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## How do I create a 2D vector array using std:vector<>?

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## 11 Answers



Sravya Vissamsetty, Being really gud at C++ is lyk being really gud at using rocks to sharpen sticks

Written Jul 19, 2016

You can create a 2D array by doing `int a[5][7]`, but `vector<int> a(5,7)` won't create a 2D vector - it will create a 5-element vector full of 7s. Instead, you need to create a vector of vectors.

Here are some ways to do it.

```
1 #include <iostream>
2 #include <vector>
3 using namespace std;
4 int main()
5 {
6     // An empty vector of vectors. The space
7     // between the 2 '>' signs is necessary
8     vector<vector<int> > v2d;
9     // If you intend creating many vectors
10    // of vectors, the following's tidier typedef
```

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```
14 // First, create a vector with 5 elements vector<int> v2(5, 99);
15 // Now create a vector of 3 elements.
16 // Each element is a copy of v2
17 vector<vector<int> > v2d2(3,v2);
18 // Print out the elements
19 for(int i=0;i<v2d2.size(); i++)
20 { for (int j=0;j<v2d2[i].size(); j++)
21 cout << v2d2[i][j] << " ";
22 cout << endl;
23 }
24 }
```

For more knowledge on vectors, visit [C++ vector memory and 2D vectors](#)

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[How I use vectors for a 2D array in C++?](#)

[What is std::vector in C++ and when is it useful?](#)



Paul Olaru, Learning C programming at UPB Romania

Written Nov 11, 2014

You want a vector of vectors of some type T? Try creating the larger vector to be a `std::vector<std::vector<T>>` where T might be any non-void type, be it value or reference.

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```
1 std::vector<std::vector<int> > matrix(row, std::vector<int>(col));
```

2D vector of row x col size, all filled with 0

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Tirupathi Rao Baggu, 2+ years experience in C/C++ in Linux env

Written May 20, 2016

```
#include<iostream>
```

```
#include<vector>
```

```
#include<iomanip>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
vector<vector<int>> items;
```

```
int k=0;
```

```
for (int i =0;i<5;i++)
```

```
{
```

```
items.push_back(vector<int>());
```

```
for (int j=0;j<5;j++)
```

```
items[i].push_back(k++);
```

```
}
```

```
}
```

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Kaustubh Yadav, Computer Science Undergraduate

Written Dec 13, 2015

To create a 2-d vector do this:

```
std::vector<vector<int>> matrix;
```

The above snippet will just declare a 2-d vector;

Now to initialise it and declare a capacity,

```
matrix = <vector<vector<int>>(CAPACITY, std::<vector<int>>
(NUMBER_TO_INITIALISE_THE_VECTOR_WITH));
```

Now, if you want to do this in a single line:

```
std::vector<vector<int>>matrix(CAPACITY, std::<vector><int>
(NUMBER_TO_INITIALISE_THE_VECTOR_WITH));
```

This is the easiest way i know!

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Manish Bisht, My Corner of Internet : <https://manishbisht.me>

Written Mar 3, 2016

You can create a 2D array by doing `int a[5][7]`, but `vector<int> a(5,7)` won't create a 2D vector - it will create a 5-element vector full of 7s. Instead, you need to create a vector of vectors.

Here is one way to implement it.

```
1 #include <iostream>
2 #include <vector>
3 using namespace std;
4
5
6 int main()
7 {
```

## Related Questions

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```
11
12
13 // If you intend creating many vectors
14
15 // of vectors, the following's tidier
16
17 typedef vector<vector<int> > IntMatrix;
18
19 IntMatrix m;
20
21
22
23 // Now we'll try to create a 3 by 5 "matrix".
24
25 // First, create a vector with 5 elements
26
27 vector<int> v2(5, 99);
28
29
30
31 // Now create a vector of 3 elements.
32
33 // Each element is a copy of v2
34
35 vector<vector<int> > v2d2(3,v2);
36
37
38
39 // Print out the elements
40
41 for(int i=0;i<v2d2.size(); i++) {
42
43     for (int j=0;j<v2d2[i].size(); j++)
44
45         cout << v2d2[i][j] << " ";
```

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```
49     }
50
51 }
52
```

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Dinesh Khandelwal, loves C++

