



Game Programming

An Introduction to Computer Science

What is Computer Science?

Have you ever seen code? Written code?

What can you think of that uses computer science?



Medical Technology



Educational Technology



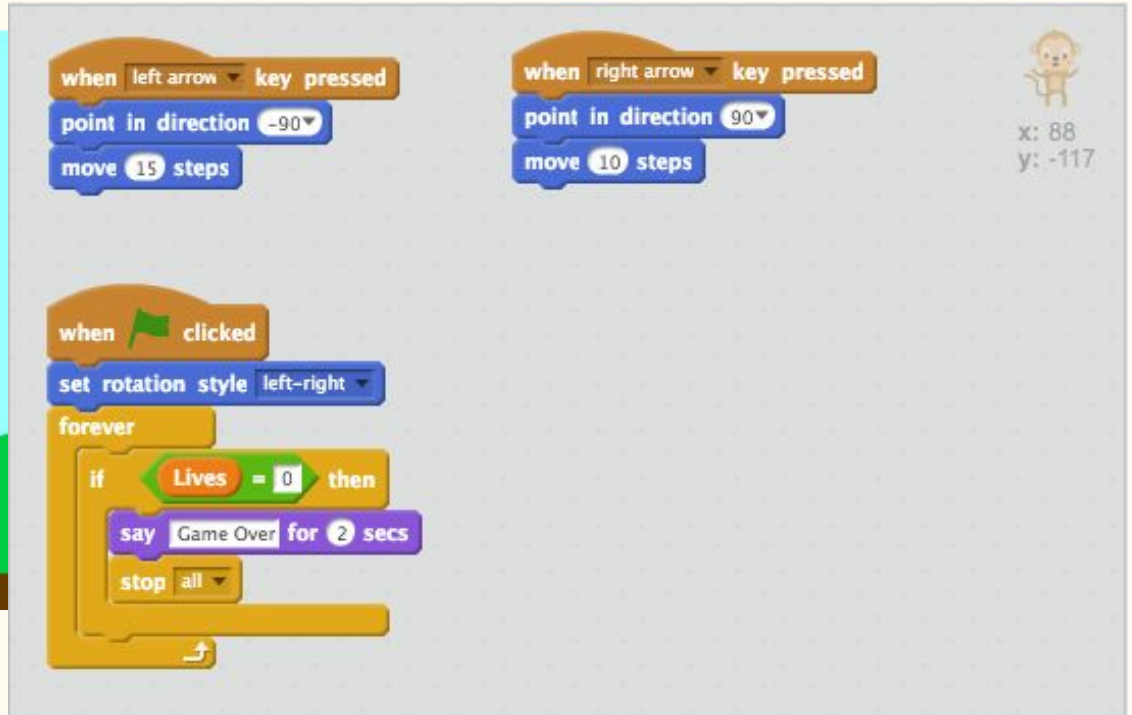
Calculators, Phones, Websites, etc.



Basic coding concepts we will cover:

- Variables
- Loops
- Conditional Statements

Variables



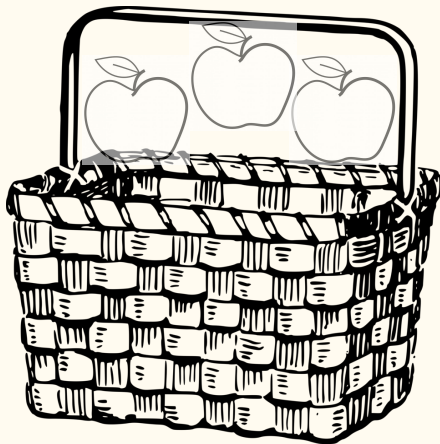
Locate a variable in
this code!

Conditional statements

- Code that executes only when a certain condition is met

In English:

If there are apples, say “There are apples in the basket”



If the basket is empty, announce the number of apples!

Conditional statements

If (it is raining),

Go outside and take an umbrella

Else if (it is below 50 degrees outside),

Go outside and take a coat

Else,

Go outside with nothing



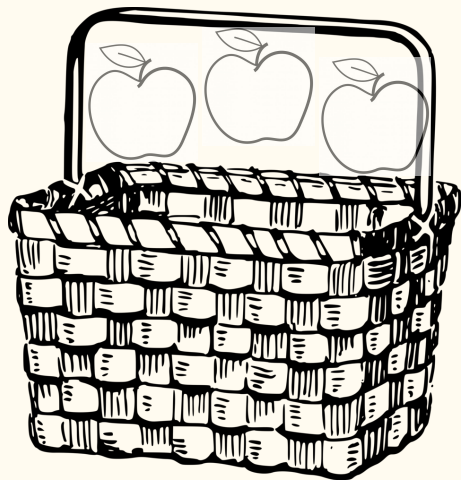
Loops

- Need to take apples out of a basket until it is empty?
- Need to give yourself one point for every 15 minutes of studying?
- Loops are used in coding for tasks that require repetition
- Loops use conditional statements!

