

List Solutions

- Which data type is implemented by the C++ Standard Library as `std::forward_list`?
 - Single-linked list, as discussed in the previous video
- Which data type is implemented by the C++ Standard Library as `std::list`?
 - Double-linked list
- What is the main difference between these two data types?
 - A double-linked list also has a pointer to the previous node

- Explain what happens with an `std::list` instance when
 - A new element is added at the end of the list
 - Allocate memory for the node
 - Set the last element's next pointer to the address of the new node
 - Set the new node's previous pointer to the address of the last node
 - An existing element is removed from the list
 - A new element is added in the middle of the list

- Explain what happens with an `std::list` instance when
 - A new element is added at the end of the list
 - An existing element is removed from the list
 - Find the nodes immediately before and after the node to be removed
 - Set the “before” node's next pointer to the address of the “after” node
 - Set the “after” node's previous pointer to the address of the “before” node
 - Release the memory allocated for the removed node
 - A new element is added in the middle of the list

- Explain what happens with an `std::list` instance when
 - A new element is added at the end of the list
 - An existing element is removed from the list
 - A new element is added in the middle of the list
 - Allocate memory for the new node
 - Find the nodes immediately before and after where the node will be added
 - Set the “before” node's next pointer to the address of the new node
 - Set the “after” node's previous pointer to the address of the new node

- Write a simple program which creates list instance, initializes it, and adds and removes some elements. After each operation, display the list elements

- Give some advantages and disadvantages of using lists compared to vector and deque
 - Adding and removing elements is faster than for vector and deque
 - Lists are not indexed (no subscript notation)
 - Accessing elements and searching is slower than for vector and deque
 - Lists use more memory per element
 - Useful when we expect to add or remove elements frequently