

4/11/2014

# STL: Erase-remove idiom

BugSquashing Seminars

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50 Years – Research for  
A Life Without Cancer

- **Container / Collection**
- remove all elements that have a certain value or fulfill a certain criterion
- `std::algorithm` provides two methods
  - `remove`
  - `remove_if`
- their names are confusing

## Definition

Method provides “remove” functionality for STL Containers

```
#include <algorithm>  
std::remove (begin, end, value);
```

- Cplusplus.com:  
**Remove value from range**
- Transforms the range [first,last) into a range with all the elements that compare equal to value removed
- returns an iterator to the new end of that range.

Remove?

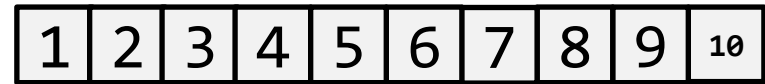
## Definition

```
template <class ForwardIterator, class T>
    ForwardIterator remove (ForwardIterator first,
    ForwardIterator last, const T& val)
{
    ForwardIterator result = first;
    while (first!=last) {
        if (!(*first == val)) {
            *result = *first;
            ++result;
        }
        ++first;
    }
    return result;
}
```

## Example

std::remove doesn't "really" remove elements from a container

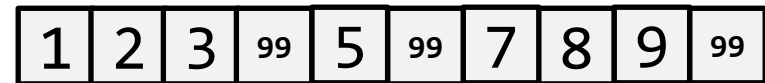
```
std::vector<int> v;  
for(int i=1; i<=10; ++i) {  
    v.push_back(i);  
}
```



10

```
std::cout << v.size();
```

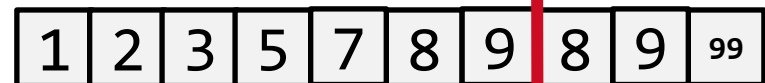
```
v[3] = v[5] = v[9] = 99;
```



10

```
std::remove(v.begin(), v.end(), 99);
```

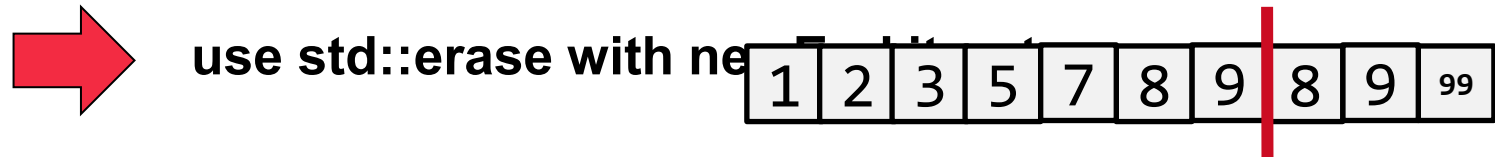
```
std::cout << v.size();
```



# Example



```
vector<int>::iterator newEnd =  
remove(v.begin(),v.end(),99)
```



## Eliminate remaining elements

```
vector<int>::iterator newEnd =  
remove(v.begin(), v.end(), 99);
```

```
v.erase(newEnd, v.end());
```

std::remove cannot eliminate elements

→ it's necessary to invoke a member function

## Additional information

- `std::list` provides own remove method  
→ Inconsistency in STL, but faster approach for lists
- `std::unique` works in the same way as remove

### References:

- <http://www.cplusplus.com/reference/algorithm/remove/>
- [http://en.wikipedia.org/wiki/Erase-remove\\_idiom](http://en.wikipedia.org/wiki/Erase-remove_idiom)
- Meyers, Scott (2001). Effective STL: 50 Specific Ways to Improve Your Use of the Standard Template Library. Addison-Wesley.