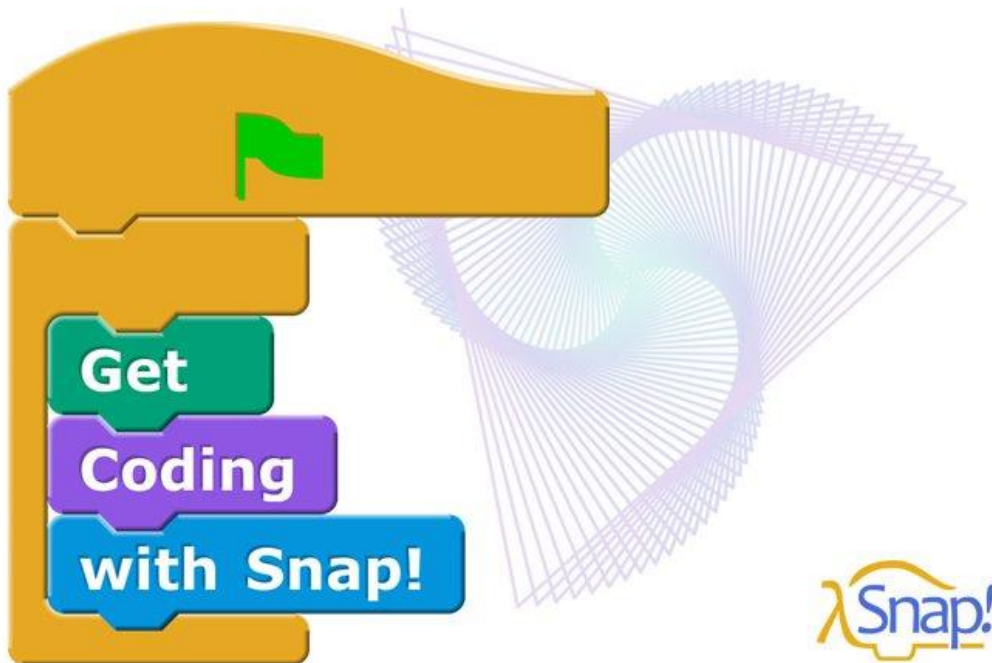


openSAP Get Coding with Snap!

Exercises Week 2 Unit 1



PUBLIC



WHAT YOU HAVE LEARNED THIS WEEK


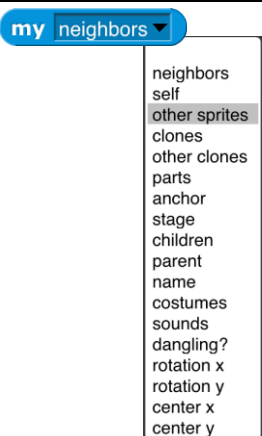
In this unit's video you got to know different terms that don't necessarily have to do with programming but are often used in computer science, like algorithms.

An algorithm is an unambiguous specification or instruction of how to solve a certain problem. They describe a computation, which starts with an initial state and "input" and is then executed for a finite number of times, eventually leading to an "output". The "output" is not necessarily the same all the time - some algorithms are deterministic, some work with a randomized "input".

Moreover, you heard about the Chaos Game, which is (according to [Wikipedia](#)) "a method of creating a fractal (an infinitely self-similar structure), using a polygon" and a randomly selected initial point (inside it). "The fractal is created by iteratively creating a sequence of points, starting with the initial random point, in which each point in the sequence is a given fraction of the distance between the previous point and one of the vertices of the polygon; the vertex is chosen at random in each iteration".

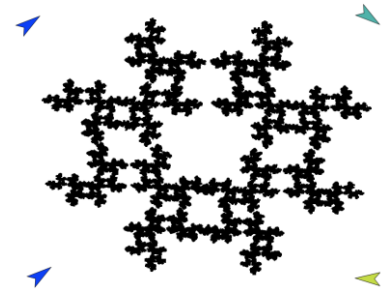
This leads to another phenomenon, called "emergence" which occurs when "the whole is greater than the sum of the parts". In the shown case, the pattern is made from dots, that move dependent on 3 other sprites in the system. The emerging pattern originates from the interaction of the different parts of the system.

Useful Blocks

This block reports the distance to the stage's center, the mouse pointer or another object.	 A Scratch 'distance to' block. The dropdown menu is set to 'distance'. The target dropdown is set to 'to'. The target list includes 'mouse-pointer', 'center', and 'Sprite(2)'.
This block gives access to a project's sprites depending on the input: <ul style="list-style-type: none">• "neighbours" gives a list with all other sprites within a certain distance• "other sprites" reports all sprites in the project except the one that is executing this block• "clones" reports a list that contains all clones derived from this clone• ...	 A Scratch 'my neighbors' block. The dropdown menu is set to 'my neighbors'. The list of options includes: 'neighbors', 'self', 'other sprites' (highlighted), 'clones', 'other clones', 'parts', 'anchor', 'stage', 'children', 'parent', 'name', 'costumes', 'sounds', 'dangling?', 'rotation x', 'rotation y', 'center x', and 'center y'.

YOUR TURN

- Implement another chaos-game algorithm. This one works pretty similar to the one you built in the video but with a little twist:
 - It has 4 reference points. Therefore, you need to add another sprite to your project and arrange all of them like a square
 - The current target vertex cannot be the same as the previous one, so you need to include a second variable to store the previous point. Then you need to check, whether the newly randomly picked sprite is the same as the previous target. If this is the case you want to pick a different target.
You can use `is [] identical to [] ?` or `[] = []` to compare both variables.
 - Then try the same algorithm with a pentagon
- Also, check out the Wikipedia article about the [chaos game](#). You can find more interesting patterns derived from other geometric shapes and constraints there.



Coding Samples

Any software coding or code lines/strings ("Code") provided in this documentation are only examples and are not intended for use in a production system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules for certain SAP coding. SAP does not warrant the correctness or completeness of the Code provided herein and SAP shall not be liable for errors or damages caused by use of the Code, except where such damages were caused by SAP with intent or with gross negligence.

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