



Scratch Programming

Lesson 2-4

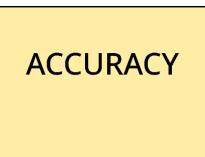
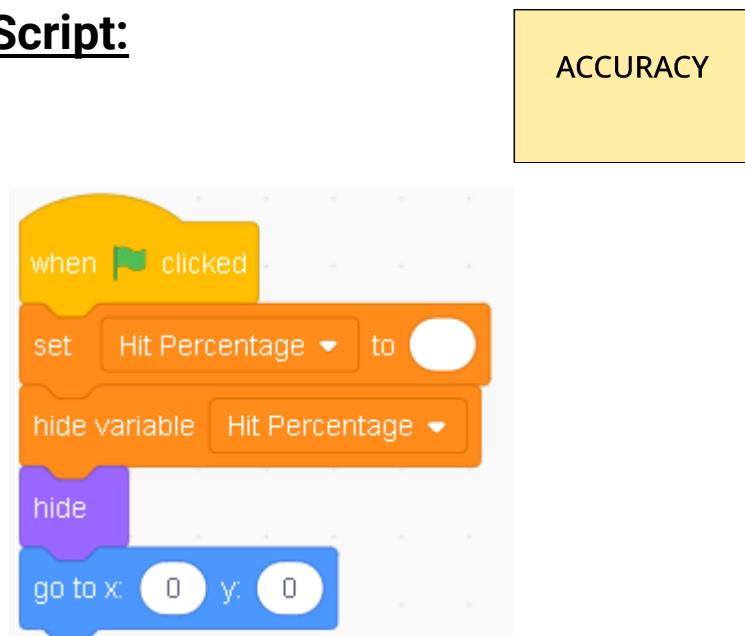
Whack-a-mole Game IV

Presented by Advaspire Team



Review – Accuracy Box Setup

Script:



First thing we want the accuracy box to do is set a new variable called “Hit percentage”, and set it to “” (nothing) at start, and hide the variable.

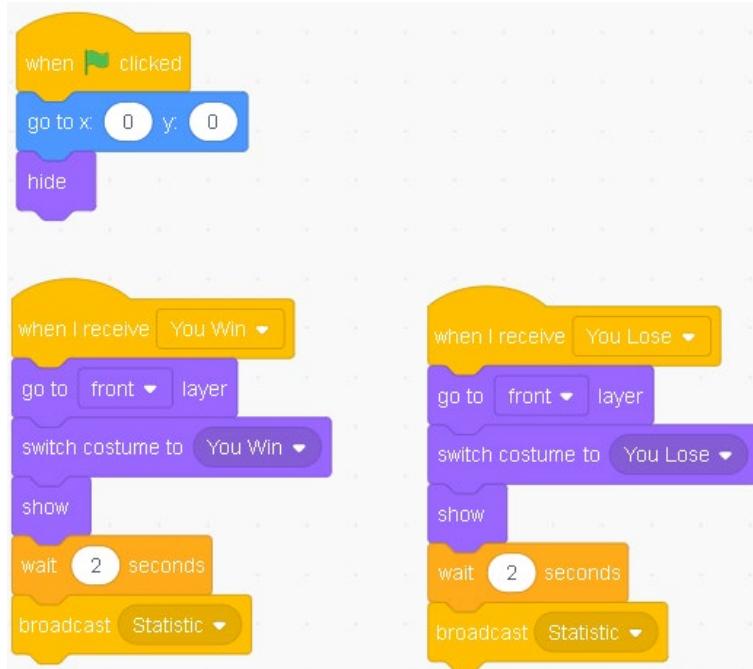
We only want this box and the variable to show once our game ends.



Review - Rescript the Win & Lose

Script:

YOU WIN!



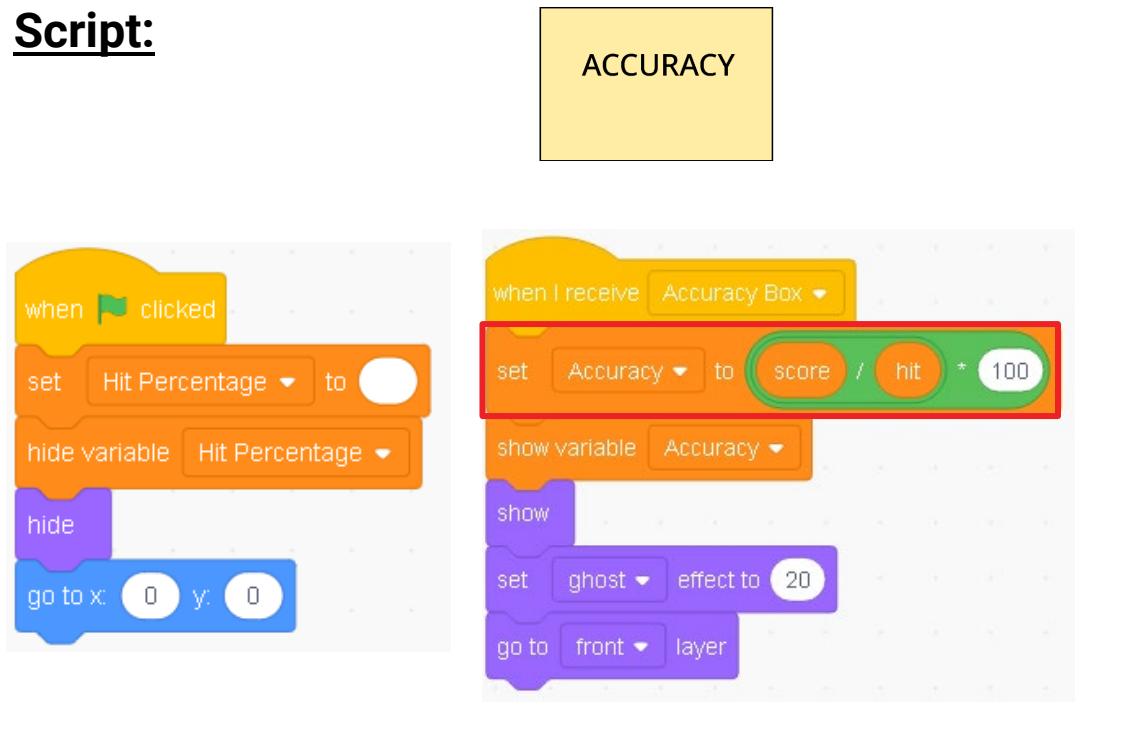
After showing “You Win” or “You Lose”, then we will show the accuracy box after 2 seconds.

I will make a broadcast called “statistic” to call out the Accuracy box.



Review - Accuracy Box

Script:



And here we need to calculate the Hit Percentage by using the formula:

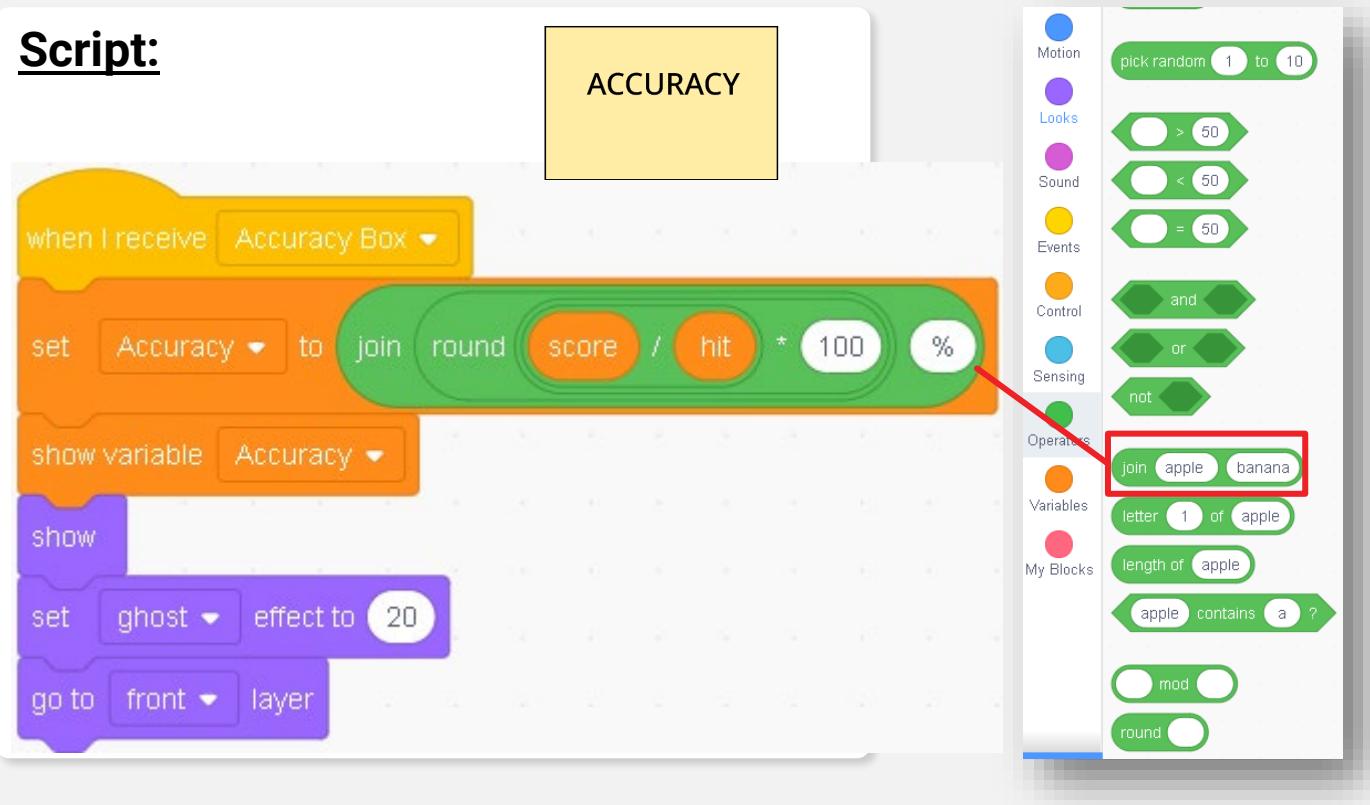
$$(\text{Accuracy} = \text{Score} \div \text{hit} \times 100\%)$$

Then I will show the variable and make my box to the front layer with transparent effect 20%.



Review - Accuracy Box – Concatenate with “%”

Script:

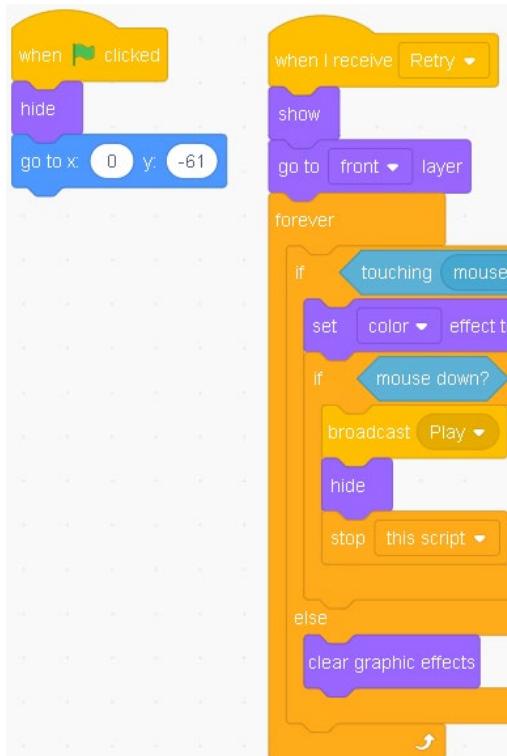


Let's use the join “_” “_” to join the accuracy with a “%” symbol.



