Kace Cottam (116095601) – Spring 2020

UNIV 497 – Final Project Outline

I am tutoring Computer Science—a subject where syntax is very important, as well as ideas and construction of something. It is a very engaging subject that needs to build upon many building blocks. Because of this, for my final project, I want to build a fully operational program.

This program will be a circuit diagram simulator, wherein users will have access to a visual interface that looks like a grid, and they can create wires by clicking and dragging, or create logic gates (that alter wire states depending on inputs and outputs) by clicking and choosing options from a toolbox. This idea comes from CPT_S 260, where students learn the basics of circuit diagrams; what a wire is, how a wire can be "on" or "off", and how to calculate something called *boolean algebra*; a topic also present in subjects such as PHIL 201 and other logic-based courses. This is to be an interactive program, where users can see in real-time what happens if they connect a wire to a certain gate, or what happens if they disconnect a wire.

The visual representation will be on the computer in the form of a window, where initially many dots are arranged in a grid. These dots are "anchor points" where wires connect to. The program will be programmed in C++, which is the main programming language students in my tutoring sessions will be learning—so that I can show them the underlying code of the program and show them where everything connects to each other; an underlying principle of software engineering.

Currently, the logic for the tool is made—albeit only in code; the logic I have made can only be tested in code. I have the tools to create a graphical user interface for the project and I plan on doing so by the project due date. I am hosting the project on https://github.com/KaceCottam/WireStructure, wherein you can find the source code (src/ folder), documentation (docs/ folder), and project outline (projects tab -> Todo).

Kace Cottam (116095601) – Spring 2020

UNIV 497 – Final Project Outline

An added benefit to me hosting this project online and **open-sourcing** it, is that programmers online can review my code and make code submissions—even students! This way, the project remains alive and updated for the foreseeable future.

When the time comes that students ask how to structure a large project, I can show them my documentation for making plans for this large project. If someone needs help learning how to use *git*, a version control system, I can show them my github account and show them how I added files to the link above. When people need help learning how to work with circuit diagrams, I can launch the program and we can interact with the program together. Even for things such as syntax on functions or templates in C++, I can refer them to the source code in this project—which I hope to document cleanly for learners.Q