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Advanced Operating Systems
Assignment 4
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Project 4 Report

Students were asked for Project 4 to develop functions to be used in the CPM file system. In this project, nine functions were developed in order to facilitate read/write capabilities, renaming, deletion, and displaying the directory.

Compilation Instructions

To compile the project, in the terminal in the directory where the project resides, type ‘make.’ In the console, type ‘./cpmRun’ in order to run the project.

Design and Implementation

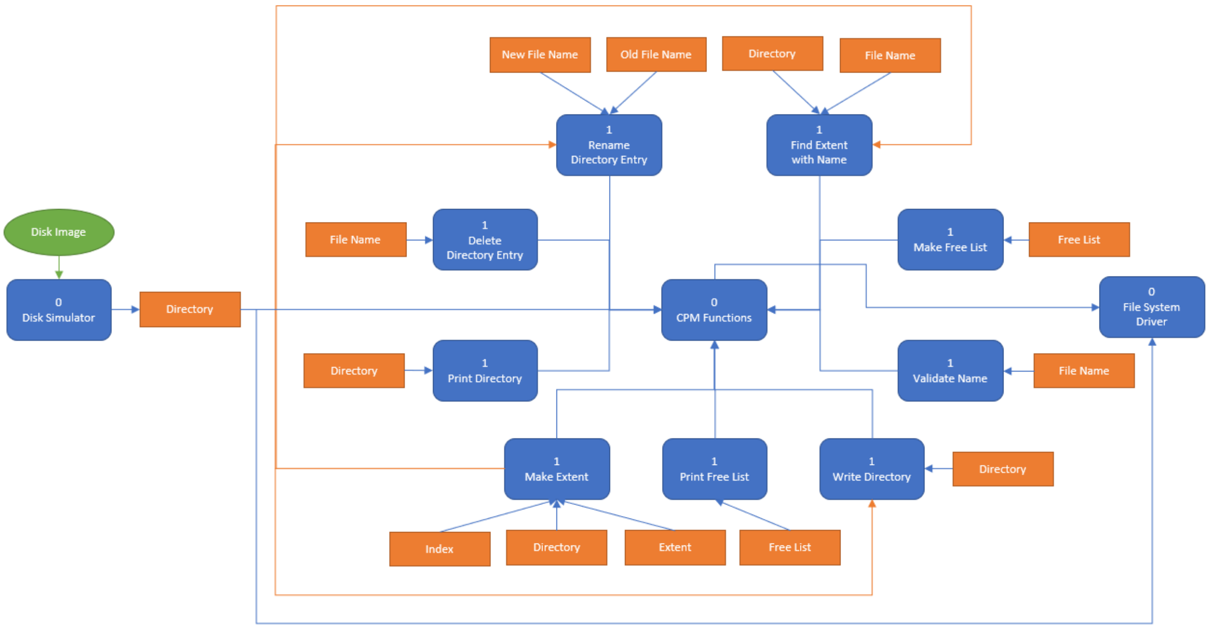

Figure 1: Data Flow Diagram

Because there were not too many choices to make about how to implement these functions (since the students were given algorithms for the functions during class), only a general overview of implementation will be provided here.

Development was only needed in the cpmfsys.c module. Each of the nine functions were tested for required functionality. The most difficult part of implementation was in the string manipulation. Working with strings in C is not enjoyable and requires much more memory management than in other languages. Therefore, splitting the file names into names and extensions was the most strenuous part of the project. Working with edge cases there took considerable time.

The directory was tracked through a global buffer. I struggled to keep addresses correct through local variables which resulted in writeDirStruct() failing to permanently write the buffer. The global buffer alleviated these concerns.

If I had to do it over, I would make another function for name validation purposes. It seemed that the name validation function had a very specific purpose, and because of that, I needed to provide some framework surrounding it in each of the functions that used it. This framework included parsing the file name from the extension and padding both the name and extension. I wish I had created another function that took care of both of those things, but I was unsure if we were allowed to create extra functions inside of this project.

Lessons Learned

This project taught me a lot about the inner workings of a file system. Though not too involved on the coding side of things, this project stressed knowledge of the system to be implemented. Working with files and their associated directory entries taught me how files are broken up into blocks, sectors, and bytes and shows how a file system is structured.

I also learned how easy it is to read and write from memory that one is not trying to read or write from. Small addressing mistakes can result in huge headaches, so making sure that pointers contain what they are assumed to contain is paramount.