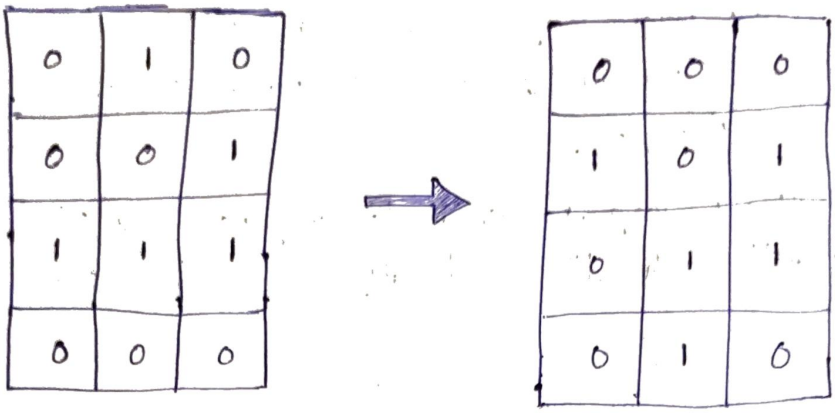
# Game of Life




## Rules :-

### For cell value == 1 :-

1) If no. of neighbouring living cell < 2 or > 3 then the cell dies (i.e., becomes 0)

2) If no. of neighbouring living cells is exactly equals to 2 or 3 then the cell remains alive (i.e., stays 1)

### For cell value == 0 :-

1) If no. of neighbouring living cells is exactly equals to 3 then the cell becomes alive (i.e., becomes 1)

2) If no. of neighbouring living cells is not equals to 3 then the cell remains dead (i.e., stays 0).

### Truth Table used here :-

| Original State | Final State | Intermediate State |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 0 | 1 | 2 |
| 1 | 0 | 3 |

Two loops are required to solve this question; One loop to convert the original board to a board which contains 0/1/2/3.

Another loop is used to replace all 2's with 1's and all 3's with 0's.

So;

Loop 1 :-

1) Find no. of neighbouring living cells for each of the position.

2) If the position is zero then
if livingNeighbours ==3 then
board[i][j] = 2

3) If the position is 1 then if livingNeighbours != 2 && livingNeighbours != 3 then board[i][j] = 3

Loop 2:-

Flip 3s to 0 and 2s to 1

Conclusion :-

0s remain 0s.

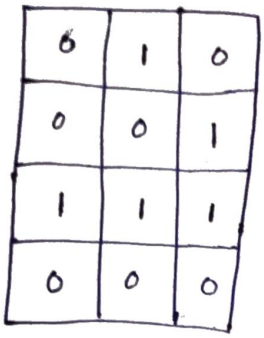
1s remain 1s.

If board[r][c] == 1 and livingNeighbours not in [2, 3], mark 3.

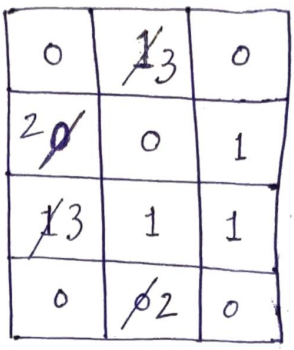
If board[r][c] == 0 and livingNeighbours == 3: mark 2

Final loop: Flip all 3s to 0, all 2s to 1

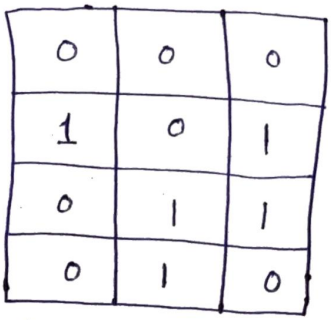
Example :—




Loop 1 :—




Loop 2 : (Replace 2s with 1 and 3s with 0)




Answer

Note: To count no. of neighbouring living cells we have to check all eight positions(if valid).
Whenever board[r][c] == 1 or board[r][c] == 3 then it will be counted.

Note :—