**Link=**[**https://www.youtube.com/watch?v=W1McvE4a910&list=PLoa\_roVVsxA1CJu4DsOljb9d7FJkMCynM**](https://www.youtube.com/watch?v=W1McvE4a910&list=PLoa_roVVsxA1CJu4DsOljb9d7FJkMCynM)

**[L1]Class - 1 (Almost Everything about STL Vector) [Bangla]**

**Class video link:**

[**https://youtu.be/W1McvE4a910**](https://youtu.be/W1McvE4a910)

**Discussed topics:**

1. **Almost everything about vector**

**Codes:**

**Link:**[**https://pastebin.com/Uh9CjY5Y**](https://pastebin.com/Uh9CjY5Y)

**I**

**#include <bits/stdc++.h>  
using namespace std;  
int main()  
{  
 int array[4];*//array* vector<int>v;*//vector* v.push\_back(2);  
 v.push\_back(3);  
 v.push\_back(5);  
 v.push\_back(6);  
  
 cout<<v[3]<<endl;*//6* cout<<v[2]<<endl;*//5* v[2]=10;  
  
 cout<<v[2]<<endl;*//10* cout<<"Vector size:"<<endl;  
 cout<<v.size()<<endl;*//4* cout<<"Vector all elment print:";  
 for(int i=0;i<v.size();i++){  
 cout<<v[i]<<" ";  
 }*// 2 3 10 6* cout<<endl;  
}**

**#include <bits/stdc++.h>  
using namespace std;  
int main()  
{  
 int n;  
 vector<int>v;  
  
 cout<<"Enter your size:";  
 cin>>n;*//5* cout<<"Enter your element:";  
 for(int i=0;i<n;i++){  
 int a;*//1 2 3 4 5* cin>>a;  
 v.push\_back(a);  
 }  
  
 cout<<"Vector size:"<<v.size()<<endl;*//5* cout<<"Print the all element:";  
 for(int i=0;i<v.size();i++){  
 cout<<v[i]<<" ";  
 }  
 *//1 2 3 4 5*}**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**int n;**

**vector<int>v={2,3,4,5,6};**

**v.clear();**

**cout<<v.size()<<endl;**

**cout<<v.empty()<<endl;//0=false/1=true**

**v={1,2,3};**

**cout<<v.empty()<<endl;**

**return 0;**

**}**

**Output:**

**0**

**1**

**0**

**#include <bits/stdc++.h>  
using namespace std;  
int main()  
{  
 int n;  
 vector<int>v={2,3,4,5,6};  
 v.resize(10);  
  
 cout<<"Vector size:"<<v.size()<<endl;*//10* for(int i=0;i<v.size();i++) cout<<v[i]<<" ";  
   
 return 0;  
}**

**Output:**

**Vector size:10**

**2 3 4 5 6 0 0 0 0 0**

**#include <bits/stdc++.h>  
using namespace std;  
int main()  
{  
 vector<int>v(10);*//same  
 //v.resize(10);* int n;  
 cin>>n;  
   
 for(int i=0;i<n;i++) cin>>v[i];  
  
 cout<<v.size()<<endl;  
 for(int i=0;i<n;i++){  
 cout<<v[i]<<' ';  
 }  
 cout<<endl;  
  
