C++ Standard Template Library (STL)

- STL is an acronym for standard template library.

- The C++ STL (Standard Template Library) is a powerful set of C++ template classes to provide general-purpose classes and functions with templates that implement many popular and commonly used algorithms and data structures like lists, queues,arrays and stacks.

- It is a library of container classes, algorithms, and iterators. It is a generalized library and so, its components are parameterized.

STL has four components

- Algorithms
- Containers
- Functions
- Iterators

STL provides numerous containers and algorithms which are very useful in completive programming , for example you can very easily define a linked list in a single statement by using list container of container library in STL , saving your time and effort.

STL is a generic library , i.e a same container or algorithm can be operated on any data types , you don’t have to define the same algorithm for different type of elements.

Sr.No	Component & Description
1	**Containers** Containers are used to manage collections of objects of a certain kind. There are several different types of containers like deque, list, vector, map etc.
2	**Algorithms** Algorithms act on containers. They provide the means by which you will perform initialization, sorting, searching, and transforming of the contents of containers.
3	**Iterators** Iterators are used to step through the elements of collections of objects. These collections may be containers or subsets of containers.

C++: Algorithms in STL

STL provide number of algorithms that can be used of any container, irrespective of their type. Algorithms library contains built in functions that performs complex algorithms on the data structures.

For example: one can reverse a range with reverse() function, sort a range with sort() function, search in a range with binary_search() and so on.

Algorithm library provides abstraction, i.e you don't necessarily need to know how the the algorithm works.

C++: Containers in STL

Container library in STL provide containers that are used to create data structures like arrays, linked list, trees etc.

These container are generic, they can hold elements of any data types, for example: vector can be used for creating dynamic arrays of char, integer, float and other types.

C++: Iterators in STL

Iterators in STL are used to point to the containers. Iterators actually acts as a bridge between containers and algorithms.

For example: sort() algorithm have two parameters, starting iterator and ending iterator, now sort() compare the elements pointed by each of these iterators and arrange them in sorted order, thus it does not matter what is the type of the container and same sort() can be used on different types of containers.

Functions

The STL includes classes that overload the function call operator. Instances of such

classes are called function objects or functors. Functors allow the working of the associated function to be customized with the help of parameters to be passed.