FW: Lab 1 guide

1 message

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Date: Thursday, August 15, 2024 at 3:41 PM
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Subject: Lab 1 guide

Here are materials for the TA/instructor guide for Lab 1.

Solutions to both algorithms the are in our Git repo: projects/labs/lab1_lego_algo/solutions.txt

Here are my coaching tips:

One thing that is really hard for students is the color pattern in algo A. I suggest they make a table with N, i and the color like:

N	**i**	**color**
0	0	G
1	0	O
1	1	O
1	2	G
2	0	O
2	1	G
2	2	O

2	3	O
2	4	G

If they still don't see it, I suggest thinking about the sum of N and i. Then they usually get it.

Another table they might make is with color like:

N							
0	0						
1	0	1	2				
2	0	1	2	3	4		
3	0	1	2	3	4	5	6

You can see the "stripes" here, and stripes mean we're looking at a modulus operation. That is, every third block is gray, but the start shifts one each row. The diagonal stripes indicate the sum of N and i.

For algo B, the hardest thing is seeing when and where to place the rectangular blocks. A lot of groups write one set of steps to place the square blocks, then separately do something like:

If N is even, start with "location" = (0, 4). Otherwise start with "location" = (4,8).

Count from 0 to floor((N+1)/2) (exclusive). For each number that you count,

Place a blue 4x2 at [location].

Update "location" to be [location] + (4, 4)

This is totally fine! But if you can coach a group to generalize a little more by making a table, you can see:

N						
0	0					
1	0	1				
2	0	1	2			

3	0	1	2	3		
4	0	1	2	3	4	
5	0	1	2	3	4	5

Once you generalize to placing a blue rectangle when (N + i) is odd, it's easier to pull out a general formula for the coordinates at which to place it.

Genevieve