Loops

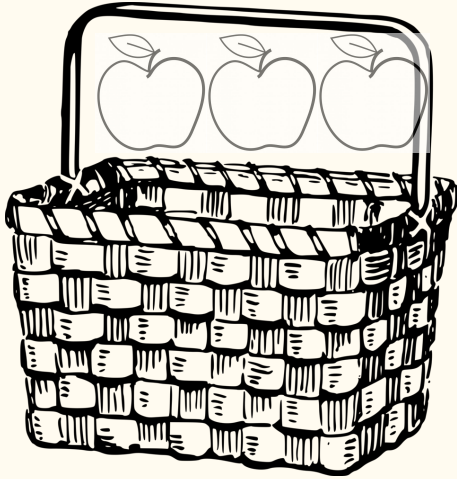
In English:

While the basket of apples is not empty, take out an apple, and count it.



Loops

While the basket is not empty



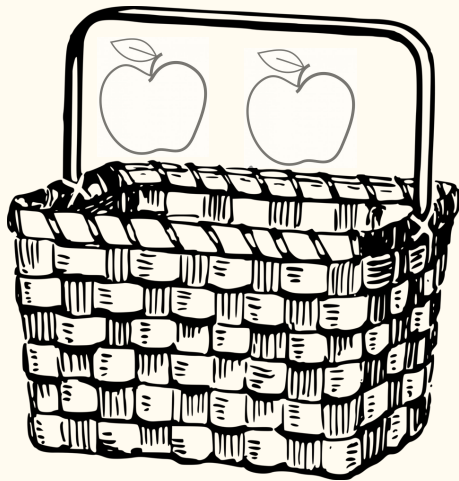
Loops

Take out an apple



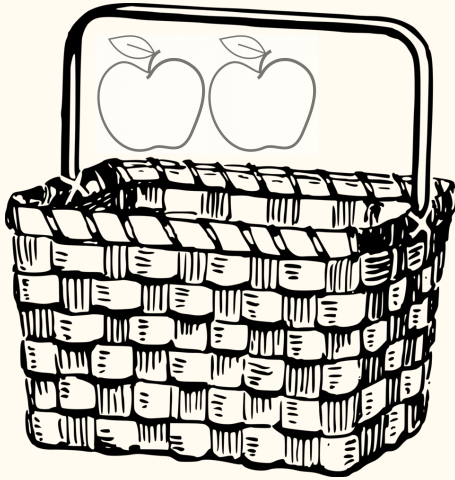
Count the apple

(apples = 1)



Loops

While the basket is not empty



1 apple

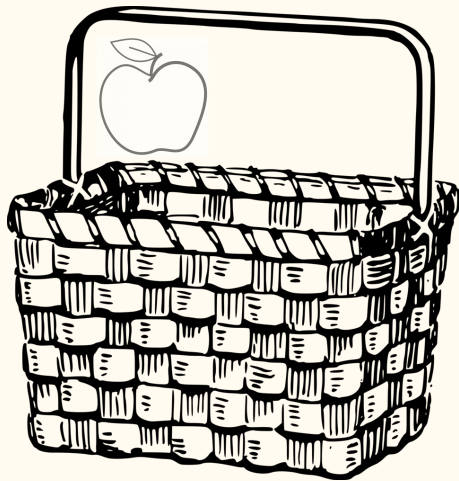
Loops

Take out an apple



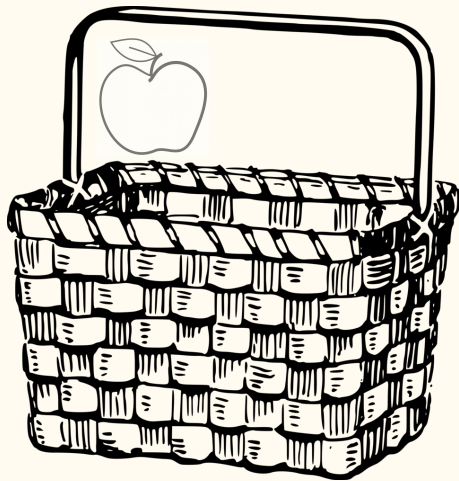
Count the apple

(apples = 2)



Loops

While the basket is not empty



2 apples

Loops

Take out an apple



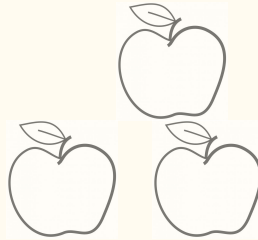
Count the apple

(apples = 3)



