2d   Vector Graphics   Algorithms in C++   Linear Algebra   C++ (programming language)

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

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.

```cpp
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
11 vector<vector<int> > IntMatrix;
12 IntMatrix m;
13 // Now we'll try to create a 3 by 5 "matrix".
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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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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Endilie Yacop Sucipto, I am a software and hardware enthusiast
Written Feb 6

```
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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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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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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$M * N$ 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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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.

```cpp
1  #include <iostream>
2  #include <vector>
3  using namespace std;
4
5
6  int main()
7  {
8      // An empty vector of vectors. The space
9      // between the 2 '>' signs is necessary
10     vector<vector<int> > v2d;
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] << " ";
46
47         cout << endl;
48
49     }
50
51  }
52
```

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Saurabh Singh, supporting applications now but still love to code ;)
Written Aug 26, 2016

Please find the attached code for M*N matrix where you can ask for users input :)

```cpp
 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  }
37
38  //printing out the elements
39  for(int i=0;i<3;i++){
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)) ;

}

3.2k Views

Prathamesh Aware, CS/IT engineer
Written Jul 24, 2016

```
 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!

2.3k Views

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