Scratch - Code With Your MEP

Code Week Dance

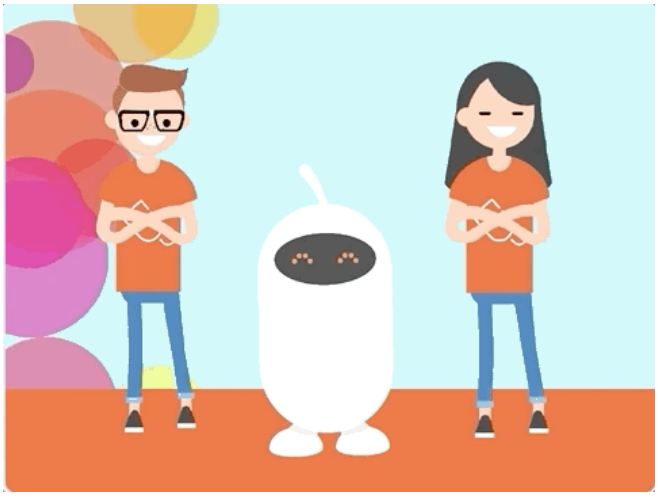
Dear all,

During this workshop, you will learn the basics of coding using the *Scratch* platform.

Scratch is a block-based visual programming language developed by the *MIT Media Lab* in the early 2000's. It is used by millions of kids (and adults!) around the world.

Today you will get an idea of what coding in Scratch is like. We will create a short animation of people dancing the EU Code week dance.

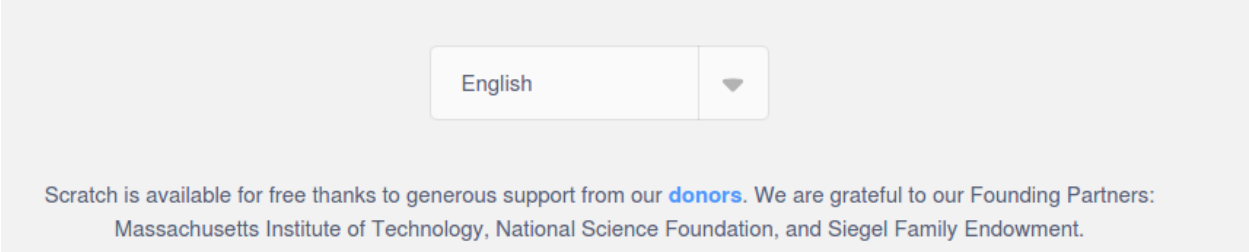
Do not forget: the most important part is to have fun and learn something!

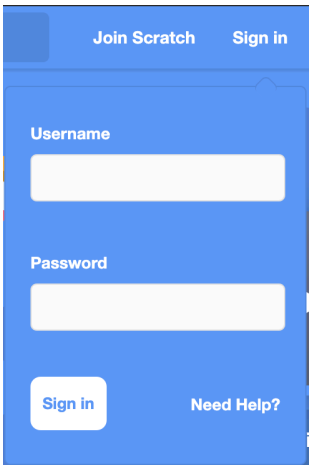


Step 1 : Create a Scratch account

To use Scratch to its fullest, you need to create an account. This will allow you to use all the features and to save your project. And guess what? Creating an account is **completely free**!

Surf to https://www.scratch.mit.edu
You can change the language at the very bottom of the webpage:





If you do not have an account yet, please create one by clicking on “Join Scratch” and by following the on-screen prompts. You will need an **email address**.

Tip1: don’t use your full name (name and surname) as a username. It’s best to remain incognito on the web ;)

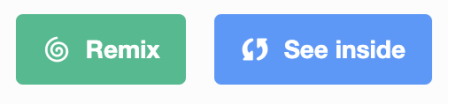
Tip2: jot down your username and password on a piece of paper. We forget those easily!

Last but not least: **don’t forget to confirm your email address**. In your email inbox (Outlook, Gmail, etc.) you should have received an email from Scratch.

Step 2 : Remix & title

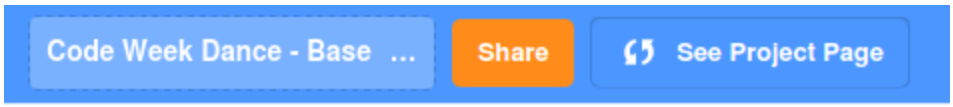
Log into your Scratch account and click on this link: https://scratch.mit.edu/projects/434851291/

You will see a project which is the base of our project today. You will **Remix** it. This basically means you will make a copy of the project in your own account and add your own code to it.



Once you've clicked on the Remix button, the Scratch programming environment will open.