Loops

While the basket is not empty



3 apples

Example in Python

```
[>>>while apples_in_basket != 0:
```

```
[. . .     apples_in_basket = apples_in_basket - 1
```

```
[. . .     apple_count = apple_count + 1
```

```
[. . .     if apples_in_basket == 0:
```

```
[. . .         forgot_apple_count = False
```

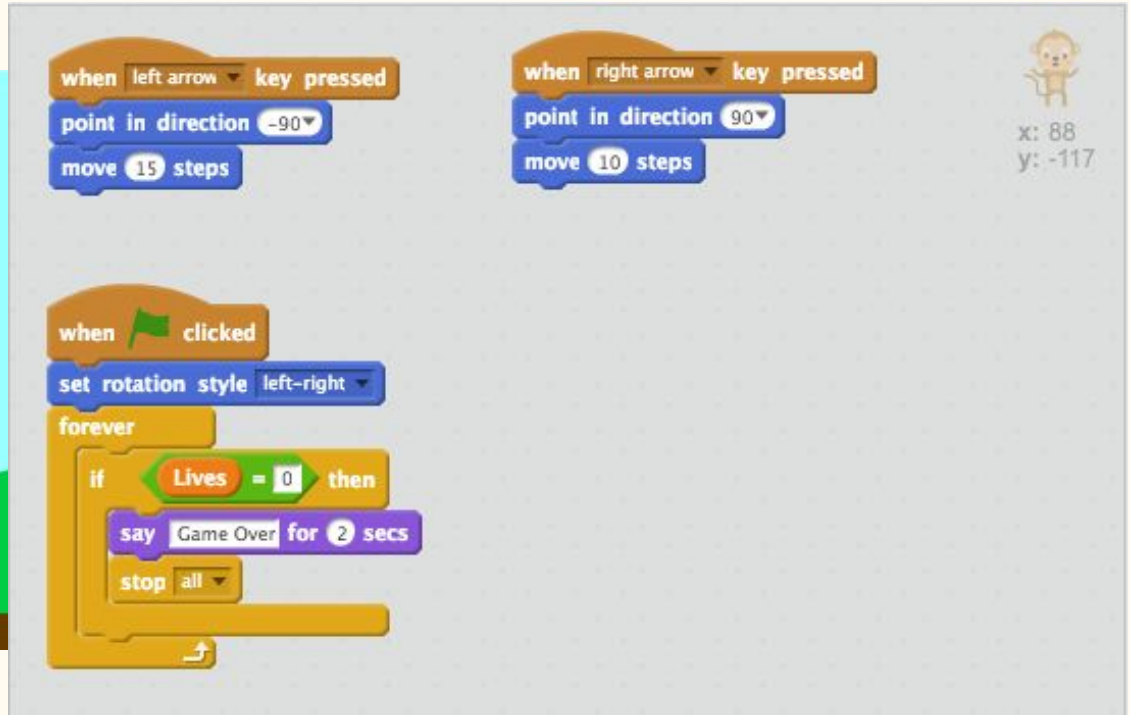
```
[. . .         print apple_count, "apples were in the basket"
```

```
[. . .     else:
```

```
[. . .         print "There are still more apples to count!"
```

```
[>>> apples_in_basket = 20  
[>>> forgot_apple_count = True  
[>>> apple_count = 0  
[>>> while apples_in_basket != 0:  
[...     apples_in_basket = apples_in_basket - 1  
[...     apple_count = apple_count + 1  
[...     if apples_in_basket == 0:  
[...         forgot_apple_count = False  
[...         print apple_count, "apples were in the basket"  
[...     else:  
[...         print "There are still more apples to count!"  
[... 
```

Find a loop and a conditional statement



Games!!

hamhash.com/should



<https://scratch.mit.edu/projects/86080676/>

Your Game! **hamhash.com/use**

We are halfway through creating a new game, but we couldn't finish it- help us fix these issues!

1. There is a sprite chasing you, but you can't move!
2. You are supposed to collect bananas to score points, but they don't give you anything right now!
3. The bananas don't move to a new location after you find them!
4. The costume of the monkey and banana are missing! (Make these whatever you want)
5. The background is missing! (Make this whatever you want)

Challenges for New Game

Now that you've learned some scratch basics, try some bonus problems

1. Make your sprite move faster if you press space bar
2. Make a “cheat code”: If you press a button, the chaser will stop for 10 seconds!
3. Make a “super bonus item” that appears and disappears, but is worth more points
4. Make a second level- after you score 1000 points, the chasers speed up
5. Use your imagination! Be creative!

Showcase!

Time to show off your final project!!

Take home thoughts...

What is something you would like to learn to how to add to your game if you had more time?

Any other cool feature ideas?

Questions?

Want to learn more?

code.org

scratch.mit.edu

ocw.mit.edu

codeacademy.com