Review - Retry Button - Script

Script:



RETRY

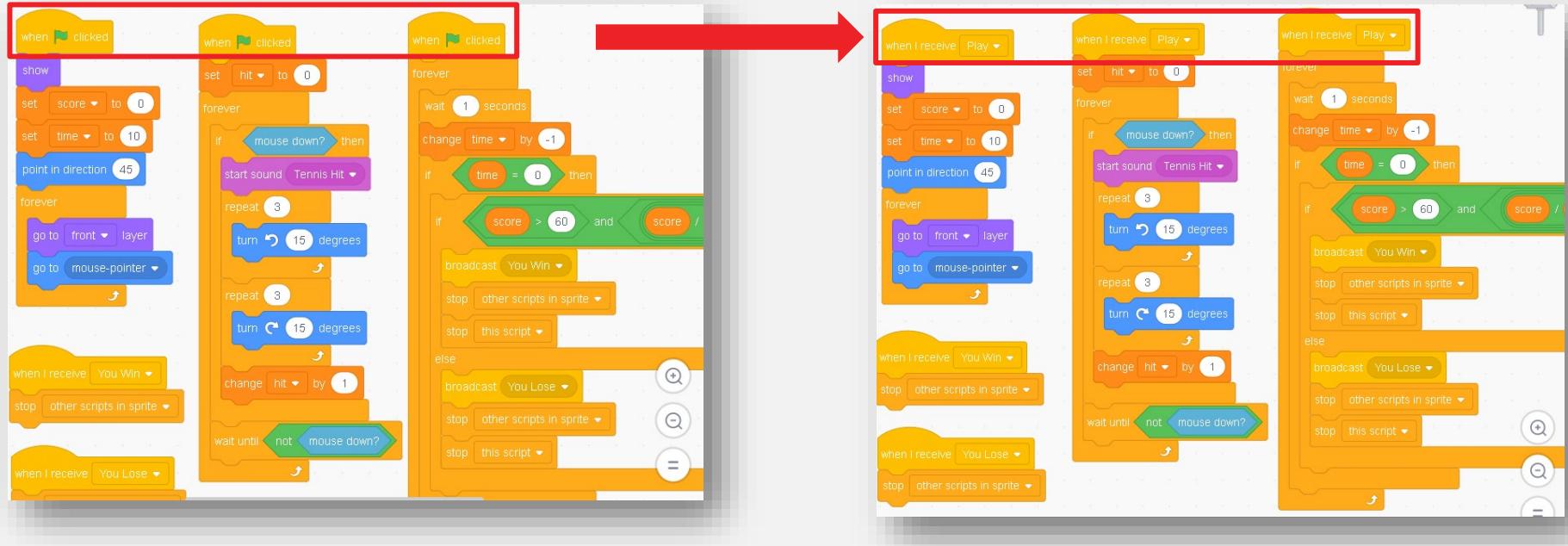
Just create the Retry button using paint like how we created the “play” button for the menu page.

The script is similar to “Play” button, but it has to has a command to make it go to front.

Then we will broadcast “Retry” after the accuracy box came out to call out the “Retry” button.



Review - Change all “Flag” to “Play” for starting blocks

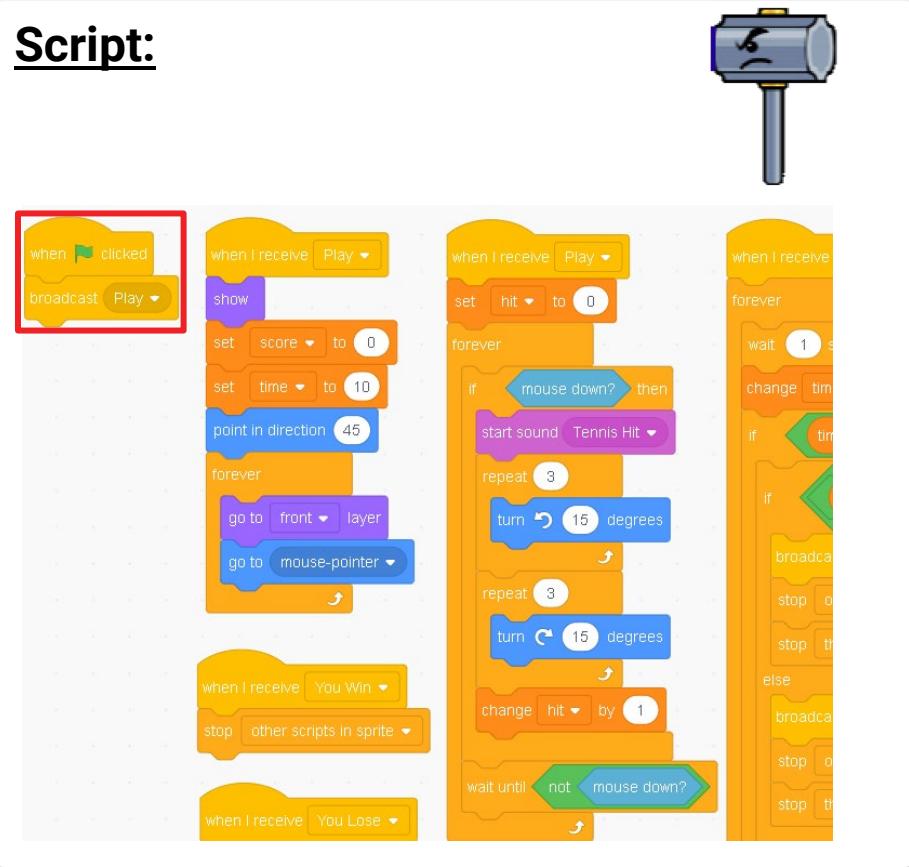


All of your starting blocks that are programmed with “When Flag clicked” should be changed to “When received Play”, including for your Hammer, Holes, Moles, Win & Lose broadcast, title, accuracy box and retry button.



Review - Start with broadcast “Play”

Script:



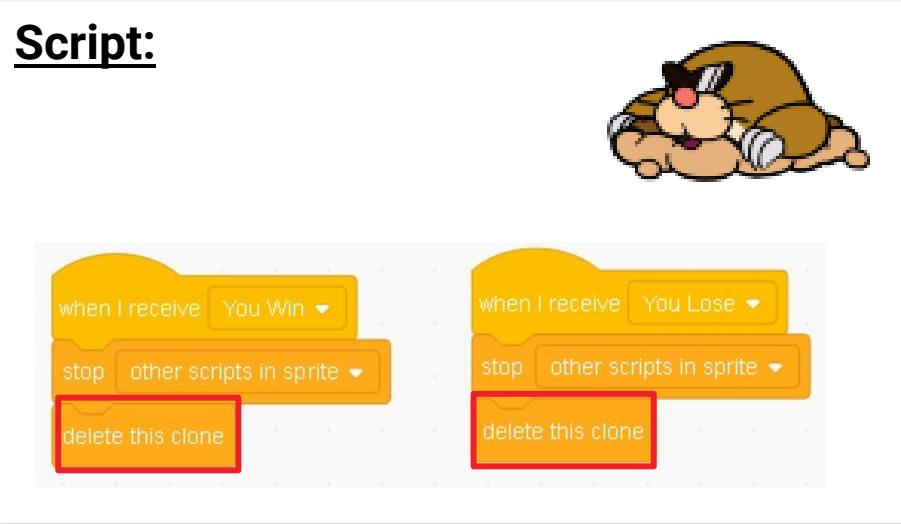
Remember to add 1 “When Flag Clicked”, then broadcast “Play”.

So everything can also restart once you clicked the “Flag”.



Review - Delete the clones once game ended

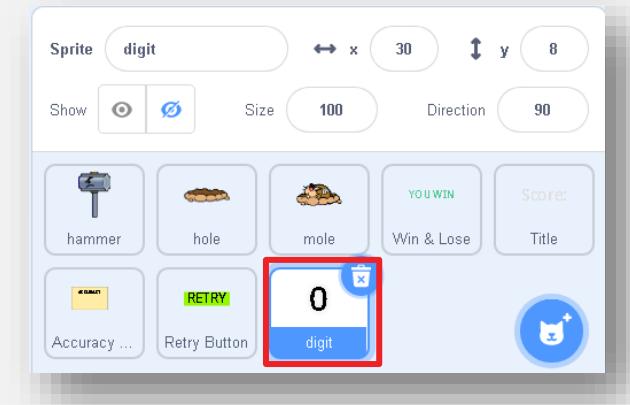
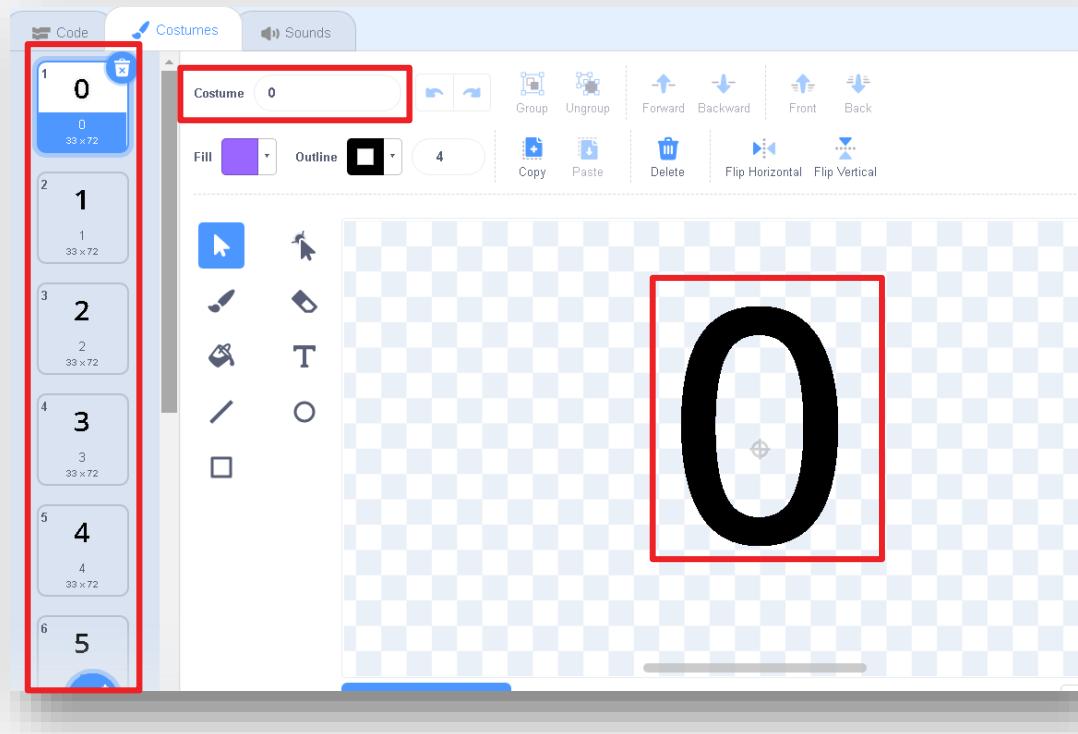
Script:



As we are going to re-run the game once we click “Retry”, then we should delete all the clones once we received “You Win” or “You Lose”, otherwise you will create too many moles for every time you retry the game, and it will get you into trouble of PC lagging.



