

Criteria	Ratings		Pts
Participation	1.0 pts Significant Effort	0.0 pts Insufficient Effort	1.0 pts
			Total Points: 1.0

M1: Studio

Due Sep 24 by 11:59pm **Points** 1 **Submitting** on paper

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(<https://classes.engineering.wustl.edu/2020/fall/cse247/modules/complexity/studio/index>)

For each of these programs, you should first look at its `run()` function and locate the `ticker.tick()` call, then try to construct a **closed-form** expression that describes the number of calls as a function of n . (For our purposes, a "closed-form" expression is one in which all summations have been reduced and there are no summations, sequences, or series remaining.) Use the analysis of loop nests as discussed in class to help you.

You might want to use your [summation formulas](#) to help derive a closed-form expression.

When you think you've got a correct expression, run the program and open the resulting tick count .csv file in the outputs folder (*did you remember to refresh?*). The input size n is given in column A, while the number of ticks for that size is in column B.

Enter your expression in cell C2, translating it into an Excel formula. The quantity n is in cell A2; hence, if your formula is (e.g.) n^2 , you would enter `=A2*A2`. Once you have your formula in place, cut and paste it into all rows of column C so that you can compare the formula's output to the empirical measurements in column B.

If you would like some help with Excel formulas, read [this introduction](#).

When using summation formulas, be sure to use the versions that are single fractions, rather than the ones that are sums of fractions, to avoid errors due to integer truncation.

Your formula's output should *exactly* match the number of ticks for each $n \geq 1$. If you're not getting the same numbers, check your expression and modify as needed. Ask your TA for help if you need it!

Part B: Practice with Big- O

Studio Participation