529. Minesweeper

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Description SubmissionsSolutions

- Total Accepted: 3778
- Total Submissions: 7310
- Difficulty: Medium
- Contributors:fallcreek

Let's play the minesweeper game (Wikipedia, online game)!

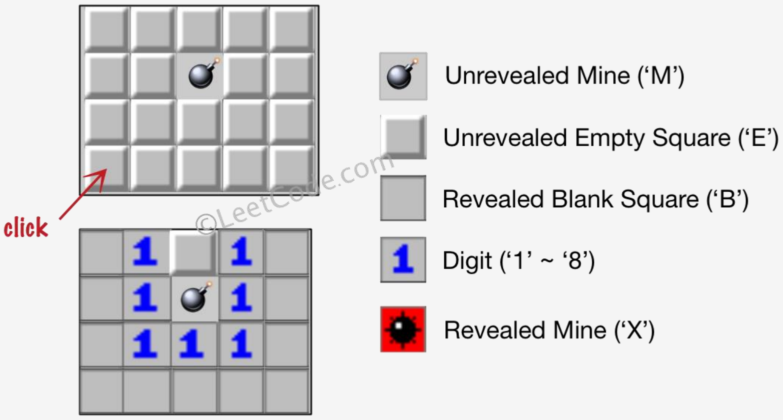
You are given a 2D char matrix representing the game board. **'M'** represents an **unrevealed** mine, **'E'** represents an **unrevealed** empty square, **'B'** represents a **revealed** blank square that has no adjacent (above, below, left, right, and all 4 diagonals) mines, **digit** ('1' to '8') represents how many mines are adjacent to this **revealed** square, and finally **'X'** represents a **revealed** mine.

Now given the next click position (row and column indices) among all the **unrevealed** squares ('M' or 'E'), return the board after revealing this position according to the following rules:

1. If a mine ('M') is revealed, then the game is over - change it to **'X'**.
2. If an empty square ('E') with **no adjacent mines** is revealed, then change it to revealed blank ('B') and all of its adjacent **unrevealed** squares should be revealed recursively.
3. If an empty square ('E') with **at least one adjacent mine** is revealed, then change it to a digit ('1' to '8') representing the number of adjacent mines.
4. Return the board when no more squares will be revealed.

Example 1:

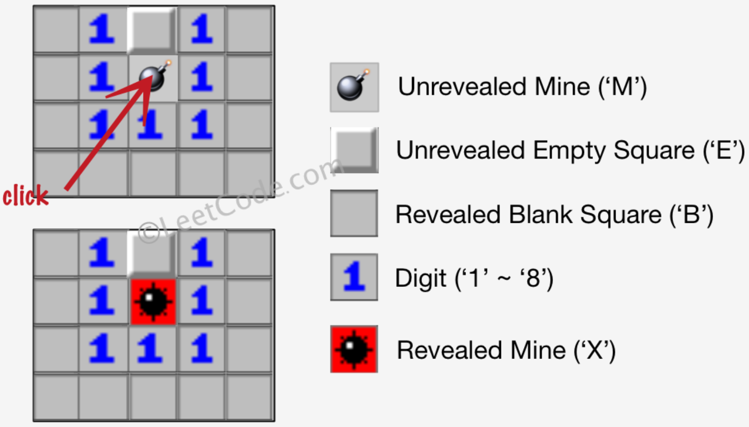
```
Input:



[['E', 'E', 'E', 'E', 'E'],
 ['E', 'E', 'M', 'E', 'E'],

 ['E', 'E', 'E', 'E', 'E'],

 ['E', 'E', 'E', 'E', 'E']]


Click : [3,0]


Output:


[['B', '1', 'E', '1', 'B'],

 ['B', '1', 'M', '1', 'B'],

 ['B', '1', '1', '1', 'B'],

 ['B', 'B', 'B', 'B', 'B']]


Explanation:
```



Example 2:

```
Input:


[['B', '1', 'E', '1', 'B'],

 ['B', '1', 'M', '1', 'B'],

 ['B', '1', '1', '1', 'B'],

 ['B', 'B', 'B', 'B', 'B']]
```

```
Click : [1,2]

Output:

[['B', '1', 'E', '1', 'B'],
 ['B', '1', 'X', '1', 'B'],
 ['B', '1', '1', '1', 'B'],
 ['B', 'B', 'B', 'B', 'B']]

Explanation:
```



Note:

1. The range of the input matrix's height and width is [1,50].
2. The click position will only be an unrevealed square ('M' or 'E'), which also means the input board contains at least one clickable square.
3. The input board won't be a stage when game is over (some mines have been revealed).
4. For simplicity, not mentioned rules should be ignored in this problem. For example, you **don't** need to reveal all the unrevealed mines when the game is over, consider any cases that you will win the game or flag any squares.

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```
//C++
class Solution {
public:

    bool inboard(vector<vector<char>>& board, int x, int y)
    {
        return(x>=0 && x<board.size() && y>=0 && y<board[0].size());
    }

    void reveal(vector<vector<char>>& board,int x, int y)
    {
        if(!inboard(board,x,y)) return;
        if(board[x][y]=='E')
        {
            //search 8 neighbors
            int cnt = 0;
            if(inboard(board,x-1,y-1) && board[x-1][y-1] == 'M') cnt++;
            if(inboard(board,x-1,y  ) && board[x-1][y  ] == 'M') cnt++;
            if(inboard(board,x-1,y+1) && board[x-1][y+1] == 'M') cnt++;
            if(inboard(board,x  ,y-1) && board[x  ][y-1] == 'M') cnt++;
            if(inboard(board,x  ,y+1) && board[x  ][y+1] == 'M') cnt++;
            if(inboard(board,x+1,y-1) && board[x+1][y-1] == 'M') cnt++;
            if(inboard(board,x+1,y  ) && board[x+1][y  ] == 'M') cnt++;
            if(inboard(board,x+1,y+1) && board[x+1][y+1] == 'M') cnt++;
            //set board[x][y] cnt
            if (cnt>0)
            board[x][y] = cnt + '0';
            else{
                board[x][y] = 'B';
                reveal(board,x-1,y-1);
                reveal(board,x-1,y  );
                reveal(board,x-1,y+1);
                reveal(board,x  ,y-1);
                reveal(board,x  ,y+1);
                reveal(board,x+1,y-1);
                reveal(board,x+1,y  );
                reveal(board,x+1,y+1);
            }
        }
    }
    vector<vector<char>> updateBoard(vector<vector<char>>& board, 
vector<int>& click) {
        if(board[click[0]][click[1]] == 'M'){
            board[click[0]][click[1]] = 'X';
            return board;
        }
        reveal(board,click[0],click[1]);
        return board;
    }
};

// python
def updateBoard(self, A, click):
    click = tuple(click)
    R, C = len(A), len(A[0])

    def neighbors(r, c):
        for dr in xrange(-1, 2):
            for dc in xrange(-1, 2):
                if (dr or dc) and 0 <= r + dr < R and 0 <= c + dc < C:
                    yield r + dr, c + dc

    stack = [click]
    seen = {click}
    while stack:
        r, c = stack.pop()
        if A[r][c] == 'M':
            A[r][c] = 'X'
        else:
            mines_adj = sum( A[nr][nc] in 'MX' for nr, nc in neighbors(r, c) )
            if mines_adj:
                A[r][c] = str(mines_adj)
            else:
                A[r][c] = 'B'
                for nei in neighbors(r, c):
                    if A[nei[0]][nei[1]] in 'ME' and nei not in seen:
                        stack.append(nei)
                        seen.add(nei)
    return A
```