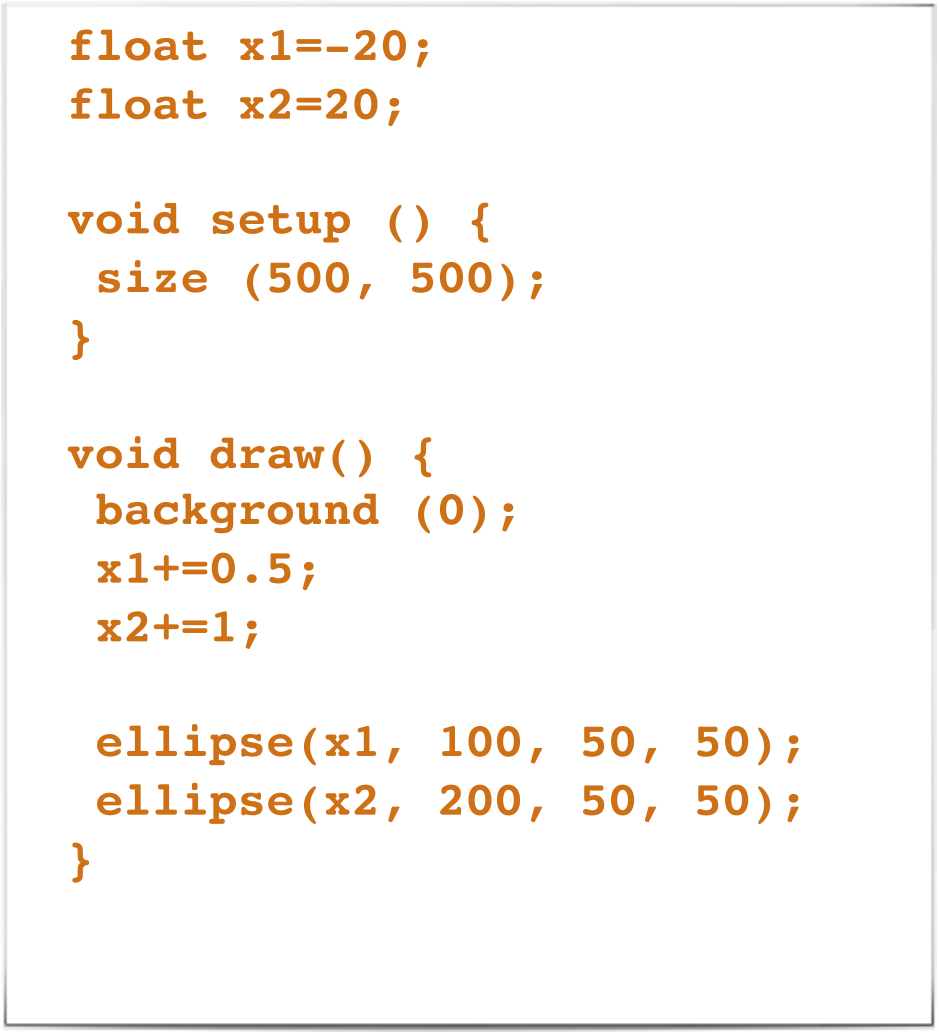
Due: Final Project: moodboard, research

Objects /

Final Project - exchange, plan

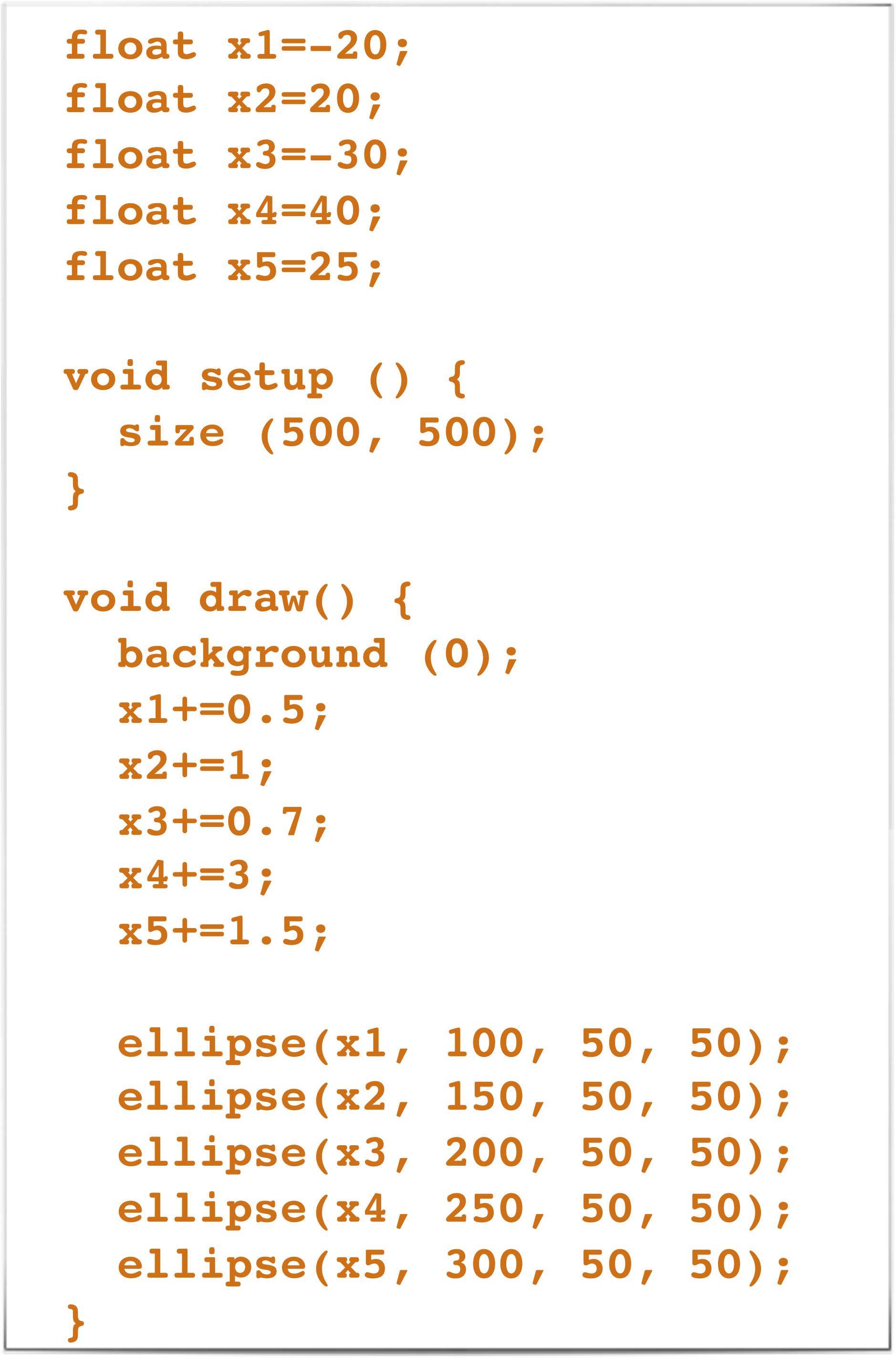
Student Presentations

Two Variables



```
float x1=-20;
float x2=20;

void setup () {
 size (500, 500);
}

void draw() {
 background (0);
 x1+=0.5;
 x2+=1;

 ellipse(x1, 100, 50, 50);
 ellipse(x2, 200, 50, 50);
}
```

Too Many Variables



```
float x1=-20;
float x2=20;
float x3=-30;
float x4=40;
float x5=25;

void setup () {
  size (500, 500);
}

void draw() {
  background (0);
  x1+=0.5;
  x2+=1;
  x3+=0.7;
  x4+=3;
  x5+=1.5;

  ellipse(x1, 100, 50, 50);
  ellipse(x2, 150, 50, 50);
  ellipse(x3, 200, 50, 50);
  ellipse(x4, 250, 50, 50);
  ellipse(x5, 300, 50, 50);
}
```

3000?!

