CS202 Program #1

Written Design and UML Diagram

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As I have been thinking about the design for program 1, the major consideration is the hierarchy that represents the relationships of each class. It took really long to get an idea of how to design at the first time. After I read the program assignment sheet and the concept slides from the class again and again, I finally found a small clue to get through. So far, I decided to create 6 main classes which are census, location, household, school, status, and class room. Starting from the location class, census, household, and school classes are derived classes from the location class. Status class is derived from household class and classroom is derived from school class. I think that these classes are going to make more sophisticated and easy to manage complicated data implementations. I think I only designed the main classes I will have to have. I assume that I am going to create some more classes that can break into more small pieces. I will try to focus on looking at the big frame this moment and later I will be focusing on small pieces of tasks.

For more details, census information is coming from an external data file(census.txt) which I will be creating and school information is also coming from an external file(school.txt). In order to manage the data efficiently, I will be using two different data structures for census and school data. A graph will be on census and a doubly linked list will be on school data. For dealing with the data structures, there will definitely nodes for the doubly linked list and the graph with vertex and edge node information.

There will be some basic functions I will be using for each class. First of all, in the location class, there will be functions of displaying location which presents specific location information of household and school. And distance calculation function will be set to calculate distances between households and schools. Secondly, in the census class, there will be read in function that reads in the external file data that has map coordinates, number of people, race, income, and more. As long as the census data is composed of the graph data structure, it will have a node class and vertex and edge node information. Next, in the household class, there will be number of people, distance data, and more. And also, some calculation method that makes you

be able to determine the best solution. As derived class, status class has some functions can show detailed information about the household. The next class is school. This class also has read in functions that reads in an external file with map coordinates, number of classes, the best size, and maximum students. There will be some more functions that manages school data. Furthermore, since the school class is built with doubly linked list, there are functions that normally doubly linked list has such as add, remove, display, retrieve. Those three; census, household, and school are the main classes will lead this program. The rest classes are status and class room classes. These are the derived classes from household and school that subdivide the implementations. I have not set up the specific functions yet but there will be important roles why I break into several classes and use inheritance.

If we talk more about inheritance, it is always used in object oriented programming. The concept of “is a” is a totally based on inheritance, which can be various types. It could be said “A is a B type of thing”. On the other hand, the “has a” is based on composition that simply mean use of instance variables that are references to other objects. Therefore, with using inheritance, we will be able to reduce getter functions.