CS3000: Algorithms & Data — Summer 2025 — Laney Strange

APP 4

Due: May 20th, 2025 @ 11:30am via Gradescope

Name:

- APPs will be assigned towards the end of roughly two lectures each week. You'll put together a solution to a short problem that we'll all use in the following lecture. We'll have time set aside to do these in class, or you can work on your own.
- You may handwrite your solutions, or typeset them in LATEX or another system.
- APPs will be graded on completeness. They must be submitted by 11:30am (just before lecture) on the due date. They will not be accepted late, but we drop 3 of them (out of 8 total).
- Collaboration is strongly encouraged for APPs!

Problem 1.

Show how to implement a queue using two stacks. Describe how you would implement the procedures ENQUEUE and DEQUEUE using only Stack operations PUSH, POP, and/or STACK-EMPTY from two stacks (no need to write full pseudocode, though). Can your two-stack solution be implemented with the same asymptotic run-time as the original queue structure?

Solution: