Quiz 2

```
if (x < 100) {
  if (y < 10) {
    println("good job!");
  }
} else if (x < 50) {
    if (y > 10) {
      println("great job!");
    } else {
      println("what happened?");
    }
} else {
    if (y > 7) {
      println("not bad!");
    } else {
      println("nice try...");
    }
}
```

```
// variable declarations
int a = 2, b = 5;
float x = 2.0;

// expression
b/a * x;
```

Review

- Array
  - `int[] diameters = new int[10];`
  - `diameters[0], diameters[2], diameters[9]`
  - `diameters.length`
- Indexing starts at 0
- A way to have a collection of variables instead of individual ones

lab02 #1

```
double[] values = {0.6, 0.2, 0.3, 0.0, 0.5, 0.3, 0.7};
int limit = values.length/2;
for (int k=0; k<limit; k++) {
  double tmp = values[k];
  values[k] = values[values.length-k-1];
  values[values.length-k-1] = tmp;
}
println(values);
println(values[0]);
```

Built-in Array Functions

append(*array, item*)
- returns a new array expanded by one and add item to end

expand(*array, newSize*)
- returns a new array with size increased to newSize

shorten(*array*)
- returns a new array shortened by one

concat(*array1, array2*)
- returns a new array that is the concatenation of array1 and array2

subset(*array, offset [, length]*)
- returns a subset of array starting at offset and proceeding for length (or end)

splice(*array, value|array2, index*) or
- returns a new array with value or array2 inserted at index

sort(*array*)
- returns a new array sorted numerically or alphabetically

reverse(*array*)
- returns a new array with all elements reversed in order

Data Visualization

- Graphical representation of information
- Charts
- Plots
- Maps
- Time series

Apple Stock Price 2010

Temperature in Bryn Mawr, PA

Date	High	Date	High
2/1	54	2/10	32
2/2	46	2/11	25
2/3	54	2/12	25
2/4	52	2/13	21
2/5	39	2/14	16
2/6	39	2/15	28
2/7	43	2/16	55
2/8	39	2/17	38
2/9	32	2/18	36

Basic Visualization

- Given an array of data (values)

```
int[] temps = {54, 46, 54, 52, 39, 39, 43, 39, 32, 32,
               25, 25, 21, 16, 28, 55, 38, 36};
```

- How do we visualize?
  - plot each value
  - connect the plotted points with lines (line chart)
  - draw rectangles with each value as height (bar graph)

Example

- tempViz

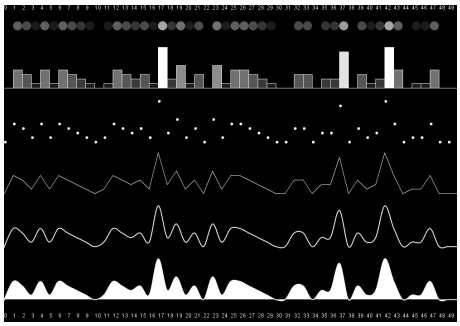
Jer Thorp. Artist/Educator - NYU

225 "random" numbers chosen and tweeted by 225 people

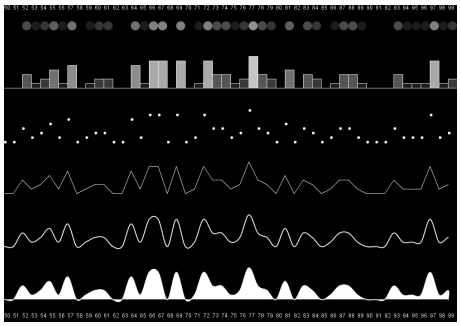
19	42	42	87	81	99	33	98	61	47	24	66
69	23	67	67	57	71	5	79	57	46	93	54
43	32	18	42	77	37	37	6	93	55	55	77
15	88	42	55	77	42	93	3	17	26	64	65
23	21	9	7	23	17	14	42	45	27	97	83
89	4	4	26	6	39	97	72	35	6	66	
19	2	72	81	37	47	66	17	12	52	74	
54	61	43	19	57	17	77	47	26	72	64	
69	99	64	88	67	1	36	2	60	27	73	
4	43	97	67	42	37	27	1	75	15	17	
13	59	32	78	40	15	64	77	11	1	17	
37	13	7	26	57	25	12	69	8	84	23	
66	42	14	33	17	97	25	57	1	81	97	
8	18	78	12	95	37	84	86	41	56	73	
78	60	21	39	28	17	83	69	12	74	37	
67	19	19	88	96	69	29	74	53	33	72	
32	81	72	72	73	39	52	97	77	77	41	
76	17	69	83	67	64	25	35	42	4	76	
13	36	2	37	52	47	43	25	66	7	6	
87	94	16	28	20	79	23	21	55	66	87	

http://blog.blprnt.com/blog/blprnt/your-random-numbers-getting-started-with-processing-and-data-

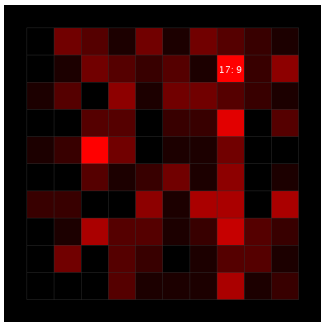
Basic Plots 0-49



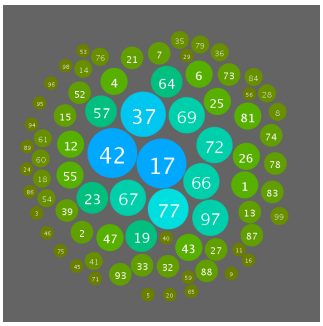
Basic Plots 50-99



Heat Map



Proportional Symbols



Birthdays 1973-1990