Recitation

Loops and Arrays

Review: Variables

- A variable has a name,
  
  example
- A variable needs to be declared,
  
  var example;
- A variable can be assigned a value,
  
  example = "Hello";
  example = 5;
  example = example;
Review: If, Else if, Else

- These statements determine how the program flows, i.e. which lines get executed.
- An if can have an else if and an else follow it.
- An else if needs to follow an if or an else if.
- Only ONE else can follow an if or a else if.
- In any chain of connected if, else if, and else statements, only one of them will ever be followed, i.e. have its code called.

Review: Arrays

- The variable must be declared as an Array
  
  ```javascript
  var myArray = new Array();
  ```
- An array can take many elements; it's length is given by
  
  ```javascript
  myArray.length
  ```
- Each element is accessed by an index, starting at zero.
  
  ```javascript
  myArray[0] = "first value";
  myArray[1] = 2;
  alert(myArray.length); //Prints 2.
  ```
Review: Loops

- Loops are used to execute a similar chunk of code multiple times with slight differences each iteration, dependent on the loop index.
- If you know how many times you want the loop to execute, use a for loop.
- If you only know a condition when you want the loop to stop, use a while loop.

Review: For Loop

- Syntax is like an if statement.
- The initial block has a variable initialization, a condition, and an update.

```javascript
for (var index = 0; index < 3; index++)
{
    ... //This stuff
}
```

- Reads as "For index equal to 0, until index equal to 3, do "This stuff" and add one to index each time."
- "This stuff" executes 3 times: index = 0, 1, 2, and then the loop stops.
Review: While Loops

- Use a **while loop** when you don't know exactly how many times you want the code to execute.
- Instead, you execute while a **condition** is true.

```javascript
var foo = "y";
while (foo == "y")
{
    foo = prompt("Huh? (y/n)");
}
```
- Executes as many times as "y" is entered into the prompt.

Exercise: Store user input

Write a program that

1) Prompts for user input until the user enters "Q".

2) Stores the input in an array.

3) Prints all input to the screen after the user enters "Q".
Storing user input

- Source code is at www.cs.unc.edu/~wilkie/loopsArrays1.html
- Declare variables and get initial input.
- Have a while loop that depends on what the user enters.
- Update an index to enter values into the array.
- Use a for loop to print out the values of the array, from 0 to length - 1.

Exercise: Nested For Loops

Write a program to create a table (20 x 20) in which each cell is drawn with a certain color.

For each cell, use colorMapRed, colorMapGreen, and colorMapBlue to create the background color. (copy from www.cs.unc.edu/~wilkie/colorMaps.html)

e.g.

color = "bgcolor=#" + colorMapRed(i, j, size) + colorMapGreen(i, j, size) + colorMapBlue(i, j, size);
Simple Color Map

- Code is at [www.cs.unc.edu/~wilkie/loopsArrays2.html](http://www.cs.unc.edu/~wilkie/loopsArrays2.html).

Exercise: 2D Array

Do the previous problem, but this time save the color value strings to a 2D array before printing out the table.

Array elements can contain other arrays.

```javascript
myArray[3] = new Array();
```
2D Array