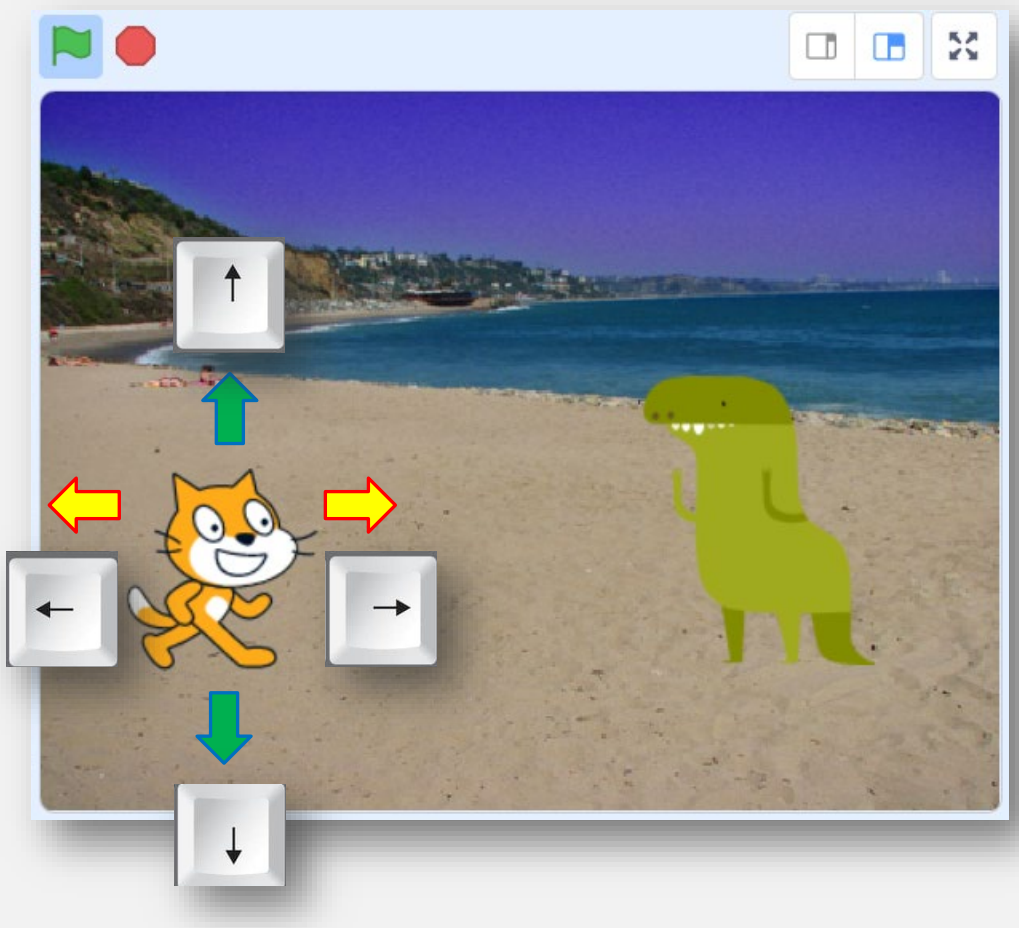
Scratch Programming

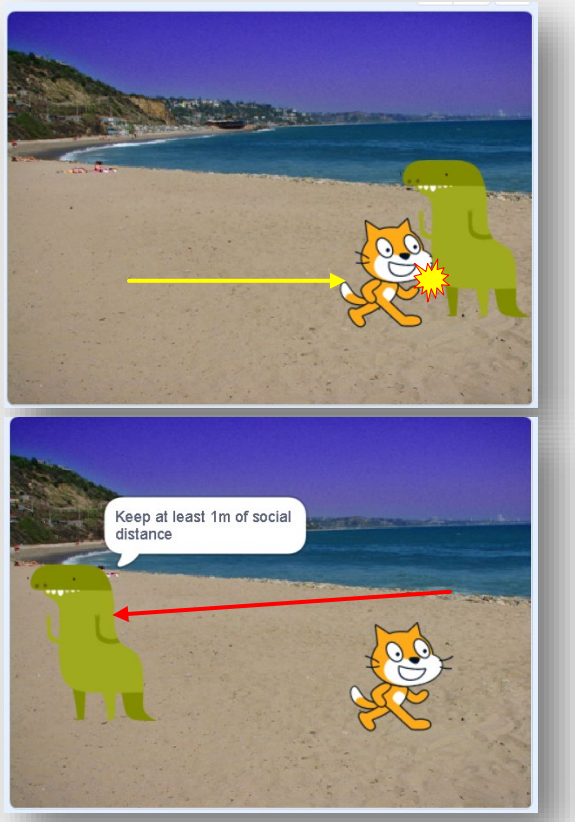
Topic 1.6

Smooth Motion Control I

Presented by Advaspire Team

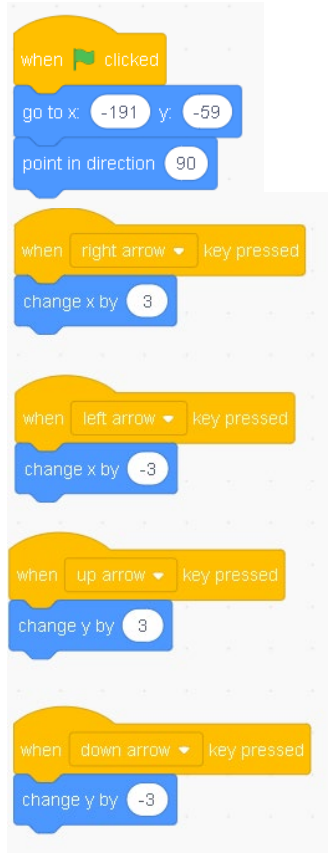
Review Last Topic – Starting Scene

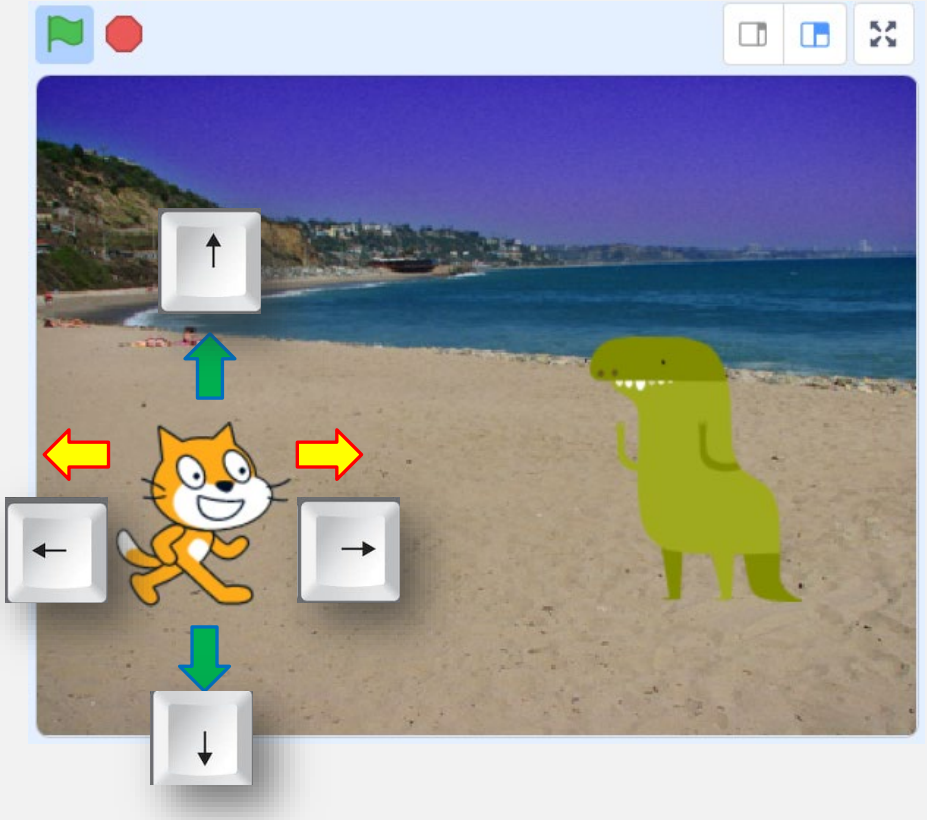




Review Last Topic – Starting Scene

Script:





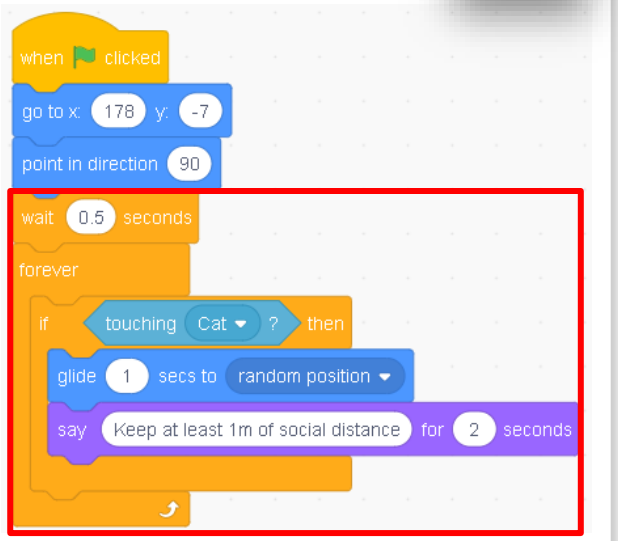
Set up starting position with "when 'flag' clicked" block.

Add "when ___ key pressed" block to move the cat with arrow buttons.

Use Change x,y by __ to alter the position of the cat.

Review Last Topic – Starting Scene

Script:



Create a forever-if loop to make the Dinosaur glide to other position when it touches cat.

