Introduction

This chapter brings us to the various computing algorithms supported by C++17.

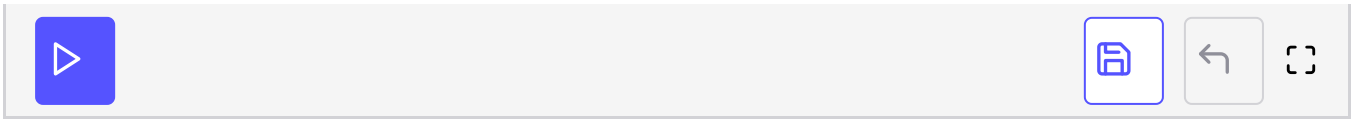
WE'LL COVER THE FOLLOWING

- Further information

The Standard Template Library has a large number of algorithms that work with containers and their elements. As the algorithms are function templates, they are independent of the type of elements in the container. The glue between the containers and algorithms is the iterators. If our custom container supports the interface of an STL container, we can apply the algorithms to our container.

```
// algorithm.cpp
#include <iostream>
#include <algorithm>
#include <deque>
#include <iostream>
#include <list>
#include <string>
#include <vector>

template <typename Cont, typename T>
void doTheSame(Cont cont, T t){
  for (const auto c: cont) std::cout << c << " ";
  std::cout << std::endl;
  std::cout << cont.size() << std::endl;
  std::reverse(cont.begin(), cont.end());
  for (const auto c: cont) std::cout << c << " ";
  std::cout << std::endl;
  std::reverse(cont.begin(), cont.end());
  for (const auto c: cont) std::cout << c << " ";
  std::cout << std::endl;
  auto It= std::find(cont.begin(), cont.end(), t);
  std::reverse(It, cont.end());
  for (const auto c: cont) std::cout << c << " ";
}

int main(){
  std::vector<int> myVec{1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
  std::deque<std::string> myDeq({"A", "B", "C", "D", "E", "F", "G", "H", "I"});
  std::list<char> myList({'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h'});
```

```
  doTheSame(myVec, 5);
  std::cout << "\n\n";
  // 1 2 3 4 5 6 7 8 9 10
  // 10
  // 10 9 8 7 6 5 4 3 2 1
  // 1 2 3 4 5 6 7 8 9 10
  // 1 2 3 4 10 9 8 7 6 5

  doTheSame(myDeq, "D");
  std::cout << "\n\n";
  // A B C D E F G H I
  // 9
  // I H G F E D C B A
  // A B C D E F G H I
  // A B C I H G F E D

  doTheSame(myList, 'd');
  std::cout << "\n\n";
  // a b c d e f g h
  // 8
  // h g f e d c b a
  // a b c d e f g h
  // a b c h g f e d

  return 0;
}
```



Generic programming with the algorithms

Further information

- algorithms
- iterators

In the next lesson, we'll discuss rules and conventions used to run algorithms.