Max island Area

Got it! Let's carefully explain this step by step.

We are finding the largest island area (count of connected `1`s) in a grid.
We only move UP, DOWN, LEFT, RIGHT (no diagonals).

Your grid:

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```
0 0 1 0 0
0 1 1 0 0
0 0 0 1 1
0 0 0 1 1
```

We scan row by row.

✅ Step 1: Scan (0,0) → `0` → skip

Scan (0,1) → `0` → skip
Scan (0,2) → `1` → found a new island!

We start DFS at (0,2).

✅ DFS from (0,2)

- Visit (0,2) → mark as 0 → area = 1
  - Neighbors:
    - UP = out of bounds
    - DOWN = (1,2) → `1` → visit
    - LEFT = (0,1) → `0`
    - RIGHT = (0,3) → `0`
- Now DFS from (1,2) → mark as 0 → area = 2
  - Neighbors:
    - UP = (0,2) → already 0
    - DOWN = (2,2) → `0`
    - LEFT = (1,1) → `1` → visit
    - RIGHT = (1,3) → `0`
- Now DFS from (1,1) → mark as 0 → area = 3

- Neighbors:
  - UP = (0,1) → `0`
  - DOWN = (2,1) → `0`
  - LEFT = (1,0) → `0`
  - RIGHT = (1,2) → already 0

No more moves → DFS finishes.

So this island's area = 3.

✅ `max_area = 3`

Now grid becomes:

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```
0 0 0 0 0
0 0 0 0 0
0 0 0 1 1
0 0 0 1 1
```

✅ Step 2: Continue scanning

- Row 2 → reach (2,3) → `1` → new island!

Start DFS at (2,3)

✅ DFS from (2,3)

- Visit (2,3) → mark as 0 → area = 1
  - Neighbors:
    - UP = (1,3) → `0`
    - DOWN = (3,3) → `1` → visit
    - LEFT = (2,2) → `0`
    - RIGHT = (2,4) → `1` → visit
- DFS from (3,3) → mark as 0 → area = 2
  - Neighbors:
    - UP = (2,3) → already 0
    - DOWN = out of bounds

    - LEFT = (3,2) → `0`
    - RIGHT = (3,4) → `1` → visit
- DFS from (2,4) → mark as 0 → area = 3
    - Neighbors:
        - UP = (1,4) → `0`
        - DOWN = (3,4) → `1` → visit
        - LEFT = (2,3) → already 0
        - RIGHT = out of bounds
- DFS from (3,4) → mark as 0 → area = 4
    - Neighbors all 0 or out of bounds

Done → DFS finishes.

So this island's area = 4.

✅ `max_area = max(3, 4) = 4`

Now grid becomes:

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```
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
```

✅ Step 3: Continue scanning

No more `1`s.

So final `max_area = 4`.

🔹 What's happening conceptually?

- DFS explores all connected `1`s (up/down/left/right) starting from one cell
- Counts how many cells belong to that island
- Updates `max_area`
- Marks them `0` so we don't visit again

Would you like me to draw a visual diagram showing how DFS expands step by step for this example?