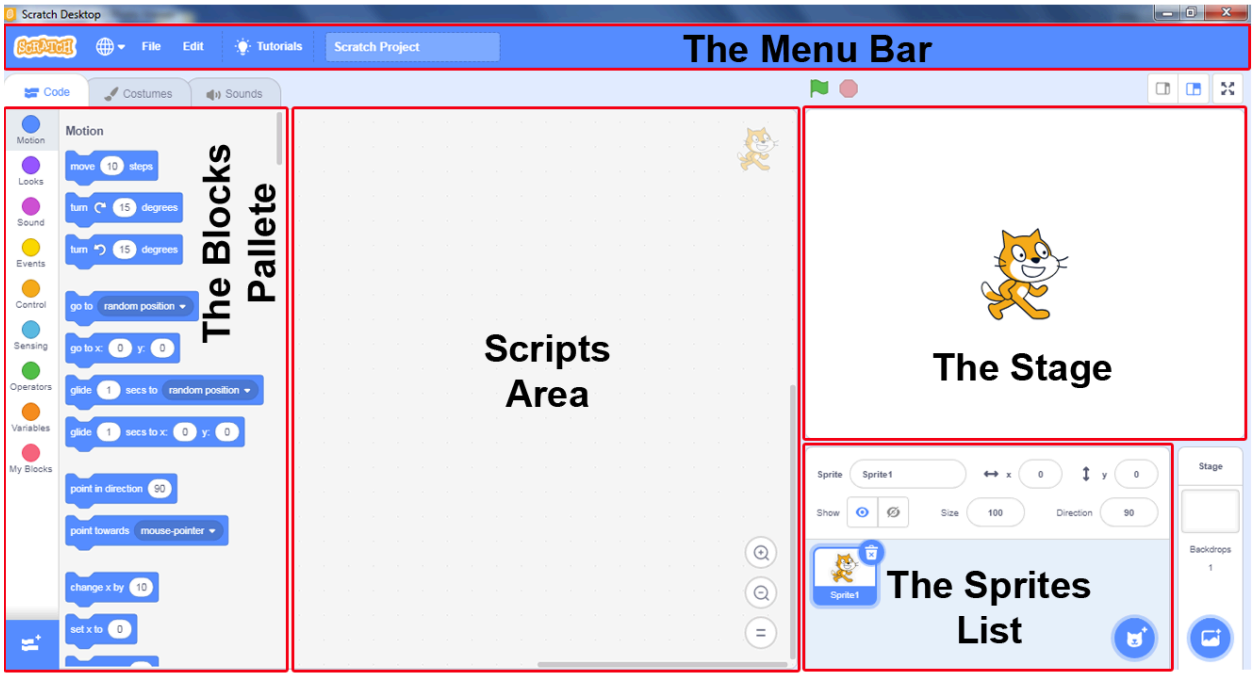
To begin with, change the title of your project (upper central part of the screen).



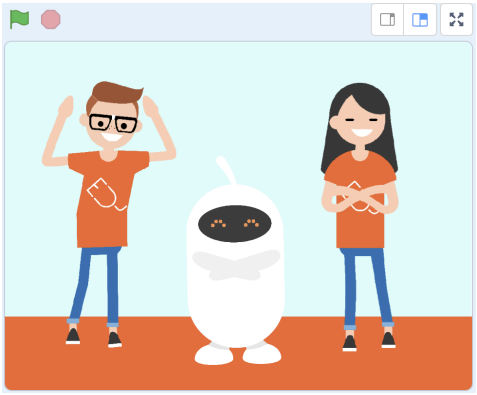
You can pick a nice title, such as "My amazing EU Code Week Dance"

Step 3 : The Scratch environment

You might feel a bit overwhelmed by all the information on the page. Don't worry, we'll walk you through.

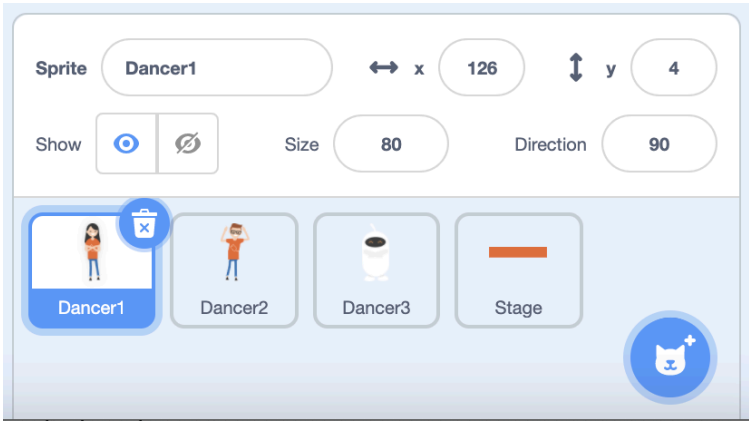


In the upper right corner of your window, you have the "Stage" area.



Clicking on the little Green Flag starts your project, and the red button stops it. The far right button makes the window fullscreen, and the two others determine the size of it. I recommend leaving it as it is.

