Assignment 1 Description:

1) Implement the simple recursive nim algorithm we did in class so it can play a game

2) Play against the program for a few problems to confirm it works

3)Time the simple recursive program for a range of n values starting at 0. Create a table mapping the problem size n to the run time. Increase n until going further is impractical (i.e., takes hours). What is the maximum size you can do?

4) Produce a graph showing this runtime function. The x-axis will be n, the y-axis will the run time. This graph must be a linear - log, where x is linear and y is a log. Do not take the logs of the time then plot, just set the graph properties to use a log scale on the y-axis (matplotlib makes this really easy). Make sure you label your graph! It must have a label on the x and y axis telling the reader what they are. It must have a descriptive title.

4a) Extra points. Calculate the slope of the line, how close is it to the analytical solution (1.618)?

5) Implement the memoizing version of the algorithm and verify that it computes the same answers as the recursive algorithm.

Submit your code and timing graph