

CS 105

Week 4

MP2

Activity 5

Grades

Rapid Fire i>Clicker

```
var hello = "Hello";  
hello.charAt(1);
```

What is stored inside of variable c
after the program runs?

A) "h"

D) "o"

B) "e"

C) "l"

```
var hello = "Hello";  
hello.charAt(1);
```

What is stored inside of variable c
after the program runs?

A) "h"

D) "o"

B) "e"

C) "l"

```
var x = "Illinois";  
var i = 0;  
while (i < x.length)  
{  
    print(x) ;  
    i = i + 1;  
}
```

How many times is "Illinois" printed?

A) 0 C) 7

B) 1 D) 8

```
var x = "Illinois";  
var i = 0;  
while (i < x.length)  
{  
    print(x) ;  
    i = i + 1;  
}
```

How many times is "Illinois" printed?

A) 0 C) 7

B) 1 **D) 8**

```
function foo(k)
{
    return (-1 * k);
}

print( foo(-3) );
```

What is printed to the screen?

A) foo(-3)

C) -3

B) 3

D) 0

```
function foo(k)
{
    return (-1 * k);
}

print( foo(-3) );
```

What is printed to the screen?

A) foo(-3)

C) -3

B) 3

D) 0

```
var str = "Hello";  
var count = 0;  
var i = 0;  
while (i < str.length)  
{  
    var c = str.charAt(i);  
    if (isVowel(c))  
        count = count + 1;  
    i = i + 1;  
}  
print("Vowels: " + count);
```

Shortcuts

x = x + 4 ; → x += 4

x = x + 4 ; → x += 4 ;

x = x + 1 ; → x += 1 ;

x = x + 4; **→** **x += 4;**

x = x + 1; **→** **x += 1;**

x += 1; **→** **x++;**

x = x + 4;



x += 4;

x = x + 1;



x += 1;

x += 1;



x++;

x += 2;



++++;

x = **x** - 4;



x -= 4;

x = **x** - 1;



x -= 1;

x -= 1;



x--;

x = **x** * 4;



x *= 4;

x = **x** * 1;



x *= 1;

x *= 1;



x***;

x = **x** / 4 ;



x /= 4 ;

x = **x** / 1 ;



x /= 1 ;

x /= 1 ;



~~**x** // ;~~

Loop #2

Motivation

- While programming, we often want to loop through a range of numbers.
- Example:
 - 0, 1, 2, ..., 9
 - 0, 1, 2, ..., s.length – 1
 - etc

- Looping through a range is awkward with only a while loop.

- Looping through a range is awkward with only a while loop.

```
var i = 0;  
while (i < 10)  
{  
    ...  
    i++;  
}
```

- Easy to forget the counter++, resulting in an **infinite loop**:

```
var i = 0;  
while (i < 10)  
{  
  
}
```

for loop

```
for (var i = 0; i < 10; i++)  
{  
    ...  
}
```

Initializes the variable



```
for (var i = 0; i < 10; i++)  
{  
    ...  
}
```

while condition



```
for (var i = 0; i < 10; i++)  
{  
    ...  
}
```

increment after each iteration of
the loop

```
for (var i = 0; i < 10; i++)  
{  
    ...  
}
```

Pseudo Code

- Having a for-loop available to us, we can add to our dictionary of **pseudo-code**:
 - for each _____ in _____
 - for each **character** in **our string**

```
for (var i = 0;  
      i < s.length;  
      i++)  
{  
    ...  
}
```

Overview

- For loops allow us to loop over a range of numbers, such as 0...10.
- For loops have a special syntax and requires curly braces.

Example: How many times do we
see “e” in a given string?

```
set counter to 0
for each characters in our string:
    if the character is an "e":
        add one to counter
```

```
// set counter to 0
// for each characters in our string:
//   if the character is an "e":
//     add one to counter
```

```
function counte(s)
{
    // set counter to 0
    var counter = 0;
    // for each character in our string:
    for (var i = 0; i < s.length; i++)
    {
        var c = s.charAt(i);
        // if the character is an "e":
        if (s.charAt(i) == "e")
        {
            // add one to counter
            counter++;
        }
    }
    return counter;
}
```

Arrays

Arrays

...just a fancy name for a “list”.

Just like numbers and strings,
arrays are stored in variables.

```
var primes = [2, 3, 5, 7, 11];
```

```
var primes = [2, 3, 5, 7, 11];
```

Each element inside of an array can be any type of a variable.

Each element inside of an array can be any type of variable.

Strings

```
var hello = ["Hello", "world"];
```

Each element inside of an array can be any type of variable.

Numbers

```
var oddNumbers =  
[1, 3, 5, 7, 9, 11, 13, 15];
```

Each element inside of an array can be any type of variable.

Arrays

```
var illiniFootball =  
    [ [28, 17],  
      [42, 34],  
      [19, 44],  
      [42, 35] ] ;
```

Array Functions

Just like strings, use `.length` to find the length of an array.

```
var primes = [2, 3, 5, 7, 11];  
var len = primes.length;
```

Unlike Strings, indexing into an array looks different.

```
var primes = [2, 3, 5, 7, 11];  
    var firstPrime = primes[0];  
    var secondPrime = primes[1];
```

Example

High temperatures for Champaign, IL during January 2014.

```
var highTemps =  
    [35, 20, 20, 36, 33, -1, 11,  
     21, 32, 41, 41, 44, 51, 38,  
     26, 37, 32, 29, 38, 41, 28,  
     21,  6, 26, 34, 44, 16, 14,  
     30, 37, 31];
```

How many days were at or below
freezing all day?

How many days were at or below
freezing all day?

```
// set counter to 0
// for each day:
//     if the high temperature <= 32:
//         add one to counter
```

```
var highTemps = [...];

// set counter to 0
var counter = 0;

// for each day:
for (var i = 0;
     i < highTemps.length;
     i++)
{
    // if the high temperature <= 32:
    if ( highTemp[i] <= 32 )
    {
        // add one to counter
        counter++;
    }
}
```