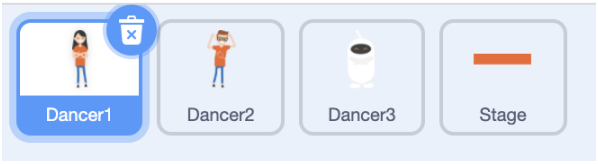
Right underneath you will find the “Sprites List” area:



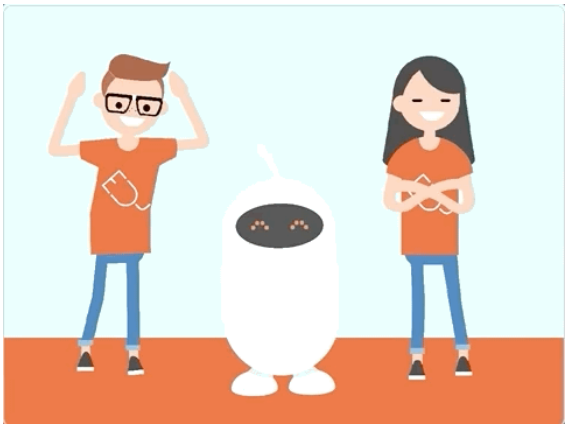
In Scratch, a Sprite is simply a character or an object of your game. You may code and customize each Sprite.

In the top part of this section, you can read some practical information about your Sprite, such as its name, its X and Y positions, its size and its direction. You can also *hide* and *show* the Sprite, using the “Eye” next to the “Show”.

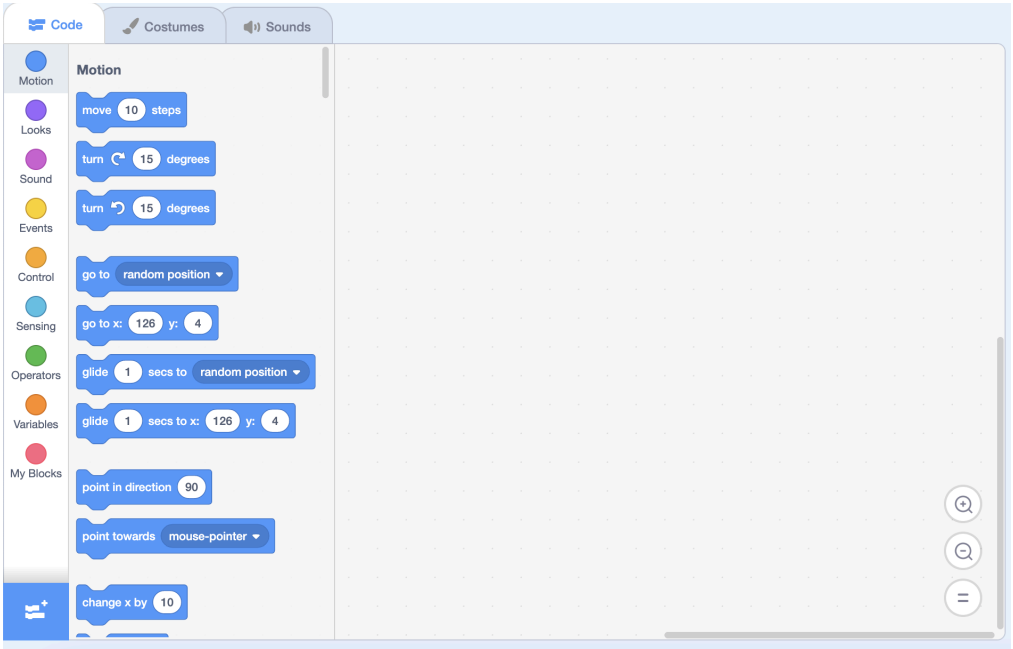
In the lower part of this section you can observe all the Sprites in your project.



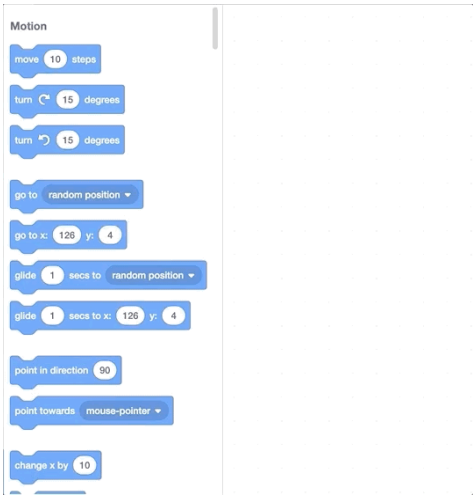
You can move Sprites by dragging them around in the Stage area.



Next you have the Blocks Palette and the Scripts area:



The Palette contains all our “building blocks”. These are the blocks we put together to form our code. Observe how they fit together as Lego blocks.

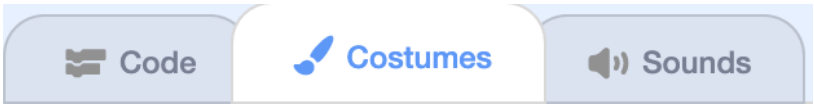


In the Scripts area, you may assemble your code blocks.

