

# Search for Ranges within Ranges

Need to acquire a sub-range from your existing range? `std::search` solves the problem efficiently.

`std::search` searches for a range in another range from the beginning, `std::find_end` from the end. `std::search_n` searches for n consecutive elements in the range.

All algorithms take a forward iterator, can be parametrized by a binary predicate and return an end an iterator for the first range, if the search was not successful.

Searches the second range in the first one and returns the position. Starts at the beginning:

```
FwdIt1 search(FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2)
FwdIt1 search(ExePol pol, FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2)

FwdIt1 search(FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2, BiPre pre)
FwdIt1 search(ExePol pol, FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2, BiPre pre)

FwdIt1 search(FwdIt1 first, FwdIt last1, Search search)
```

Searches the second range in the first one and returns the positions. Starts at the end:

```
FwdIt1 find_end(FwdIt1 first1, FwdIt1 last1, FwdIt2 first2 FwdIt2 last2)
FwdIt1 find_end(ExePol pol, FwdIt1 first1, FwdIt1 last1, FwdIt2 first2 FwdIt2 last2)

FwdIt1 find_end(FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2, BiPre pre)
FwdIt1 find_end(ExePol pol, FwdIt1 first1, FwdIt1 last1, FwdIt2 first2, FwdIt2 last2, BiPre p
```

Searches `count` consecutive values in the first range:

```
FwdIt search_n(FwdIt first, FwdIt last, Size count, const T& value)
FwdIt search_n(ExePol pol, FwdIt first, FwdIt last, Size count, const T& value)

FwdIt search_n(FwdIt first, FwdIt last, Size count, const T& value, BiPre pre)
FwdIt search_n(ExePol pol, FwdIt first, FwdIt last, Size count, const T& value, BiPre pre)
```

### ⚠ The algorithm `search_n` is very special

The algorithm `FwdIt search_n(FwdIt first, FwdIt last, Size count, const T& value, BiPre pre)` is very special. The binary predicate `BiPre` uses as first argument the values of the range and as second argument the value `value`.

```
#include <algorithm>
#include <array>
#include <cmath>
#include <iostream>

int main(){

    std::cout << std::endl;

    std::array<int, 10> arr1{0, 1, 2, 3, 4, 5, 6, 7, 8, 9};
    std::array<int, 5> arr2{3, 4, -5, 6, 7};

    auto fwdIt= std::search(arr1.begin(), arr1.end(), arr2.begin(), arr2.end());

    if (fwdIt == arr1.end()) std::cout << "arr2 not in arr1." << std::endl;
    else{
        std::cout << "arr2 at position " << std::distance(arr1.begin(), fwdIt) << " in arr1." <
    }

    auto fwdIt2= std::search(arr1.begin(), arr1.end(), arr2.begin(), arr2.end(), [](int a, int

    if (fwdIt2 == arr1.end()) std::cout << "arr2 not in arr1." << std::endl;
    else{
        std::cout << "arr2 at position " << std::distance(arr1.begin(), fwdIt2) << " in arr1." <
    }

    std::cout << std::endl;

}
```



``std::find, std::find_end`, and `std::search_n``