Enumerating the states of a system

0.1 Level 1

For this exercise we have five spins that can take have a microscopic coordinate of +1 or -1. Use the blocks provided to set the microscopic coordinates of all the spins equal to 1.

0.2 Level 2

Use the blocks provided to set the microscopic coordinates of all the odd numbered spins in the system to 1 and all the even numbered spins in the system to -1.

0.3 Level 3

We can write the coordinates of the microstate that you just generated as $(1, 0, 1, 0, 1)$. Notice that we have used 0 in place of -1 here for reasons that should become apparent by the end of this exericse. Can you use the blocks below to generate the configuration $(1, 1, 0, 0, 1)$.

0.4 Level 4

We can write the microscopic coordinates for the microstate that you just generated as 11001, which is the number 19 in binary. We might therefore state that this particular microstate is the 19th of the possible microstates that this system of five spins can occupy. Can you use the blocks below to generate the 12th?

0.5 Level 5

Now generate the 18th of the possible microstates.

0.6 Level 6

Now see if you can bring it all together. Generate the 0th microstate, then the 1st microstate, then the 2nd microstate and so on until you have generated all of the microstates in sequence. To check that your code is correct use the check microstate block after each block is generated each microstate to see if you are getting the correct sequence of microstates. The check microstate block takes the number of the microstate in base 10 as input.