Number of Islands

For this problem the idea is to count connected components of 1s using either DFS (Depth First Search) or BFS (Breadth-First Search). Each time we find a 1, we mark the entire island (all connected 1s) as visited and increment the island count.

Approach : DFS (Flood Fill)

Steps :

1. Iterate through every cell in the grid.
2. When you find a 1 (unvisited land):
   - Increment island count.
   - Call DFS to mark all connected land (1s) as visited by turning them into 0s.
3. DFS explores up, down, left, right directions.

Complexity:

- Time : $O(m * n)$ — each cell is visited once.
- Space : $O(m * n)$ — in worst case (recursion stack for DFS).

Alternative : BFS

You can also solve with a queue-based BFS to avoid deep recursion (important for large grids).