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Homework 2 Program Main Loop Iterations

To begin to find a formula for which the number of iterations of the main loop, I first found the number of correct elements that would be in each iteration of the main loop. This created the pattern,

$$f(x) = \{ 3, 6, 11, 18, 27\ldots\}$$

So for 0 iterations, there were 3 correct terms and for 1 iteration, there were 6, etc. Using inductive reasoning, we can formulate an equation for the number of steps required for length,

$$g(n) = \sum_{i=1}^{n} (2i + 1)$$

g(n) being the sum of every odd integer starting from 3. By calculating this number for running the program, a for loop can be implemented to run the main loop n times. Therefore, the main loop will have a big O of O(n) with a constant of 2.