Introduction of STL

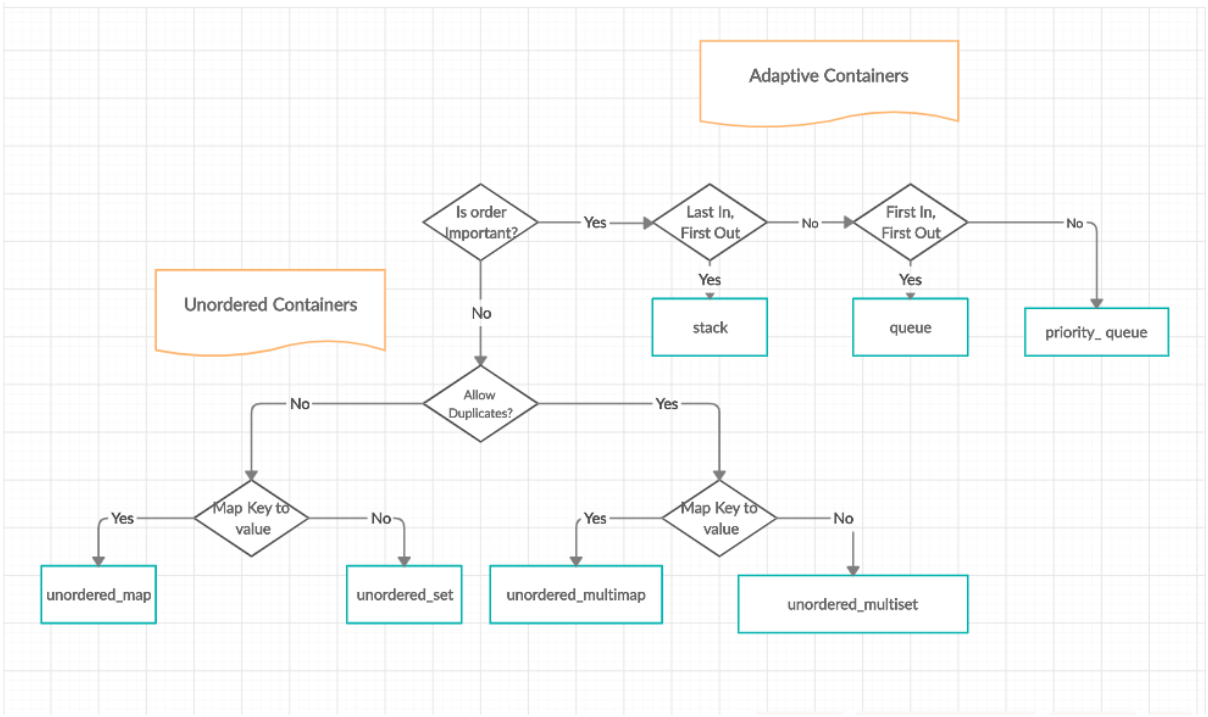
What is STL?

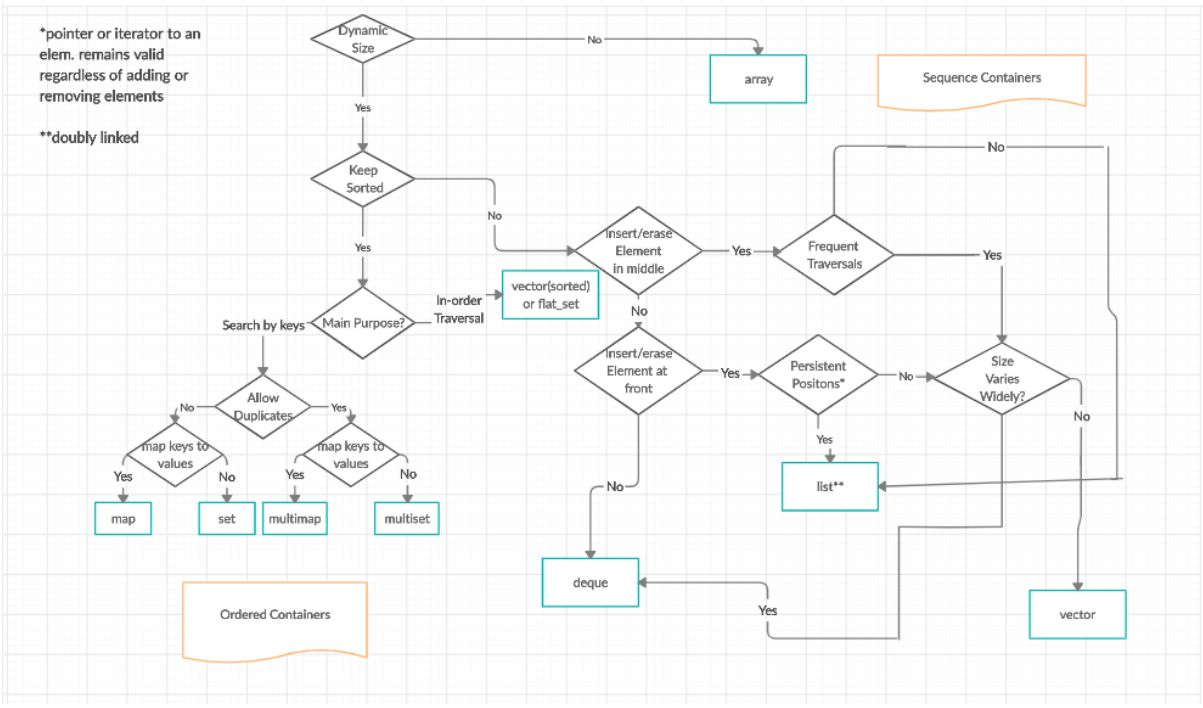
The Standard Template Library (STL) is a set of C++ template classes to provide common programming data structures and functions such as lists, stacks, arrays, etc.

