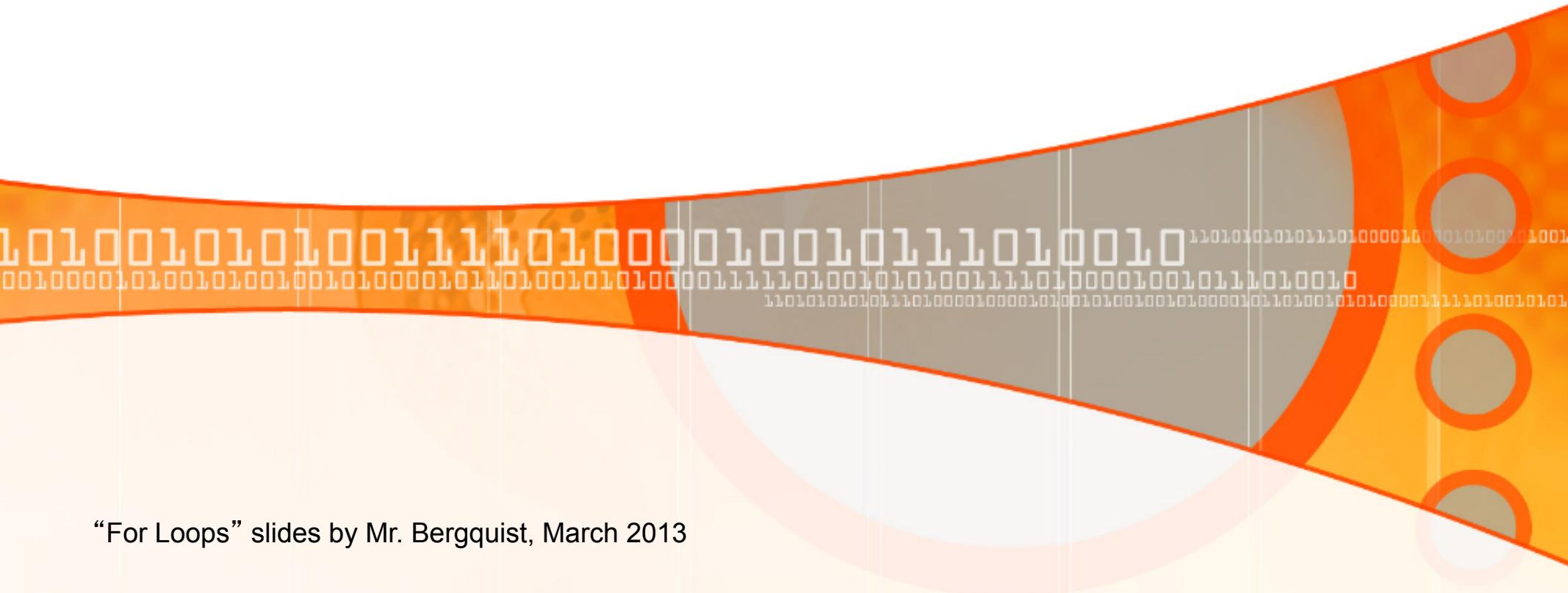


Introduction to Computer Science

For Loops

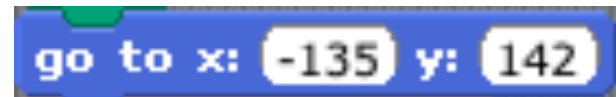


Key Concepts: Initialization

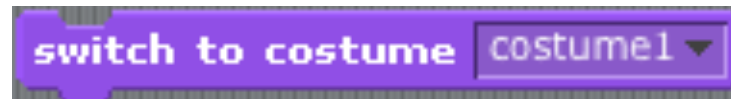
- Initialization of:



- Position of all Sprites



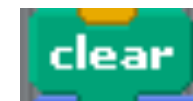
- Correct first Costume of Sprite & Background of Stage



- Set the value of variables – could be 0, 1 or other values depending on what they do



- Appearance: show or hide Sprites & clear screen



What do you think this Code does?


```
for (int i = 1; i <= 6; i = i + 1) {  
    System.out.println("I am so smart");  
}
```

```
I am so smart  
I am so smart  
I am so smart  
I am so smart  
I am so smart  
I am so smart
```

How would we do this in Scratch?
Let's try...


How can we do this using a “repeat until” loop with a “Count” variable?

Count 1



```
when green flag clicked
clear
go to x: -135 y: 142
repeat 6
  say I am So Smart for 2 secs
  stamp
  change y by -30
  wait 0.1 secs
hide
```

A Scratch script starting with a 'when green flag clicked' event block. It includes a 'clear' block, a 'go to x: -135 y: 142' block, a 'repeat 6' loop containing 'say I am So Smart for 2 secs', 'stamp', 'change y by -30', and 'wait 0.1 secs' blocks, and finally a 'hide' block.



```
when green flag clicked
clear
go to x: -135 y: 142
set Count to 1
repeat until Count > 6
  say Hello! for 2 secs
  stamp
  change y by -30
  wait 0.1 secs
  change Count by 1
hide
```

A Scratch script starting with a 'when green flag clicked' event block. It includes a 'clear' block, a 'go to x: -135 y: 142' block, a 'set Count to 1' block, a 'repeat until Count > 6' loop containing 'say Hello! for 2 secs', 'stamp', 'change y by -30', 'wait 0.1 secs', and 'change Count by 1' blocks, and finally a 'hide' block.

