

Approach

1. Here iterate from the end & Keep track number of rows and number of cols that can be assigned a value
2. Add to answer $val * remaining\ row$ when col operation is performed & add to answer $val * remaining\ col$ when row operation is performed.
3. Decrease remaining row when row operation is performed & remaining col when col operation is performed

Note : The trick is to when ever we perform a row operation then number of column remaining for next col operation 1 less and same is the case for col operation.

Complexity

Time : $O(N)$ where $N = q.size()$

Space : $O(N)$ where $N = n$