 return 0;  
}**

**Output:**

**3**

**1 2 3**

**10**

**1 2 3**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v(10);**

**cout<<v.size()<<endl;**

**for(int i=0;i<v.size();i++){**

**cout<<v[i]<<' ';**

**}**

**cout<<endl;**

**v[4]=12;**

**cout<<v[4]<<endl;**

**return 0;**

**}**

**Output:**

**10**

**0 0 0 0 0 0 0 0 0 0**

**12**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v(10,5);**

**cout<<v.size()<<endl;**

**for(int i=0;i<v.size();i++){**

**cout<<v[i]<<' ';**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**10**

**5 5 5 5 5 5 5 5 5 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={1,2,3,4,5};**

**vector<int>temp;**

**temp=v;**

**cout<<temp.size()<<endl;**

**for(int i=0;i<temp.size();i++){**

**cout<<temp[i]<<" ";**

**}**

**cout<<endl;**

**cout<<v.size()<<endl;**

**for(int i=0;i<v.size();i++){**

**cout<<v[i]<<' ';**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**5**

**1 2 3 4 5**

**5**

**1 2 3 4 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**//vector iterator**

**vector<int> v={1,2,3,4,5};**

**vector<int> ::iterator it;**

**for(it=v.begin();it!=v.end();it++){**

**cout<<\*it<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3 4 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={1,2,3,4,5};**

**//for each loop**

**for(int u:v){**

**cout<<u<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3 4 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={1,2,3,4,5};**

**//for each loop**

**for(int u:v){**

**cout<<u+2<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**3 4 5 6 7**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={1,2,3,4,5};**

**//for each loop**

**for(auto u:v){**

**cout<<u<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3 4 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v;**

**int n;**

**while (1){**

**cin>>n;**

**if(n==0){**

**break;**

**}**

**v.push\_back(n);**

**}**

**/\***

**while (cin>>n)**

**{**

**if(n==0){**

**break;**

**}**

**v.push\_back(n);**

**}**

**\*/**

**cout<<v.size()<<endl;**

**for(auto x:v){**

**cout<<x<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1**

**2**

**3**

**4**

**5**

**0**

**5**

**1 2 3 4 5**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v={2,1,4,3,8,5,6,4,3};**

**sort(v.begin(),v.end());**

**for(auto u:v) cout<<u<<" ";**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3 3 4 4 5 6 8**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v={2,1,4,3,8,5,6,4,3};**

**sort(v.begin(),v.begin()+7);//if my 0 index to 6 index sort**

**for(auto u:v) cout<<u<<" ";**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3 4 5 6 8 4 3**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v={2,1,4,3,8,5,6,4,3};**

**sort(v.begin()+2,v.begin()+7);//if my 2 index to 6 index sort**

**for(auto u:v) cout<<u<<" ";**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**2 1 3 4 5 6 8 4 3**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v={2,1,4,3,8,5,6,4,3};**

**//if sort is decreasing order then**

**//sort(v.begin(),v.end(),greater<int >());**

**sort(v.rbegin(),v.rend());**

**for(auto u:v) cout<<u<<" ";**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**8 6 5 4 4 3 3 2 1**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int>v={2,1,4,3,8,5,6,4,3};**

**reverse(v.begin(),v.end());**

**//reverse(v.begin()+2,v.begin()+7);**

**for(auto u:v) cout<<u<<" ";**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**3 4 6 5 8 3 4 1 2**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**int a[]={1,2,3,4,8,5,4};**