Let's Compare this with the Java for Loop

```
for (int i = 1; i <= 6; i = i + 1) {  
    System.out.println("I am so smart");  
}
```



Count 1

In Python, it's:

```
for i in range(6):  
    print "I am so smart"
```

How can we have the number printed be based on a variable Total Count?

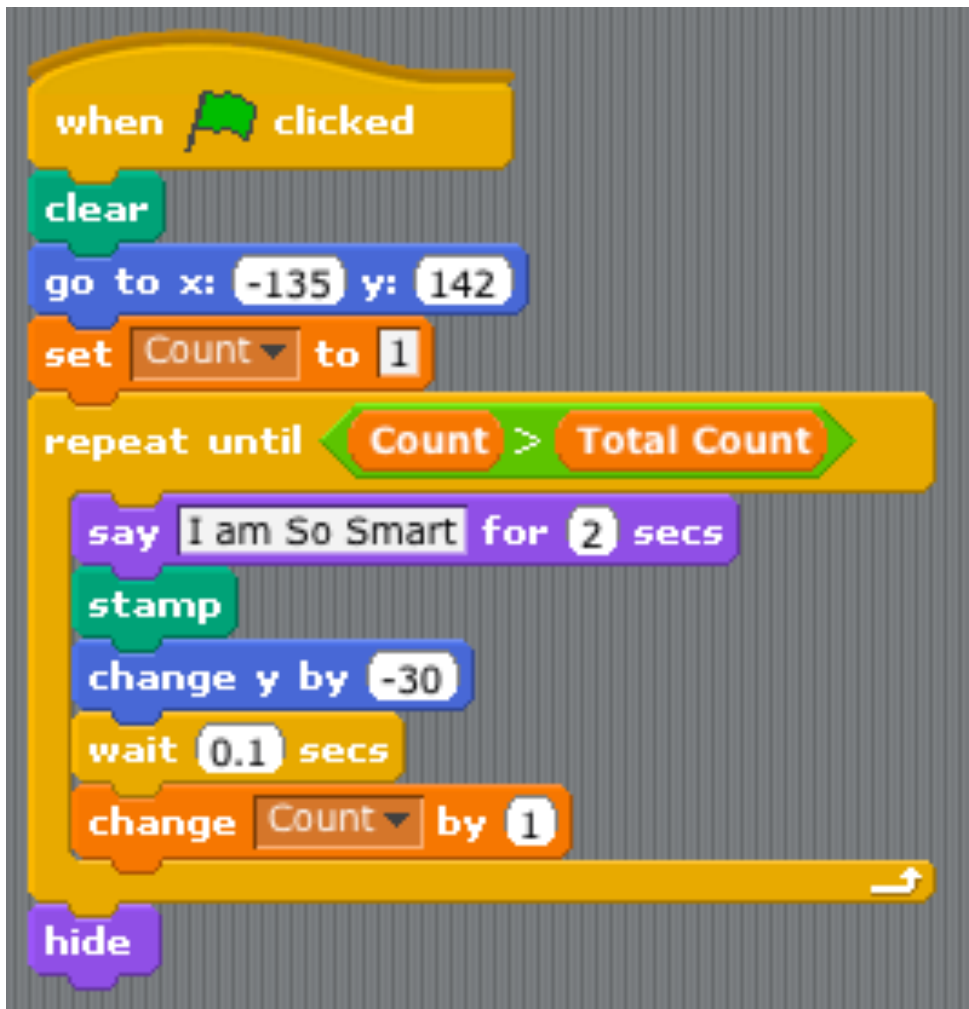


```
when clicked
  clear
  go to x: -135 y: 142
  set Count to 1
  repeat until Count > 6
    say Hello! for 2 secs
    stamp
    change y by -30
    wait 0.1 secs
    change Count by 1
  hide
```

```
when clicked
  clear
  go to x: -135 y: 142
  set Count to 1
  repeat until Count > Total Count
    say I am So Smart for 2 secs
    stamp
    change y by -30
    wait 0.1 secs
    change Count by 1
  hide
```

How would it look in the Java for Loop?

```
for (int i = 1; i <= totalCount; i = i + 1) {  
    System.out.println("I am so smart");  
}
```



In Python, it's:

```
for i in range(totalCount):  
    print "I am so smart"
```

Now Let's "Nest" some loops to add a few columns...