Add a wait block (0.5 seconds) for a buffer time before the forever-if loop starts.

Today's Topic

1. Use Forever-if Loop for control
2. Smooth Control
3. Cat Vs Mouse Game

Learning Outcome

1. Able to make smooth keyboard control for sprite
2. Know how to use forever-if loop for smooth control
3. Able to build a Cat vs Mouse Game

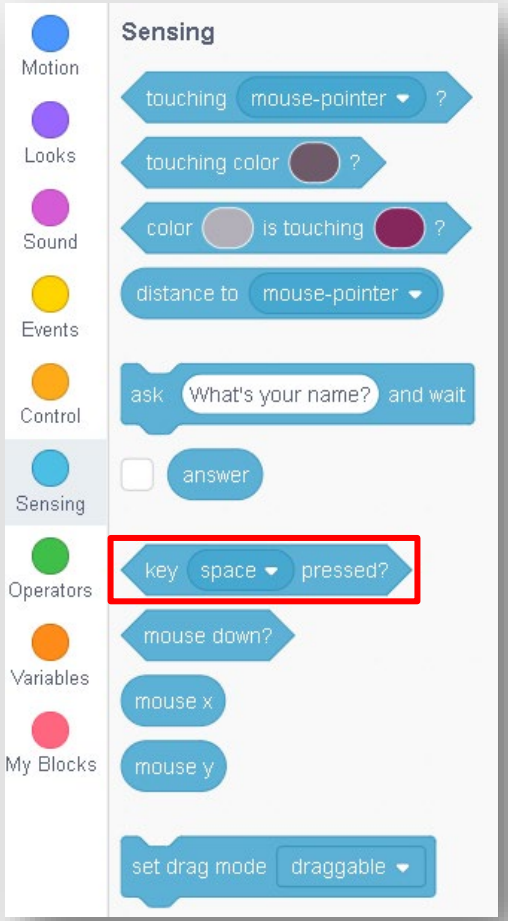
Smooth Control with Forever-if Loop

Drag a forever loop and put it after setting up your starting position.

Then drag a if-then loop into the forever loop

I will call this combination a "forever-if loop"

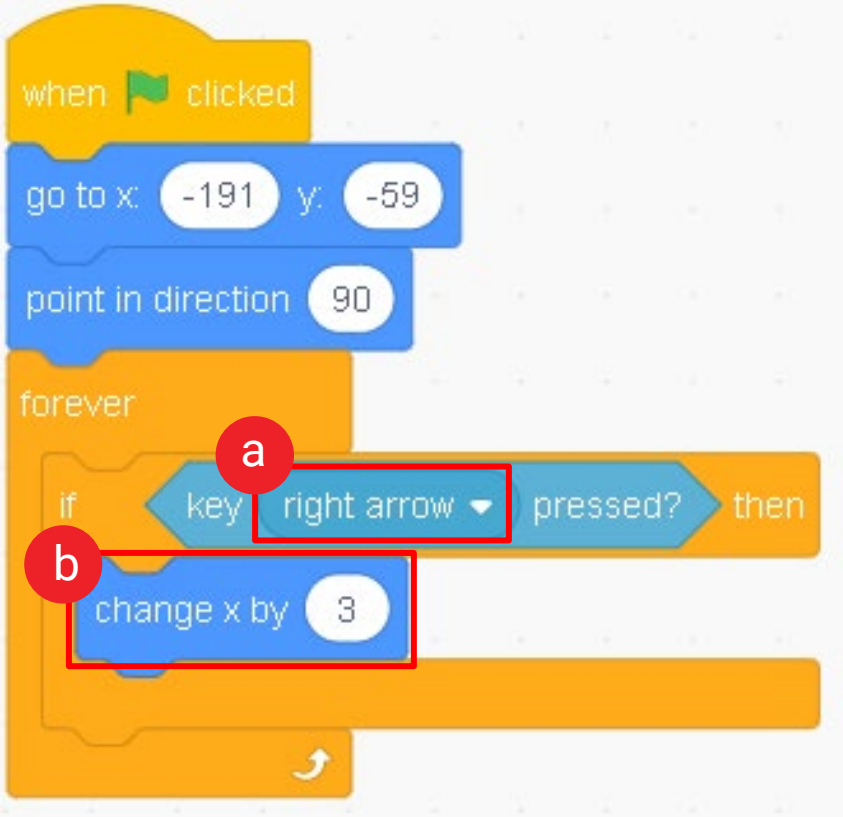
Smooth Control with Forever-if Loop



Script:

Drag a <key pressed> from sensing tab into the if statement.