Updated Aug 30, 2016

$M * N$  matrix (assuming *int* type elements) initialized with all values as  $K$

```
1 std::vector<std::vector<int>> matrix(M, std::vector<int>(N, K));
```

Otherwise,

```
1 std::vector<int> va(5, 1);    // vector a {1, 1, 1, 1, 1}
2 std::vector<int> vb(5, 2);    // vector b {2, 2, 2, 2, 2}
3 std::vector<int> vc(5, 3);    // vector c {3, 3, 3, 3, 3}
4
5 std::vector<std::vector<int>> vv {va, vb, vc};    // vector of vectors
```

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Ajit Kumar, love to learn new algorithms

Written Feb 2, 2016

```
vector<vector<int>> myvec(rowsize,vector<int>(colsize));
```

if you want to initializ it then use :

```
vector<vector<int>> myvec(rowsize,vector<int>(colsize,0));
```

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Saurabh Singh, supporting applications now but still love to code ;)

Written Aug 26, 2016

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```
1 //include iomanip
2
3 #include<vector>
4
5 #include<iomanip>
6
7 using namespace std;
8
9 int main()
10
11 {
12
13 // declaring vector of vectors here
14
15 vector<vector<int> > items;
16
17 int k;
18
19 // i value stands for no of rows here(manipulate i as you like)
20
21 for (int i =0;i<3;i++)
22
23 {
24
25 //adding rows of vectors here
26
27 items.push_back(vector<int>());
28
29 //inputting each value into a particular of column size 4
30
31 for (int j=0;j<4;j++){
32     cin >> k;
33
34 items[i].push_back(k);}
35
36 }
```

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```
40     for(int j=0;j<4;j++){
41         cout<< items[i][j]<<"\t\t";
42
43     }cout<<endl;
44 }
45 return 0;
46
47 }
```

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Giorgi Janjgava, works at Web Development

Written Aug 27, 2016

```
#include <iostream>
```

```
#include <vector>
```

```
using namespace std ;
```

```
int main()
```

```
{
```

```
// m row n column ;
```

```
int m , n ;
```

```
cin >> m >> n ;
```

```
/*
```

```
typedef vector<int> vi ;
```

```
vector<vi> v(m , vi(n)) ;
```

```
*/
```

```
vector<vector<int>> v(m , vector<int>(n)) ;
```



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Prathamesh Aware, CS/IT engineer

Written Jul 24, 2016

Here's an example code:

```
1 #include <bits/stdc++.h>
2 using namespace std;
3 int main() {
4     int rows = 2;
5     int cols = 2;
6     int val = 1;
7     vector< vector<int> > v(rows, vector<int> (cols, val));
8     /*creates 2d vector "v[rows][cols]"
9     and initializes all elements to "val == 1" (default value is 0)*/
10    v[0][0] = 5;
11    v[1][1] = 4;
12    cout << v[0][0] << endl; //Output: 5
13    cout << v[1][0] << endl; //Output: 1
14    return 0;
15 }
```

Hope this helps you out!

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## Who was the most ignorant American you have ever met?



Alison Bennett, Everything I learned in life, I learned the hard way  
Written Jan 5

I worked with an English guy at a job I once had. He got tired of people asking him where he was from, a town called Guildford nobody in America had heard of, and just started saying England instead. A girl once asked him if London was near England. She was definitely not the brightest bulb, but she knew how to

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## Should I try to raise my child without a gender?



Murphy Barrett  
Updated Jan 26

That would be utterly ridiculous. An overwhelmingly small number of people in the world (0.3%) have gender disphoria. If your kid has a penis, he's a boy, and if she has a vagina she's a girl. It's not "assignment", its observation. Now, what you CAN do is not insist the kid follow gender stereotypes. If your son likes trucks and toy soldiers. fine. If he'd rather

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## What is the most hurtful thing someone has said to you?



Tiffany Chère, health & wellness guru; creator of @Positively.Optimistic  
Written Mar 9

When I was about 14 years of age (almost a freshman in high school), I started researching *where* I wanted to go to college. My whole life I had always been an A+ student, very active in extracurriculars, and admired by my teachers for my inquisitive mind & love of learning. My family & I were driving

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