Review - Add new Sprite - Digit



Create a new sprite with paint and add in the costume from 0-9 and a "%" symbol. Then rename the costume to its own name.



Review - Use our own digit to show the variable



Our digit display should be like left picture, so it has four position (left to right):

1st digit = (-60,8)

2nd digit = (-30,8)

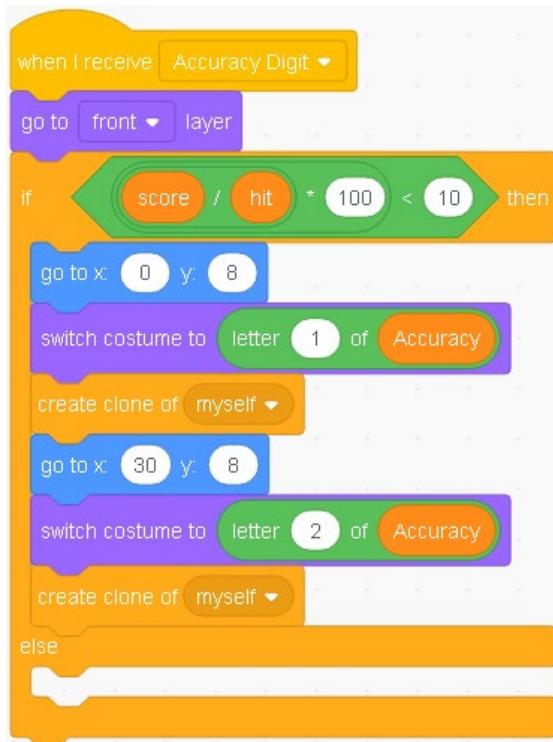
3rd digit = (0,8)

4th digit (%) = (30,8)



Review - Digit If-statement

Script:



0

I will create a new broadcast called “Accuracy Digit”, which will be broadcasted after the accuracy box is created.

Then we need to check how many digit will be used for showing the accuracy.

In previous slide, we know that it will only have 3 possibilities:

- 2 digits when accuracy < 10%
- 3 digits when accuracy = 10% - 99%
- 4 digits when accuracy = 100%



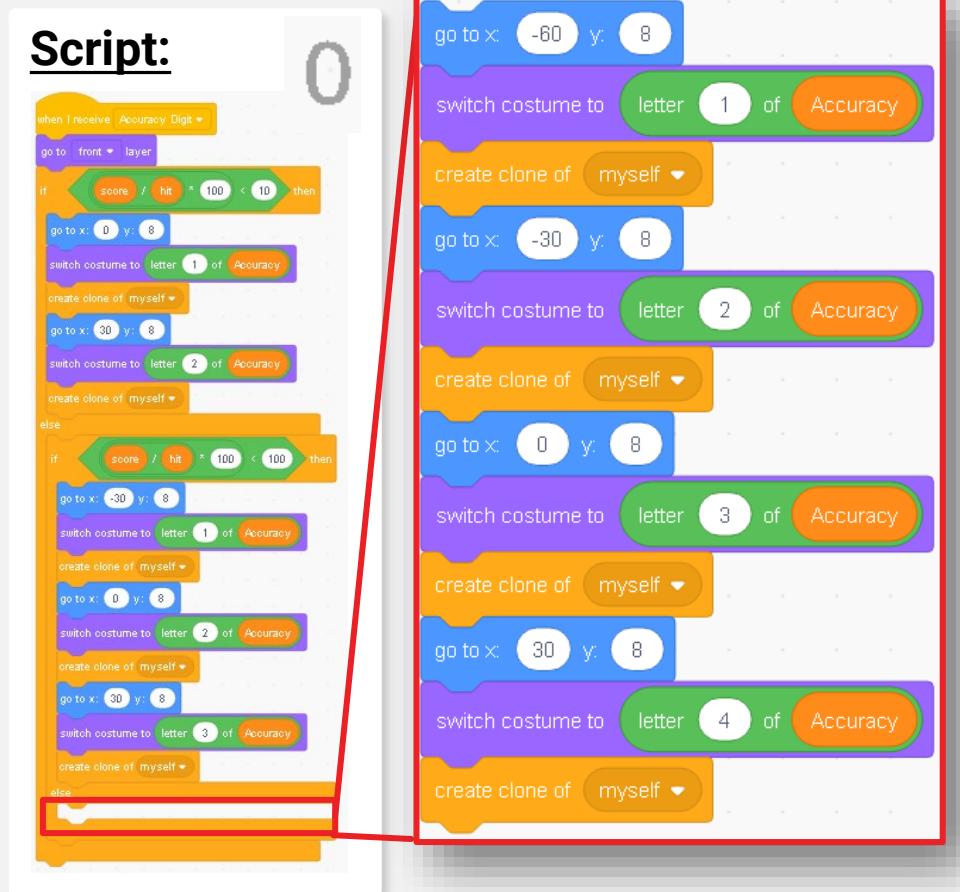
Review – Digit If-statement explained



So if the accuracy checking shows it is lower than 10% (e.g, 8%), it will only create 2 clones for showing first letter “8” and 2nd letter “%”.



Review – Digit If-statement

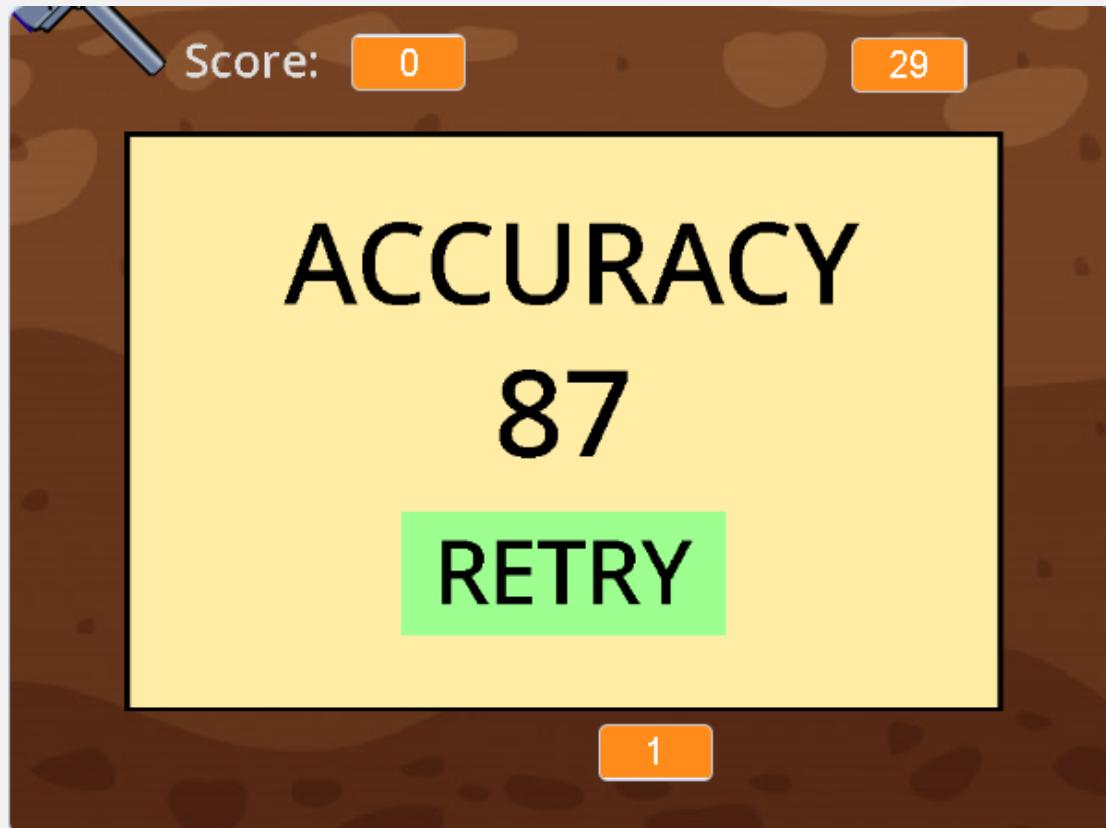


If the 2nd condition doesn't fulfil, then it must be 100%, and it will execute the command blocks in the else statement.

Therefore we will put in these commands to show 4 digits on the screen.



Mission 2-3 – Show digits for all variable



Today we want to use our digits to represent the variables (score, timer, hit).

Apart from accuracy digits setting, the mentioned 3 variables are responsive in the game (it keeps changing in the game).



Fix the bug (Hitting with Hammer)



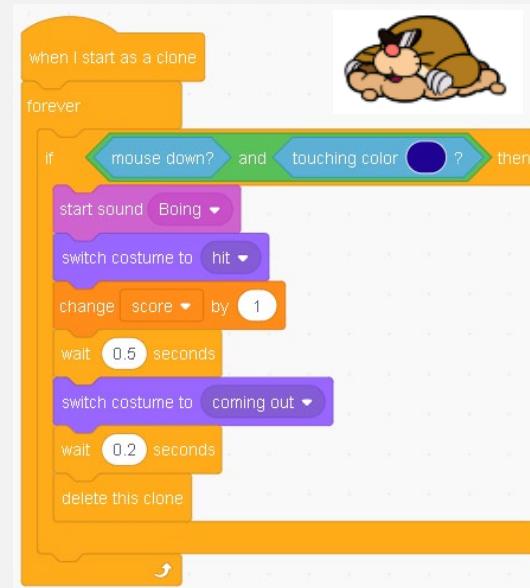
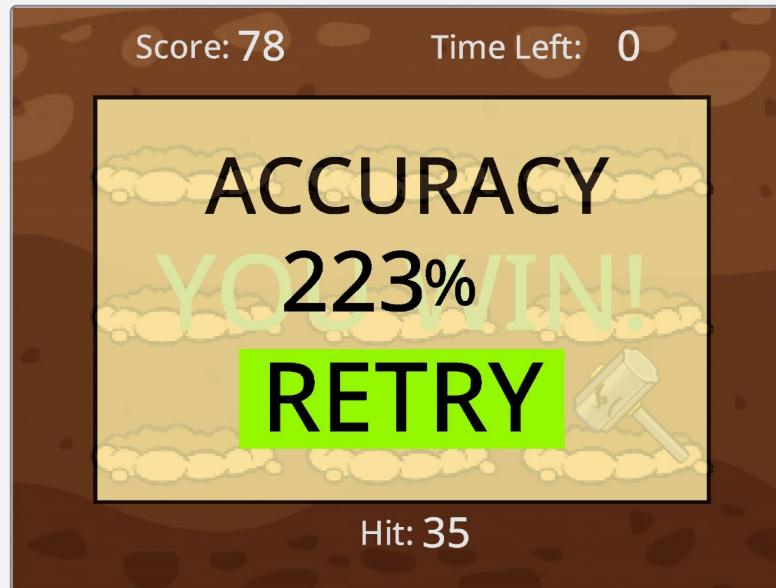
Did you notice that you can play cheat in the game?

When you are holding your mouse down (not releasing the mouse click), even when your hammer is not hitting, but when your hammer touches the moles, you still can get points without increasing the hit count.

This will get you more than 100% accuracy at the end.



