Suggested Questions on Week 4 Lecture

1. **Stack with 2 Queues:** You are given the Queue class from the textbook (pg138). Use two queues to implement a Stack class with all its constituent methods (see pg120).

2. **Queue with 2 Stacks:** You are given the Stack class from the textbook (pg120). Use two stacks to implement a Queue class with all its constituent methods (see pg138).

3. **I hate even subarrays:** You are given a binary string (string which contains 0's and 1's), you need to perform several operations on this string. In each operation, choose a non-empty, even-length substring containing only 0's or only 1's, then remove it from the string.
   Your goal is to minimize the final length of the string after performing several such operations, each could remove a different substring meeting the requirement. It is possible that the final string may become empty, in that case print "EMPTY" without quotes.
   And it can be proved that there is always an unique string with minimal length after performing such operations.
   Input:
   First line of input contains an integer T denoting number of testcases.
   Next T lines of input contains a binary string S.
   Output:
   for each testcase print the required minimal string.
   Constraints:
   1 <= T <= 10
   1 <= |S| <= 105

   Test Cases:
   Input:-
   2
   101001
   1001
   Output:-
   10
   EMPTY

   Explanation: for the first test case, first remove substring "00", now string will become "1011", now remove "11", hence "10" will be the resulting string.

4. **Arithmetic Calculator:** Develop an arithmetic calculator that can take an expression of arbitrary lengths, levels of parentheses, and multi-digit numbers, and produce the final result.