Replace Elements and Ranges

Let's look at the functions we can use to update and replace values in ranges.

There are four variations of `std::replace`, `std::replace_if`, `std::replace_copy`, and `std::replace_copy_if` that can be used to replace elements in a range. The algorithms differ in two aspects: first, does the algorithm need a predicate? Second, does the algorithm copy the elements in the destination range?

`replace`: Replaces the old elements in the range with `newValue`, if the old element has the value `old`.

```
void replace(FwdIt first, FwdIt last, const T& old, const T& newValue)
void replace(ExePol pol, FwdIt first, FwdIt last, const T& old, const T& newValue)
```

`replace_if`: Replaces the old elements of the range with `newValue`, if the old element fulfills the predicate `pred`.

```
void replace_if(FwdIt first, FwdIt last, UnPred pred, const T& newValue)
void replace_if(ExePol pol, FwdIt first, FwdIt last, UnPred pred, const T& newValue)
```

`replace_copy`: Replaces the old elements in the range with `newValue` if the old element has the value `old`. Copies the result to `result`.

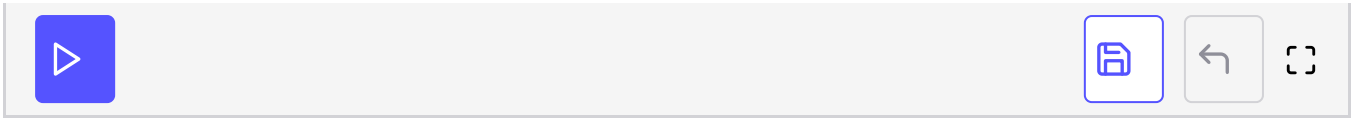
```
OutIt replace_copy(InpIt first, InpIt last, OutIt result, const T& old, const T& newValue)
FwdIt2 replace_copy(ExePol pol, FwdIt first, FwdIt last, FwdIt2 result, const T& old, const T
```

`replace_copy_if`: Replaces the old elements of the range with `newValue` if the old element fulfills the predicate `pred`. Copies the result to `result`.

```
OutIt replace_copy_if(InpIt first, InpIt last, OutIt result, UnPre pred, const T& newValue)
FwdIt2 replace_copy_if(ExePol pol, FwdIt first, FwdIt last, FwdIt2 result, UnPre pred, const
```

The algorithms in action:

```
#include <algorithm>
#include <cctype>
#include <iostream>
#include <string>

int main(){

  std::cout << std::endl;

  std::string str{"Only for testing purpose."};

  std::cout << str << std::endl;

  std::replace(str.begin(), str.end(), ' ', '1');
  std::cout << str << std::endl;

  std::replace_if(str.begin(), str.end(), [](char c){ return c == '1'; }, '2');
  std::cout << str << std::endl;

  std::string str2;
  std::replace_copy(str.begin(), str.end(), std::back_inserter(str2), '2', '3');
  std::cout << str2 << std::endl;

  std::string str3;
  std::replace_copy_if(str2.begin(), str2.end(), std::back_inserter(str3), [](char c){ return
  std::cout << str3 << std::endl;

  std::cout << std::endl;

}
```



Replace elements and ranges

In the next lesson, we'll discuss how we can delete elements completely.