

Configurations of molecules

Left Variable

Middle Variable

Right Variable

Statement: LMR must take on the following natural number values

5 4 7

6 4 6

6 5 7

7 4 5

7 5 6

7 6 7

In order to reach a "complete" aka, 8-8-8 state

Method by which we reach the 8-8-8 state:

1. Left-Middle Add (Adds 1 to L, M)
2. Right-Middle Add (Adds 1 to R, M)

Limitation:

1. At least 1 Left-Middle and 1 Right-Middle must be applied
2. Cannot have more than 4 functions applied

Proof:

1. Show that these 6 are valid
 - Pretty simple
 - Just show what combination of Left-Middle Add / Right-Middle Add

can work

2. Show that any other configuration is invalid
 - Infinite many of other configurations (dealing w/ natural numbers)
 - If narrow natural numbers we are dealing with

We can limit these variables by defining them as natural numbers from 0 to 9

Steps to Implementation:

Part A: Definitions

1. Define L-M-R variables are natural numbers from 0-9
2. Define Left-Middle as a function that adds to Left and Middle
3. Define Right-Middle as a function that adds to Right and Middle

Part B: Defining the System

1. Defining System: Left, Middle, and Right (as list). $L = S[0]$, $M = S[1]$, $R = S[2]$.
2. Define functions
 - a. Left-Middle Add: Adds 1 to L and M
 - b. Right-Middle Add: Adds 1 to R and M
3. Complete System function
 - Applies Left- Middle add until the left variable is equal to 8
 - Applies Right- Middle add until the right variable is equal to 8
 - Check middle variable,
 - if equal 8 (if we don't simplify, just return true at this step)
 - If at least one Left- Middle applied
 - If not more than 4 functions applied
 - return true
 - if not equal 8, return false

Part C: The proof

1. Show that the above 6 configurations are valid (this should be easy)
2. Show that any other configuration is false (this will be harder)