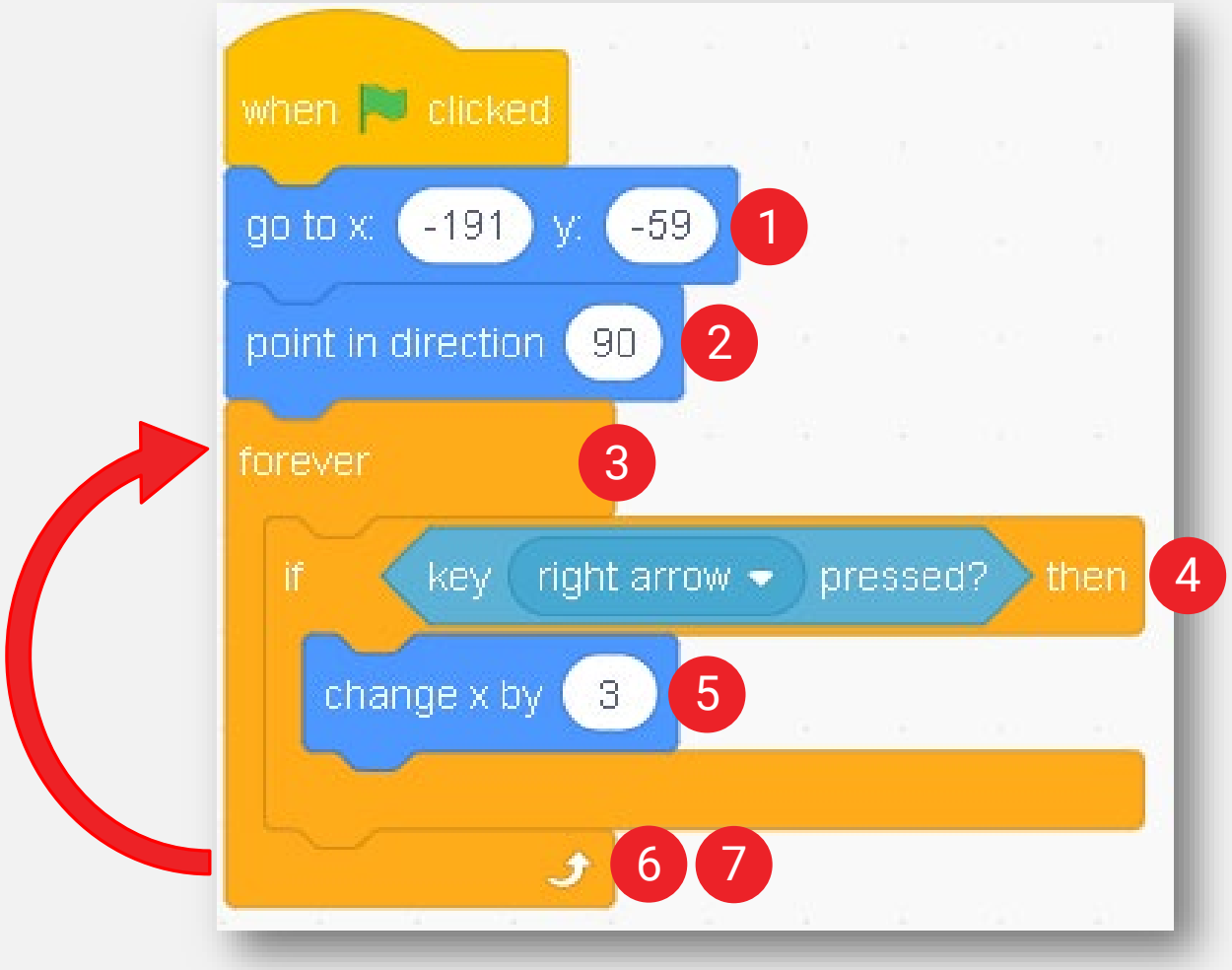
Smooth Control with Forever-if Loop



a **Change this to "Right Arrow"**

b **Drag a change x by 3 into the loop if <key "right arrow" pressed>**

The flow of the loop - Explained

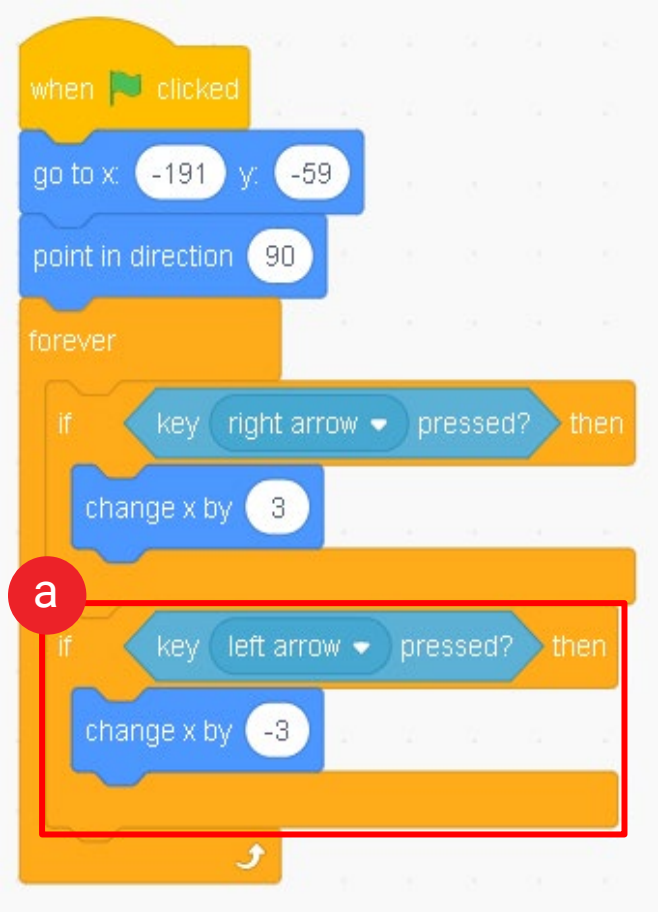


How does the computer execute the program?

<u>This is what happened when you click the "Flag":</u>

1. Go to (-191, -59)
2. Point in direction 90°
3. Move in to forever loop
4. Check if "right arrow" is pressed
5. Change the x coordination of cat by 3
6. Go back to the forever loop and check if "right arrow" is pressed or not
7. If "right arrow" is not pressed, it will do nothing and keep looping in the forever loop.

