



Department Of Electrical Engineering and Computer Sciences

Instructor: Mehreen Tahir

Date: December 10, 2023

Lab Engineer: Mehwish Kiran

Time: 10:00am – 12:50pm

CS 212: Object Oriented Programming

Lab 12: STL

Information	Description
Name:	Irfa Farooq
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Class:	BEE-14
Section:	D
Tenure:	Fall 2023



Task 1: Create a template function remove_duplicates() that takes a list and remove consecutive duplicates from the list.

Code:

```
#include <iostream>
#include <list>

template <class T>
T remove_duplicates(T& L) {
    for (auto i = L.begin(); i != L.end(); i++) {
        for (auto j = std::next(i); j != L.end(); ) {
            if (*i == *j) {
                j = L.erase(j);
            } else {
                j++;
            }
        }
    }
    return L;
}
int main() {
    std::list<int> List = { 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6 };
    std::cout << "Default list is: " << std::endl;
    for (auto i : List) {
        std::cout << i << " ";
    }
    std::cout << std::endl;
    std::cout << "List without duplicates is: " << std::endl;
    for (auto i : remove_duplicates(List)) {
        std::cout << i << " ";
    }
    std::cout << std::endl;
}
```

Output Screenshots

The screenshot shows the Microsoft Visual Studio Debug Console window. It displays two lines of text: "Default list is:" followed by the sequence "1 1 2 2 2 3 3 4 5 5 6", and "List without duplicates is:" followed by the sequence "1 2 3 4 5 6".

```
Microsoft Visual Studio Debug Console
Default list is:
1 1 2 2 2 3 3 4 5 5 6
List without duplicates is:
1 2 3 4 5 6
```



Task 2: Create a template function `remove_multiples()` that takes a list and a number (int) as an argument and removes all the multiples of the number from list.

Code:

```
#include <iostream>
#include <list>

template <class T>
T remove_multiples(T& L, int n) {
    for (auto i = L.begin(); i != L.end(); ) {
        if (*i % n == 0) {
            i = L.erase(i);
        } else {
            i++;
        }
    }
    return L;
}
int main() {
    std::list<int> List = { 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6 };
    std::cout << "Default list is: " << std::endl;
    for (auto i : List) {
        std::cout << i << " ";
    }
    std::cout << std::endl;
    std::cout << "List without multiples of 2 is: " << std::endl;
    for (auto i : remove_multiples(List, 2)) {
        std::cout << i << " ";
    }
    std::cout << std::endl;
}
```

Output Screenshots

The screenshot shows the Microsoft Visual Studio Debug Console window. It displays two lines of text: "Default list is:" followed by the integers 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6 on a single line, and "List without multiples of 2 is:" followed by the integers 1, 1, 3, 3, 5, 5 on a single line.

```
Microsoft Visual Studio Debug Console
Default list is:
1 1 2 2 2 3 3 4 5 5 6
List without multiples of 2 is:
1 1 3 3 5 5
```



Task 3: Create template function display that displays all the items of the vector.

Code:

```
#include <iostream>
#include <vector>

template <class T>
void display(T& V) {
    for (auto i:V) {
        std::cout << i << " ";
    }
    std::cout << std::endl;
}
int main() {
    std::vector<double> Vector = { 1.2355, 2.5184, 3.512, 4.2514, 5.123, 6.114};
    std::cout << "Your Vector is: " << std::endl;
    display(Vector);
}
```

Output Screenshots

The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar says "Microsoft Visual Studio Debug Console". The console output shows the message "Your Vector is:" followed by the elements of the vector separated by spaces: "1.2355 2.5184 3.512 4.2514 5.123 6.114".

Conclusion:

In this lab, we were able to grasp the concepts of two libraries i.e.; list and vector within the boundaries of STL and made use of them in writing different functions. Other than that, we were able to understand the importance of STL itself and how we can make efficient codes using their pre-defined functions.