Fix the bug (Hitting with Hammer)

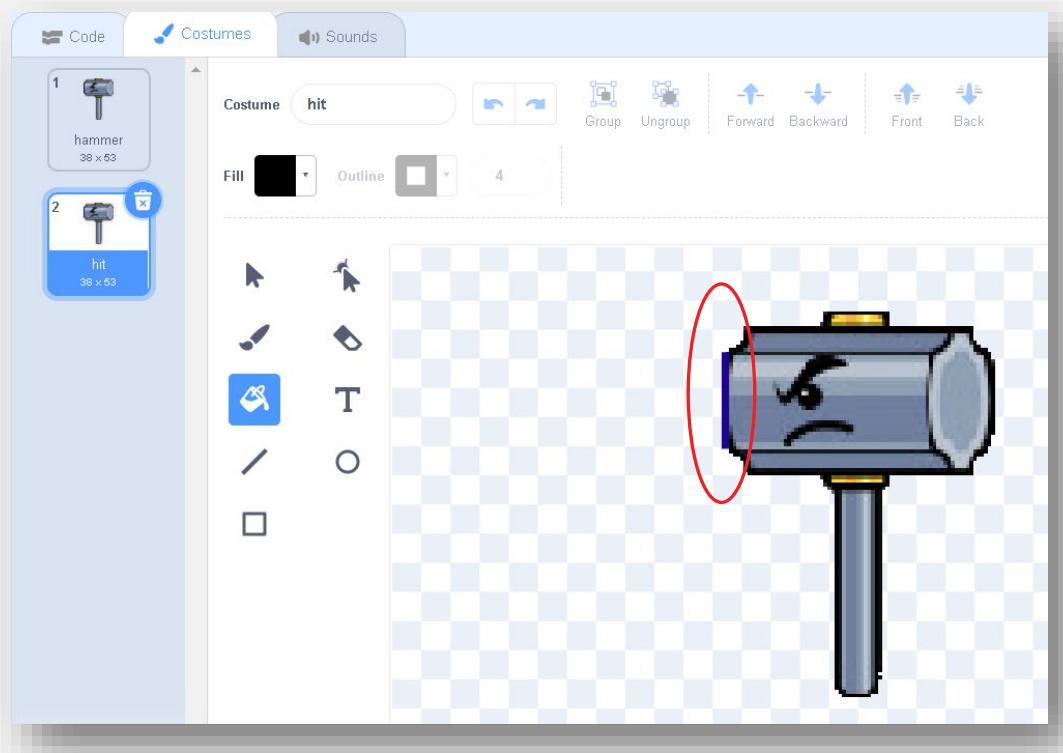


This is because your mole will get hit when “mouse down” and it’s “touching blue color”.

How should we fix this?



Rescript the Hammer



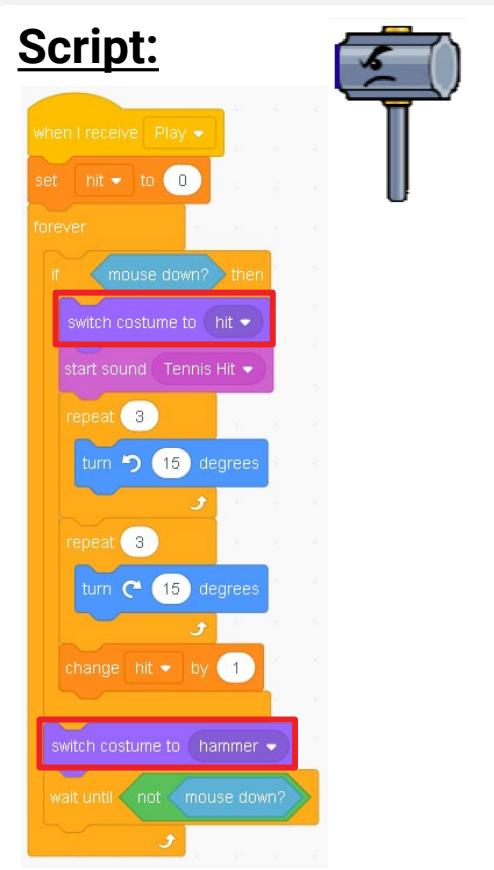
Let's rescript our hammer.

I will add a new costume to the hammer which has the color blue on the hitting edge, and I will rename this costume to "hit".

Where first hammer I will paint the edge to black color. Therefore, without "hit" costume, we can't hit the mole and get point.



Rescript the Hammer



When I click my mouse, the hammer will change to “hit” costume (which has the blue colour edge), then it will switch back to normal “hammer” (no blue edge) again.

And only when you release the mouse click, you are able to re-click again.

But during this moment, the moles won’t respond to your hammer even when you’re holding the mouse click.

Use our digit to show the variables

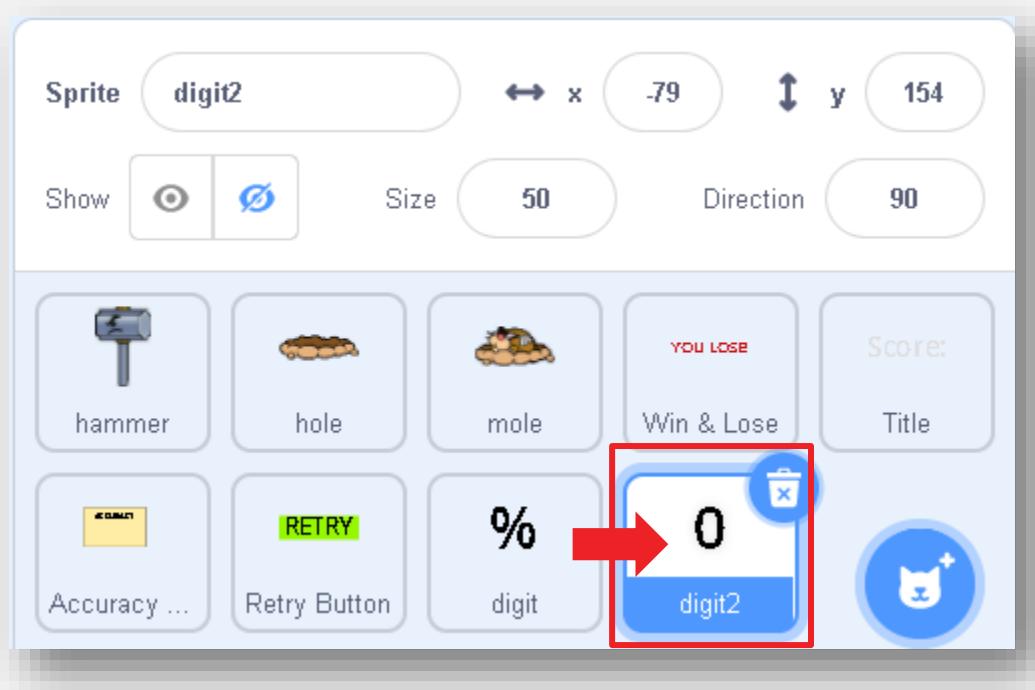


Now we want to use our own digits to represent our variables.

As these variables are responsive to the game, it's not like 1 time calculation, so we will need a forever-loop to code for this.



Use our digit to show the variables

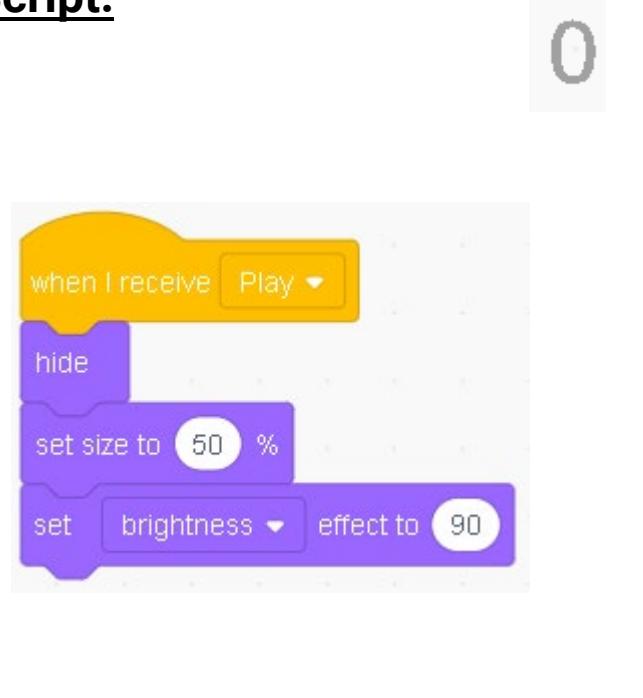


Let's duplicate the digit so that we won't need to recreate all of our digits from 0 to 9 again.



Script – Digit (Variables)

Script:

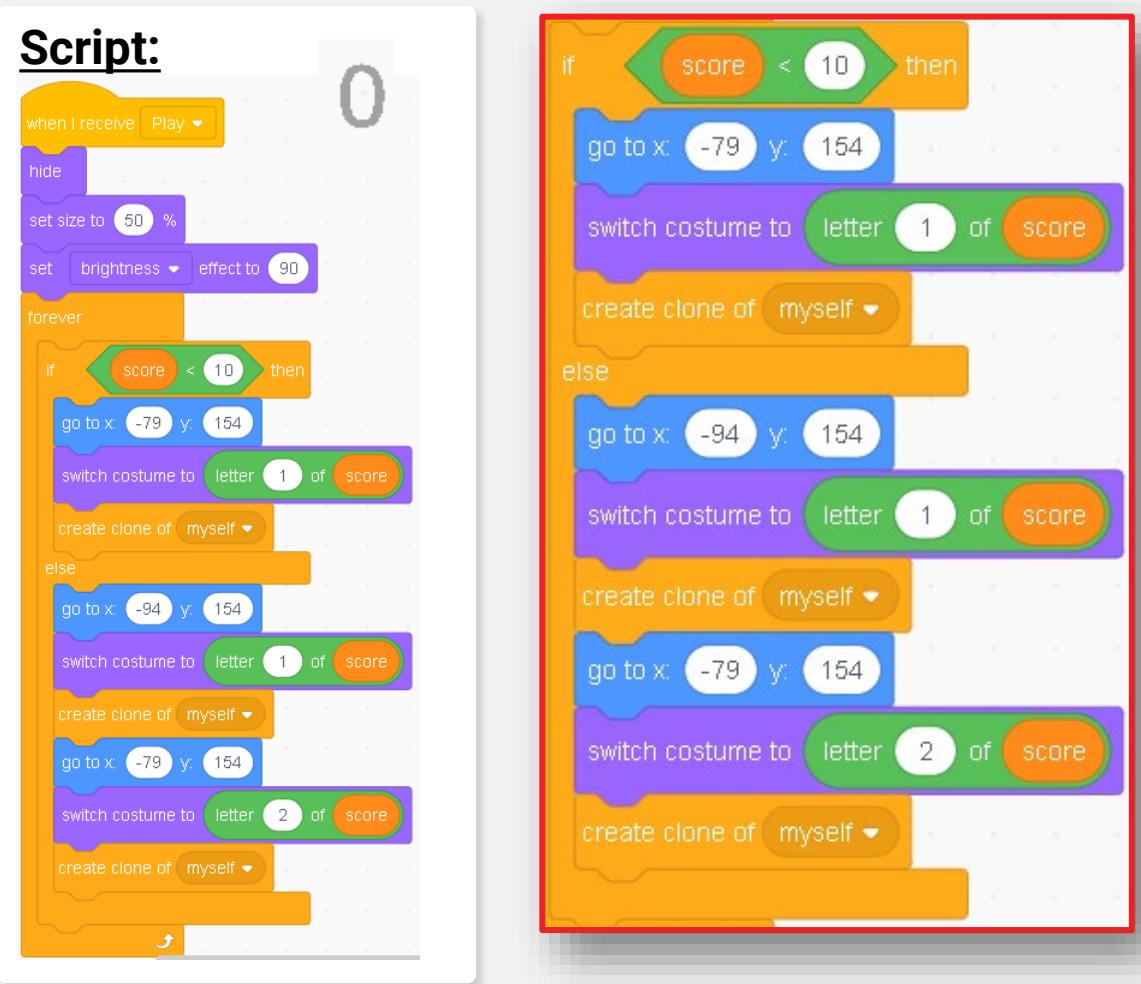


0

First thing to set up is the size of the digit, I will set it to 50%. Remember to hide it when starting to play (we will only show clones).

