

# MTH 4300: Algorithms, Computers, and Programming II

Fall 2024

## Midterm 2 Review

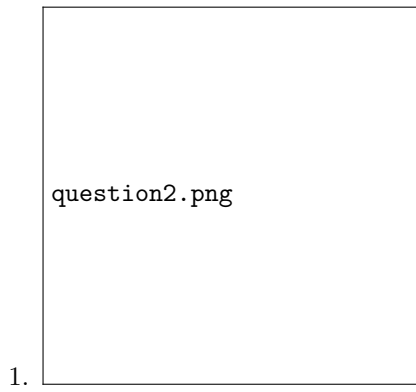
### 1 TRUE OR FALSE

1. Returning by reference allows you to avoid copying an object, improving performance, but returning by value ensures the caller receives a new copy of the object.
2. The `this` pointer in C++ is a constant pointer that holds the address of the current object.
3. The size of an `std::vector` is fixed once it is created and cannot change.
4. `std::list` in C++ allows random access to its elements, just like `std::vector`.
5. You can overload the arrow (`->`) operator in a class, and it is commonly used when a class contains or behaves like a pointer.
6. In a singly linked list, each node has a pointer to the previous node as well as the next node.
7. The time complexity of the selection sort algorithm is  $O(n \log n)$  in the worst case.
8. The `fstream` class in C++ allows for both input and output operations on files.
9. Overloaded operators must have at least one operand that is of user-defined type.
10. In C++, using header guards (or `pragma once`) is essential in multifile projects to prevent multiple inclusions of the same header file.

## 2 SHORT ANSWER

1. Name

### 3 CODING



## 4 SOLUTIONS

### 4.1 TRUE OR FALSE

1. true
2. true
3. coding\_question4.cpp