Create and Delete

Below, we examine the different methods available for constructing and destroying containers with particular parameters.

We can construct each container using a multitude of constructors. To delete all elements of a container `cont`, use `cont.clear()`. It makes no difference if you create and delete a container or if we add and remove elements. Each time the container takes care of memory management.

The table shows the constructors and destructors of a container. All these functions can be used with `std:vector`.

Type	Example
Default	`std::vector<int> vec1`
Range	`std::vector<int> vec2(vec1.begin(), vec1.end())`
Copy	`std::vector<int> vec3(vec2)`
Copy	`std::vector<int> vec3= vec2`
Move	`std::vector<int> vec4(std::move(vec3))`
Move	`std::vector<int> vec4= std::move(vec3)`
Sequence (Initializer list)	`std::vector<int> vec5 {1, 2, 3, 4, 5}`

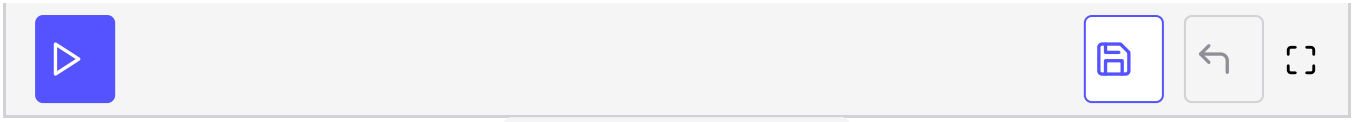
Sequence (Initializer list)	`std::vector<int> vec5= {1, 2, 3, 4, 5}`
Destructor	`vec5.~vector()`
Delete elements	`vec5.clear()`

Creation and deletion of a container

Because `std::array` is generated at compile-time, there are a few things that are special. `std::array` has no move constructor and can't be created with a range or with an initializer list. However, an `std::array` can be initialized with an aggregate initialization. Also, `std::array` has no method for removing its elements.

Now we can use the different constructors on the different containers.

```
// containerConstructor.cpp
#include <iostream>
#include <map>
#include <unordered_map>
#include <vector>
using namespace std;

int main(){
  vector<int> vec= {1, 2, 3, 4, 5, 6, 7, 8, 9};
  map<string, int> m= {{"bart", 12345}, {"jenne", 34929}, {"huber", 840284} };
  unordered_map<string, int> um{m.begin(), m.end()};

  for (auto v: vec) cout << v << " "; // 1 2 3 4 5 6 7 8 9
  cout << "\n";
  for (auto p: m) cout << p.first << "," << p.second << " "; //bart,12345 huber,840284 jenne,
  cout << "\n";
  for (auto p: um) cout << p.first << "," << p.second << " "; //bart,12345 jenne,34929 huber,
  cout << "\n";

  vector<int> vec2= vec;
  cout << vec.size() << endl; // 9
  cout << vec2.size() << endl; // 9

  vector<int> vec3= move(vec);
  cout << vec.size() << endl; // 0
  cout << vec3.size() << endl; // 9

  vec3.clear();
  cout << vec3.size() << endl; // 0
  return 0;
}
```



In the next lesson, we'll discuss how to determine the size and capacity of a container.