

C++ Programming

STL Vector 2

Mostafa S. Ibrahim

Teaching, Training and Coaching since more than a decade!

Artificial Intelligence & Computer Vision Researcher

PhD from Simon Fraser University - Canada

Bachelor / Msc from Cairo University - Egypt

Ex-(Software Engineer / ICPC World Finalist)



2D vector

```
5 void test1() {
6     vector<string> matrix {"mostafa", "ali", "me"};
7
8     // string is 1D array of chars
9
10    // what about vector<string> ?
11    // matrix of 3 rows, each one has dynamic columns
12    // mostafa
13    // ali
14    // me
15
16    cout<<matrix.size()<<"\n";    // 3 rows
17
18    int rows = matrix.size();
19    for (int i = 0; i < rows; ++i) {
20        // Dynamic Column sizes: 7 3 2
21        cout<<matrix[i].size()<<" ";
22    }
23 }
```

2D vector

```
25 void print(vector< vector<int> > &v2d) {  
26     for (auto &row : v2d)          // auto = vector<int<  
27     {  
28         for (auto &col : row)      // auto = int  
29             cout<<col<<" ";  
30         cout<<"\n";  
31     }  
32     cout<<"\n\n";  
33 }  
34  
35 void test2() {  
36     // 2D Array using vector  
37     // (5, 7) 2d array  
38     vector<int> row(5, 1); // 5 numbers, each is 1  
39  
40     // 3 rows: each is 5 values of 1  
41     vector< vector<int> > v2d(3, row);  
42  
43     print(v2d);  
44  
45     int rows = v2d.size(), cols = v2d[0].size(); // 3 5  
46  
47     v2d[0][0] = 9;  
48     v2d[1].push_back(5);  
49     v2d[1].push_back(6);  
50     v2d[2].erase(v2d[2].begin());  
51  
52     print(v2d);  
53 }
```

Console

<terminated> ztem

```
1 1 1 1 1  
1 1 1 1 1  
1 1 1 1 1
```

```
9 1 1 1 1  
1 1 1 1 1 5 6  
1 1 1 1
```

3D vector

```
54  
55 void test3() {  
56     // 3D Array using vector  
57     // (5, 7) 2d array with initial value 3  
58     vector<vector<vector<int>>> v3d(5, vector<vector<int>>(6, vector<int>(7)));  
59  
60     // 5 x 6 x 7  
61     cout << v3d.size() << " " << v3d[0].size() << " " << v3d[0][0].size() << "\n";  
62  
63     for (int i = 0; i < v3d.size(); ++i) {  
64         print(v3d[i]); // print 2D vec  
65     }  
66 }
```

“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”