

# CS302 - Assignment 7

Due: Thursday, Mar. 7 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 $\rightarrow$ 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`.