Add in new if-loop (Left movement)

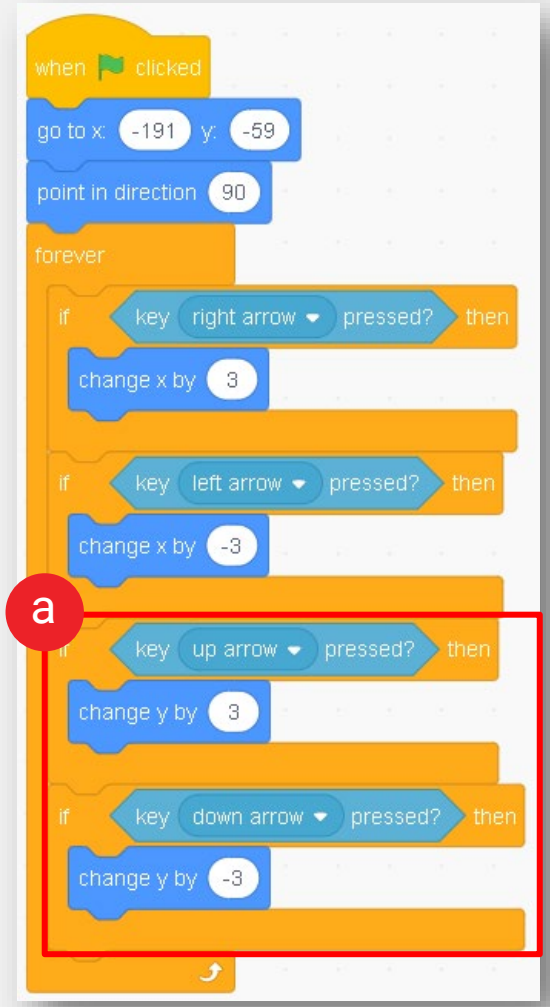


a

Drag another if loop for "left arrow" in to the forever loop after "right arrow"

Now your forever loop will check on 2 conditions for every looping round. If right arrow pressed, cat will move to right and if left arrow pressed, cat will move to left.

Up-Down-Left-Right Control



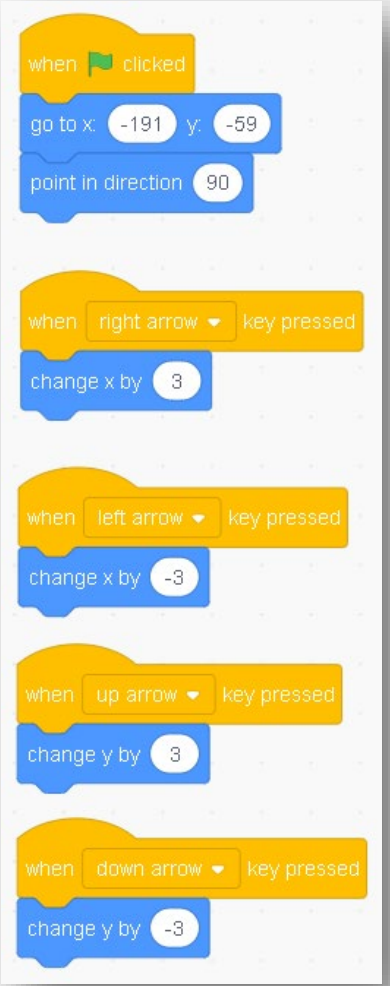
a

Add in up and down arrow control after left & right.

Now you will be able to move your cat with all arrow keys.

And this forever-if loop control method will enable you to have smooth control even when you pressed right and up arrows at the same time.

Events Vs Forever-if loop



VS

If you are making a game, it's nicer if you can make the control into forever-if loop as the player will have a smooth control of the Sprite.

But if your purpose is just to make an interactive story and arrow buttons are not as frequently used, you can go for event triggered method.

Try to run the program and observe what's difference between these 2 control method.

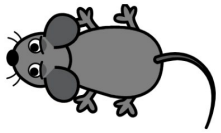
Cat & Mouse Game

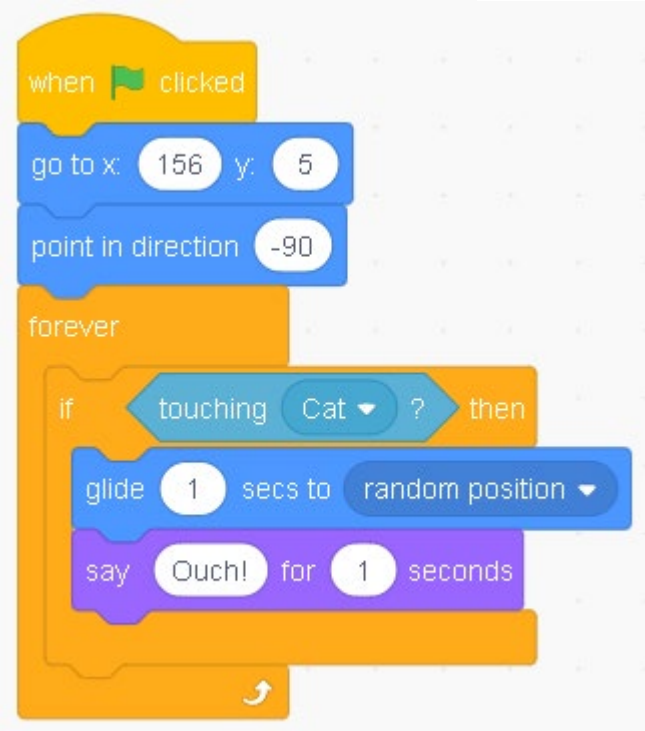
It's time to make a Cat & Mouse Game.

So let's choose a background and add a sprite of Mouse into the stage.

Coding for Mouse

Script:





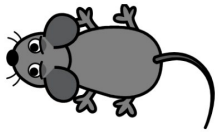
Mouse will start at a specific location (or you can set it randomly) and specific direction.

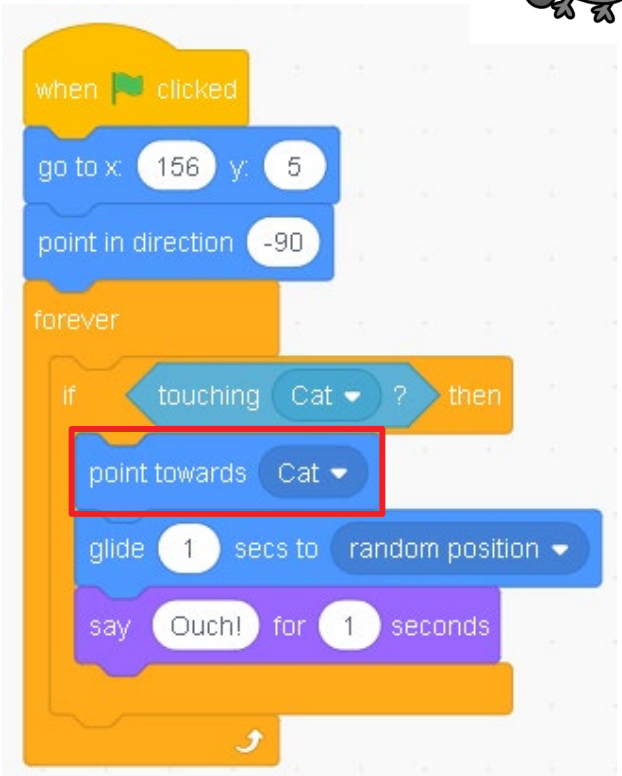
Then add a forever-if loop that if mouse touches the cat, it will glide to random position, then say "Ouch" for 1 second.

It's exactly like how we programmed Dinosaur in previous lesson.

Coding for Mouse

Script:





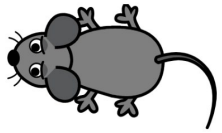
I added on the "point towards Cat" block before it glides to random position after touching cat.

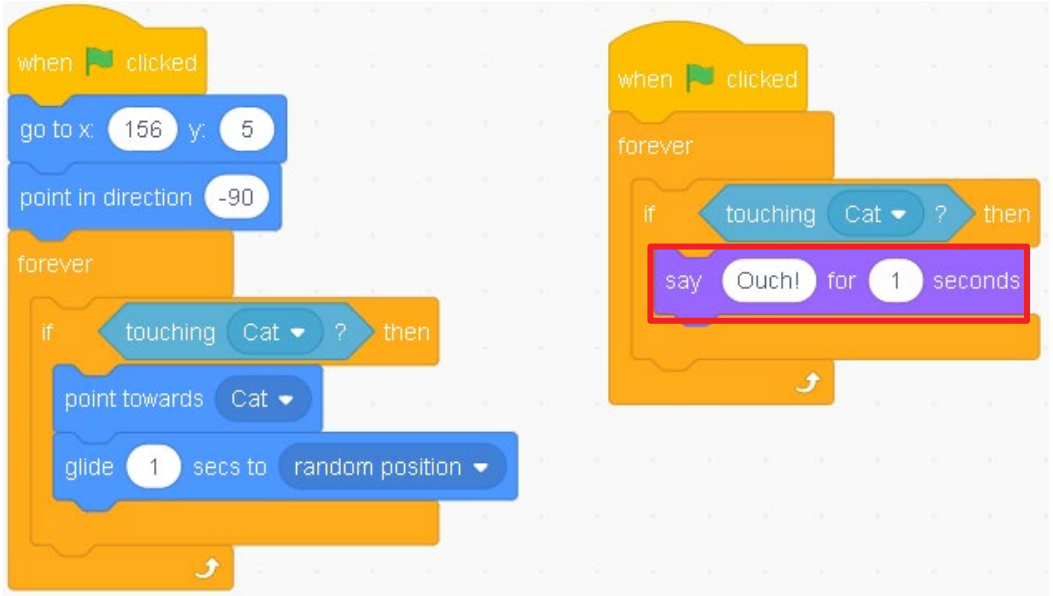
So when your cat touches the mouse, it will point at Cat first then glide to random position.

So you will see the mouse changing it direction after touching the cat.

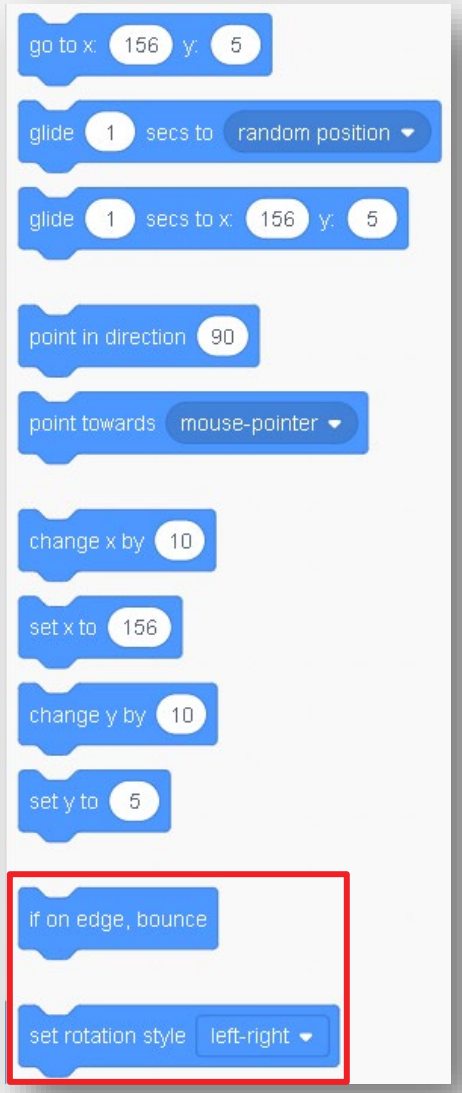
Coding for Mouse

Script:

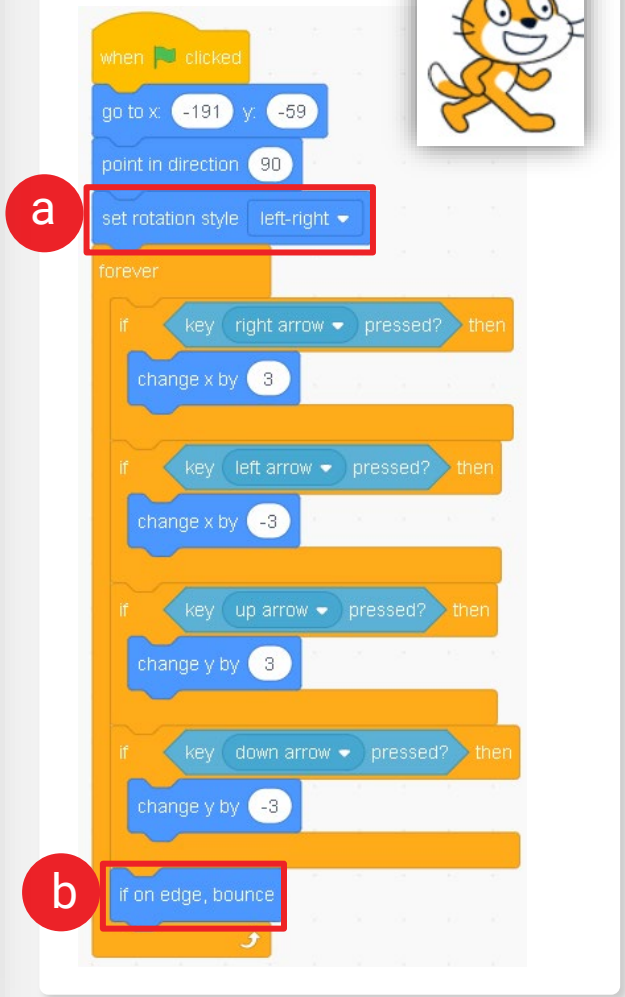




I split out the "Say 'Ouch' for 1 second" block so that the mouse will say ouch and glide to random position at the same time.



