Fundamentals of Physical Computing

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Plan for Today

- Lab Review
- loops
- drawing with variables
- mouse interaction
- keyboard
- ASCII
- bounce
- Readings & Assignments

Lab Review

Loops!

While Loop

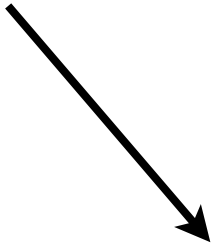
- do something until it stops
- while(*test*)
- getting out
  - cnt = 0
    while(cnt < 10) {
      Serial.print(cnt, DEC);
      cnt = cnt + 1;
    }
  - while (true) {
      if (something > 8) {
        break;
      }
    }

For Loop

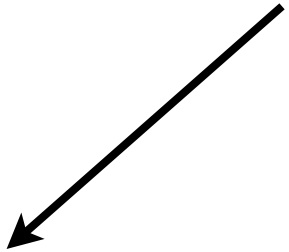
- do something a certain number of times
- for(int i = 0; i < 10; i++) {
  Serial.print(i, DEC);
  }
  - incrementation
- can also count backwards
- can also be used in nifty and confusing ways but we'll avoid that

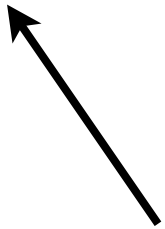
For Loop Anatomy

happens first and only once



tested each time through the loop



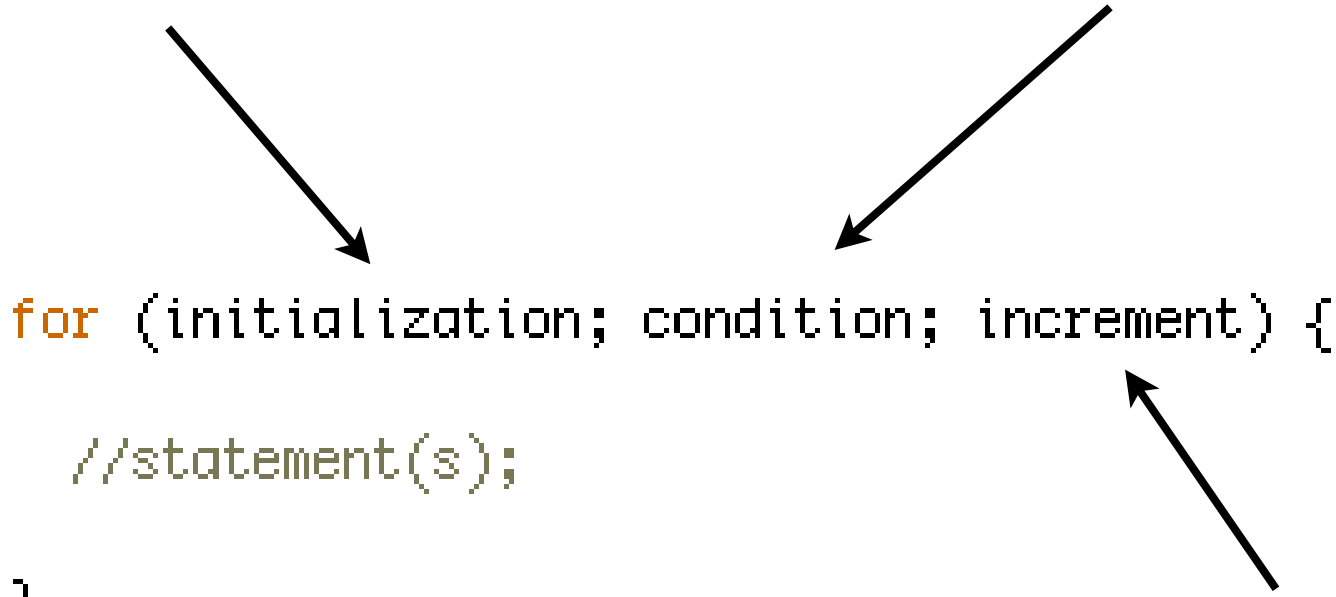


if the condition is true, the statement block, and the increment is executed, then the condition is tested again. When the condition becomes false, the loop ends.

For Loop Anatomy

happens first and only once

tested each time through the loop



```
for (initialization; condition; increment) {

  //statement(s);

}
```

if the condition is true, the statement block, and the increment is executed, then the condition is tested again. When the condition becomes false, the loop ends.

Drawing with Variables

Squares with For Loop

- drawing squares
- drawing squares from a variable
- drawing six squares
- drawing 1000 squares
- nesting for loops

Mouse Interaction

mousePressed

- Whether or not the mouse button is pressed

- boolean variable

mousePressed( )

- Called continuously while the mouse button is pressed

- function

mouseDragged( )

- Called every time the mouse is moved while a button is pressed

- variable or function?

mouseButton

- which button, LEFT, RIGHT or CENTER
- variable or function?
- what does it show if the mouse is not pressed?

mouseClicked( )

- called once each time the mouse is clicked

Keyboard Interaction

keyPressed

- what's this?

- how does it probably function?

keyPressed( )

- what’s this?
- how does it probably function?

keyCode

- what’s this?
- what does it contain?

ASCII

ASCII

- American Standard Code for Information Interchange
- 65 = A
- 48 = character zero, 49 = character one
- 32 = space, 10 = line feed, 13 = carriage return

One Question Quiz

- what is this: 10

Conditionals

Remember if statements?

