

Transform Ranges

Now we will study `std::transform` which is used to perform transformations on a range.

The `std::transform` algorithm applies a unary or binary callable to a range and copies the modified elements to the destination range.

`std::transform` applies the unary callable `fun` to the elements of the input range and copies the result to `result`.

```
OutIt transform(InpIt first1, InpIt last1, OutIt result, UnFun fun)
FwdIt2 transform(ExePol pol, FwdIt first1, FwdIt last1, FwdIt2 result, UnFun fun)
```



In the following snippet `std::transform` applies the binary callable `fun` to both input ranges and copies the result to `result`.

```
OutIt transform(InpIt1 first1, InpIt1 last1, InpIt2 first2, OutIt result, BiFun fun)
FwdIt3 transform(ExePol pol, FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt3 result, BiFun fun)
```



The difference between the two versions is that the first version applies the callable to each element of the range; the second version applies the callable to pairs of both ranges in parallel. The returned iterator points to one position after the last transformed element in both cases.

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

int main(){

    std::cout << std::endl;

    std::string str{"abcdefghijklmnopqrstuvwxyz"};

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

    std::transform(str.begin(), str.end(), str.begin(), [](char c){ return std::toupper(c); });
```



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

std::cout << std::endl;

std::vector<std::string> vecStr1{"Only", "for", "testing", "purpose", "."};
std::vector<std::string> vecStr2(5, "-");

std::vector<std::string> vecRes;

std::transform(vecStr1.begin(), vecStr1.end(),
               vecStr2.begin(),
               std::back_inserter(vecRes),
               [](std::string a, std::string b){ return std::string(b) + a + b; });

for ( auto str: vecRes ) std::cout << str << std::endl;

std::cout << std::endl;

}
```



Transform algorithms

In the next lesson, we'll learn a function used for reversing ranges.