1) (5 pts) ANL (Algorithm Analysis)

Consider an implementation of a queue with two stacks, A and B. If the last operation was an enqueue, all elements will be in stack A and the top of the stack represents the back of the queue. If the last operation was a dequeue, then all of the elements will be on stack B and the top of the stack will represent the front of the queue. For example, if we start with an empty queue and enqueue the items 6, 8, 2 and 4 in succession, the picture on the left is what both stacks look like. If we follow that up with a dequeue, we first must pop off each item from stack A and push each item onto stack B, and then remove the top element of stack B:

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4
2
8                    →                    8
6                                         2
                                          4
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Stack A      Stack B           Stack A      Stack B
```

(a) (2 pts) What would be the total run-time, in terms of n, of n enqueue operations, followed by n dequeue operations, using this implementation. (Assume both stacks are implemented efficiently.) Please give your answer as a simplified Big-Oh answer.

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(b) (3 pts) What would be the total run-time, in terms of n, of n enqueue operations, followed by n more **<u>alternating</u>** enqueue and dequeue operations? Please give your answer as a simplified Big-Oh answer.

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