

# Stacks

## Assignment Questions



# Assignment Questions

**Q1. Given a rows x cols binary matrix filled with 0's and 1's, find the largest rectangle containing only 1's and return its area.**

**Example 1:**

1	0	1	0	0
1	0	1	1	1
1	1	1	1	1
1	0	0	1	0

**Input:** matrix =

[["1","0","1","0","0"], ["1","0","1","1","1"], ["1","1","1","1","1"], ["1","0","0","1","0"]]

**Output:** 6

**Explanation:** The maximal rectangle is shown in the above picture.

**Example 2:**

**Input:** matrix = [[ "0" ]]

**Output:** 0

**Example 3:**

**Input:** matrix = [[ "1" ]]

**Output:** 1

**Q2. Given an encoded string, return its decoded string. The encoding rule is: k[encoded\_string], where the encoded\_string inside the square brackets is being repeated exactly k times. Note that k is guaranteed to be a positive integer.**

You may assume that the input string is always valid; there are no extra white spaces, square brackets are well-formed, etc. Furthermore, you may assume that the original data does not contain any digits and that digits are only for those repeat numbers, k. For example, there will not be input like 3a or 2[4].

**Example 1:**

**Input:** s = "3[a]2[bc]"

**Output:** "aaabcbc"

**Example 2:**

**Input:** s = "3[a2[c]]"

**Output:** "accaccacc"

**Example 3:**

**Input:** s = "2[abc]3[cd]ef"

**Output:** "abcabccdcdcdef"

# Assignment Questions

**Q3. You are keeping the scores for a baseball game with strange rules. At the beginning of the game, you start with an empty record.**

You are given a list of strings operations, where operations[i] is the ith operation you must apply to the record and is one of the following:

An integer x.

Record a new score of x.

'+'.

Record a new score that is the sum of the previous two scores.

'D'.

Record a new score that is the double of the previous score.

'C'.

Invalidate the previous score, removing it from the record.

Return the sum of all the scores on the record after applying all the operations.

**Example 1:**

**Input:** ops = ["5", "2", "C", "D", "+"]

**Output:** 30

**Explanation:**

"5" - Add 5 to the record, record is now [5].

"2" - Add 2 to the record, record is now [5, 2].

"C" - Invalidate and remove the previous score, record is now [5].

"D" - Add  $2 * 5 = 10$  to the record, record is now [5, 10].

"+" - Add  $5 + 10 = 15$  to the record, record is now [5, 10, 15].

The total sum is  $5 + 10 + 15 = 30$ .

**Example 2:**

**Input:** ops = ["5", "-2", "4", "C", "D", "9", "+", "+"]

**Output:** 27

**Explanation:**

"5" - Add 5 to the record, record is now [5].

"-2" - Add -2 to the record, record is now [5, -2].

"4" - Add 4 to the record, record is now [5, -2, 4].

"C" - Invalidate and remove the previous score, record is now [5, -2].

"D" - Add  $2 * -2 = -4$  to the record, record is now [5, -2, -4].

"9" - Add 9 to the record, record is now [5, -2, -4, 9].

"+" - Add  $-4 + 9 = 5$  to the record, record is now [5, -2, -4, 9, 5].

"+" - Add  $9 + 5 = 14$  to the record, record is now [5, -2, -4, 9, 5, 14].

The total sum is  $5 + -2 + -4 + 9 + 5 + 14 = 27$ .

**Example 3:**

**Input:** ops = ["1", "C"]

**Output:** 0

**Explanation:**

"1" - Add 1 to the record, record is now [1].

"C" – Invalidate and remove the previous score, record is now [].

Since the record is empty, the total sum is 0.

**Q4. We are given an array of asteroids of integers representing asteroids in a row. For each asteroid, the absolute value represents its size, and the sign represents its direction (positive meaning right, negative meaning left). Each asteroid moves at the same speed.**

**Find out the state of the asteroids after all collisions. If two asteroids meet, the smaller one will explode. If both are the same size, both will explode. Two asteroids moving in the same direction will never meet.**

#### Example 1:

**Input:** asteroids = [5,10,-5]

**Output:** [5,10]

**Explanation:** The 10 and -5 collide resulting in 10. The 5 and 10 never collide.

#### Example 2:

**Input:** asteroids = [8,-8]

**Output:** []

**Explanation:** The 8 and -8 collide exploding each other.

#### Example 3:

**Input:** asteroids = [10,2,-5]

**Output:** [10]

**Explanation:** The 2 and -5 collide resulting in -5. The 10 and -5 collide resulting in 10.

**Q5. Given an array of integers temperatures represents the daily temperatures, return an array answer such that answer[i] is the number of days you have to wait after the ith day to get a warmer temperature. If there is no future day for which this is possible, keep answer[i] == 0 instead.**

#### Example 1:

**Input:** temperatures = [73,74,75,71,69,72,76,73]

**Output:** [1,1,4,2,1,1,0,0]

#### Example 2:

**Input:** temperatures = [30,40,50,60]

**Output:** [1,1,1,0]

#### Example 3:

**Input:** temperatures = [30,60,90]

**Output:** [1,1,0]