

Reordering Algorithms

Solutions

- What does `reverse()` do?
 - It reverses the order of the elements in an iterator range
- What arguments does `reverse()` take?
 - The iterator range of the elements to be reversed
- Write a simple program that uses `reverse()`
- Write the equivalent code without using `reverse()`

- What does `remove()` do?
 - `remove()` moves all the elements with a given value to the back
- What arguments does `remove()` take?
 - The iterator range and the value to be removed
- What value does `remove()` return?
 - An iterator to the first removed element

- What happens to the removed elements?
 - They are still present in the container, but accessing them gives undefined behaviour
- What happens when `size()` is called after removing elements from a container?
 - It returns the same value as before
- Write a simple program that uses `remove()`. Display the return value from `size()` before and after
 - The return value of `size()` is unchanged

- Use a range for loop to display the vector after calling `remove()`. Explain your results
 - The output on my system was 3, 4, 5, 9, 5, 9,
 - The elements have been “logically removed” from the container, but are still physically present, with indeterminate values
 - `size()` and `end()` return the same values as before
- Alter your program so it displays the expected results
 - Use a for loop with the return value from `remove()` in the conditional instead of `end()`

- What does `erase()` do?
 - `erase()` deletes all the elements from an iterator range
- What arguments does `erase()` take?
 - The iterator range for the elements to be deleted

- Alter your program from the previous exercise to call `erase()` after it calls `remove()`
- Display the return value from `size()` after calling `erase()`
 - `size()` now returns the expected value, 4
- Use a range for loop to display the elements after calling `erase()`. Explain your results
 - The range for loop now displays 3, 4, 5, 9,
 - The `erase` call deleted the elements and updated the vector's internal data. `size()` and `end()` now match the vector's contents

- What does `remove_if()` do?
 - `remove_if()` is similar to `remove()`, but elements are only moved for which a predicate is true
- What arguments does `remove_if()` take?
 - Iterator range and the predicate function
- Write a simple program that uses `remove_if()`

- What does `remove_copy()` do?
 - `remove_copy` copies all elements in an iterator range which do not have a given value
- What arguments does `remove_copy()` take?
 - The iterator range, an iterator range into the destination and the given value

- Write a simple program that uses `remove_copy()`
- Write the equivalent code using a different algorithm function
- Write the equivalent code without using any algorithm functions

- What does `remove_copy_if()` do?
 - `remove_copy_if` copies all elements in an iterator range for which a predicate is false
- What arguments does `remove_copy_if()` take?
 - The iterator range, an iterator range into the destination and the predicate function
- Write a simple program that uses `remove_copy_if()`
- Write the equivalent code using a different algorithm
- Write the equivalent code without using any algorithms

- What does `unique()` do?
 - `unique()` removes duplicate elements by moving them to the back
- What arguments does `unique()` take?
 - An iterator range. The elements in the range must be sorted for it to work correctly
- What value does `unique()` return?
 - An iterator to the first removed element

- What happens to the duplicate elements?
 - They are still present in the container, but accessing them gives undefined behaviour
- What happens when `size()` is called after calling `unique()`?
 - It returns the same value as before

- Write a simple program that uses `unique()`. Display the return value from `size()` before and after
- Use a range for loop to display the vector after calling `unique()`. Explain your results
 - As with `remove()`, elements are only “logically removed” and are still present in the container, with indeterminate values
- Alter your program so it displays the expected results