Start by left-clicking the chosen block, and drag it over to the main part, and release your mouse click.

Step 4 : Your first code

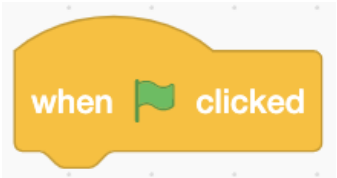
Let's have a look at our Sprites' **Costumes**. You may see them by clicking on the "Costumes" tab in the upper left corner.



The boy and girl Sprites have multiple costumes. These are basically different versions of the same Sprite. To make your Sprite dance, we need to switch between different costumes.

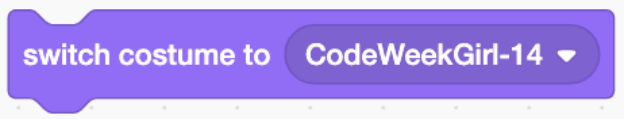
Now you may go back to the **Code** tab.

Your project will start when you click on the Green Flag. If you look through the different blocks, you will find one named "When [Green Flag] clicked". This is the starting block of your code!



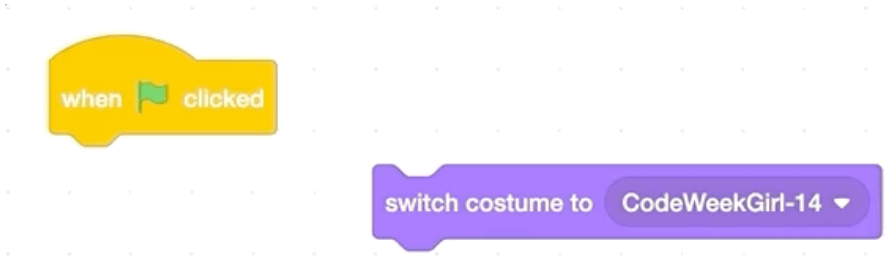
Every block that follows this block will be executed when the green flag is pressed.

It is now time to make our Sprite do its first dance move. Look for the block "Switch costume to []"



Choose a random costume in the list by clicking on the little down arrow :

You may then slide it just underneath the other block. They will “snap” together.



As surprising as it may sound, this is already a fully functional code. Try clicking on the green flag on top of the Stage area. You should see your Sprite changing position.

A dance is rarely made out of a single move. How would you make your Sprite make 2 consecutive moves?

It is a little tricky.

Intuitively, you may want to add another block “Switch costume to []”, but unfortunately this does not work.

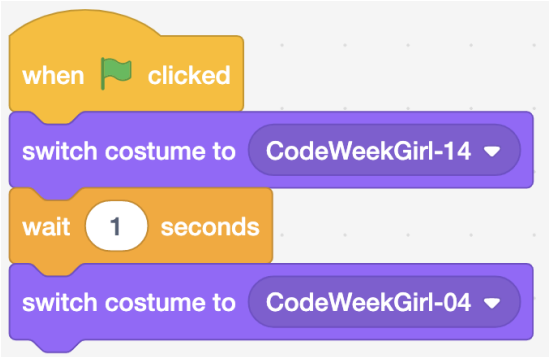
Why? Because the two **blocks of code** get executed **suuuuuuuper fast** one after another. Our poor human eyes can’t see both moves.

To solve this problem, we simply need to wait some time before the computer executes the second block of code. You can do that with the “Wait [] seconds” block. So

will tell the computer to wait 1 second before going to the next block.

By clicking in the white circle, you may change the number of seconds to wait.

Here's how it goes:



Don't forget to press the green flag to see your characters in action!

Now, let's not limit ourselves to only 2 dance moves! What about an entire dance? Repeat what you just coded for all the other costumes and make sure to separate each move by a "Wait [] seconds".

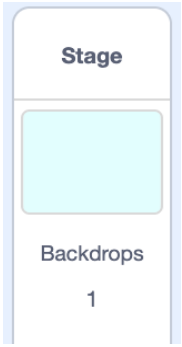
In order for you to know which dance moves are associated with which numbers, go take a look again in the **Costumes** section. You may see the names of each costume accompanied with the given costume.

Create a creative dance and have fun! If you're fast, you can make a second Sprite dance! You need to select the Sprite in the Sprite list.

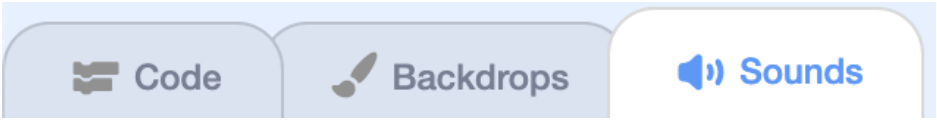
Step 5 : Music Maestro!

What is dance without music? Let's add some music!

Please go to the **Backdrop** code. To access this section, you simply have to click on the backdrops, in the lower right corner.



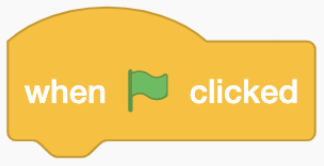
Now navigate to the **Sounds** tab.



