1254. Number of Closed Islands
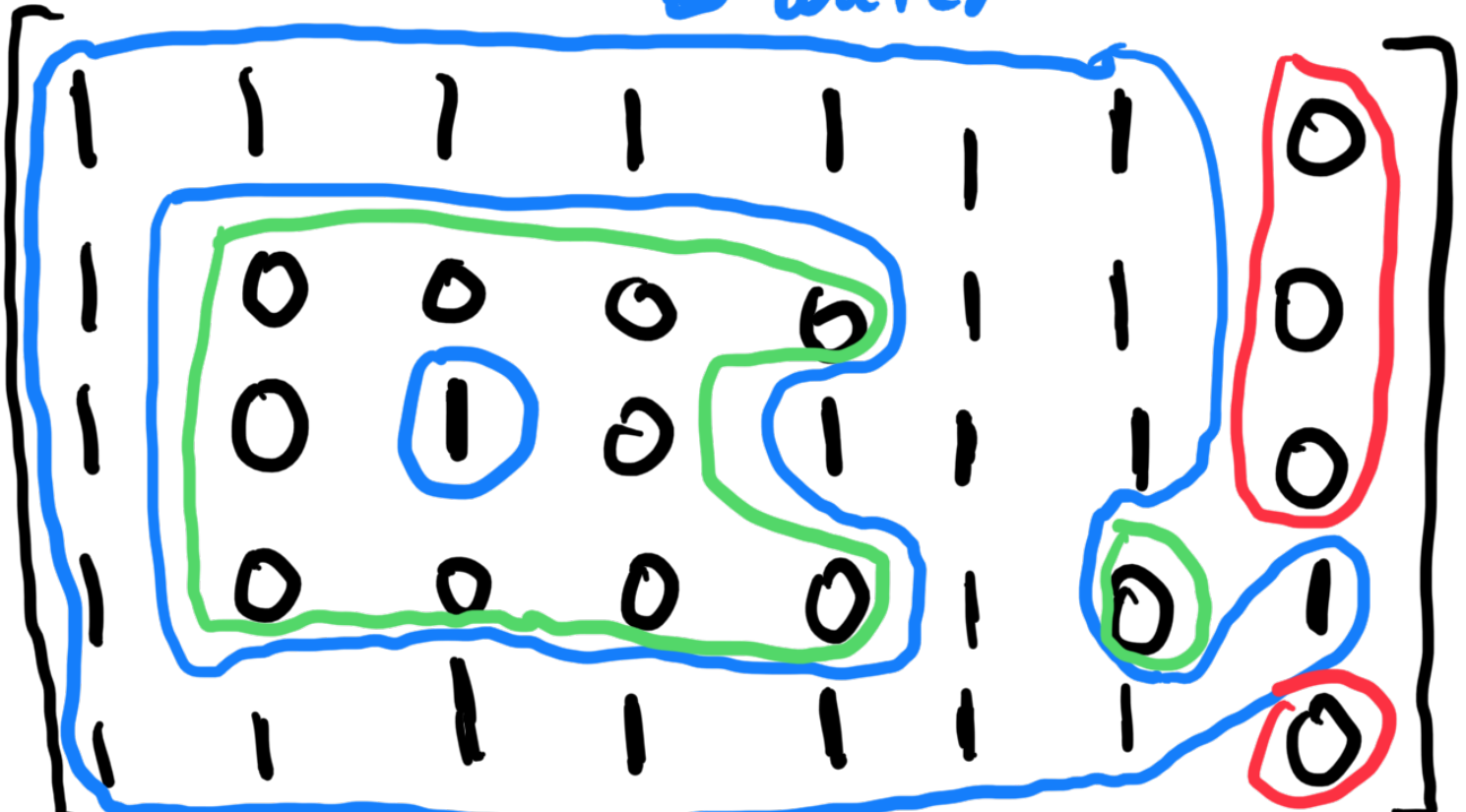
given: m×n grid - grid

Island: maximal 4 directionally connected group of <u>Os</u> & a closed island is an island <u>totally</u> surrounded by 1s.

Return: number of closed islands

- - - - - - - - - - - - - -

🟩 closed island 🟥 island (not closed)
🟦 water

$$
\begin{bmatrix}
1 & 1 & 1 & 1 & 1 & 1 & 0 \\
1 & 0 & 0 & 0 & 1 & 1 & 0 \\
1 & 0 & 1 & 0 & 1 & 1 & 0 \\
1 & 0 & 0 & 0 & 1 & 0 & 1 \\
1 & 1 & 1 & 1 & 1 & 1 & 0
\end{bmatrix}
$$

Solution: dfs

Step 1: destroy all islands connected to the border (dfs 1)

Step 2: count remaining islands (dfs 2)

Note: we can use the same dfs function w/ a "destroy" flag

Time: $O(M \times N)$
Space: $O(M \times N)$