As I want my digit to be slightly brighter on my screen as my backdrop is very dark in this game, therefore I will set the brightness to 90.

Script – Digit (Variables)



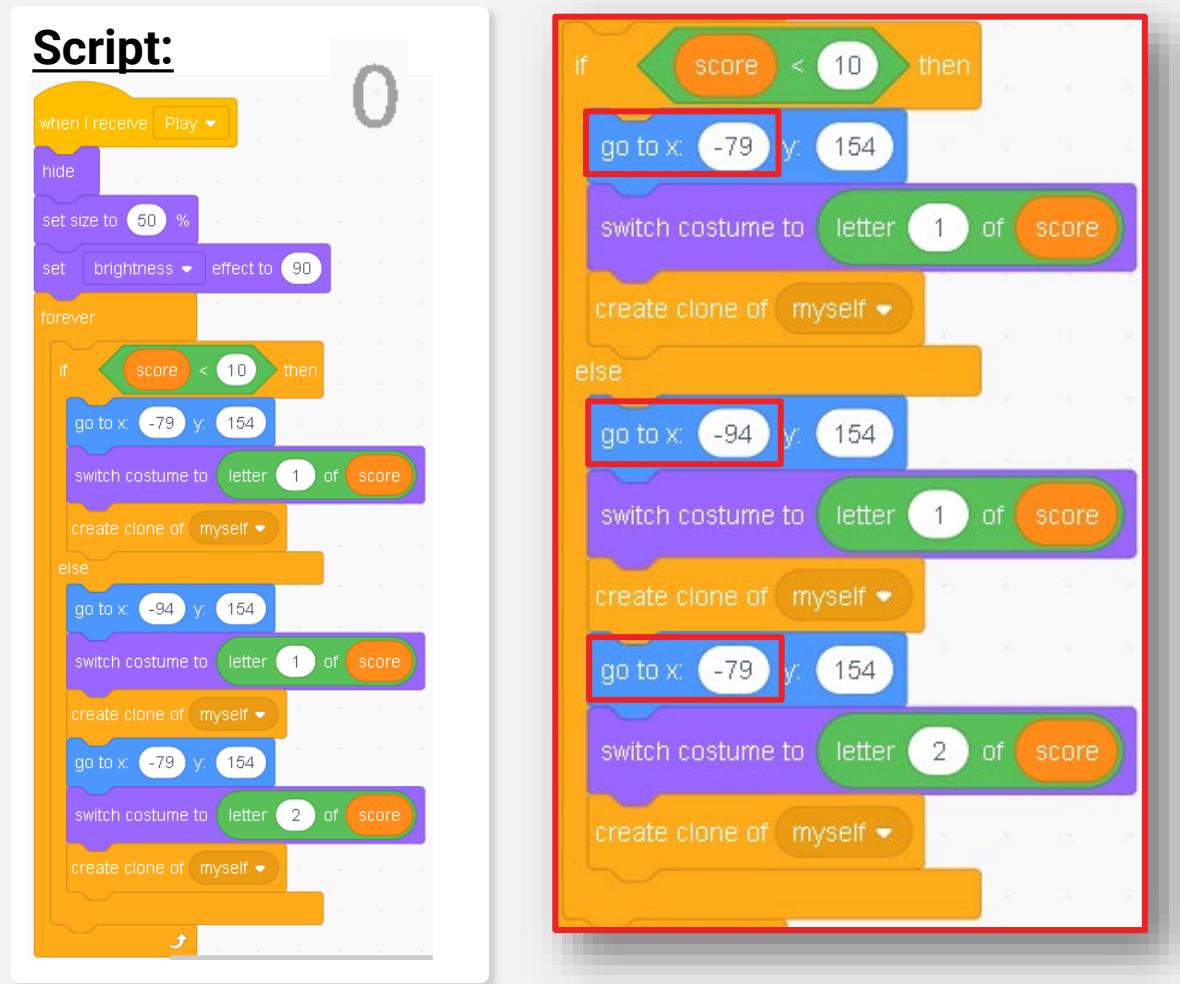
Similar to the accuracy box, but this time we need to add forever loop to it.

And here I will only program for 2 digits (I believe we won't get 100 or above to our scores in 1 game).

If less than 10, it will only have 1 digit, else it will show 2 digits. (totally same concept with accuracy, but accuracy is up to 4 digits in total).



Script – Digit (Variables)

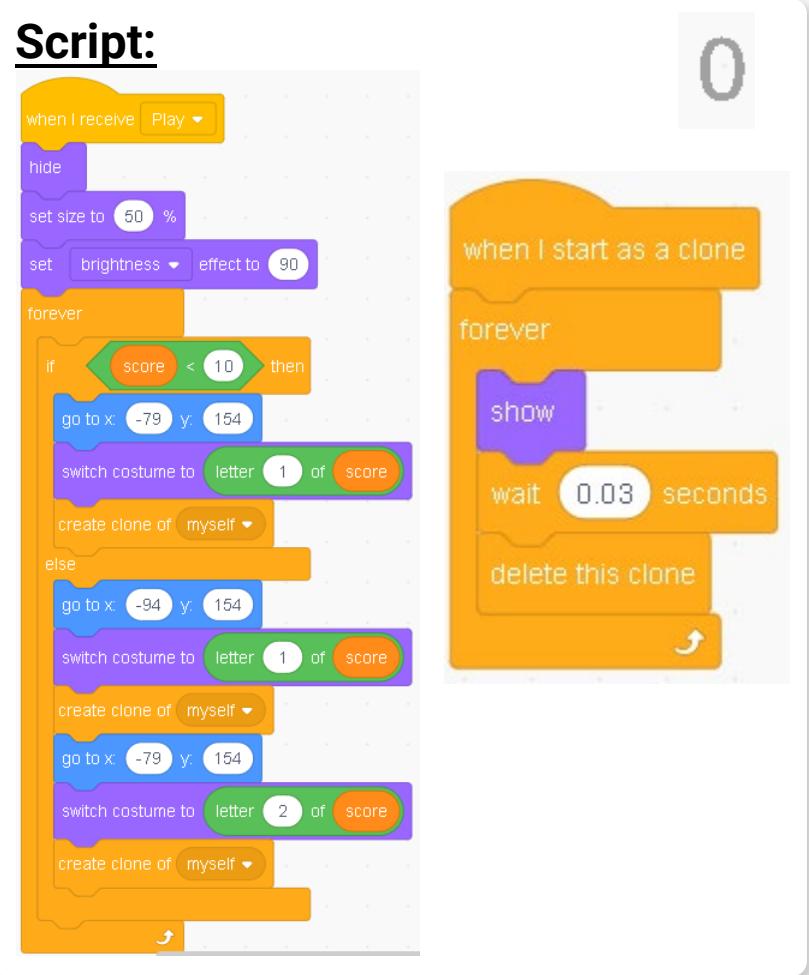


Try to measure your position for first and second digit (when we make the size to 50%, the distance between each number will also change, here is only 15).

**My ones digit is at (-79, 154).
My tens digit is at (-94, 154).**



Script – Digit (Variables) Clones



When start as clones, we will need to display the numbers but keep deleting it for every 0.03 seconds.

When you run the game, you won't see the number flickering like keep deleting and showing back.

Here means that your real body will keep creating clones while your clones keep deleting itself. It will keep your variable updated all the time.



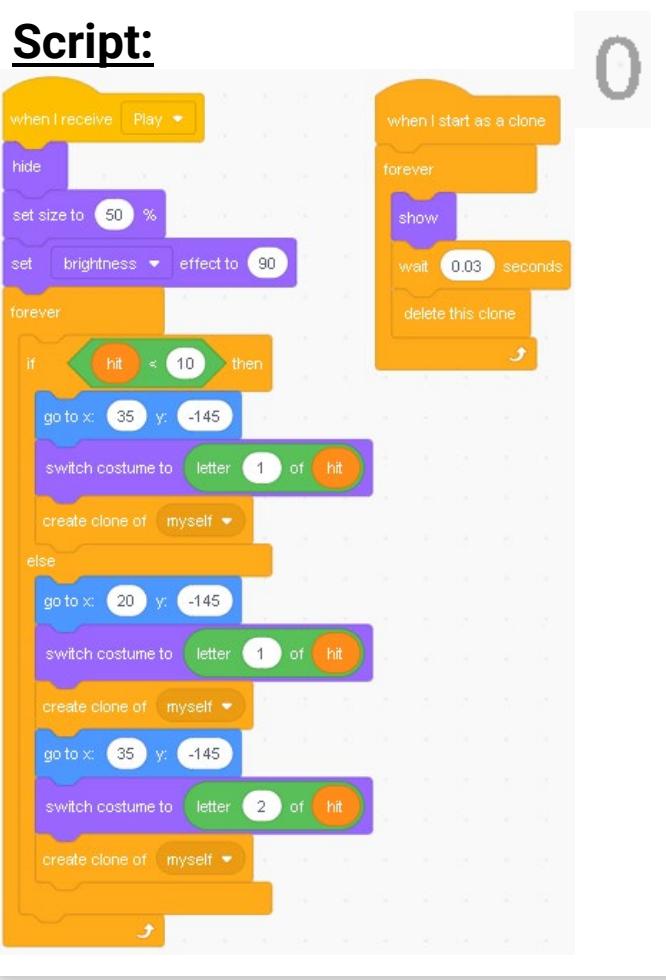
Script – Score Variable Setup



Now you have score in place, let's setup for another 2 variables (timer and Hit count).



Hit – Duplicate the digits for Timer & hit



It's totally same script with just variable (score → hit), and revise the position.