- if (*condition*) {
  codeStuff();
  }

- elseif (*condition*) {
  codeotherStuff();
  }

- else {
  codemoreStuff();
  }

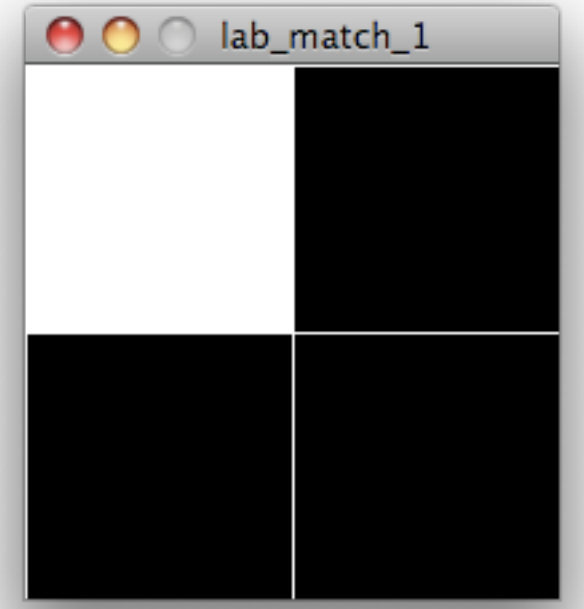
Switch and Case

- switch(*variable*) {
  case *value*:
  dostuff();
  break;
  case *othervalue*:
  dootherstuff();
  break;
  default:
  domorestuff();
  break;
  }

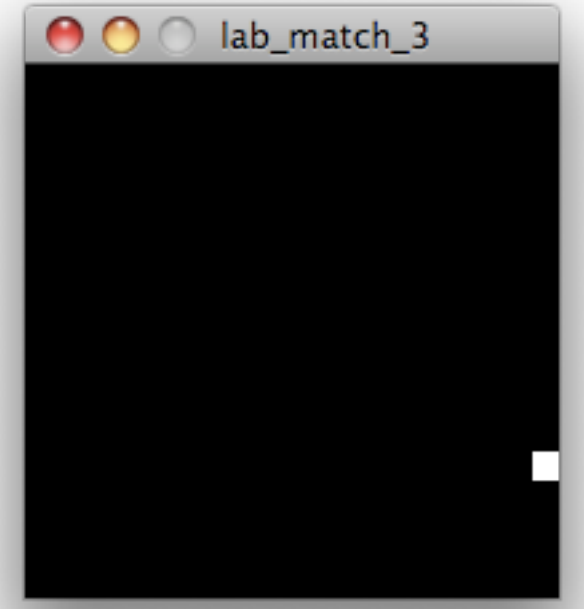
Switch and Case Example

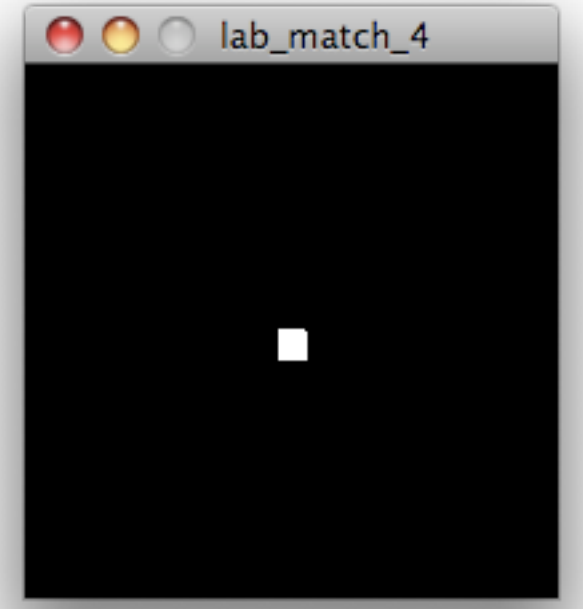
- char letter = 'B';

```
switch(letter) {
  case 'A':
    println("Alpha");  // Does not execute
    break;
  case 'B':
    println("Bravo");  // Prints "Bravo"
    break;
  default:
    println("Zulu");   // Does not execute
    break;
}
```

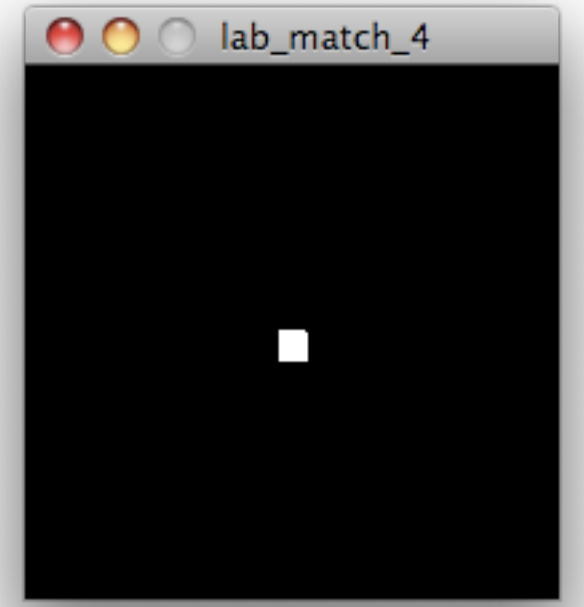


Duplicate These Examples





Bounce



http://faludi.com/classes/fundamentalsphysicalcomputing/code/lab_match_4/applet/

Groups Assignment

Readings and Assignments

- Readings
  - none this week!
- Assignment
  - Programming Lab 2
  - Observation for Midterm Project: *Design a new solution for an existing problem. Work in groups to observe the situation, create an early prototype, test the prototype and incorporate your findings into a revised solution system.*