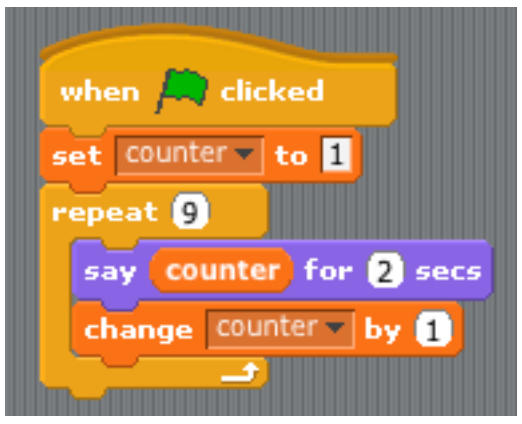
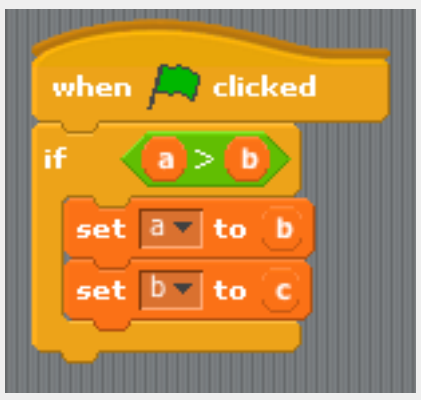
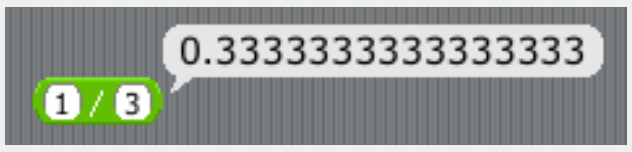
A quick comparison of common functionality in Scratch, Java and Python

Scratch 1.4	Java	Python
In Scratch an assignment statement binds a name to an object; objects can be of any type — in short, Scratch is dynamically typed and performs auto-boxing as necessary. 	In Java, all variable names (along with their types) must be explicitly declared. Attempting to assign an object of the wrong type to a variable name triggers a type exception.That's what it means to say that Java is a statically typed language. Java container objects (e.g. Vector and ArrayList) hold objects of the generic type Object, but cannot hold primitives such as int. To store an int in a Vector, you must first convert the int to an Integer. When you retrieve an object from a container, it doesn't remember its type, and must be explicitly cast to the desired type. int age = 26;	In Python, you never declare anything. An assignment statement binds a name to an object, and the object can be of any type. If a name is assigned to an object of one type, it may later be assigned to an object of a different type. That's what it means to say that Python is a dynamically typed language. Python container objects (e.g. lists and dictionaries) can hold objects of any type, including numbers and lists. When you retrieve an object from a container, it remembers its type, so no casting is required. age = 26

	public class HelloWorld
	{
	public static void main (String[] args)
	{
	System.out.println("Hello, world!");
	}
	}
		print "Hello, world!"
		
		————————————————————
		
		print("Hello, world!") # Python version 3

	// print the integers from 1 to 9
	
	for (int i = 1; i < 10; i++)
	{
	System.out.println(i);
	}
	
	Note: In Java a single line block does not require braces, so the following is identical to above
	
	for (int i = 1; i < 10; i++)
	System.out.println(i);
		# print the integers from 1 to 9
		
		for i in range(1,10):
		print i

	if (a > b)
	{
	a = b;
	b = c;
	}
		if a > b :
		a = b
		b = c

	import java.util.Scanner; . . . Scanner input = new Scanner(System.in); System.out.print("Enter age: "); int age = input.nextInt(); . . .	age = input("Enter age: ")
 **Note: In all cases 1.0/3.0 = 0.33333333…**	System.out.println(1/3); 0	Python 2.7.x: >>> 1/3 0 Python 3.6.x: >>> 1/3 0.3333333333333333

For the Java and Python comparison, many of the examples were taken from:

https://pythonconquerstheuniverse.wordpress.com/2009/10/03/python-java-a-side-by-side-comparison/

Notes:

1. Types
   a. In Scratch variable types are dynamic and automatic, including conversion as necessary
   b. In Java variables are statically "typed" in most cases; conversion must be explicitly performed by the programmer
   c. In Python variables are dynamically typed, as in Scratch; however, conversion (via casting) is necessary at times

2. Blocks
   a. In Scratch a block is identified by a construct
   b. In Java a block is defined by braces
   c. In Python a block is indented

3. Of course these are just the basics; lists, graphics, methods, events, timers, messaging, and more are also supported
   a. What are lists, graphics, methods, events, timers, messaging and more?

Take CSC 121 and 123 to find out…