**sort(a,a+7,greater<int>());**

**for(int i=0;i<7;i++){**

**cout<<a[i]<<" ";**

**}**

**return 0;**

**}**

**Output:**

**8 5 4 4 3 2 1**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={1,2,3,4,5,6,7,8};**

**cout<<"Last element print:";**

**cout<<v.back()<<endl;//O(1) last element**

**v.pop\_back();//O(1)**

**cout<<"last element pop than last element print: ";**

**cout<<v.back()<<endl;**

**cout<<"First element print:";**

**cout<<\*v.begin()<<endl;//O(1)**

**cout<<"First element delete:";**

**cout<<\*v.erase(v.begin())<<endl;**

**v.erase(v.begin());**

**cout<<"After element:";**

**for(auto u:v)cout<<u<<' ';**

**cout<<endl;**

**return 0;**

**}**

**Output:**

**Last element print:8**

**last element pop than last element print: 7**

**First element print:1**

**First element delete:2**

**After element:3 4 5 6 7**

***#include <bits/stdc++.h>***

**using namespace std;**

**int main()**

**{**

**vector<int> v={2,3,4,5};**

**//O(n\*\*2)**

**while (!v.empty()){**

**cout<<\*v.begin()<<endl;**

**v.erase(v.begin());**

**}**

**cout<<endl;**

**vector<int> v1={2,3,4,5};**

**//O(n)**

**reverse(v1.begin(),v1.end());**

**while (!v1.empty()){**

**cout<<v1.back()<<endl;**

**v1.pop\_back();**

**}**

**return 0;**

**}**

**Output:**

**2**

**3**

**4**

**5**

**2**

**3**

**4**

**5**

**/// In the name of ALLAH**

***#include<bits/stdc++.h>***

**using namespace std;**

**int main ()**

**{**

**vector<int> v;**

**v.push\_back( 1 );**

**v.push\_back( 2 );**

**v.push\_back( 3 );**

**cout << v[0] << " " << v[1] << " " << v[2] << endl; /// 1 2 3**

**v[1] = 3;**

**cout << v[0] << " " << v[1] << " " << v[2] << endl; /// 1 3 3**

**cout << v.size() << endl; /// 3**

**for ( int i = 0; i < v.size(); i++ ) cout << v[i] << " "; /// 1 3 3**

**cout << endl;**

**vector <int> v1 = { 2, 3, 4 };**

**cout << v1.size() << endl; /// 3**

**for ( int i = 0; i < v1.size(); i++ ) cout << v1[i] << " "; /// 2 3 4**

**cout << endl;**

**v.clear();**

**cout << v.size() << endl; /// 0**

**cout << v.empty() << endl; /// 1**

**cout << v1.empty() << endl; /// 0**

**v1.resize(5);**

**cout << v1.size() << endl; /// 5**

**for ( int i = 0; i < v1.size(); i++ ) cout << v1[i] << " "; /// 2 3 4 0 0**

**cout << endl;**

**vector<int> a(5);**

**cout << a.size() << endl; /// 5**

**for ( int i = 0; i < a.size(); i++ ) cout << a[i] << " "; /// 0 0 0 0 0**

**cout << endl;**

**a = v1;**

**for ( auto u : a ) cout << u << " "; /// 2 3 4 0 0**

**cout << endl;**

**vector<int>::iterator it;**

**for ( it = a.begin(); it != a.end(); it++ ) cout << \*it << " "; /// 2 3 4 0 0**

**cout << endl;**

**a = { 3, 4, 5, 1, 2 };**

**sort ( a.begin(), a.end() ); ///O(n\*log2(n))**

**for ( auto u : a ) cout << u << " "; /// 1 2 3 4 5**

**cout << endl;**

**sort ( a.rbegin(), a.rend() );**

**for ( auto u : a ) cout << u << " "; /// 5 4 3 2 1**

**cout << endl;**

**a = { 3, 4, 5, 1, 2 };**

**sort ( a.begin(), a.end(), greater<int>() );**

**for ( auto u : a ) cout << u << " "; /// 5 4 3 2 1**

**cout << endl;**

**a = { 3, 4, 5, 1, 2 };**

**reverse( a.begin(), a.end() );**

**for ( auto u : a ) cout << u << " "; /// 2 1 5 4 3**

**cout << endl;**

**cout << a.back() << endl; /// 3**

**a.pop\_back(); /// O(1) complexity.