**ICP C++ Individual Project Reflection – Sena A. Vuvor**

**Approach**

To solve the challenge, we first created a class for each of the files, created instance variables based on the column titles from the file, and created accessors and mutator methods for each of the instance variables. We created a general main class for reading from each of the csv files and processing them. We created node to represent each entry in the routes file and used the breadth-first search algorithm to find the valid routes from each start city. The bfs method takes the source city, generates a map from it, and generates successor cities. The successors are checked to see if any of them happens to be the destination. If it is, then the successor is returned as the destination, along with its solution path. If none of the successors happens to be the destination, the search continues to the successor destinations of the initial successors.

The algorithm uses a C++ implementation of deques to keep track of maps that are yet to be explored, and a vector to keep track of all maps that have been explored to prevent repetitive searches on the same map.

Initially, we tried to implement the bfs with a node created from route objects, but we ran into several errors and settled on using a map to represent each node.

**Lessons learned**

I did the brainstorming with Wepea. We wrote the pseudocode before starting to write the actual code. One lesson this project taught me is that programming is a lot more about problem solving and brainstorming than writing code. Additionally, brainstorming ideas with friends is really helpful in coming up with a good approach to solving problems.

For language-specific lessons, I learned that C++ does not have most implementations of data structures and classes from Java that make work easy. For instance, C++ does not have an Objects class, hashmap, arrayQueue, among others. We had to find alternatives to

**References**

Breadth-first search algorithm from Dr. Ayokor Korsah’s Intro to AI class