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*UNIVERSITY OF ALABAMA | MARCH 29TH, 2019*

What I Learned

IMDB Catalog

**C PROGRAMMING**

C progamming language is a low level language – a programming language that provides little or no abstraction from a computer’s instruction set architecture.

**Advantages**

Data Structures

To develop an environment to store datasets efficiently and effectively, a use of data strucutres comes in handy. In order to create my own data structure, I used struct including variables to store information about the record such as index and title as well as pointers to its left child, right child, and its parent. Using this method, I was able to gain more indepth and clear understanding of data strucures overall and especially tree structure.

**Disadvantages**

String Literals

Due to the structure of the C language, strings are just sequence of characters. Because of this, modifying string literals are very difficult. When reading an input data file, I started by storing in an array of characters and modified to format as needed. This tend to cause errors with accessing memory result in a segmentation fault.

Difficult Debugging Process

To maximum efficiency of memory, it is ordinary to allocate minimum space needed. This means that whenever I modify the variable that requires more space, I need to reallocate more space. There are many locations in the code that requires this process that causes errors when not applied. Segmentation faults and box errors are some of the errors that happen and debugging these errors can be challenging at times.

Pass by Reference

**NCURSES**

Ncurses is a programming library providing an application programming interface (API) that allows the programmer to write text-based user interfaces in a terminal-independent manner.

**Advantages**

Easy Installation

To start working with ncurses, you can simply install packages through a terminal command. Although I’ve only worked with some GUI libraries and basic web development, this installation process seems very easy and simple.

Simple to Use

After installation, all that is needed to use the library is create a window by providing dimensions, then print to any x-coordinate and y-coordinate in range. Input and output is very easy to understand due to its similarity with scanf and printf functions.

**Disadvantages**

Ugly

Just like any other tools, ncurses comes with some disadvantages. Ncurses was first released in 1993 so it is very difficult to create the user interface to be aesthetic.

Limited Features

I’ve experience with a Java GUI, Swing. It allows buttons, input boxes, drop down menus, and more however none of these features are unavailable with ncruses because it is a text-based intereface.

Resources and Documentation

Due to its small user base, resources are limited and documentation tends to be difficult to understand with its lack of explanation and examples.

**SOFTWARE DEVELOPMENT PROCESS**

Agile Methodology

When I started working on this project, I begun planning out how to store the dataset with a data structure, then moved on to the UI overview. I set a schedule for each step of the way and planned to improve the project later. Although, agile methodology would have been a good fit for this project. By dividing each step of the development process into chunks with small steps inside it such as design, implement, and test.

Git

Commit often, perfect later, publish once.

Runtime and Space Complexity Tradeoff

Because this program requires to parse a file with over 100MB of data, my focus to begin was runtime. Although this method worked in the beginning with the time complexity of O(logn), I didn’t put too much focus on the space complexity for each record.

Back-End to Front-End

For my web development projects, I always start with the Front-End then move on to the Back-End. It seemed to me that that was the obvious way to develop a web application due to its structure. If you wish to take an input from a user, you can create a input field in the front-end then use that data in the back-end. Although, for this project, because developing a data structure is the hardest part, I begun with the Back-End and connected with the Front-End to finish. This way seemed to work as well and I was able to understand some of the pros and cons of both sides.

Unit Testing

Overall, the testing process needed more time. Plus, my testing method was to go through every single possible but with unit testing, it is more efficient and more likely to find errors throughout the program due to its variety of input options.