

Standard Template Library (STL) in C++

Student's Name

Department, Institutional Affiliation

Course Number and Name

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Due Date

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Standard Template Library (STL) is a collection of multiple classes that provide common C++ programming functions and data structures. The library consists of iterators, algorithms, and containers. As a result of being a generalized library, its elements are parameterized.

Algorithms in C++ STL act on containers through iterators. The algorithm header defines methods that are used for various purposes such as counting, sorting, and searching. These functions usually work on a given range of elements. For instance, on an array of ten integers. The functions in the algorithm header enhance code reusability (Menon, 2022). Therefore, algorithms in STL save time.

Containers in C++ STL store data and objects. According to Great Learning Team 2021, containers store a collection of elements that can have either a defined length or infinity length. Examples of containers in C++ STL include deque, array, forward_list, vector, and list. Associative containers include maps and sets. Elements in a container can be accessed through iteration or directly.

Iterators in C++ STL work on a sequence of values. According to Menon 2022, iterators act as connectors of algorithms to containers for extracting or modifying individual elements in a container. Examples of iterators include random access iterators, input iterators, forward iterators, and output iterators. As a result, iterators minimize the execution time of a program.

Demonstration of Standard Template Library in C++

The C++ STL Code

```
std.cpp
1  #include <iostream>
2  //container header
3  #include <vector>
4  using namespace std;
5  int main()
6  {
7      //Declaration of a container (vector)
8      vector<int> a;
9      // appending a vector
10     a.push_back(1);
11     a.push_back(2);
12     a.push_back(3);
13     a.push_back(4);
14     a.push_back(5);
15
16     //Printing the Output of vector 'a' using iterators begin() and end()
17     cout << "Elements in the vector are: ";
18     for (auto i = a.begin(); i != a.end(); ++i)
19         cout << *i << " ";
20     return 0;
21 }
```

Figure 1 Working with Standard Template Library in C++

The Output After Iteration

```
D:\assignment\C\weight\std.exe
Elements in the vector are: 1 2 3 4 5
-----
Process exited after 0.01663 seconds with return value 0
Press any key to continue . . .
```

Figure 2 The output after iterating the container (Vector)

References

Great Learning Team. (2021, March 25). Standard template library in C++. GreatLearning Blog:

Free Resources what Matters to shape your Career!

<https://www.mygreatlearning.com/blog/standard-template-library-in-c/>

Menon, K. (2021, November 29). Guide to learn C++ STL (Standard template library) |

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