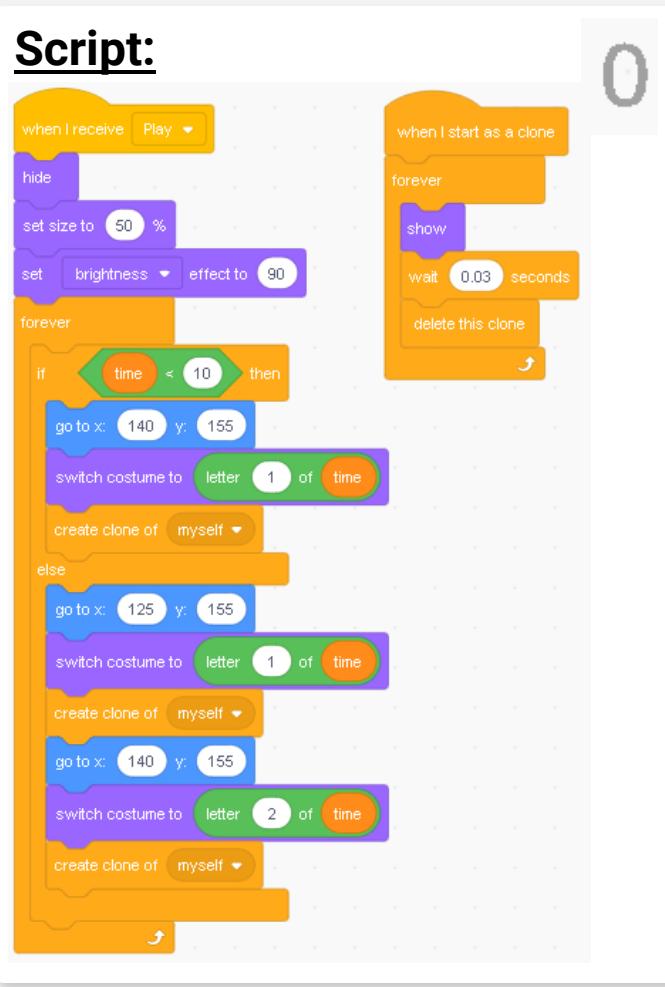
My position for hits:

Ones digits (35, -145)

Tens digits (20, -145)



Timer – Duplicate the digits for Timer & hit



Duplicate another and make the change for (score → time) and revise the position.

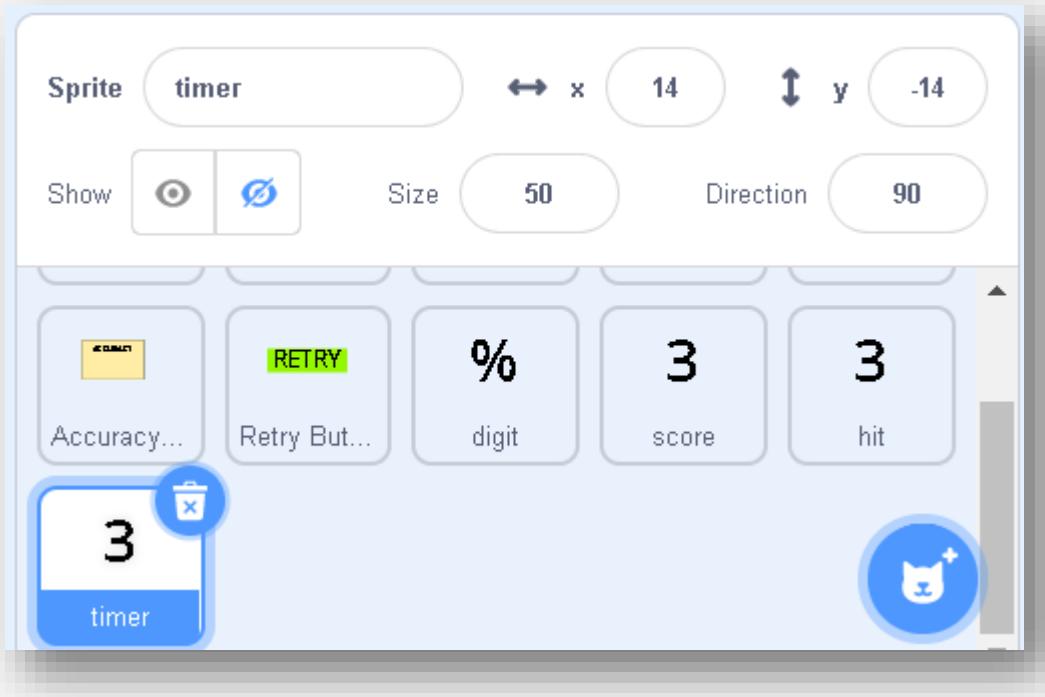
My position for timer:

Ones digits (140, 155)

Tens digits (125, 155)



Digits for variables

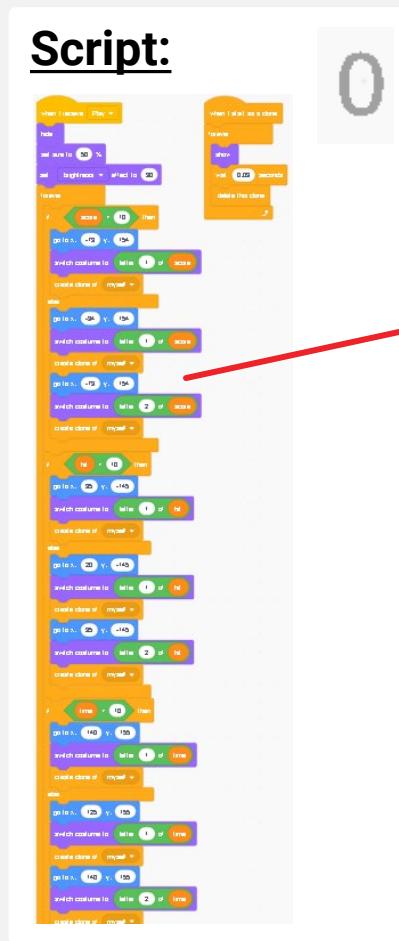


Now you have 4 sprites to show the digits (Accuracy, score, hit, time).

We can combine 3 responsive digits into 1 (score, hit and time).



Combine the responsive digits



What we need to do is to combine all of these into 1 forever loop. Just add each to the bottom of another.



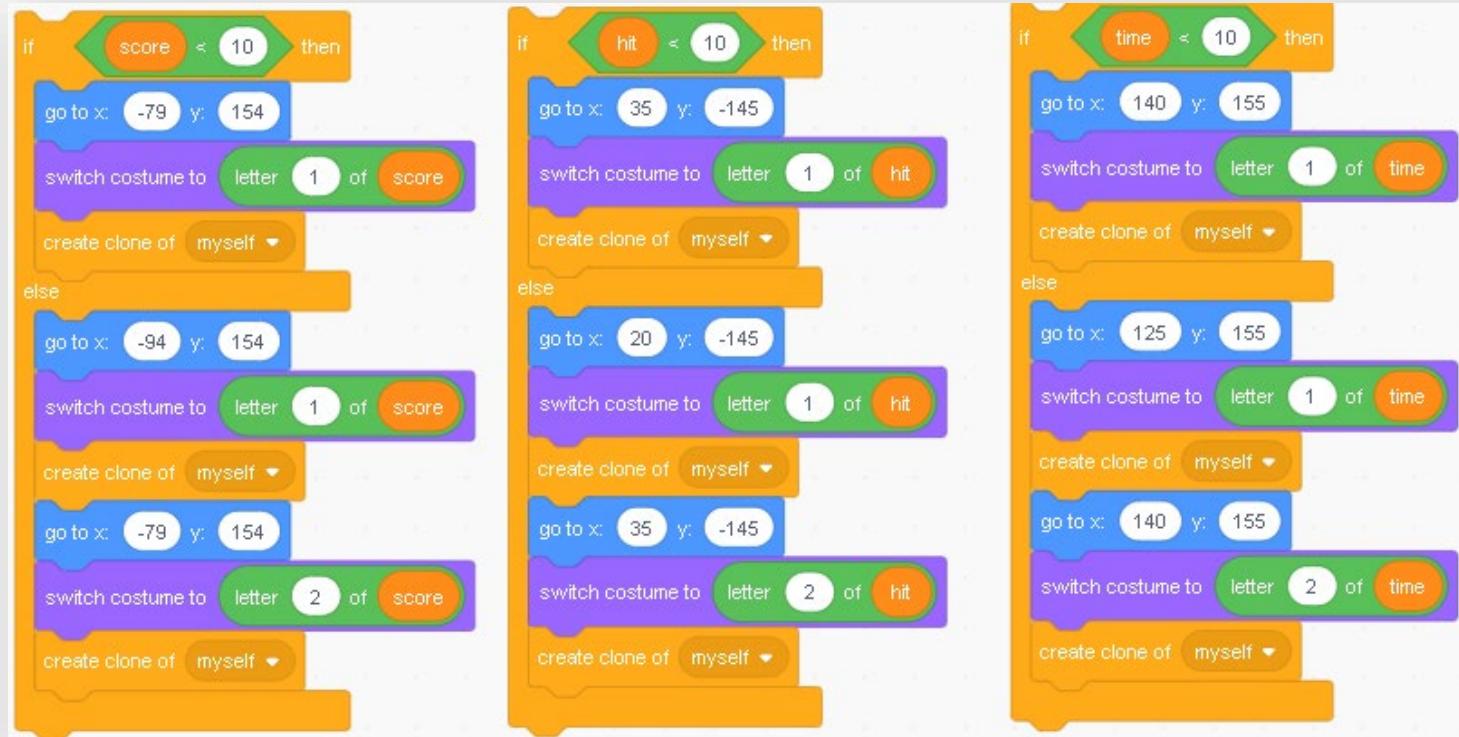
Play the game



Rerun the game.

Now the figure looks nicer.

Combine the responsive digits



Do you notice that all these 3 are totally with same framework, the difference are:

- 1. Variable**
- 2. Ones digit position**
- 3. Tens digit position**
- 4. Y-position**

Others are all same.



Combine the responsive digits

Script:



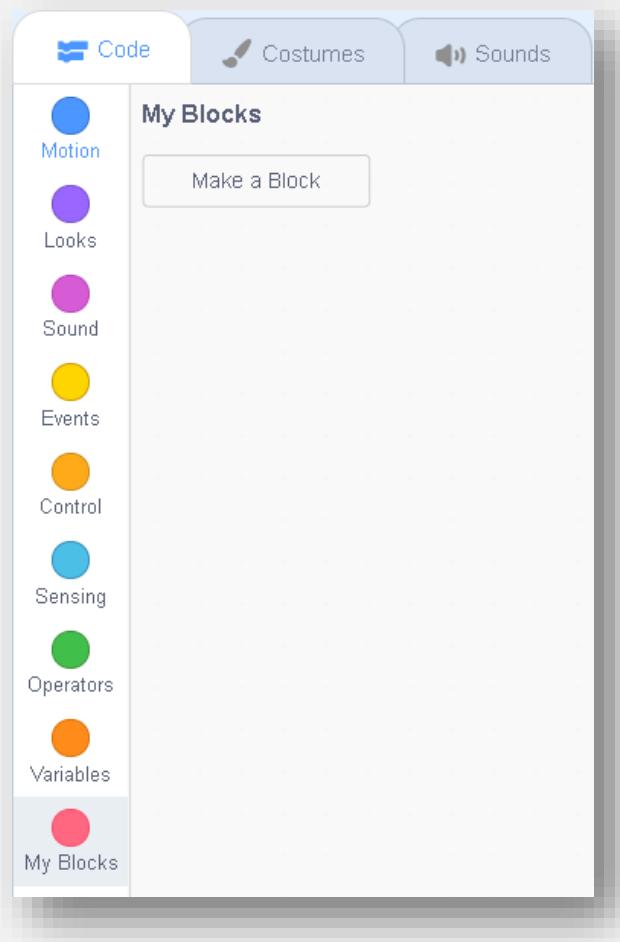
0

If there are another new variable comes in, we will need to program it again and this will make the script become longer.

Or if our variables will have 3 or more digits, we need to change all these 3 again. Is there a way to make adding things simple?



