Lecture E1
Complex Conditionals and Variables

Computing and Art : Nature, Power, and Limits
CC 3.12: Fall 2007

Functionalia

Instructor

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Course Web Page

`http://www.sci.brooklyn.cuny.edu/~chipp/cc3.12/`

- **Tea - Thursday - 1:30 - 3:30 - 0317 N**

- **HW D**: DUE Wednesday, Oct 31, 11:59 pm
- **HW D BONUS!**

FinalProject

Office Hours | Extra Help

My Office Hours :

Mondays 12:30 to 1:30 - basement Ingersoll 0317N

Virtual: Tuesdays 9 to 11pm - AIM: chippbot

Bridges Student Resource Center : 0317N

Monday	1:30 to 5pm
Tuesday	1:30 to 3:30
Wednesday	1:30 to 3:30
Thursday	12:45 - 1:45, 2:15 - 3:15

Functionalia

Today:

- Conditional Review
- Making a Button
- Variables

```
void setup() {
  size(400, 400);
  background(0);
  stroke(255);
}
```

Within the parentheses, is a **Boolean Expression**.

```
void draw() {
  background(0);
  if(mousePressed) {
    ellipse(mouseX, mouseY, 20, 20);
  }
}
```

`mousePressed` is a Boolean variable.

```
void setup() {
  size(400, 400);
  background(0);
  stroke(255);
}


void draw() {
  background(0);
  if(mousePressed) {
    ellipse(mouseX, mouseY, 20, 20);
  }
}
```

Code contained within the curly-braces is executed, only if the expression is **true**.

```
void setup() {
  size(400, 400);
  background(0);
  stroke(255);


}
void draw() {
  background(0);
  line(200,0,200,400);
  if(mouseX > 200) {
    ellipse(mouseX, mouseY, 20, 20);
  }
}
```

Use a conditional to respond to the Mouse's Position on the screen

Which side will the ellipse appear?

Conditional Examples

Greater Than Conditional

Less Than Conditional

Less Than And Greater Than

Checking for being Within an Area

WithinARectangle

WithinARectangleAndPressed

WithinARectangleDone

Boolean	Processing
AND	&&
OR	||
NOT	!

Making a Clear Button

Clear Button Step 0

Clear Button Step 1

Clear Button Step 2

Clear Button Step 3

Clear Button Done

Project Skeleton

Variables in Processing

Variables are containers used in programs to store data.

We used variables in programs to store and process mouse data.

mouseX, **mouseY**, and **mousePressed**

Also use variables to store a **state**.

Can be used to *animate* your sketches and to store user interactions (i.e. imagine adding different brushes to your drawing program)

Example: Basics > Data > IntegersFloats

- **here two lines are being animated across the stage**
- **the program keeps track of the x-value of both of the lines independently)**

Implementing Variables

Variables have 3 parts:

- name (i.e. mouseX)
- value (i.e. 320)
- type (i.e. integer)

Here are 3 types of variables (there are many more!):

- integers: **23, 0, -31**
- floats: **3.14, -0.22, 0.0**
- booleans: **true, false**

We can see the value of a variable in processing by using **println**

Examples of Variables

Anatomy - how to declare a variable

ChangeValues - you can change values of a variable

PrettierPrint - print out prettier messages

ShortHandNames - give variables meaningful names

Can use Mathematics with Variables

Basic > Data > Variables

Add	+
Subtract	-
Multiply	*
Divide	/

Can use variables in parameters for functions!

Animation Example

width and **height** are variables that store the width and the height of the sketch

Why would we want to use this

Variables > WidthHeightArea

IntegersFloats

- **frameRate(30);** // sets the looping of draw(), 30 times a second!
- Variables declared outside of these functions, **globals**
- Variables **a** and **b** are incremented
- What **conditions** are checked?
- What if they are **removed**?

Animation Example Continued

- How do we speed each line up?
- How do we reverse the direction of a line?
- How can we add an additional shape?

More Complex Animation

IncrementDecrement and switch Direction

- what is changing?
- what shape is being used in the code?
- how is the color changing?

- **++** and **--**
- **direction = !direction;**

- how can we increase the spacing?

Use a Variable to Store **State**

TwoShapes

TwoShapesStep1 - draw 2 extra buttons

TwoShapesStep2 - add a variable **whichShape,** set it to a value that you decide on in the button conditions

- 0 for circle
- 1 for square

TwoShapesStep3 - draw the shapes, use an **else if**

TwoShapes - finishing touch, ignore the buttons with a condition

(mouseX < 340)

ThreeShapes

TO DO

READ: Chapter 13 (For Iteration next Week)

(*Javascript is VERY similar to Processing*)