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Final Project Design Overview

Proposed data structures:

The primary data structure is a graph where the nodes represent cities and the edges represent the connections between the cities and have distance and time information associated with them. Each city node has an ArrayList of edges to the neighboring cities, and an ArrayList of points of interest that are located in that city. ArrayLists are used as a simple method to store the data in which order does not matter. A hash map is used to access a specific city node because it operates in O(1) time to find a node. A priority queue is used to sort the cities in order of interestingness. This maintains the order of the cities to make it easy to display this information for the user.

User stories:

The user presses a start button to start the applet.

The user looks at a map of a domain with nodes representing cities and paths between them representing roads with a navigation pane to the left with buttons for different features.

The user clicks a calculate route button and selects a start city and a destination city to display the shortest path between the two cities as well as the time and distance information.

The user clicks a points of interest button and selects a city to view the points of interest in that city and their interest ratings.

The user clicks the city ratings button to display a list of cities in order of interestingness.

The user clicks a calculate route button and selects a start city, a destination city, and any additional waypoints the user wants to visit to display the shortest path connecting all the cities as well as the time and distance information.

The user clicks the home button to return to the original sidebar with the buttons for the different features.

Screen review:

 Figure 1: Main screen of the GUI

Figure 2: Screen after the calculate route button is clicked on the main screen

 Figure 3: Screen after the calculate path button is clicked on the calculate route screen

 Figure 4: Screen after the points of interest button is clicked on the main screen

 Figure 5: Screen after the city ratings button is clicked on the main screen

UML diagram:

