

Revision Questions | Week 07

These are self-revision questions, to help you track if you are understanding the weekly course content.

You should *FIRST* answer these questions using “pen-and-paper”. Only after this should you test your answers by writing and compiling programs.

1. Using the definition of a Linked List as provided in the lectures for Week 06, draw the picture of a the final state of the linked list, `list`.

```
1 LinkedList* list = new LinkedList();
2 list->addFront(42);
3 list->addFront(0);
4 list->addBack(-100);
5 list->deleteFront(0);
```

2. Is deleting from the *front* of a linked list *linear time* or *constant time*? Why?
3. Is deleting from the *end* of a linked list *linear time* or *constant time*? Why?
4. This question requires you to think about implementing the `get` method of the Linked List ADT, using different *programming paradigms*. For reference the method is:

```
// Get the element of the linked list at index i
int get(int i);
```

- (a) Implement `get` using a fully *defensive programming* paradigm
- (b) Implement `get` using a fully *defensive programming* paradigm, and throwing an *exception* if there is an error.
- (c) Implement `get` using a the *programming-by-contract* paradigm where the contract is:

```
// Get the element of the linked list at index i
// The index must be: 0 < i < size()
int get(int i);
```

- (d) How could you change the definition of the `get` method use the C++ to enforce that the index must be greater than or equal to 0?
5. In C++ is a switch statement a form of structured programming? Explain your answer.