

## Week 5: It's Complicated — Write-up Problem

**Collaboration:** You should work on this problem yourself. **You may not collaborate on the assigned writeup with your cohort-mates or anyone else, but you may use notes taken before or during your assessed cohort meeting.** You may also use other published resources you find, but if you use any materials that were not provided by the course, you should cite them in your solution.

### Write-up Problem: Asymptotic Operators

For each sub-problem, indicate if the statement is *true* or *false* and support your answer with a convincing argument.

- (a)  $3012n \in O(n^2 + n \log n)$
- (b)  $n^n \in O(n!)$
- (c)  $n + \log n \in \Theta(n)$
- (d)  $1.9^n \in \Theta(2^n)$
- (e)  $O(n^2) \subset O(n^3)$