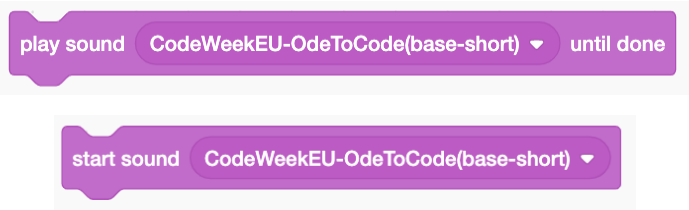
You will find the Code Week music which we already uploaded to the project. Try to play it using the "Play" button.

Going back to the **Code** tab, we will add the necessary code to launch this musical excerpt when we run our project.

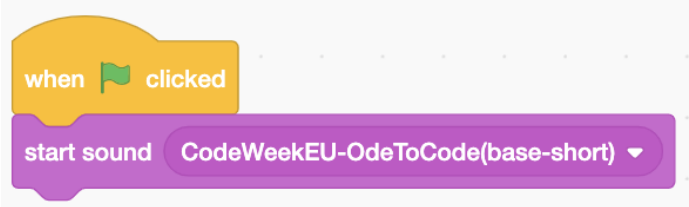
Recall that our project is ran by clicking on the Green Flag. You can start with this block:



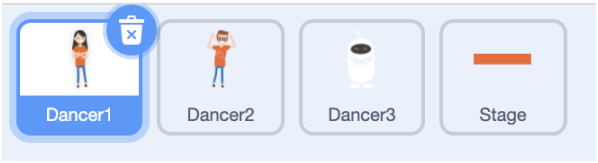
Go take a look at the magenta-colored blocks in the “sound” category. Notice the following blocks:



In your project, you may use either:

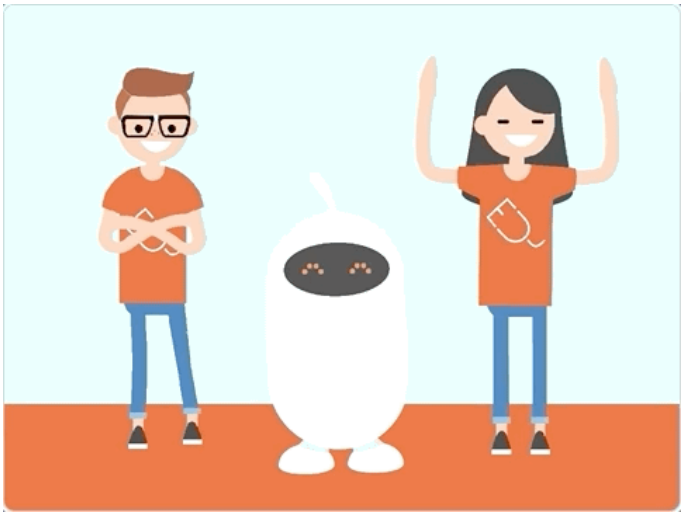


You can now adapt your dance to be in rhythm with the music. Do not forget to return to the code of the Sprites to change your dance moves ;-)

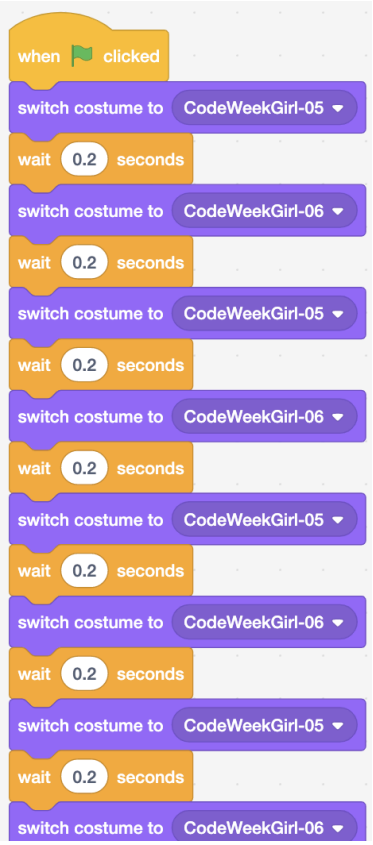


Step 6 : Some more advanced moves

Imagine we want to make our characters wave...

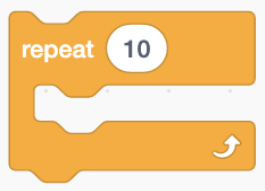


The code is fairly simple. We need to switch between costumes #05 and #06 a few times:



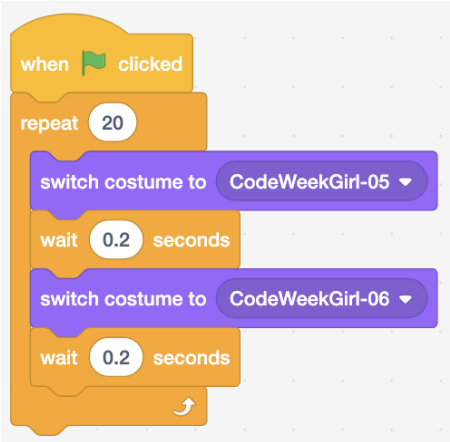
This, however, is very boring and long to code. You are **repeating** the same 2 blocks over and over. Coders hate repeating themselves!