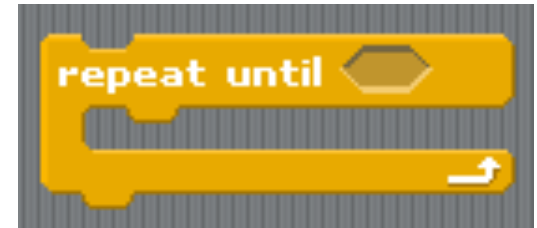
Column

Column Count

```
when clicked
clear
go to x: -135 y: 142
set Count to 1
repeat until Count > Total Count
  say I am So Smart for 2 secs
  stamp
  change y by -30
  wait 0.1 secs
  change Count by 1
hide
```

```
when clicked
clear
go to x: -135 y: 142
set Count to 1
repeat until Count > Total Count
  change y by -30
  set Column to 1
  repeat until Column > Column Count
    stamp
    wait 0.1 secs
    change x by 75
    change Column by 1
  set x to -135
  change Count by 1
hide
```


Key Concepts: Loops



- Control action with the “repeat until” loop:
- Two kinds of variables:
 - Counts – changes tracking your state (i.e. Column)
 - Limits – set to determine the max (i.e. ColumnCount)
- Compare the Count with Limit atop “repeat until”



- Count:
 - Make sure you initialize them at the start of loop
 - Update them within

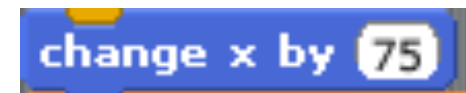


- Position:

– Start at the right place



– Move appropriately within the loop



How would our Nested Loops look Java?

```
for (int i = 1; i <= totalCount; i = i + 1) {  
    for (int j = 1; j <= totalColumn: j++) {  
        System.out.print("I am so smart ");  
    }  
    System.out.println(); //goes to next line  
}
```

Make your Program Perfect

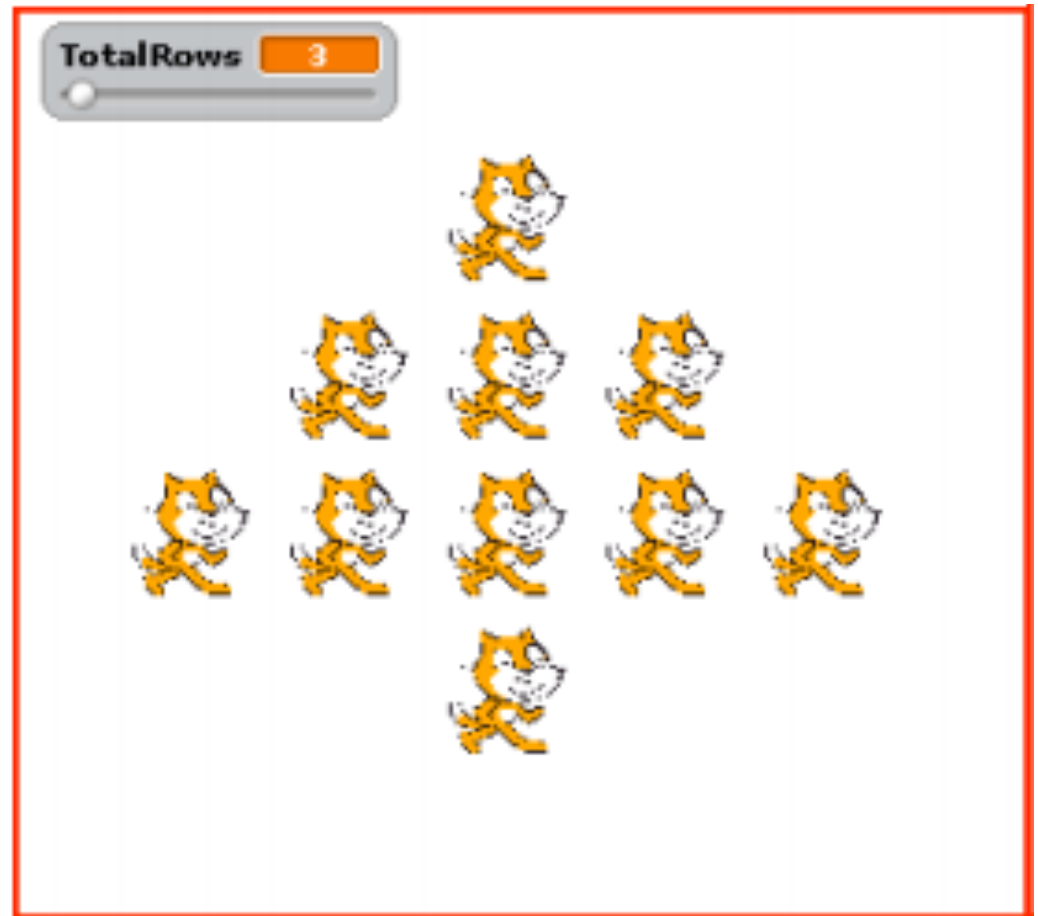
- Test it out with some sample values
- Determine what limits to put on your variables and then set both the min and max
- Re-test for min and max and some sample values in between.

```
* slider *
```

```
set slider min and max
```

- Ask yourself if it will be clear to your user how to use the program, if not add instructions – by creating a background with details and hide all sprites.

Hopefully this will help you master your box & trees...



Questions?