Homework 5 - Questions

1. What is the STL? What is a vector?

- STL stands for Standard Template Library which is a pack of C++ template classes that provides general-purpose classes and functions with templates that are used to execute programming data structures and functions/algorithms.

- A C++ vector is a dynamic array capable of automatically resizing itself when an element is added or deleted from it. The storage for a vector is handled automatically by the container. The elements of a vector are stored in contiguous storage. This allows C++ programmers to access and traverse the vector elements using iterators.

Reference:

BTechGeeks. <https://btechgeeks.com/stl-tutorials-and-interview-questions/>

Guru99. <https://www.guru99.com/cpp-vector-stl.html#:~:text=Summary:%201%20A%20C++%20vector%20is%20a%20dynamic,accessed%20then%20traversed%20using%20iterators.%20More%20items...%20>

2. Which vector operations change the size of a vector after its construction?

- vector::resize () The function alters the container’s content in actual by inserting or deleting the elements from it.

Reference:

GeeksforGeeks. <https://www.geeksforgeeks.org/vector-resize-c-stl/>

3. What is the STL array container and how does it differ from the built-in array and from a vector?

- The array is a collection of homogeneous objects, and this array container is defined for constant size arrays or (static size). This container wraps around fixed-size arrays and the information of its size are not lost when declared to a pointer.

- On the other hand, vector is a sequential container to store elements and not index based. And, vector is dynamic in nature so, size increases with insertion of elements while array stores a fixed-size (once initialized can’t be resized) sequential collection of elements of the same type and it is index based.

- Lastly, a normal array is a static object that its size is fixed and determined at compile time. Moreover, an array container has multiple important member functions such as front() and back() function. These methods are used to access the first and the last element of the array directly. Meanwhile, to print out the content in an normal array, for or while are needed to be used to go through each element.

Reference:

GeeksforGeeks. <https://www.geeksforgeeks.org/stdarray-in-cpp/>

4. How does the vector member function resize() differ from reserve()?

- The main difference between vector resize() and vector reserve() is that resize() is used to change the size of vector where reserve() doesn’t. reserve() is only used to store at least the number of the specified elements without having to reallocate memory. But in resize() if the number is smaller than the current number then it resizes the memory and deletes the excess space over it.

Reference:

TurtorialsPoint. <https://www.tutorialspoint.com/std-vector-resize-vs-std-vector-reserve-in-cplusplus#:~:text=The%20main%20difference%20between%20vector%20resize%20()%20and,the%20specified%20elements%20without%20having%20to%20reallocate%20memory>.

5. What should begin() and end() do for a container?

- begin() function is used to return an iterator pointing to the first element of the vector container. begin() function returns a bidirectional iterator to the first element of the container.

- end() function is used to return an iterator pointing to next to last element of the vector container. end() function returns a bidirectional iterator.

Reference: GeeksforGeeks. <https://www.geeksforgeeks.org/vectorbegin-vectorend-c-stl/>

6. Give an example of using the vector push\_back() modifier.

- When we want to add initialize a vector array, we can use push\_back() operation to accomplish the task. For instance:

vector<int> g1;

for (int i = 1; i <= 5; i++)

g1.push\_back(i);