To avoid this, we will use the “Repeat []” block.

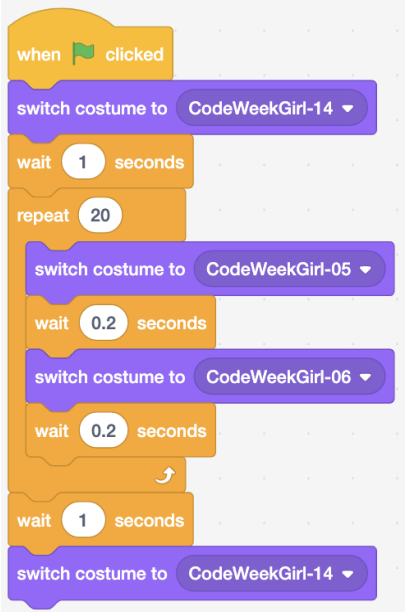


The “Repeat []” block will execute the code **inside** the block 10 times. Of course, you can change the “10” to any wanted number. If you want 100 waves, simply change it to “100”!

We may now rewrite our Wave code:



The “Repeat []” block can of course also be placed after other dance moves, and may be followed by other dance moves! Just remember to place “Wait [] seconds” block before and after it.



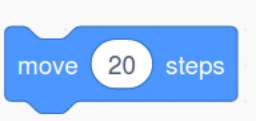
Step 7 : Moving

It's time to move around the dance floor to show off our cool dance moves! Go to the Motion blocks (darker blue) and find the "Move [] steps" block:

Try adding this block to the code of one of your characters and observe what it does.

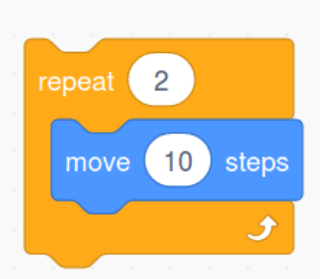
Indeed! It makes your character move to the right. To make the Sprite move further to the right, you can:

- Increase the number of steps :



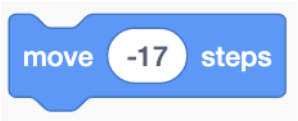
- Add multiple blocks:

- Use a loop:



Being able to achieve the same result in different ways is very common in coding!
Here's a challenge for you: **how would you use the block "Move" block to make your Sprite move left?**

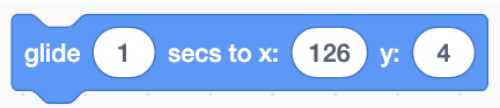
Answer: you can simply enter a negative number of steps!



Tip: If your Sprite completely disappears from the Stage area, it's probably because you've hit the "Move" block too many times. You can recenter your Sprite by changing his or her coordinates to x=0 and y=0.

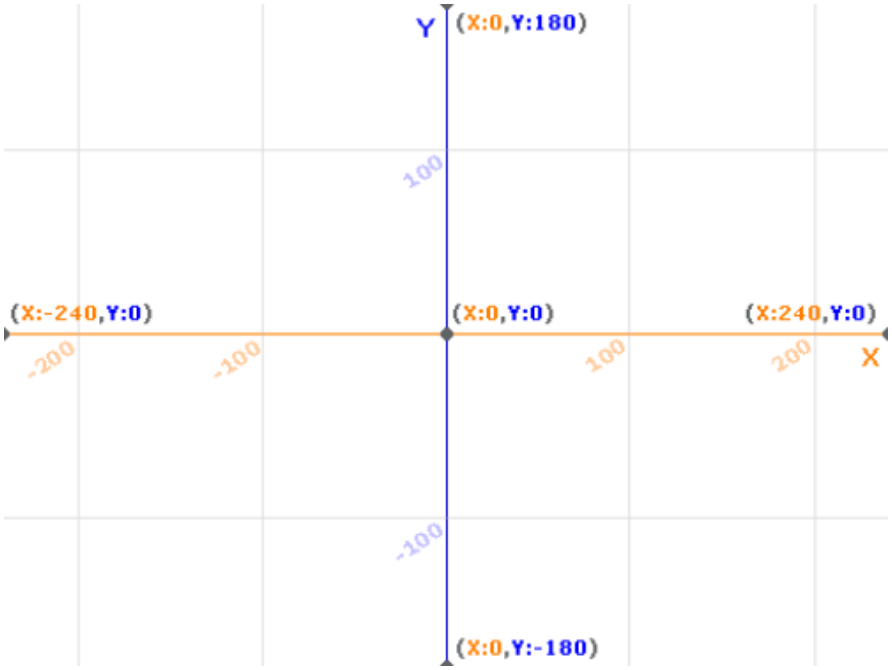
By the way! Moving a large number of steps 

will make your characters look like they are being *teleported*. For a fluid move, use the block "Glide [] seconds to x: [] y: []":



You do not need to add a "Wait [] seconds" after such a Glide block, since it is included in it.

