Module 26.5 Practice Problem Set

1. Write a program to check for balanced brackets in an expression.. Balanced brackets are the pairs and the orders of "{", "}", "(", ")", "[", "]" are correct in the given expression.

   For example: [()]{}{[()()]()} is a balanced bracket.
                [({}]) is not a balanced bracket

   You will be given a string, you need to check if the brackets are balanced or not. If they are balanced, print "YES", otherwise print "NO".

   Expected time complexity: O(N)

Sample Input	Sample output
({(())[{}])	NO
({(())[{}]})	YES

   Reference:
   https://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/

2. Given N integers, the task is to insert those elements in the queue. Also, given M integers,your task is to find the frequency of each number of M in the Queue.

   Expected time complexity: O(N)

Sample Input	Sample output
8 1 2 3 4 5 2 3 1 5 1 3 2 9 10	2 2 2 -1 -1

Explanation: Frequency of 1 is 2. Frequency of 3 is 2. Frequency of 2 is 2. Frequency of 9 is -1 and Frequency of 10 is -1 (since 9 and 10 are not there in the queue).
Reference: GFG-Queue Operations

3. Write a program to sort a stack of integers.

   You will be given a size N, and N integer values. You need to insert those values in a stack, and sort that stack and print it.

   Expected time complexity: O(N*N)

Sample Input	Sample output
5 1 8 5 4 2	1 2 4 5 8
8 5 1 4 7 9 2 5 4	1 2 4 4 5 5 7 9

   Reference: https://www.geeksforgeeks.org/sort-stack-using-temporary-stack/

4. Write a program to reverse a queue of integers.

   You will be given a size N, and N integer values. You need to insert those values in a queue, and reverse that queue and print it.

   Expected time complexity: O(N)

Sample Input	Sample output
5 5 4 1 3 7	7 3 1 4 5
7 1 4 5 1 2 7 4	4 7 2 1 5 4 1

   Reference: https://www.geeksforgeeks.org/reversing-a-queue/

5. Given a number N. The task is to generate and print all binary representations of decimal values from 1 to N.

Expected time complexity: O(N*log2(N))

Sample Input	Sample output
2	1 10
5	1 10 11 100 101

Reference:
https://practice.geeksforgeeks.org/problems/generate-binary-numbers-15871156 20/

6. Write a program to reverse the first K elements of a queue.

You will be given a size N and K. In the next line you will be given N integer values. You need to insert those values in a queue, and reverse the first K elements of that queue and print it.

Expected time complexity: O(N+K)

Sample Input	Sample output
10 5 10 20 30 40 50 60 70 80 90 100	50 40 30 20 10 60 70 80 90 100
7 4 1 2 3 4 5 6 7	4 3 2 1 5 6 7

Reference: https://www.geeksforgeeks.org/reversing-first-k-elements-queue/

7. Given a String. Reverse each word in it where the words are separated by dots.

    Expected Time Complexity: O(N).

Sample Input	Sample output
i.like.this.program.very.much	i.ekil.siht.margorp.yrev.hcum
pqr.mno	rqp.onm

    Reference:
    https://practice.geeksforgeeks.org/problems/reverse-each-word-in-a-given-string1001

8. You are given an array A of size N. You need to first push the elements of the array into a stack and then print the current minimum present in the stack at each pop until the stack becomes empty.

    Expected Time Complexity: O(N).

Sample Input	Sample output
5 1 2 3 4 5	1 1 1 1 1
7 1 6 43 1 2 0 5	0 0 1 1 1 1 1

    Explanation 1:
    After pushing elements to the stack,
    the stack will be "top -> 5, 4, 3, 2, 1"

    Now, start popping elements from the stack:
    popping 5: current min in the stack is 1.
    popping 4: current min in the stack is 1.
    popping 3: current min in the stack is 1.
    popping 2: current min in the stack is 1.
    popping 1: current min in the stack is 1.

Explanation 2:
After pushing the elements to the stack,
the stack will be "top -> 5->0->2->1->43->6->1"

Now, popping the elements from the stack:
popping 5: current min in the stack is 0.
popping 0: current min in the stack is 0.
popping 2: current min in the stack is 1.
popping 1: current min in the stack is 1.
popping 43: current min in the stack is 1.
popping 6: current min in the stack is 1.
popping 1: current min in the stack is 1.

Reference: https://practice.geeksforgeeks.org/problems/get-min-at-pop

এক্সট্রা কিছু প্রবলেম (এগুলো অপশনাল যারা এক্সট্রা আরো প্রবলেম সল্ভ করতে চাও তাদের জন্য) -
https://www.hackerearth.com/practice/data-structures/stacks/basics-of-stacks/practice-problems/

https://www.cs.princeton.edu/courses/archive/spr01/cs126/exercises/adt.html