# CS108L Computer Science for All
# Module 8: Recursion Extension

This Lab 8 Extension should be completed after you finish the Lab 8 Recursion Assignment. You will turn in a separate .nlogo file for the Lab 8 Extension.

For this extension project, you will create a recursive program that directs turtles to color all the patches in the world. You can use the Sierpinksi Simple Model as a foundation of your own recursive model. Your task is to create a space-filling fractal using a recursive procedure.

You can find the **Sierpinski Simple Model** in the Mathematics/Fractals section of the "Models Library"

Note that the Sierpinski Fractal has gaps. You can create a similar fractal that does not have gaps by making a pattern like that shown in the "Things to Try" Info tab. You will need to rotate your fractal to fill in any gaps.

| Module 8 Extension Rubric (20 points total) | | |
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| Done | Points | Task |
| | 2 | A.<br>• Submit a NetLogo source code with the file name: M1.*firstname.lastname*.nlogo.<br>• The first few lines of your Code tab are comments including the following:<br>`;Student's Name:`<br>`;School:`<br>`;Teacher's Name:`<br>`;Date:` |
| | 2 | B.<br>• The code in the code tab of your program is appropriately documented with inline comments. Info Tab is appropriately completed. See Coding Standards Guidelines for more information. |
| | 6 | C.<br>• Your code includes a procedure that recursively calls itself multiple times to generate a pattern that fills the patches with color.<br>• Your program includes a valid base case. |

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| | 2 | D.<br>• You have created a Monitor button that the number of turtles. |
| | 4 | E.<br>• You've created a slider to set the base case. The values on the slider can be adjusted to:<br>a) only partially color the patches (so the pattern you are using is visible)<br><br>or<br><br>b) fill the entire space (in which case you may not be able to see the pattern you used because the patches are all colored in). |
| | 2 | F.<br>• In the Info tab section "How to Use It" describe how to set the slider(s) to generate a pattern that does not completely fill the space, and how to set slider(s) to completely fill the space. |
| | 2 | G.<br><br>• In the related models tab, cite any code you built upon. For example, if you modified the Sierpinski model or the spiral code from the video, you should list that code here. Instructions for how to cite the Sierpinski Model is described in the How to Cite tab of the original Serpinski model. |
| | | H.<br>• Extra Credit: You can earn up to 4 points by implementing a creative procedure that uses interesting shapes and/or colors. |