Array, Not Variables

arrays - the idea

what if - I can tell the computer to **generate and store**

- 3000 x positions **float[ ] x=new float[3000];**
- 3000 y positions **float[ ] y=new float[3000];**
- 5 different travel speeds to choose from
  float[ ] speed={0.5, 1, 1.8, 3, 0.7};

then - all I have to do is to plug the values into

ellipse (x, y, 20, 20)

x+= one of the speeds

and do this 3000 times! —- **use for loop**

arrays

an array is a collection of variables of the same data type

arrays can be collections of all data types:

ints, floats, booleans, etc

arrays

variable:

```
int x;
```

array:

```
int[] x;
```

beauty of array:

```
int[] x = new int[3000];
//create an array of 3000 integer variables.
Length of the array goes inside [ ].
```

declare, create, assign

step 1: declared array and define data type

```
float[] x;
```

step 2: create array with keyword *new* and define length

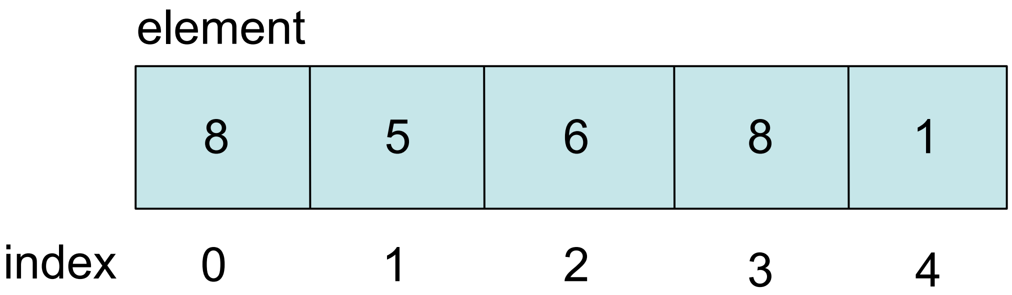
```
float[] x = new float[3000];
```

step 3: assign values to each element

```
x[i] = random (0, 500);
```

array: index, elements

```
int[]x = new int[5];
x[i] = random (1,10);
```



element	8	5	6	8	1
index	0	1	2	3	4

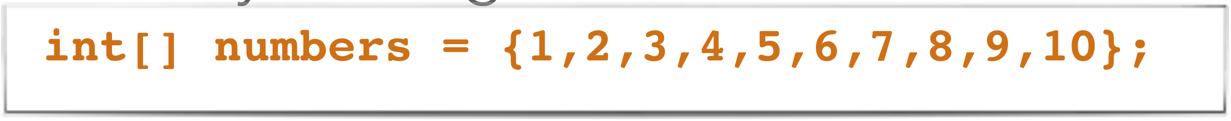
think of it as storage units:

- each unit is assigned an unit number
- each unit can contain one value

Later on, you can retrieve the value according to the unit number!

arrays…two ways to declare

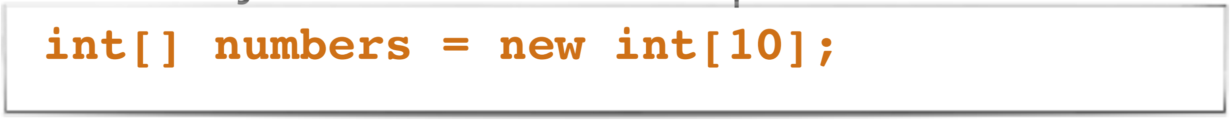
an array of integers:



```
int[] numbers = {1,2,3,4,5,6,7,8,9,10};
```

