Nucleus (Foundations & Data Structures With Java)

Assignment 12 – Stacks & Queues

1. Given an expression check if brackets are balanced

   For e.g. Input : { a + [b+ (c + d)] + (e + f) }
   Output : true

2. Reverse a Stack with the help of another empty stack.

3. Implement a Queue using two stacks.
   a. Make Enqueue efficient
   b. Make Dequeue efficient

4. Implement a Stack using two queues
   a. Make push efficient
   b. Make pop efficient

5. Reverse a Queue (using recursion).

6. Implement a class MinStack using the stack class we have already built. It should support –
   a. Push() – O(1)
   b. Pop() – O(1)
   c. getMinimum() – O(1). It returns the minimum element present in the stack

   Hint : You would need two stacks for doing this

7. Check for duplicate parenthesis in an expression e.g. ((a + b) + ((c+d))) has duplicate parenthesis.

8. The span si of a stock's price on a certain day i is the maximum number of consecutive days (up to the current day) the price of the stock has been less than or equal to its price on day i. Given input array with all stock prices return the spans. We can do this using an array in O(n^2) time but stack can help us do it in O(n) time.
   Implement the array approach if you can't find a solution using stack.