CS2024 Assignment 10 Writeup

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In this assignment, we were tasked with replacing all instances of MenuItem objects with smart pointer variants instead, specifically by using the shared_ptr object. Initially, MenuItem * was the datatype we used in the Menu map, however after this assignment, the map will allow a shared_ptr instead.

In order to complete this assignment, I had to make changes to the main class, MenuCommand class, Menu class, and MenuItem class.

For the Menu class, I had to do the following…

- Replace the mItem's map's usage of a MenuItem pointer with a MenuItem smart pointer (shared_ptr)
- Add a destructor that gets called upon the deletion of a Menu pointer

For the MenuCommand class, I had to do the following…

- Add a destructor that gets called upon the deletion of a MenuCommand pointer

For the MenuItem class, I had to do the following…

- Add a destructor that gets called upon the deletion of a MenuItem pointer

We don't inherently need these destructors, as with a smart pointer, we don't have to manage the deletion of pointers, however we do it just to see that things are being deleted as intended.

With our new implementation using shared_ptr, we are more easily able to manage our memory (we dont even have to manage our memory at all), and reduce the risk of memory leaks and dangling pointers.

Overall this assignment was a bit tedious. There were alot of small things that had to be changed in main in order for the smart pointer implementation to work, but it wasn't terrible. I don't have the greatest grasp on pointers, and I still really don't understand what they do and how they work, so it was a bit hard to work through. I should probably read a book about it or something.

In this assignment I learned…

- How to use smart pointers
- How to use shared_ptr to create a smart pointer
- How to ensure that a destructor was called