Scratch Tutorial - Multi-armed Bandit

Summary

Create the beloved game of Multi-armed Bandit in which the goal is to stop the animation when the three elements on the screen are identical. The activity is created step by step, and allows to quickly get the result of each step. You will start by choose the different costumes of your sprites, that you will then have scroll at a regular pace, before making the game more difficult by making the scrolling random. Tutorial created by Théo Lafage and translated by Soizic Pénicaud.

Skills developed

- The difference between an object and its appearance

- The concept of loop

- Deal with user interactions

- Program in a "modular" way

Activity

Step 1: Create a sprite with multiple costumes

We will say that there are 3 sprites on the screen (the one on the left, the one in the middle and the one on the right). They are the same throughout the whole game, but they continuously change costume.

Let's start by creating a sprite that changes costume every half-second. Commençons par créer un lutin qui change de costumes toutes les demi-secondes :

1.Start by create the fixed image: to do so, we need an adequate background and a ball. Look through the windows on the bottom left corner of the screen to select these elements. For the

background, click on "stage" and go to the "background" tab on the right. (For example, import "chalkboard" in "indoors").
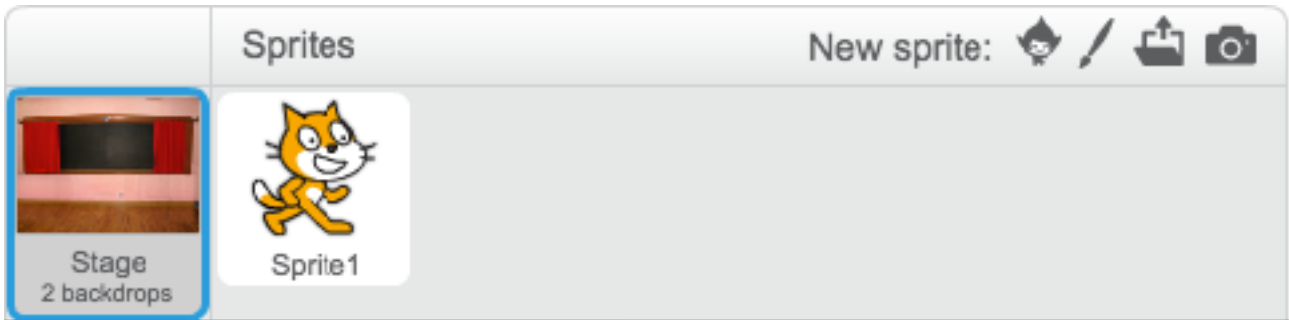
2. Create a new sprite (for example, select "Basketball" in the category "Things"). We will need to delete the cat Sprite (Scratch's mascot). To do so, right-click on the sprite and click "delete".

3.Rename the sprite by clicking on the blue "i". Call it "Ball".

4. Now, click on the "Costumes" tab and import 2 new costumes so that we have 3 in total. For example, you can choose "Baseball" and "Beachball".

Now that we have the 3 costumes, we are going to make the sprite "Ball" change costume every half-second.

Step 2: Modify the image every half-second.

1.Click on the "Script" tab.

2.Write the following code:

Test your code.

What would happen if you hadn't put the instruction "wait 0.5 secs"?

Step 3: Stop the appearance changes when spacebar is pressed

Great! We have created a sprite that continuously changes appearance! But how to make it so that the image freezes when spacebar is pressed?

1.The easiest method is to use the "stop all" command. You only have to add the following script:

2.Test your program by clicking on the green flag. What happens? Does the sprite freeze when you press spacebar?

Step 4: Choose the first costume of each sprite at random

At this point in the programming, when you click on the green flag, all the sprites have the same costume and change costume together. To make the game more interesting and more difficult, we are going to make the costume changes less predictable.

1.In the "Costumes"tab of each sprite, you will see that each costume has a number. The number allows to identify each costume.

2.We will choose to show the costumes at random. To do so, modify the previous script in the following way (be careful, you need to add green and purple blocks):

Step 5: Create the other sprites

1.Duplicate the sprite that you have created by right-clicking on it.

2.Duplicate it again to have 3 sprites in total.

3.Align the 3 sprites in the center of the screen, on a horizontal lign.

Test your program. The three sprites should now change costume. Try to freeze them by pressing the spacebar.
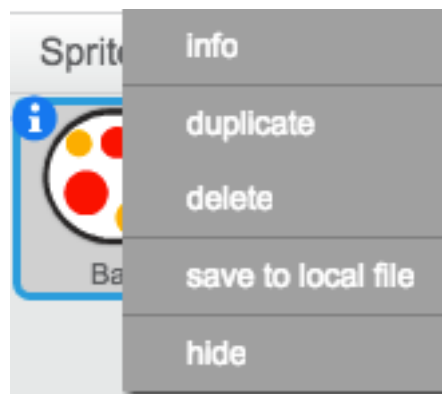
Bonus

You can make the game more difficult:

- by increasing the speed of costume changes
- by changing the number of costumes for each sprite
- by creating unique costumes for some sprites
- by programming different durations of costume showing for each sprite