Script:



Bounce on edge - Cat

a

I will set the rotation style to left-right for the Cat.

So no matter how the cat turn its pointing direction, the appearance of the cat is only showing left and right

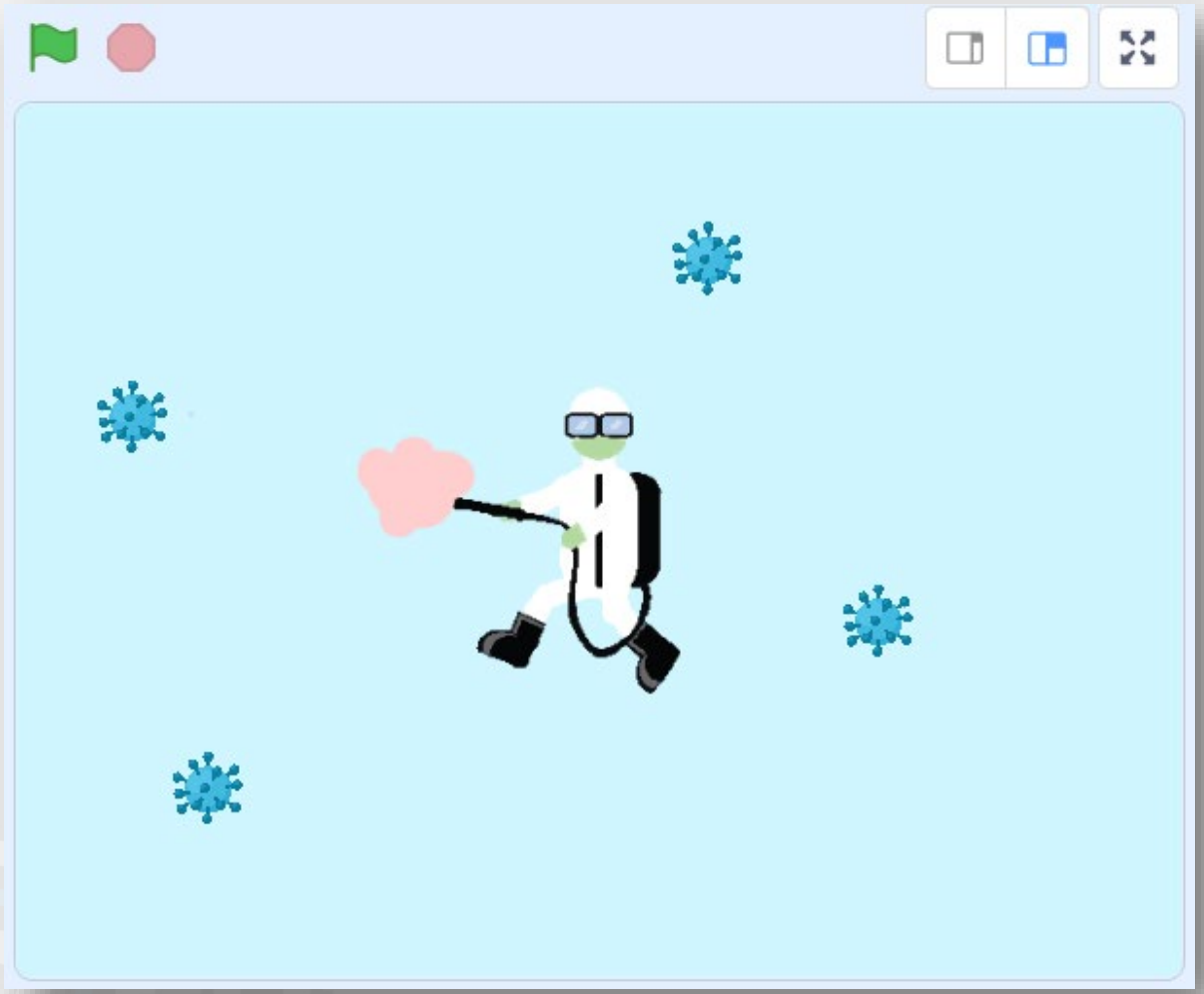
b

I set a "if on edge, bounce" block into the forever loop.
This is to make the cat bounce back if it hit the edge of the stage.
It's in the forever loop but outside of those if-loop

Start and Try your game now!

ASSIGNMENT *for*

Topic 1.6



T1.6 – Mission 1

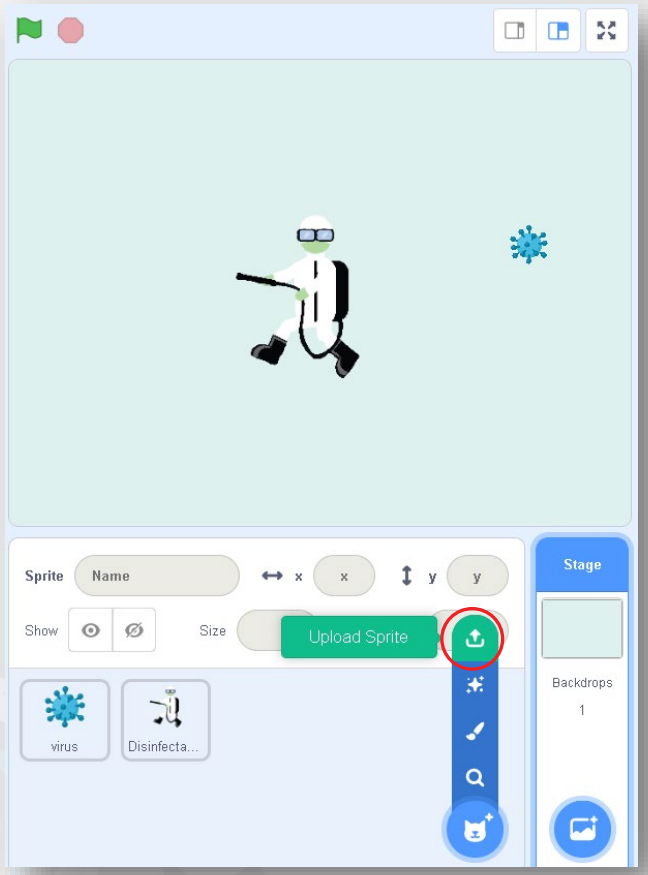
Make a Covid-19 game.

You are required to use the sprites (disinfectant cleaner & virus) in the link that I shared in discord Group.