It is a library of container classes, algorithms, and iterators. It is a generalized library and so, its components are parameterized. Working knowledge of **template classes** is a prerequisite for working with STL.

STL has 4 components:

- **Algorithms**
- **Containers**
- **Functions**
- **Iterators**





C++ is one of the most popular high-level programming language which is used extensively for a long time by developers and has always been loved by all programmers, especially competitive programmers because of its faster execution time.

STL is one of the unique abilities of C++ which makes it stand out from every other programming language. STL stands for standard template library which contains a lot of pre-

defined templates in terms of containers and classes which makes it very easy for developers or programmers to implement different data structures easily without having to write complete code and worry about space-time complexities.

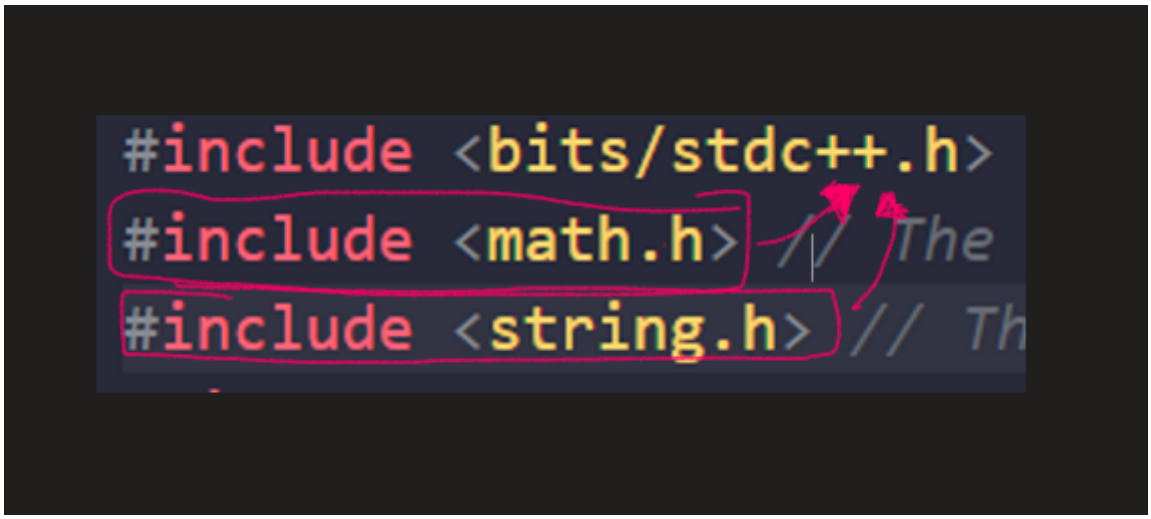
If you dive a little deeper into STL, you will have to understand everything about templates and how they work, which is one of the most power full tools when it comes to C++ programming language.

However, in this tutorial we will stick to some of the most popular STL containers and algorithms, and its useful functions which is used by programmers very frequently in day to day programming.

- unordered_set in C++ STL
- Vector in C++ STL
- Set in C++ STL
- unordered_multiset in C++ STL
- multiset in C++ STL
- unordered_map in C++ STL
- map in C++ STL
- unordered_multimap in C++ STL
- queue in C++ STL
- stack in C++ STL
- deque in C++ STL
- priority_queue in C++ STL
- multimap in C++ STL
- list in C++ STL
- next_permutation in STL
- __builtin_popcount() in STL
- sort() in C++ STL
- min_element() in C++ STL
- max_element() in C++ STL

```
#include <bits/stdc++.h> // It is basically a header file that includes every standard
library.
#include <math.h> // The math.h header defines various mathematical functions and one
 macro.
#include <string.h> // The string.h header defines one variable type, one macro, and v
arious functions for manipulating arrays of characters.
using namespace std;

int main()
{
	return 0;
}
```



We not have to include all the library, all the library are in the #include <bits/stdc++.h>

if not include (using namespace std; in the file) then we have to right the line such as

```
#include <bits/stdc++.h> // It is basically a header file that includes every standard
library.
using namespace std;

int main()
{
	int a;
	std::cin >> a;
	std::cout << a;
	return 0;
}
```

```
#include <bits/stdc++.h>
using namespace std;
void print() // doesn't return anything
{
      cout << "raj";
}
int sum(int a, int b) // Return Something
{
      return a + b;
}

int main()
{
      print();
      int s = sum(10, 15);
      cout << s;

      return 0;
}
```

STL(Standard template library) divide into 4 parts:

1. Algorithms
2. Containers
3. Functions
4. Iterators