Scratch Variables & Loops: Stamping Squares with Nested Loops

Name: _____ Period: ___

Learning about Stamping

Our goal is to create a scene that looks like this by duplicating or "Stamping" our sprite on the background.

We will call this file **boxcats.sb**. Save often to your Scratch folder!

Starting with your cat in the middle of the  screen

A) Draw a picture of what you think happens when you run this script:

B) Now create the script on your sprite. What actually happens?

C) What happens if you run the script a second time? Is this what you would expect?

D) What commands would you use to clear the screen?

E) What command would you use to initialize the x and y coordinates of the sprite to the center of the screen?

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Separate your 

from the 

.

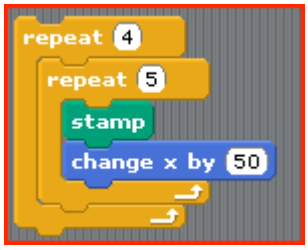
Add the following initialization to your script:

1. Clear your background.
2. Set your sprite to the center of the screen

Now write a bit of code that will draw the following:

F) What control do you need to use to stamp the cat 5 times? Where do you find this statement?

Doubly Nested Loops



In order to get our rectangle of cats, you need to repeat your "line" of cats 4 more times. You can do this by "wrapping" the part of the script that stamped the line of cats in another repeat control. This is called a **Doubly Nested Loop**. The *repeat 4* loop is often called the **outer loop**, and the *repeat 5* loop is often called the **inner loop**.

Try creating a doubly nested loop in your script now and run it.

A) Does this work exactly as you expected? Why not?

B) What command would move the cat left to line up with the start of the line?

C) What command would move the cat down one line?

D) In order to make your cats stamp as a rectangle, you have to add the commands to move the cat back over and down to start the new line. You should do this (circle one):
   a. Only before the outer loop is executed
   b. Just before the inner loop is executed
   c. Inside the inner loop
   d. After both loops are done executing

Add the code to move the cat over and down to start the new line in the correct place. If you're not sure, try all the places listed above and see which one actually works.

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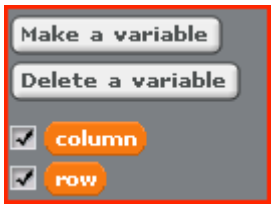
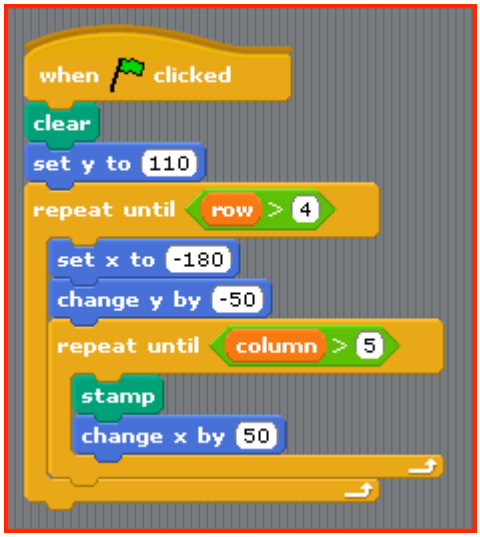
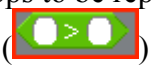
Adding Variables

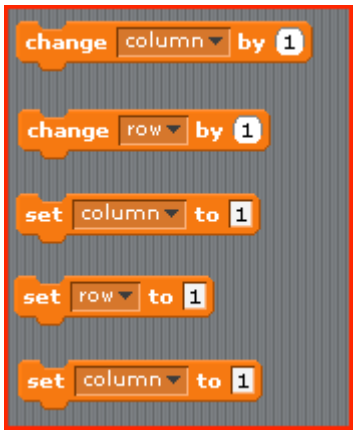


Create two variables, one called **row** and another called **column**.



Change your repeat loops to be repeat until loops. Use the greater than inequality () in the number section in the "until" part – your script should look like what's on the right when you're done.

A) What happens if we just run it right now?



You will need to add the following commands to your script in either
- before the outer loop
- just inside the outer loop
- just inside the inner loop.

(Note: the commands say '**1**' not '**0**' which is the default in Scratch. **You will have to change this!**)

Think about this BEFORE you do it.

B) Where do you have to **initialize** the row and column to 1?

C) Where do you have to change the row by 1 each time?

D) Where do you have to **re-initialized** the column to 1?

E) Where do you have to change the column by 1 each time?

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F) Create two more variables named **TotalRows** and **TotalColumns**.

TotalRows replaces what number in your script?

TotalColumns replaces what number in your script?

Get your Program working.
Make sure to test it out with a variety of values.
Save it as boxcats.sb (or similar) and have it signed off!

+ Feel free to try adding color changing to your grid of cats (or whatever you are stamping). Feel free to be creative but make sure the row & column count continues to work.