Disinfectant cleaner

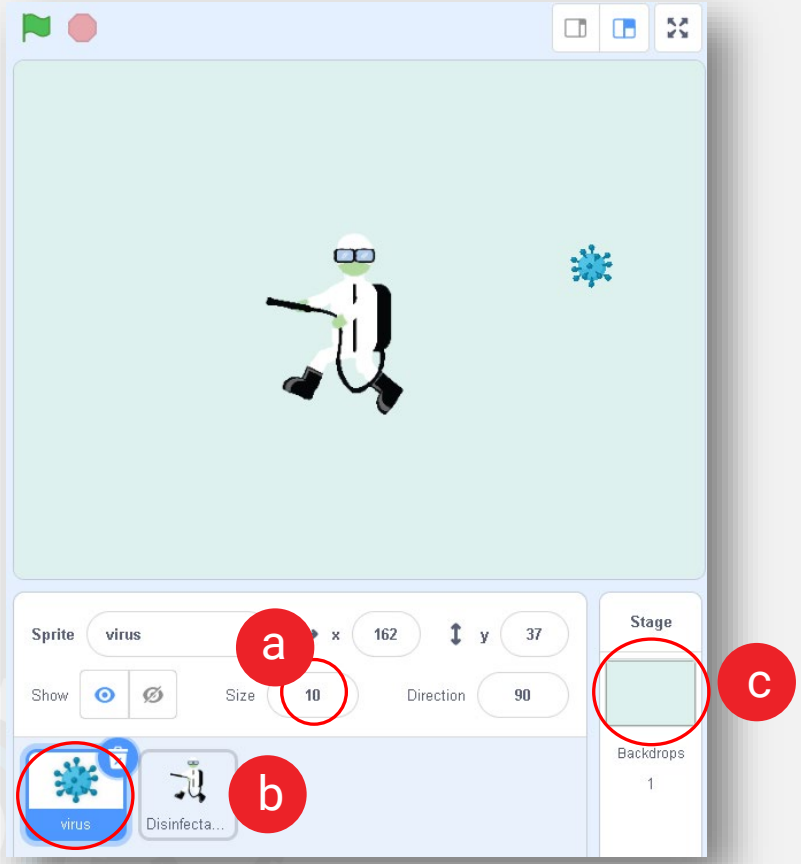
virus

T1.6 – Mission (guidance)



Firstly, download both png files (disinfectant cleaner and virus) from our discord Group and upload the Sprite to your project.

T1.6 – Mission (guidance)

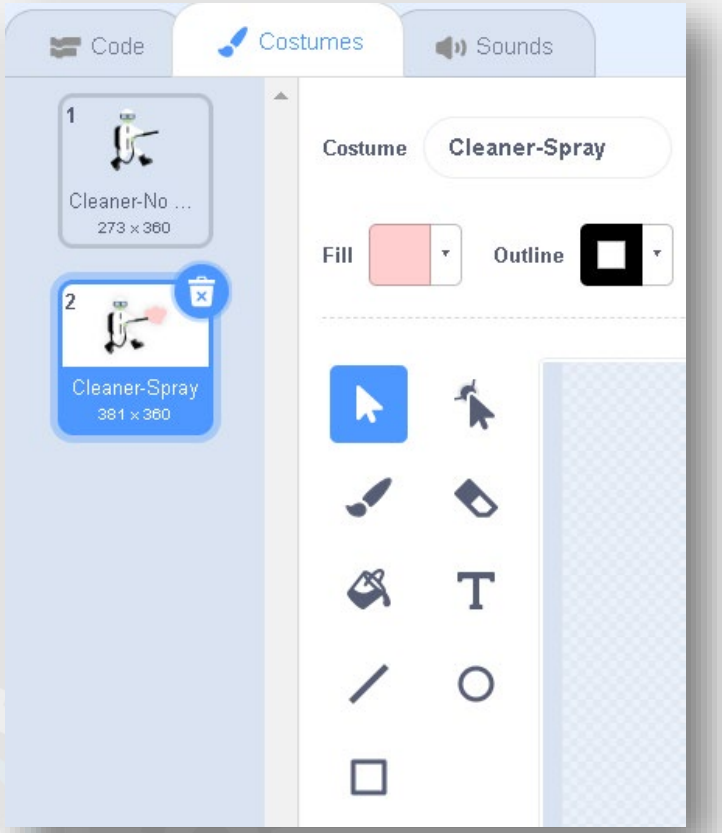


a **Set your virus size to 10%**

b **And Disinfectant cleaner to 35%**

c **Add a backdrop to your background**

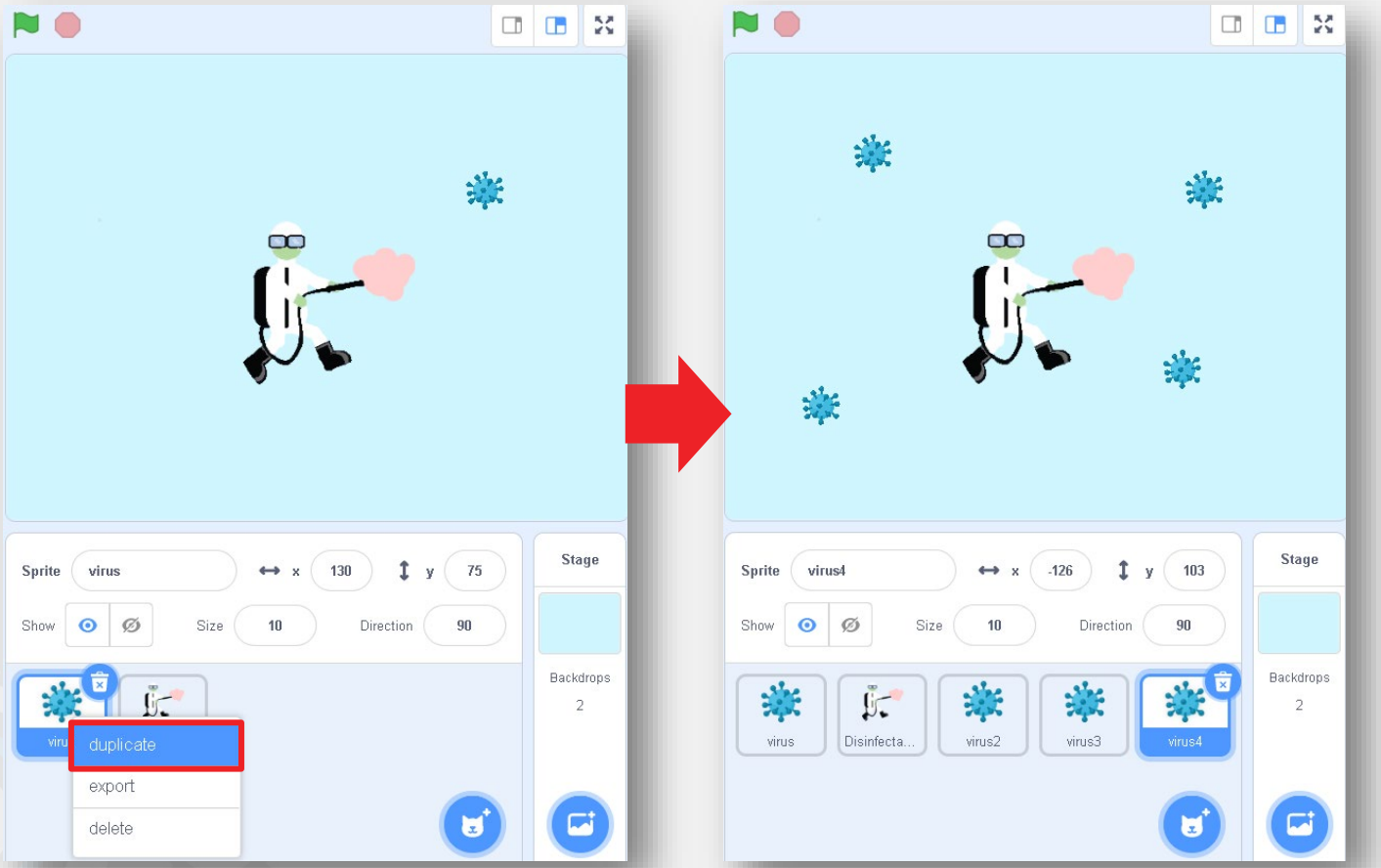
T1.6 – Mission (guidance)



In the costume of your disinfectant cleaner, duplicate your costume and add the white thing in front of your sprayer to your second costume so that you can make a "space arrow" pressed to change to costume to make it like spraying something.

You can draw few circles to make up a gas form

T1.6 – Mission (guidance)

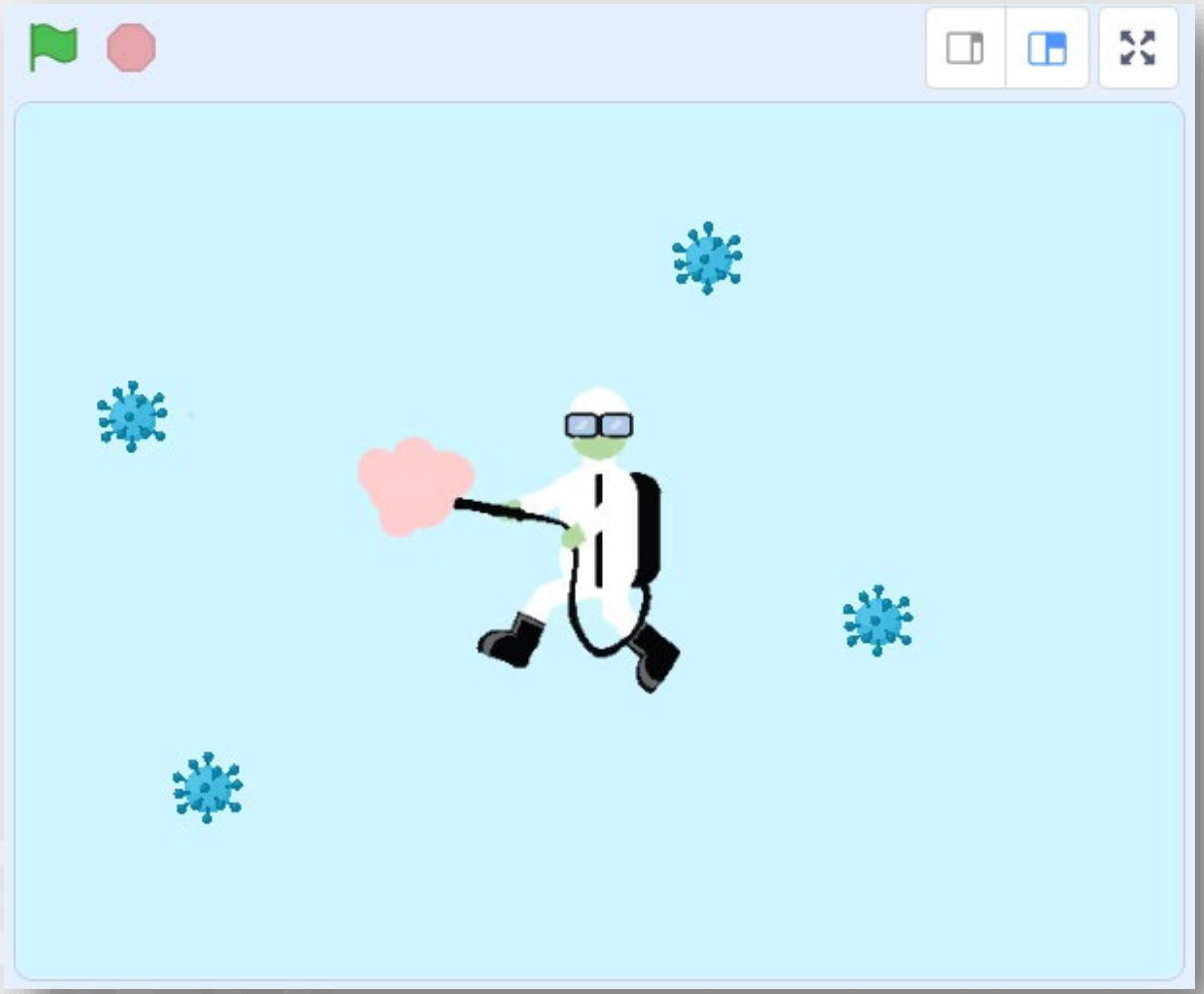


After programming your virus, duplicate them and make few of them on the stage.

T1.6 – Mission – Game Rules

Game Rules:

1. You are able to control your cleaner with up-down-left-right arrow keys (rotation style = left-right)
2. Your cleaner starts at the centre
3. When pressing <space bar> your disinfectant cleaner will spray the gas but it will remain back to the costume without spraying if <space bar> is not pressed
4. If the cleaner hits the edge, bounce back
5. When your cleaner move to the right, it will face right, otherwise it will face to the left
6. There will be 4 viruses on the stage on the start and all of them spawn randomly
7. If disinfectant hit the virus with spraying costume, the virus will shout “No~~” then disappear.
8. The virus will say “I’m not afraid of you!” and remain there.



T1.6 – Mission 2

Can you do a 2 players game for the disinfectant game?

Set a control <w-s-a-d> for player 1 and <up-down-left-right> for player 2.

Add more viruses in the game so that 2 players can play together to kill the viruses.

T1.6 – Mission 3

Do a similar 2 players game that have smooth control coding and can interact with the non-playing-character (NPC).

You can try to look from Google for your favorite sprite character and put it to your game.

Summary

1. Using event block for control is hard to control the sprites with 2 or more button

2. Forever-if loop is for sensing condition use, we can use this method to code a smooth controlling for our game

3. “If on edge, Bounce” block is to make the cat bounce back if it hit the edge of the stage.

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 :)