CS 201: Final Project Design – Elijah Wendel

Describe the user interface. What are the menu options and how will the user use the application?

1. **Create a station**
   (User Inputs):
   1. Name:
   2. Latitude:
   3. Longitude:
   4. Description:
   5. Wheelchair access?
   6. Lines:
2. **Modify a station:**
   (User Inputs):
   1. Name:
   2. Latitude:
   3. Longitude:
   4. Description:
   5. Wheelchair access?
   6. Lines:
3. **Remove a station:**
   (User Inputs):
   1. Name:
4. **Search for a station**: (Uses polymorphism)
   (User select):
   - Search for name of station:
     (User Inputs):
     - Insert name:
   - More parameters
     (User Inputs):
     - Wheelchair access?
       (Or/and)
     - Description:
       (Or/and)
     - Line:
5. **Nearest station:**
   (User Inputs):
   1. Latitude:
   2. Longitude:
6. **Plan a trip:**
   (User Inputs):

The user will first select one of the 7 options in the menu, and then the user inputs the information the program requests.

1. From (station):
2. To (station):
3. Save transit path (Program writes the trip to a .csv file)

7. **Exit program**

Describe the programmers' tasks:

Describe how you will read the input file.

My program will read the input file by a method called readExistingFile() that will add each value to an ArrayList in alphabetical order using a Scanner. It will use a couple of loops that will split the lines by the "," and create an object, adding it sequentially to the ArrayList checking whether it is in the correct spot. I want the ArrayList to be in alphabetical order so that it is easier for the search and remove methods. It will cycle through the input file till there are no more lines (next == null).

Describe how you will process the data from the input file.

The data that was read from the file will be stored in a central list with every object and then organized into 7 separate lists depending on the position and line it is on. The adding of objects will simply go at the end of the main list, which then updates the 7 other lists.

Describe how you will store the data (what objects will you store?)

The data will be stored in ArrayLists, storing an object of type CTAStation which has all of the attributes listed in the .csv file. This type of object will include an array for the position on every single line.

How will you add/delete/modify data?

Add: The program will request inputs from the user, and it will add the new station using the user's inputs and allocate it in the ArrayList depending on its alphabetical order of the "name." This way the list remains in the correct order.

Delete: The program will ask for the name of the station the user wants to remove, and eliminate it from the ArrayList using the deleteStation() method but keeping the order the same.

Modify: The modify will ask the user which station should be modified using the search method (requesting a name or parameters), then return it so the user can see, and ask for the inputs to modify it. If the user changed the name, the position of the object in the ArrayList will be moved so that it remains alphabetical.

How will you search the data?

There will be two search methods:

When asking for the name: the program will use a linear search to look through the ArrayList till it finds all of the stations with the name.

When asking for parameters, the user will be able to select a specific parameter or multiple and using a sequential search it will iterate through the ArrayList for each parameter. Then it will return all of the stations that have the parameters listed by the user.

List the classes you will need to implement your application.

I will need a **GeoLocation** class to be able to handle tasks for distances.

A **CtaStation** class to create an object for a train station.

A **CtaLine** class to manage the ArrayList of CtaStation objects, with methods such as add, modify and delete.

Finally an **Application** class that handles all of the communication with the user and program.

UML Diagram: