

Kerry Ojakian's CSI 33 Class

Due Date: Tuesday October 27 at the start of class

HW #4

General Instructions: Create a folder HW04 in Homework where you put all this. Hand in written problem 1 at the beginning of class. Programming problems are due by 11pm.

Put the 4 programs into a single Colab notebook, with a clear header for each problem.

The Assignment

1. From textbook (page 184): Short-Answer Question- 4a and 4c.
NOTE! - **Not** Programming Exercise 4. Do question 4 at the top of the page (just parts (a) and (c); not part (b)).
2. Write a **template class** for a Stack in C++ so that the stack can contain any data type (not just integers as in class). The Stack should be called exactly **Stack** and the method names should all be the standard names, exactly like in the our class versions, i.e. **push**, **pop**, **top**, **size**.
3. Write a **template class** for a Queue in C++ so that the stack can contain any data type. The Queue should be called exactly **Queue** and the method names should all be the standard names, exactly like in the our class versions, i.e. **enqueue**, **dequeue**, **front**, **size**.
4. Write a Stack class in Python that looks exactly the same (from the outside) as the one we did in class. However, on the inside it should be programmed using a linked list - i.e. use our Python ListNode class. Your pop and push should be $O(1)$ operations.
5. Ch 5, page 184, **Programming Exercise 4**. Write this using the Python Queue class we did in class. The name of the function must be exactly as the problem asks for.