**

**cout << a.back() << endl; /// 4**

**a = { 3, 4, 5, 1, 2 };**

**cout << \*a.begin() << endl; /// 3**

**a.erase( a.begin() ); /// O(n) complexity.**

**for ( auto u : a ) cout << u << " "; /// 4 5 1 2**

**cout << endl;**

**a.erase( a.begin()+2 );**

**for ( auto u : a ) cout << u << " "; /// 4 5 2**

**cout << endl;**

**a = { 1, 1, 2, 2, 2, 3, 3 };**

**unique( a.begin(), a.end() );**

**for ( auto u : a ) cout << u << " "; /// 1 2 3 2 2 3 3**

**cout << endl;**

**a = { 1, 1, 2, 2, 2, 3, 3 };**

**int n = unique( a.begin(), a.end() ) - a.begin();**

**cout << n << endl; /// 3**

**for ( int i = 0; i < n; i++ ) cout << a[i] << " "; /// 1 2 3**

**cout << endl;**

**a = { 2, 3, 1, 5 };**

**cout << max\_element( a.begin(), a.end() ) - a.begin() << endl; /// 3**

**cout << \*max\_element( a.begin(), a.end() ) << endl; /// 5**

**cout<<\*max\_element(a.begin(),a.end())<<endl;**

**cout<<\*min\_element(a.begin(),a.end())<<endl;**

**return 0;**

**}**

**Output:**

**1 2 3**

**1 3 3**

**3**

**1 3 3**

**3**

**2 3 4**

**0**

**1**

**0**

**5**

**2 3 4 0 0**

**5**

**0 0 0 0 0**

**2 3 4 0 0**

**2 3 4 0 0**

**1 2 3 4 5**

**5 4 3 2 1**

**5 4 3 2 1**

**2 1 5 4 3**

**3**

**4**

**3**

**4 5 1 2**

**4 5 2**

**1 2 3 2 2 3 3**

**3**

**1 2 3**

**3**

**5**

**5**

**1**

**2D array:**

**int row=4,col=5,value=5;  
vector<vector<int>>m;  
  
m.resize(row,vector<int>(row,value));  
  
for(int i=0;i<row;i++){  
 for(int j=0;j<m[i].size();j++) {  
 cout<<m[i][j]<<" ";  
 }  
 cout<<endl;  
}**

**Output:**

**5 5 5 5**

**5 5 5 5**

**5 5 5 5**

**5 5 5 5**

**Copy one vector to another vector:**

**vector<int>v,v1;  
v.push\_back(1);  
v.push\_back(2);  
v.push\_back(3);  
  
v1=v;  
  
for(auto u:v1){  
 cout<<u<<" ";  
}**

**Output:**

**1 2 3**

**Vector assign ():**

**vector<int>v;  
v.assign(3,4);  
for(auto u:v){  
 cout<<u<<" ";  
}**

**Output:**

**4 4 4**

**The syntax for assigning values from an array or list:**

**vector<int>v;  
int a[]={1,2,3};  
v.assign(a,a+3);  
for(auto u:v){  
 cout<<u<<" ";  
}**

**Output:**

**1 2 3**

**Syntax for assigning values with initialize list:**

**vector<int>v;  
v.assign({ 1, 2, 3 });  
for(auto u:v){  
 cout<<u<<" ";  
}**

**Output:**

**1 2 3**

**The syntax for modifying values from a vector:**

**vector<int> v;  
v.assign(7, 100);  
for(auto u:v){  
 cout<<u<<" ";  
}  
cout<<endl;  
v.assign(v.begin(), v.begin() + 3);  
for(auto u:v){  
 cout<<u<<" ";  
}**

**Output:**

**100 100 100 100 100 100 100**

**100 100 100**

**Insert function: vector\_name.insert(pos,value)**

**vector<int> v = { 10, 20, 30, 40 };  
v.insert(v.begin()+2,1000);*//vector\_name.insert(pos,value)*v.insert(v.begin(),2000);  
for(auto u:v){  
 cout<<u<<" ";  
}**

**Output:**

**2000 10 20 1000 30 40**

**Insert function : vector\_name.insert(position, size, val)**

**vector<int> v = { 10, 20, 30, 40 };  
v.insert(v.begin(),2,2000);*//vector\_name.insert(position, size, val)*for(auto u:v){  
 cout<<u<<" ";  
}**

**Insert function: *vector\_name.insert(position, iterator1, iterator2)***

**vector<int> v1 = { 10, 20, 30, 40 };  
vector<int> v2;  
  
v2.insert(v2.begin(),v1.begin(),v1.end());*//vector\_name.insert(position, iterator1, iterator2)  
//10 20 30 40*v2.insert(v2.begin(),v1.begin(),v1.begin()+2);*//10 20*for(auto u:v2){  
 cout<<u<<" ";  
}**