Introduction - My Blocks



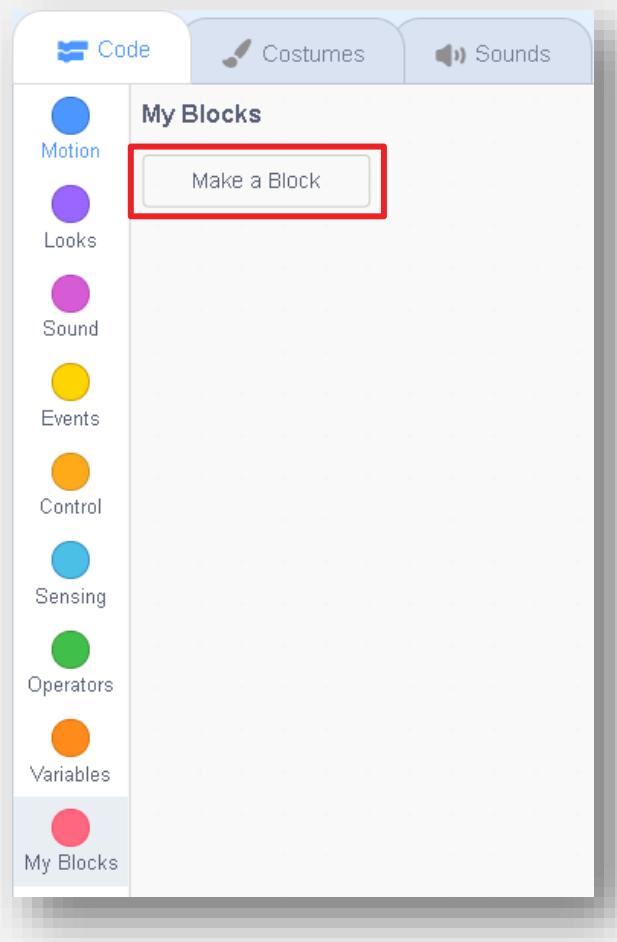
We have a block called “My Blocks” which is for us to customize our own blocks. And it’s often used for complex and repeating block.

We will make those repeating block into a function (customized block), then we just change the value / variable inside to make the function.

It's going to be convenient if you know how to use this block and make your code cleaner and easier to review.



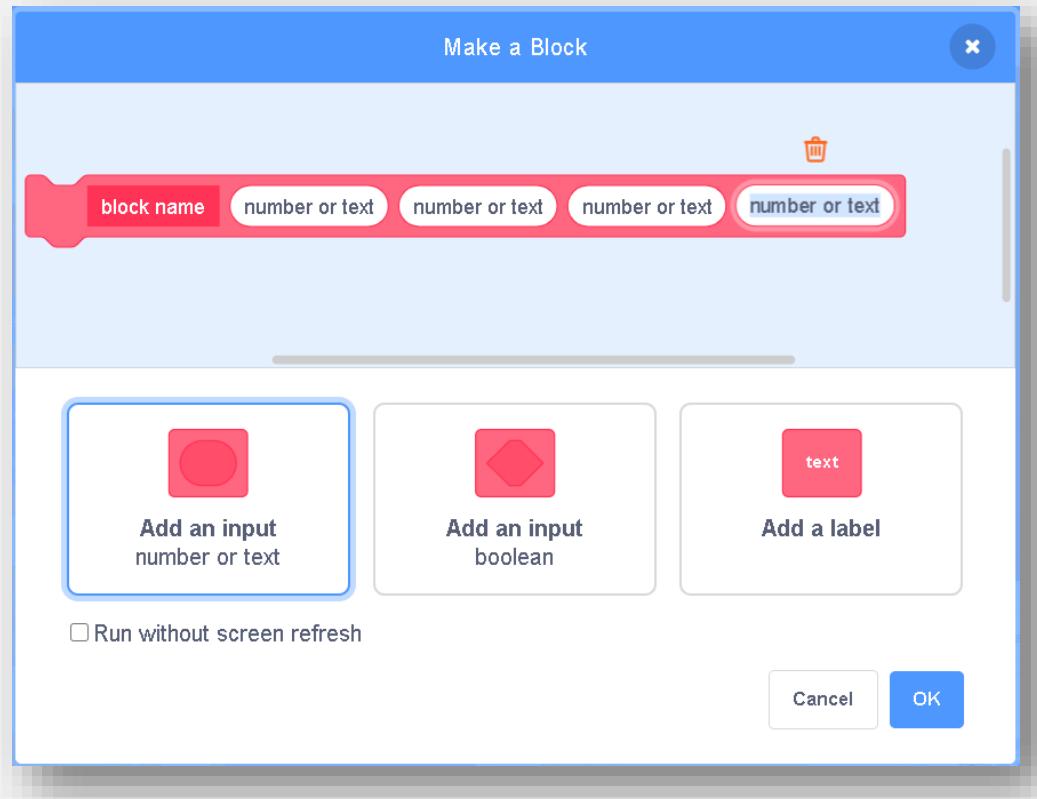
Introduction - My Blocks



Click on the “Make a Block” to create your customized block.



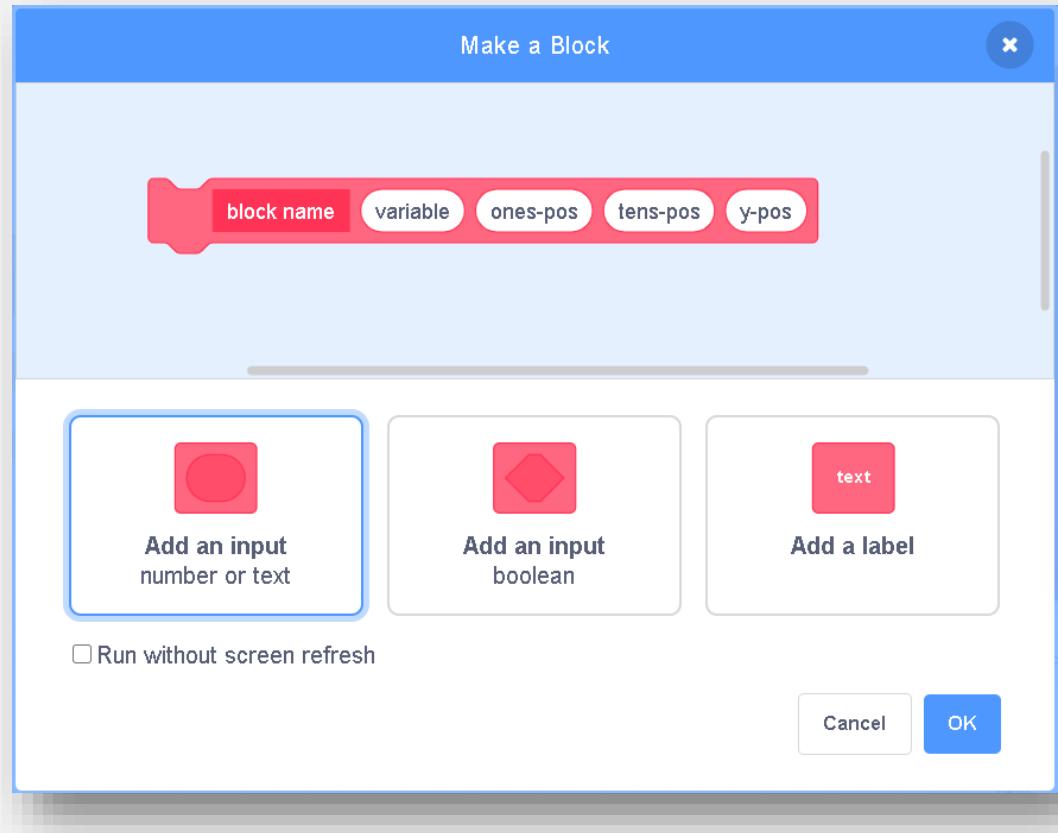
Introduction - My Blocks



Click on the “Add an input” to create 4 columns for our variables, since we know we have 4 different values in our digits showing script.



My Blocks Variables

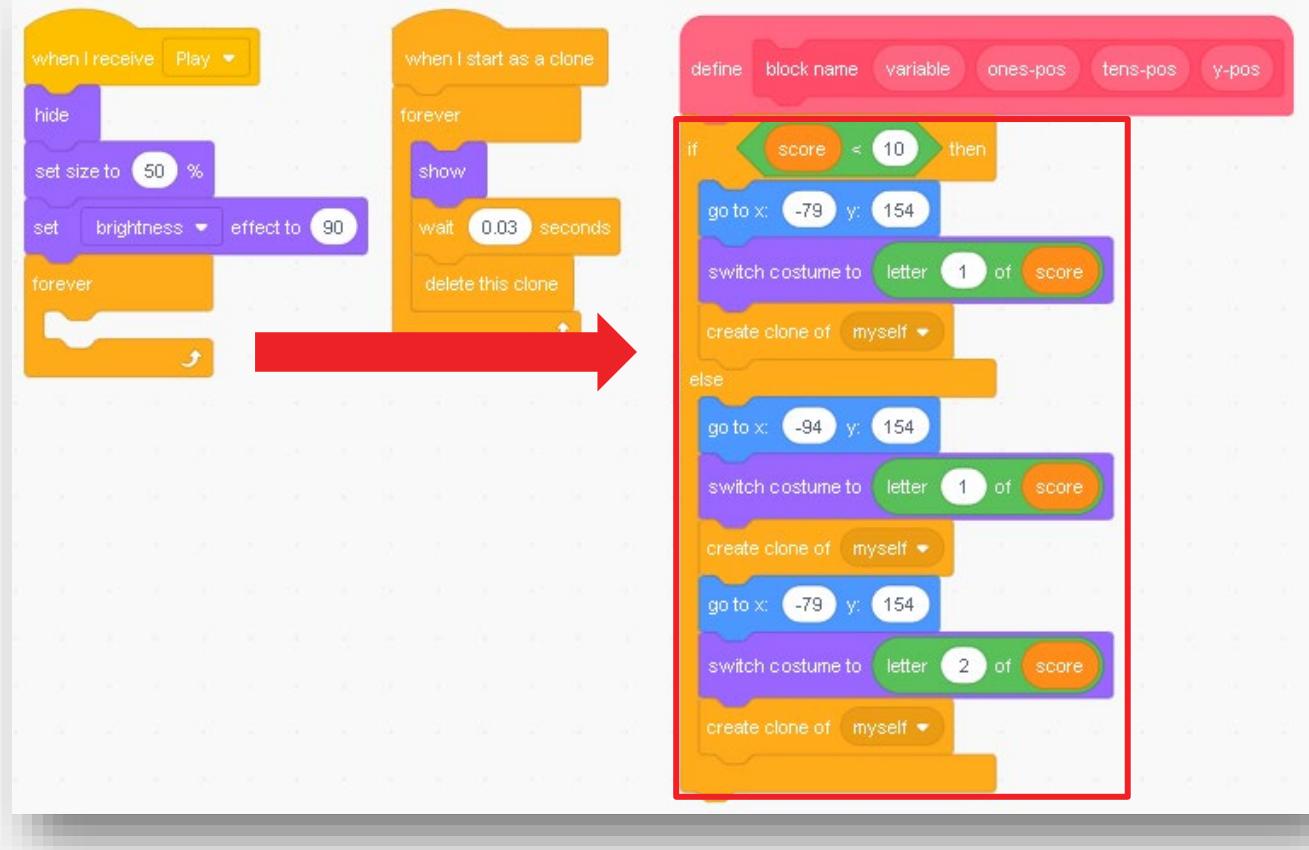


As we know the only differences are:

1. Variable
2. Ones digit position
3. Tens digit position
4. Y-position

Therefore we will add 4 of these into our my block.