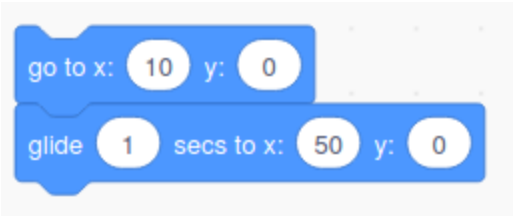
The coordinates (**x** and **y** values) pre-filled in the glide block represent the current position of your Sprite. You can of course change them manually if you are not happy with them. To get an idea of the coordinate system in Scratch, this might help:



Yes! Back to our good old geometry class ☺

The center of the screen is represented by ‘x: 0, y: 0’, and X varies between -240 (farthest left point) and 240 (farthest right point), whereas Y varies between -180 (farthest bottom point) and 180 (farthest top point).

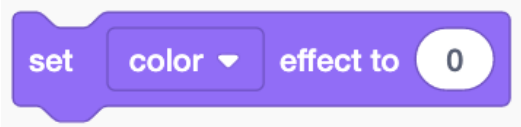
Tip: if you don’t want to manually drag your Sprite back to its original position on the Stage each time you launch your project, you might want to use the “Go to” block in conjunction with the glide block:



Step 8 : Effects

The last point we shall discuss today are **effects**. These include transparency, brightness, pixelating, and much more!

To find these effects, browse to the “Looks” category (Purple blocks). You will find a block called “set [color] effect to []”



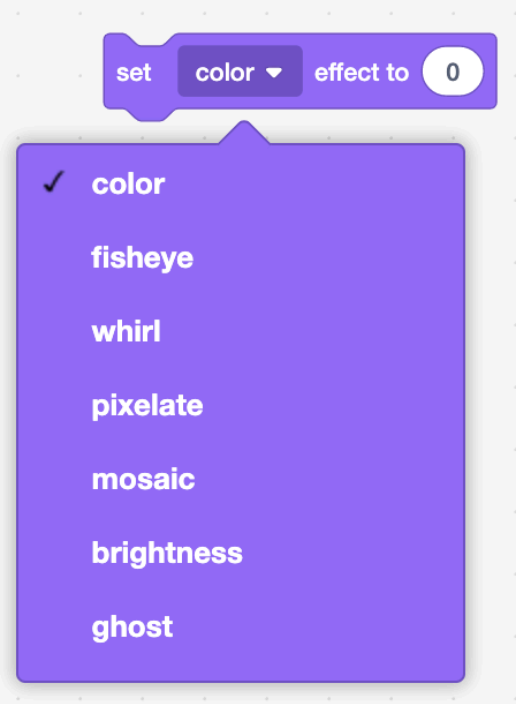
The default value is 0. Try changing the value and adding it to your code. You should see an effect like this one:

If you do not see this change in color, try with another value (around 50 will result in a big contrast).

To get your Sprite back to normal, simply add a “set [color] effect to [0]” in your code.

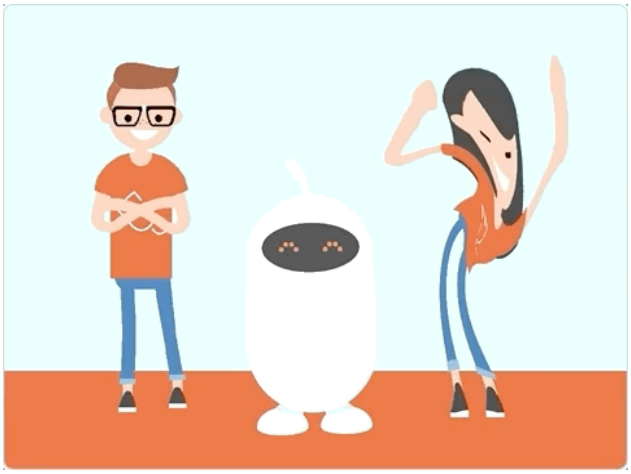
You could make the effect change over time: the color is “normal” at the beginning of the dance and changes later on. Be creative :-)

Of course the color effect is not the only one there is. If you click on the little triangle next to “color” you will get a whole selection of effects:



Try the different effects out to find out which ones you prefer. It is possible to make a really cool dance with the effects!

You can combine them with the different costumes, by applying a change in effect at the same time as you change your costume.

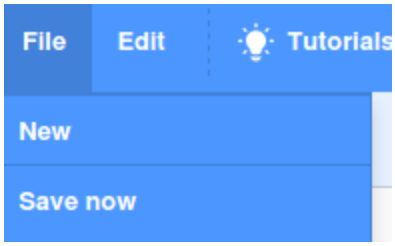


By the way, some of the effects also accept **negative** values, such as the *whirl* effect and the *fisheye* effect. The combination of the two makes the Sprites look real funny.

