CS302 - Assignment 7

Due: Thursday, Mar. 8 at the beginning of class
Hand-in method: paper

*Can you make a **queue** of pancakes from two **stacks** of pancakes?*

For this assignment you must use latex to generate your work.

1. **Stacks → Queues**

   Given an implementation of a stack that supports `push` and `pop` in $O(1)$:

   (a) [10 points] Describe how to implement a queue using two stacks. Your implementation must support the `enqueue` and `dequeue` operations in $O(1)$ amortized cost.

   (b) [10 points] Prove (e.g. use the aggregate method) that your implementation above supports $O(1)$ amortized costs for both operations. Recall this will involve showing that a sequence of n calls will have average case $O(1)$. *Hint:* it will be hard to prove these operations independently, so in your proof examine a sequence of n intertwined calls of `enqueue` and `dequeue`.