CS-594: Mid Sem Exam

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Duration: 2 hrs

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1. Given a 0-indexed array of integers nums, return *the number of **good pairs***. A pair (i, j) is called *good* if nums[i] == nums[j] and i < j. **[1 Mark]**

   Input 1

   ```
   [1,2,3,1,1,3]

   Output: 4

   Explanation: There are 4 good pairs (0,3), (0,4), (3,4),
   (2,5).
   ```

   Input 2

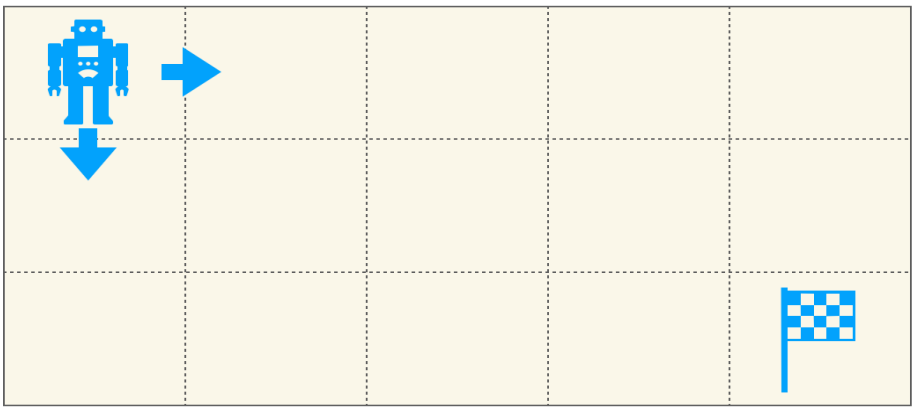
   ```
   [1,2,3,1,2,3]

   Output : 3

   Explanation: There are 3 good pairs (0,3), (1,4), (2,5).
   ```

2. There is a robot on an m x n grid. The robot is initially located at the top-left corner (i.e., grid[0][0]). The robot tries to move to the bottom-right corner (i.e., grid[m - 1][n - 1]). The robot can only move either down or right at any point in time.

   Given the two integers m and n, return the number of possible unique paths the robot can take to reach the bottom-right corner. **[2 Marks]**



Input 1

```
m=3, n=7

Output :

28
```

Input 2

```
m=3, n=2

Output :

3
```

3. Given a string containing only ‘(‘ and ‘)’, are the parentheses in the string balanced? For the parentheses to be balanced, each open parenthesis must have a corresponding close parenthesis, in the correct order Print "Yes" if it is balanced else Print "No". **[1 Mark]**

Input 1

```
((())

Output: No

Explanation:  The leftmost open parenthesis doesn’t have a
corresponding closing parenthesis.
```

Input 2

```
()()

Output: Yes

Explanation:  all parentheses are balanced.
```

4. You are given a list of repeated set of integers. Your task for the problem is to return a list of the given elements in decreasing sorted order of their frequency of repetition in the given list with the element with the highest frequency of repetition first and so on. If two numbers have the same frequency then keep the one that was present before the other in the original given list (array) first. **[2 Marks]**

Input: arr[] = {2, 5, 2, 8, 5, 6, 8, 8}

Output: arr[] = {8, 8, 8, 2, 2, 5, 5, 6}

Explanation :

8 has the highest frequency followed by 2, 5 and 6