My Blocks Setup

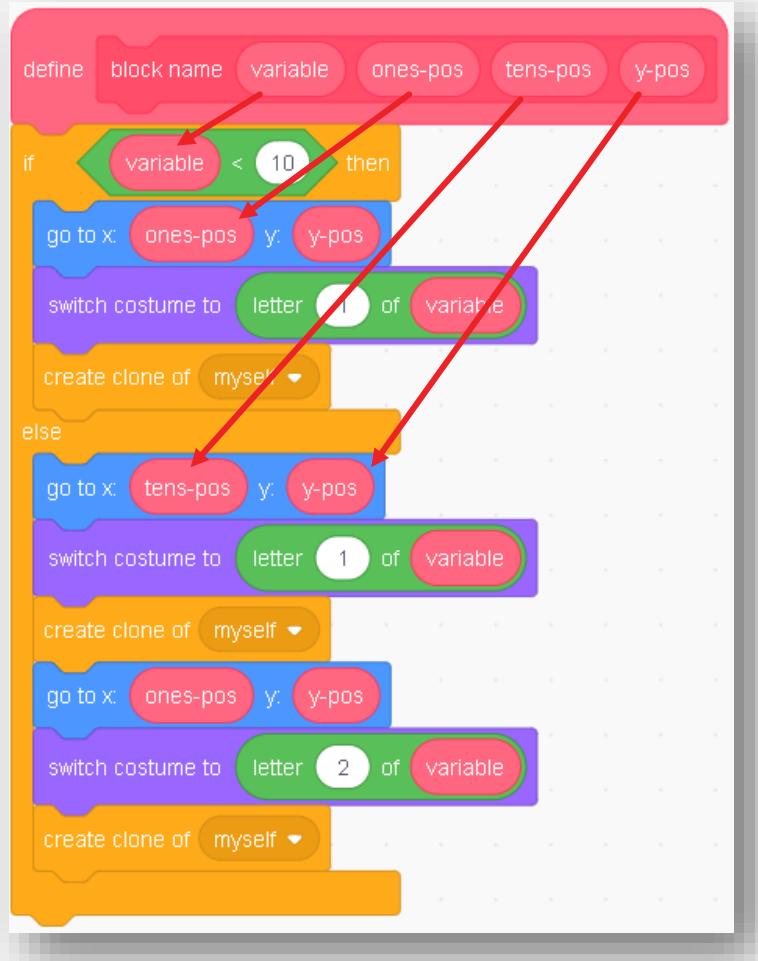


Drag your score script to below of the my blocks.

Only one of the digits showing scripts, do not put “hit” or “time” if you have put the “score”, we only need 1 script for the my blocks. Otherwise, it will duplicate the actions.



My Blocks Setup

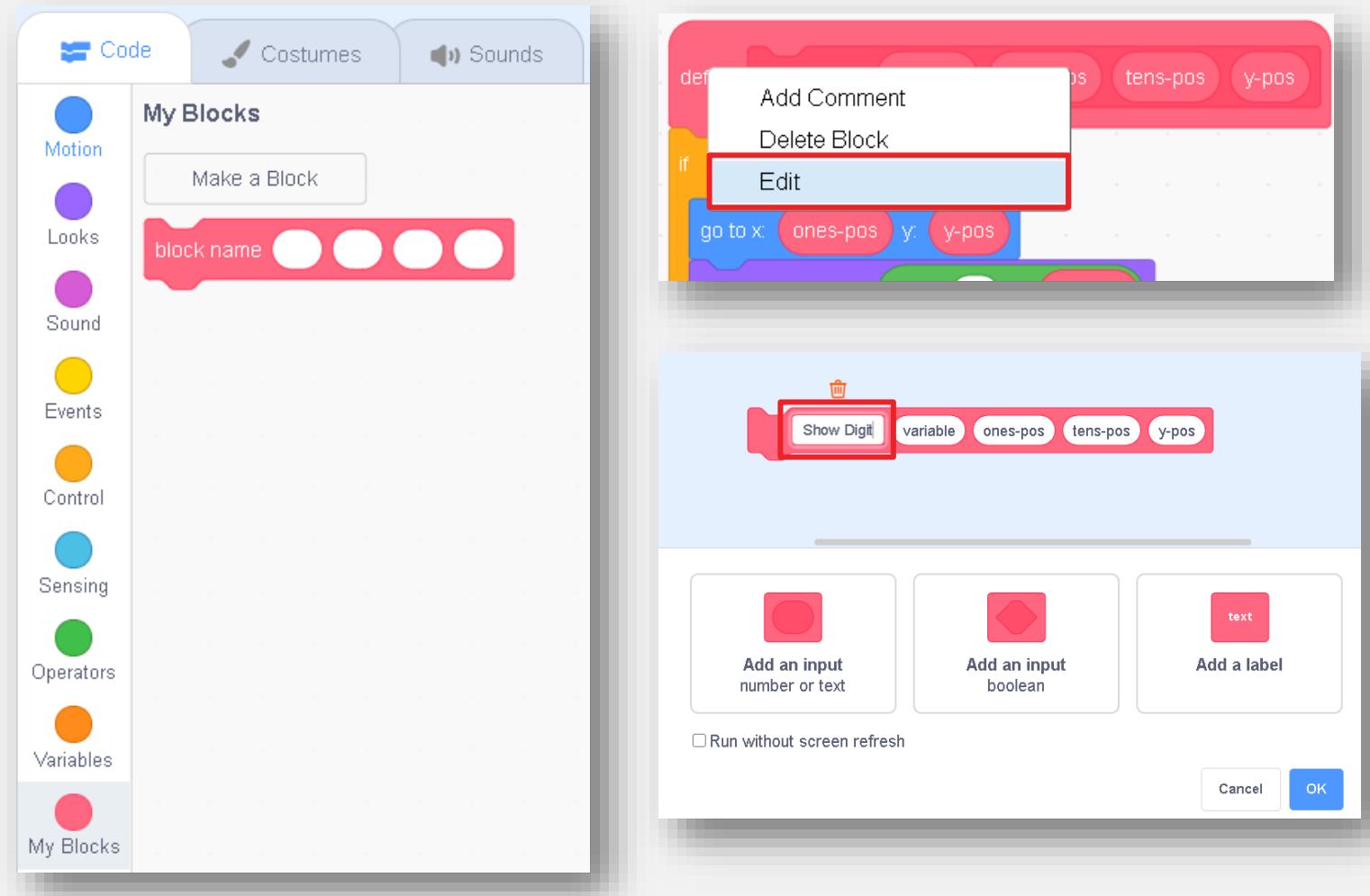


Now drag the variable field into corresponding places (all of them).

Once you done this, the variables of the my blocks will follow this to execute.



Newly Created My Blocks



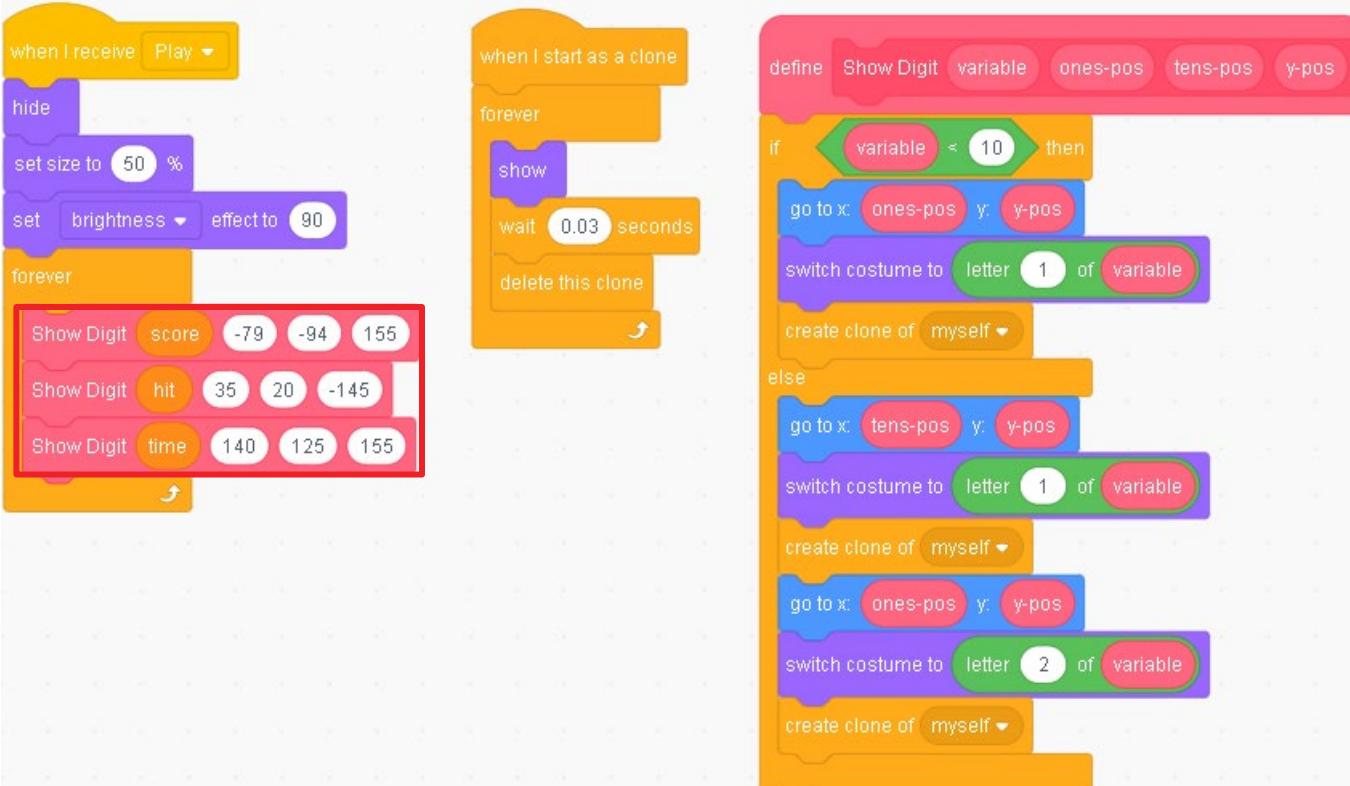
When you go and check your My Block
(**This is only for the digit sprites, you won't see this My Block in other sprite*).)

You can right-click on the my block and select edit to change the name (I will change it to "Show Digits")



Newly Created My Blocks

Script:



Then drag out the “Show Digit” my blocks into your forever loop, and change the value in each of the fields.

1. Variables (“score”)
2. Ones digit (-79)
3. Tens digit (-94)
4. Y-position (155)

Above is for my score.



Play the game



The game is still same as previous, just the code is more cleaner now and easier for other people to understand and review.



ASSIGNMENT for

Lesson 2-4



L2-4 – Mission

Use the digits to show all the variables (score, hit and time).

Use my blocks to make the code cleaner in your scripts.

L2-4 – Extra Challenge



This is the extra challenge, you can try and challenge this (1,000 Adcoins reward):

1. Setup Game Menu
2. Do 3 different level (3x3, 4x4, 5x5)
3. Timer selection (30, 60, 90)
4. Difficulties (Easy, medium, hard)
5. Level, timer and difficulties can be selected in game menu before game starts



You can direct message your teacher and ask your question through [Slack Robotene Community](#) or arrange a [One-to-One Consultation](#) with your teacher.

Any Questions?



Thank you ;)