



Shri Vile Parle Kelavani Mandal's
INSTITUTE OF TECHNOLOGY
DHULE (M.S.)
DEPARTMENT OF COMPUTER ENGINEERING

Subject: Competitive Programming Lab (BTCOL606)

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Date :

Title : Problem 2: Minesweeper

Remark

Signature

Code:

```
// MOHAMMAD ANAS Student_31
```

```
// Lab_1 3/3/25;
```

```
#include <iostream>
```

```
#include <vector>
```

```
using namespace std;
```

```
int dx[] = {-1, -1, -1, 0, 0, 1, 1, 1};
```

```
int dy[] = {-1, 0, 1, -1, 1, -1, 0, 1};
```

```
int countMines(const vector<vector<char>>& field, int n, int m, int x, int y) {
```

```
    int count = 0;
```

```
    for (int i = 0; i < 8; i++) {
```

```
        int nx = x + dx[i], ny = y + dy[i];
```

```
        if (nx >= 0 && nx < n && ny >= 0 && ny < m && field[nx][ny] == '*') {
```

```
            count++;
```

```
        }
```

```
    }
```

```
    return count;
```

```

}

int main() {
    int n, m, fieldNum = 0;
    bool firstField = true;
    while (true) {
        cin >> n >> m;
        if (n == 0 && m == 0) break;
        vector<vector<char>> field(n, vector<char>(m));
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < m; j++) {
                cin >> field[i][j];
            }
        }
        vector<vector<char>> result(n, vector<char>(m, '0'));
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < m; j++) {
                if (field[i][j] == '*') {
                    result[i][j] = '*';
                } else {
                    result[i][j] = '0' + countMines(field, n, m, i, j);
                }
            }
        }
        if (!firstField) cout << endl;
        firstField = false;
        cout << "Field #" << ++fieldNum << ":" << endl;
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < m; j++) {

```

```

        cout << result[i][j];
    }
    cout << endl;
}
}
return 0;
}Output:

```

The screenshot shows a C++ IDE with a file named 'Untitled1.cpp'. The code defines a function 'countMines' that takes a 2D vector of characters representing a field, its dimensions, and starting coordinates. It uses two direction vectors, 'dx' and 'dy', to check adjacent cells for mines ('*'). The main function initializes a field and calls 'countMines'.

```

1 // MOHAMMAD ANAS Student 31
2 // Lab 1 3/3/25;
3
4 #include <iostream>
5 #include <vector>
6
7 using namespace std;
8
9
10 int dx[] = {-1, -1, -1, 0, 0, 1, 1, 1};
11 int dy[] = {-1, 0, 1, -1, 1, -1, 0, 1};
12
13
14 int countMines(const vector<vector<char>>& field, int n, int m, int x, int y) {
15     int count = 0;
16     for (int i = 0; i < 8; i++) {
17         int nx = x + dx[i], ny = y + dy[i];
18         if (nx >= 0 && nx < n && ny >= 0 && ny < m && field[nx][ny] == '*') {
19             count++;
20         }
21     }
22     return count;
23 }
24
25 int main() {

```

The output window shows the execution results for two fields. Field #1 is a 10x10 grid with mines at (1,1), (1,3), (3,5), and (5,5). Field #2 is a 10x10 grid with mines at (1,1), (3,2), (1,1), and (0,0). The process returned 0 (0x0) and the execution time was 3.038 s.

```

C:\Users\anasm\Document
4 4
*...
....
*..
....
Field #1:
*100
2210
1*10
1110
3 5
**...
....
*...
Field #2:
**100
33211
1*11*
0 0
Process returned 0 (0x0)   execution time : 3.038 s
Press any key to continue.

```