Achilles Ecos

15-112 Project

TP1 Project Proposal

**Project Description:** The name of the project is “CMU Map” and it will basically allow any user to find the most optimal route within the CMU campus. It will be a basic map navigation from getting from one place in CMU to another part.

**Competitive Analysis:** The project will be similar to most maps on the Internet, such that it will return the most optimal route from a single place to another place. My map application, like most others will also highlight the route that one should take to get to their destination.

It becomes a bit different from other projects when it gives the user the option to either import or manually set up their schedule in order and return a list of paths that would be the most optimal to get from class to class. This would be important for students who want to maximize their time studying and not waste time walking inefficient routes or any other reason. There will also be another feature that will recommend students to visit nearby locations during their “free time” based on the current location from their most recent class.

**Structural Plan:** I currently have three files. One will be the dijkstra’s algorithm which will contain the class Graph, and its functions are addEdge(), getNeighbors(), getWeight(). The dijkstra() function itself, will return two dictionaries. The first is the distance dictionary and the second is the previous dictionary. The next file will be the map file. This includes a Node class that initializes the different nodes on the map by implementing methods from the dijkstra file. This will run the tkinter and produce the user interface. The third file is the module importer that allows me to import Photo Imaging Library and display a picture of a map onto the canvas.

**Algorithmic Plan:** I plan on approaching the aspect of having the schedule feature of the map be based off of the basic function. The basic function would be routing a path between 2 nodes and the schedule aspect would be using this idea to route over multiple nodes, each node in the order of class schedule. I would create a dictionary of key being the class and value being the node of the class location. I can iterate through the dictionary and call the route path function for each class that a student takes, represented by an element of the dictionary. I would also make some function that returns the neighboring nodes for each class to class “freetime” gap in the schedule by iterating through the neighboring nodes of that specific node and the neighboring nodes of the destination node and seeing the intersection of both sets of nodes.

**Timeline Plan:** I intend to have the actual pathfinding algorithm implemented and working as well as a basic user interface and the schedule feature implemented into the project by the end of Thanksgiving break.

**Module List:** Just Photo Image Library to import image onto canvas.

**Version Control Plan:** I have all my code uploaded on github.

A screenshot of a cell phone

Description automatically generated

**Storyboard:**

A picture containing text, map

Description automatically generated