this is an array with 10 elements that have already been specified

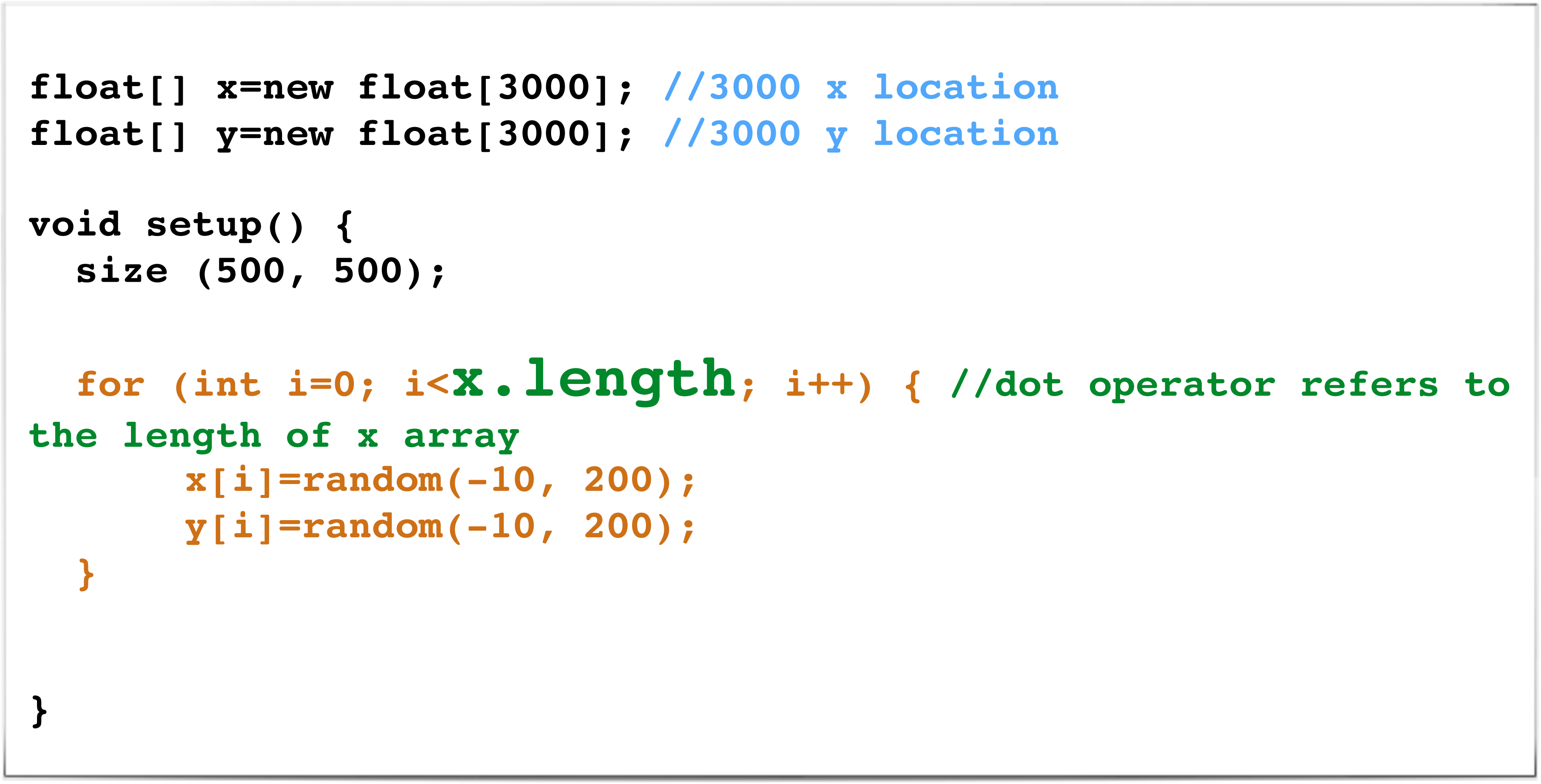
an array with no values specified:



```
int[] numbers = new int[10];
```

this is an array large enough to store 10 elements but the elements have not been specified (or you could say that the array has not been *populated*)

