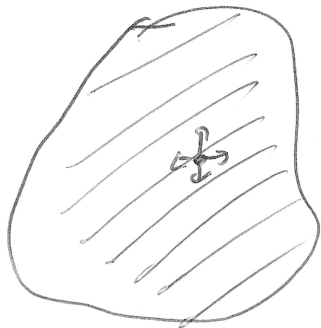


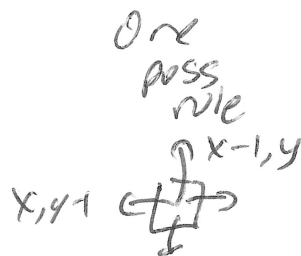
Flood fill

- ① Counting Stars Example (live code)
- ② Minesweeper
- ③ Sky Islands (live code)

MS Paint



Paint Bucket



another



```
int DX[4] = {-1, 0, 0, 1}
int DY[4] = {0, -1, 1, 0}
```

```

(x, y)
NumDIR row col
for (int i=0; i<4; i++) {
    int newX = x + DX[i];
    int newY = y + DY[i];
    //...
}

```

```

x + DX[0] → (x-1, y)
y + DY[0]
x + DX[1] → (x, y-1)
y + DY[1]

```

$(x, y) \rightarrow (x-1, y)$   
 $(x, y) \leftarrow (x-1, y)$ 
} avoid infinite recursion

**PREVENT THIS**  
**\* STORE WHOSE**  
**BEEEN FILLED /**  
**VISITED.**

int\*\* used  
^

fill (int\*\* grid, int x, int y) {

grid[x][y] = FULL;

for (int i=0; i < NumDIR; i++) {

int newX = x + DX[i];

int newY = y + DY[i];

if (!inbounds(newX, newY)) continue;

if (grid[x][y] == FULL) continue;

// if (used[x][y]) continue;

if (grid[newX][newY] == BLOCKED) continue;

fill(grid, newX, newY);

}

}

FF aichetype

Code  
put into  
one

# Minesweeper

1	1	0	1	1
⚡	2	1	1	⚡
2	⚡	1	1	2
1	1	1	2	⚡
0	0	0	2	⚡

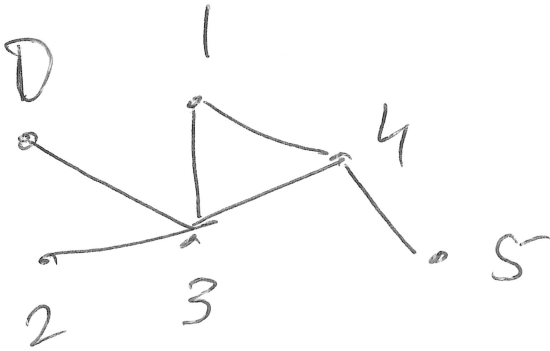
Click here

To store (x,y) coordinate on an R by C grid in one number is  $x \cdot C + y$  [0, RC-1]

CODE / C  $\Rightarrow$  row #

CODE % C  $\Rightarrow$  col

# Sky Islands



	0	1	2	3	4	
0	0	0	0	1	0	0
1	0	0	0	1	1	0
2	0	0	0	1	0	0
3	1	1	1	0	1	0
4	0	1	0	1	0	1
	0	0	0	0	1	0