This is a project that gets 2 stop names as an input and creates an animation visualizing the route between those metro stops using a given metro line information text file.

Working process of the code is below:

First, the code reads the coordinates.txt file (which has the information about the given metro lines) line by line. Then it categorizes different kinds of information about the metro lines and stores them separately in ArrayLists. With these data there are some complementary methods defined that will be relevant further in the code. Explanation of the main method will continue after the introduction of these methods.

The method inputIsValid checks if the given initial and final stop names appear in the corresponding ArrayList that has been gathered from the text file. It has a simple iteration of elements logic behind it.

The method nameToCoord returns the coordinates of the stop name given to it as an argument. It also is a very simple method that only matches indexes from ArrayLists that store stop names and stop coordinates.

The method neighbourStopFinder is still a basic method. It searches for the given stop name in ArrayLists that store stop names in the order of the given metro line. It returns the previous/next stop if it is a terminal/initial station, returns previous and next station if it is an intermediate station. At intersection points of lines, it can return more than 2 stations of course. Its only purpose is finding the neighbours of a given stop name as the name suggests.

The method recursiveNeighbourChecker, is the last and the most complex method of this project. Its complexity is not because the length but rather the difficulty of imagining the recursion's result. This is the method that will finally put all pieces together to find a result. It gets the ArrayList of neighbours from the previous method, name of the initial and final stations and a new variable that will change throughout the recursions, previousStop variable. This method will basically start at the initial station and will travel recursively to every possible neighbour of that station, except the previousStop which means going back where it came from, until it finds the final station. If no branch of the "possibilities tree" reach the final station and all of them end up in a dead end, it means those two stations are not connected. It will return the correct path as an ArrayList.

Now continuing the explanation of the main method, the code checks if the given station names are valid using inputIsValid, then it will check if these stations are connected using the result of recursiveNeighbourChecker. If all of these conditions are satisfied, it will print the solution path to the console and will start animating that result using StdDraw library. StdDraw will first draw the lines between the stations using corresponding line colors and coordinates stored in ArrayLists in the beginning. It will then draw the white points on stations coordinates. After that, it will start to add orange points to visited stations in the way that the assignment description tells. When the process is over, animation window stays open in its final state and the console will have the solution path printed, each station in one line.

Example input and output results:

Input1:

Levent
Uskudar

Expected Output:

Levent
Gayrettepe
Sisli-Mecidiyekoy
Osmanbey
Taksim
Sishane
Halic
Vezneciler
Yenikapi
Sirkeci
Uskudar

My Output:

Levent
Gayrettepe
Sisli-Mecidiyekoy
Osmanbey
Taksim
Sishane
Halic
Vezneciler
Yenikapi
Sirkeci
Uskudar

Input 1 Animation Last Frame

Input 2:

Aksaray
Bahariye

Expected Output:

These two stations are not connected

My Output:

These two stations are not connected

Input 3:

Bogazici
Kadikoyyy

Expected Output:

No such station names in this map

My Output:

No such station names in this map

Input 4:

IstanbulHavalimani
SabihaGokcenHavalimani

Expected Output:

IstanbulHavalimani
Ihsaniye
Gokturk
Kemerburgaz
Hasdal
Kagithane
Caglayan
Sisli-Mecidiyekoy
Osmanbey
Taksim
Sishane
Halic
Vezneciler
Yenikapi
Sirkeci
Uskudar
AyrilikCesmesi
Acibadem
Unalan
Goztepe2
Yenisahra
Kozyatagi
Bostanci2
Kucukyali2
Maltepe2
Huzurevi
Gulsuyu
Esenkent
Hastane-Adliye
Soganlik
Kartal2
Yakacik
Pendik2
Tavsantepe
FevziCakmak
Yayalar
Kurtkoy
SabihaGokcenHavalimani

My Output:

IstanbulHavalimani
Ihsaniye
Gokturk
Kemerburgaz
Hasdal
Kagithane
Caglayan
Sisli-Mecidiyekoy
Osmanbey
Taksim
Sishane
Halic
Vezneciler
Yenikapi
Sirkeci
Uskudar
AyrilikCesmesi
Acibadem
Unalan
Goztepe2
Yenisahra
Kozyatagi
Bostanci2
Kucukyali2
Maltepe2
Huzurevi
Gulsuyu
Esenkent
Hastane-Adliye
Soganlik
Kartal2
Yakacik
Pendik2
Tavsantepe
FevziCakmak
Yayalar
Kurtkoy
SabihaGokcenHavalimani

Input 4 Animation Last Frame

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