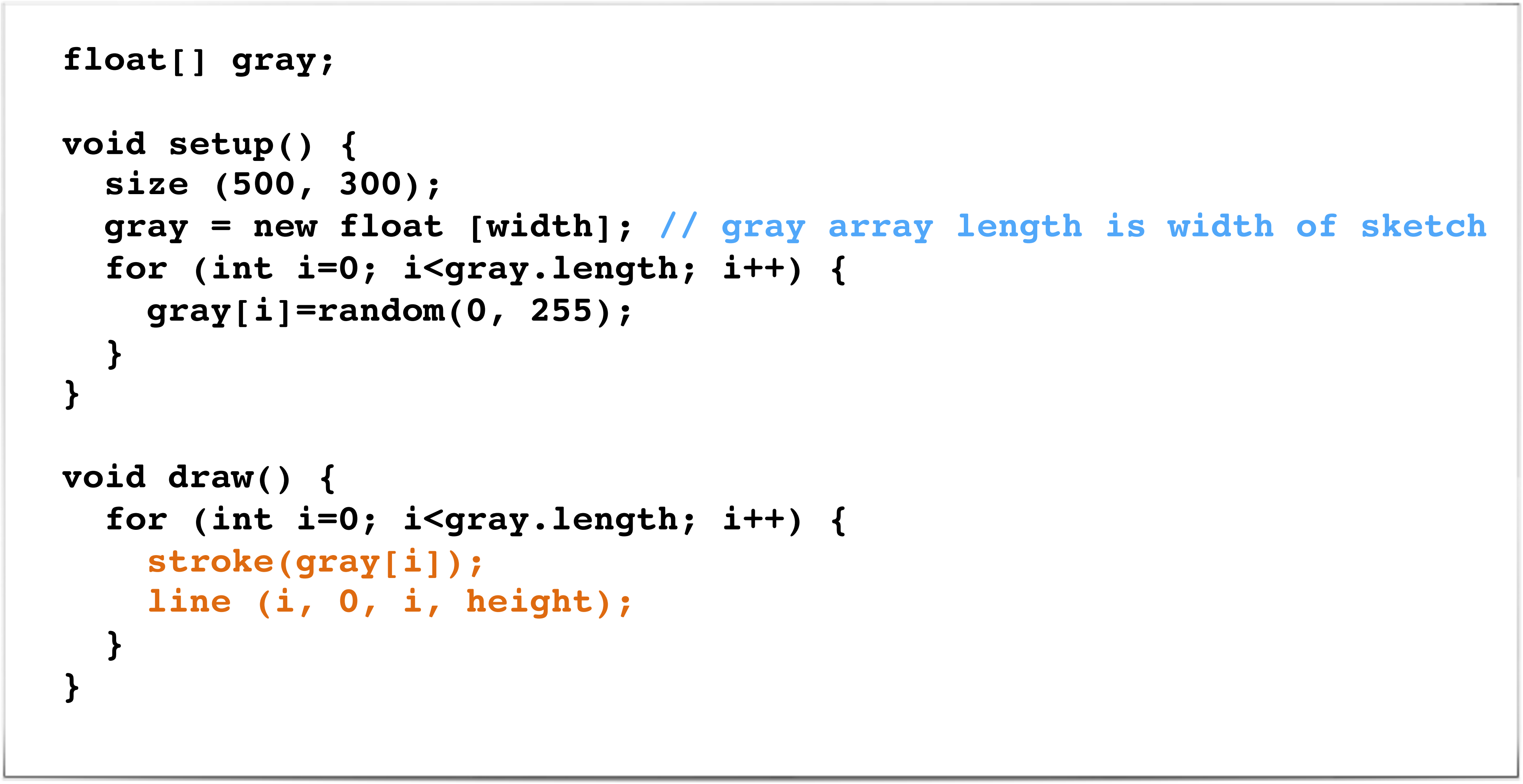
loops work great with arrays
index i used to generate x and y values



```
float[] x=new float[3000]; //3000 x location
float[] y=new float[3000]; //3000 y location

void setup() {
  size (500, 500);

  for (int i=0; i<x.length; i++) { //dot operator refers to
the length of x array
        x[i]=random(-10, 200);
        y[i]=random(-10, 200);
  }


}
```

two uses for index i

sketch_2_Array_for_loop.pde

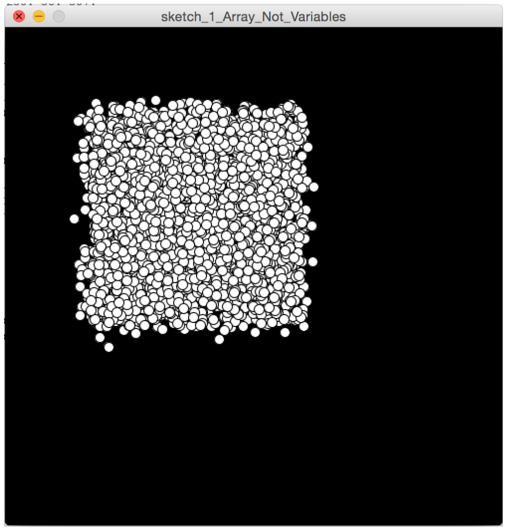


```
float[] gray;

void setup() {
  size (500, 300);
  gray = new float [width]; // gray array length is width of sketch
  for (int i=0; i<gray.length; i++) {
    gray[i]=random(0, 255);
  }
}

void draw() {
  for (int i=0; i<gray.length; i++) {
    stroke(gray[i]);
    line (i, 0, i, height);
  }
}
```

3000?!

