

ASSIGNMENT 3 CPP

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Submission instruction: Create a folder (A3_StudentName_StudentID) that contains 4 sub folders for each part. Each sub folder contains a solution for the corresponding task. Compress the A3_StudentName_StudentID folder and submit A3_StudentName_StudentID.zip to Moodle.

PART 1

Improve the simple C++ student management program from Assignment 2.

In this part, you need to utilize at least one of the C++ data structures below to improve your program.

Struct:

1 Minute C++ Struct | Cat Can Code

<https://youtu.be/b7zehj0qIDs>

Vector:

1 Minute C++ Vector | Cat Can Code

https://youtu.be/_W0cZCLWk8U

Stack:

1 Minute C++ Stack | Cat Can Code

<https://youtu.be/detOrVlbBOg>

Queue:

1 Minute C++ Queue | Cat Can Code

<https://youtu.be/4M1UeN5ro54>

Set:

1 Minute C++ Set | Cat Can Code

<https://youtu.be/dVVDQcGgzDY>

Map:

1 Minute C++ Map | Cat Can Code

https://youtu.be/1U_9rQXnAxY

PART 2

Improve the simple C++ student management program from Part 1.

In this part, you need to utilize at least one of the following design patterns to improve your program.

Singleton:

1 Minute C++ Design Pattern Singleton | Cat Can Code

https://youtu.be/_763HQ17wY8

Factory:

1 Minute C++ Design Pattern Factory | Cat Can Code

https://youtu.be/K38KM_pDhrc

Adapter:

1 Minute C++ Design Pattern Adapter | Cat Can Code

<https://youtu.be/1H3rDXVu0dE>

PART 3

Improve the simple C++ student management program from Part 2.

In this part, you need to utilize at least one of the following modern C++ features to improve your program.

Smart Pointers:

1 Minute C++ Modern Smart Pointers | Cat Can Code

https://youtu.be/9VO_vjG67QY

Range For Loop:

1 Minute C++ Modern Range For Loop | Cat Can Code

<https://youtu.be/wRG2AWqwPI8>

Auto:

1 Minute C++ Modern Auto | Cat Can Code

https://youtu.be/9vyt_VnVWYo

Decltype:

1 Minute C++ Modern Decltype | Cat Can Code

<https://youtu.be/qHF7WYubBo>

Lambda Expression

1 Minute C++ Modern Lambda Expression | Cat Can Code

<https://youtu.be/lgdbeqaYROo>

PART 4

Produce a report (PDF format) that includes all the following contents:

- An UML diagram with all the classes and relationships and necessary details. Use the notations shown in my UML essentials cheat sheet.
<https://youtube.com/shorts/VXXx7j8XPfw>
- Detailed explanations why your changes in Part 1 lead to good improvements.
- Detailed explanations why your changes in Part 2 lead to good improvements.
- Detailed explanations why your changes in Part 3 lead to good improvements.