Sequencing in programming What is Sequencing?

An algorithm is a detailed step-by-step process that needs to be followed in order to complete a task or to solve a problem.

There are three basic building blocks that can be used when designing algorithms:

Sequencing Selection Iteration

These building blocks help us to convert any complex problem into a well-defined solution that can be understood and implemented by others using programming.

Sequence

A sequence is a list of activities that are done one after another. Sequencing refers to the specific order in which we need to perform the activities in order to get the desired output.

Let's see what we have to do to create a square?



If you do these steps in any other order, would the result still be square? In programming, tasks need to be done in the correct sequence to get the desired output.

Sequencing is a foundational concept in programming, and everything we learn in the future will build on this concept.

Selection

Now let us understand the concept of **Selection** using an example.

Look at the below flowchart to check if the age entered by the user is of a senior citizen or not. Consider that person is considered a senior citizen if his age is above 60 years old.



If you follow the flowchart, you will see that the program makes a "**selection**" of which flow to enter depending on the age defined in the program.

This is how the concept of selection is applied in programming.

Iteration

Moving forward, let us have a look at an example of Iteration.

In programming, loops follow the iteration depending on the condition. Every loop iterates at least once if not more.



As you can see in the flow chart the flow of the program will repeat or iterate for each number from 1 to 9.

For every single iteration, it will check for the condition and take the appropriate workflow. This is how iteration works in programming. It will repeat the block of code multiple times till the specified condition is achieved.

Activity: Drawing a Square

What are Shapes?

A shape is an external form, boundary, or outline of an object. Some of the common shapes are:



Prepping the Stage for Drawing

Click on File button and select New to open a new project.

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First, we will set the *Backdrop*. Choose the Xy-grid backdrop from the Backdrop library.





Just like you need a pen (or a pencil) to draw on paper, you also need a pen to draw on the Stage. Therefore, let's add a pen sprite from the sprite library.







In the *sprite* palette, you'll see both Tobi and the pencil. Select Tobi and right click on him. In doing so, a menu will dropdown.



Click on 'delete'.



Pen Extension

To draw anything with the pen, we will need pen extension blocks.

Click on the Add Extension button.





Then, click on the Pen extension to add The Pen palette.

Pen Extension Blocks

We will be using the following blocks from the pen extension in the next topic.

When you run the pen down block, you enable a mode where, whenever the sprite moves, it will draw lines on the stage.



When you run the pen up block, you enable a mode where the sprite does not draw while moving.



To erase all the lines, we will use erase all block.



Now that you know the basics, let's draw some real shapes in the next topic.

Making the Square Manually

To make a square, follow the steps below:

Click the pen down block. Then, click the move 100 steps block. Next, click the turn clockwise 90 degrees block. Repeat steps 2 & 3 three more times.

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Editing the costume

Click the Costumes tab, you'll see the pencil in the costume area on the left. Select the full costume by clicking on one end of the editor and dragging the mouse over and across the costume. The pencil will get highlighted. Now, we can move the pencil around.

Click on the pencil and drag it in such a way that the tip of the pencil overlaps the center dot on the editor. After aligning them release the pencil.

Once you do it, you'll observe that in the stage the line now is at the tip of the pencil. Success!



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Making the Square using Script

Now, let's create the script to draw the square by stacking all the blocks together. To draw the square, you had to click each of the 3 blocks 4 times. To make a script that does the same, you need to add all 3 blocks in the given sequence 4 times!



Now when you click on the modified script, you'll be able to see the pencil moving and drawing side of the square on by one.



You can simplify all this by using a repeat block. Just add it around the 3 blocks and write 4 in the space.

Place a pen down block above the repeat block to draw the square and place a when () key pressed block above the entire script. That's it.



Activity: Output