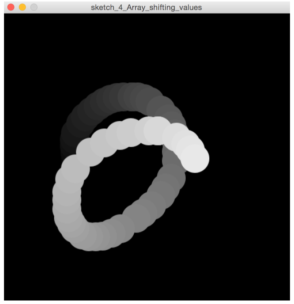
sketch_1_Array_Not_Variables.pde

```
float[] x=new float[3000]; //3000 x location
float[] y=new float[3000]; //3000 y location
float[] speed={0.5, 1, 1.8, 3, 0.7}; //5 speeds

void setup() {
  size (500, 500);
  for (int i=0; i<x.length; i++) {
    x[i]=random(-10, 200);
    y[i]=random(-10, 200);
  }
}

void draw() {
  background(0);
  for (int i=0; i<x.length; i++) {
    x[i]=x[i]+speed[int(random (0, 5))];
    y[i]=y[i]+speed[int(random (0, 5))];

    ellipse(x[i], y[i], 10, 10);
  }
}
```



shifting the values in an array one place to the right

```
int []x=new int[60];
int []y=new int[60];
int []a=new int[60]; //alpha

void setup() {
  size (500, 500);
  noStroke();
  for (int i=0; i<60; i++) {
    a[i]=(59-i)*4; //reverse storage
order-dark first
  }
 }

void draw() {
  background(0);
//reverse fill - fill index 59 first
  for (int i=59; i>0; i--) {
    x[i]=x[i-1];//x location is
always the previous x location
    y[i]=y[i-1];

    fill(a[i]);
    ellipse(x[i], y[i], 50, 50);
  }
  x[0]=mouseX;
  y[0]=mouseY;
}
```

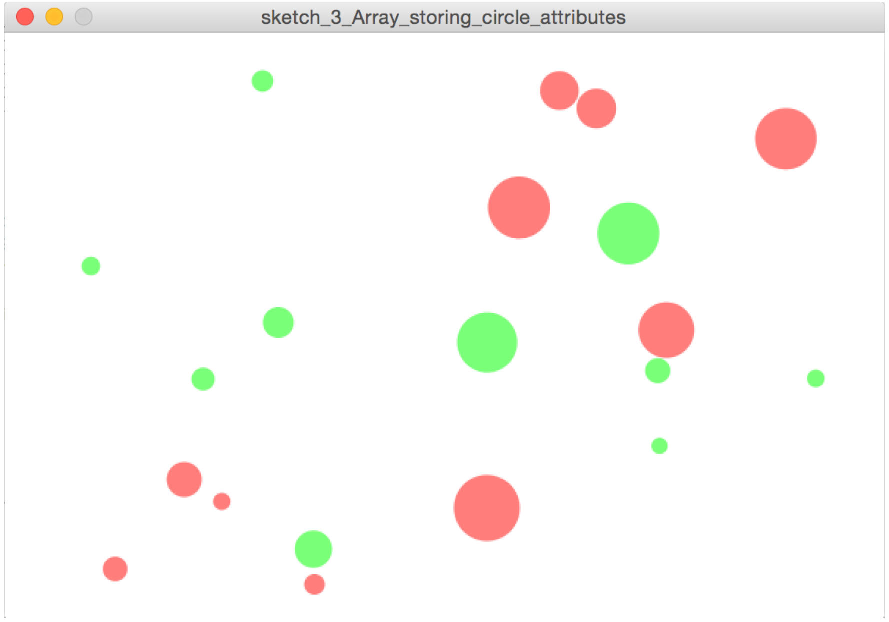


mouseX 3	5	6	8	11
index 0	1	2	3	4

mouseX 2	3	5	6	8	~~11~~
index 0	1	2	3	4	

a fun sketches to check out

sketch_3_Array_storing_circle_attributes.pde



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