Step 9 : Saving and Sharing

When you feel like your project is done, we encourage you to save it and share it with the world (i.e. on the web)!

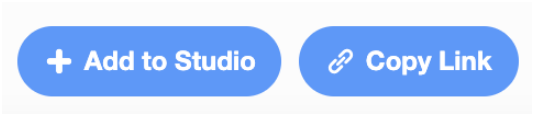
Fortunately for us, Scratch saves all your work automatically **if you are logged into your account**. You can always double check by hitting the “Save now” button:



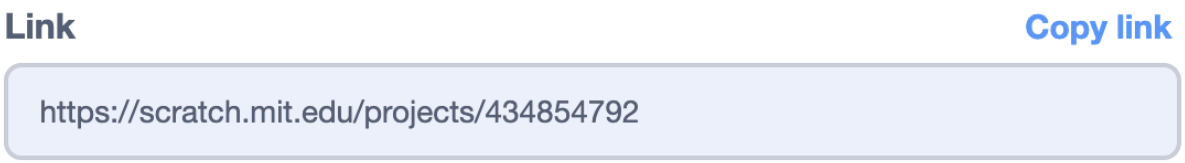
To share your project, click on the orange “Share” button in the central top part of your screen.

Once you click this button, you will be redirected to your project page. Here you can replay your project, but you cannot edit it. To do so, click on the “See inside” button:

You can now send your project as a link to your family and friends. Back on your project page, see the button “Copy Link” in the bottom left corner:



Clicking on this will open a popup window. Here, click on “Copy Link”, which will copy the link to your clipboard.



You may now paste it on your preferred social media! Use the following hashtags: **#CodeWeek #CodeWeekDance**

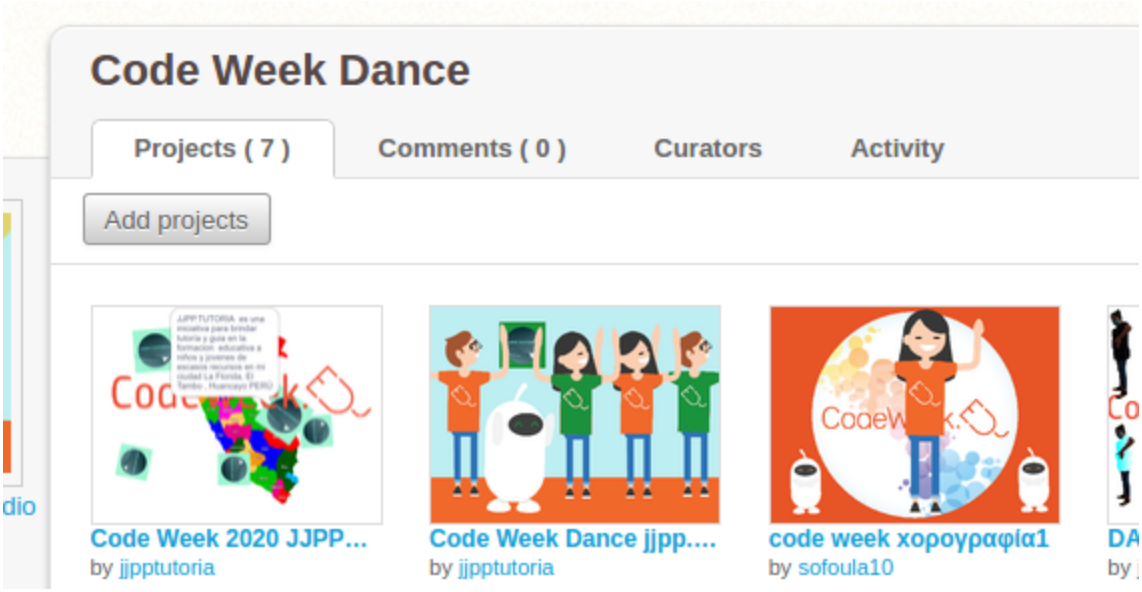
Here is a standard message to which you can add the link to your creation and share it on social media:

“*#Coding is fun! And @CodeWeekEU is a great opportunity to learn it. Have a look at what I did with #Scratch in the last 60 minutes and let me know when you also try it. Happy #CodeWeek* + your link”

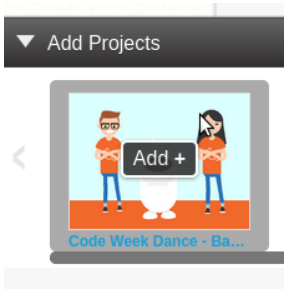
Finally, you can upload your project to our Studio. We wish to collect all the Scratch Code Week dances :)

Follow this link:
https://scratch.mit.edu/studios/27581197/

Click on the “Add projects” button:



Add your project to our Studio!



Happy EU Code Week!

