Documentation

System Design and Programming

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System Overview

This is the portal for London Transport underground network on which the user can input “Departure Station” and “Destination Station”. By clicking the search button the user can see the route which takes minimum time to travel. Both time and graphically drawn route can be seen on this portal.

Methodology and Flow of the code

- “connections_list”, “stations_list” and “line_list” contains dictionaries as elements which have key value pairs of elements of “londonconnections.csv”, “londonstations.csv” and “londonlines.csv” files respectively.
- csv_reader() function is used to fetch data from all the three csv files and save in desired lists containing dictionaries.
- Creating “merged_list” by merging above “connections_list” and “stations_list” where value of “station1” in “londonconnections.csv” is equal to “id” in “londonstations.csv”.
- Creating a List of tuples that is “tuple_list” containing unique pairs of values of “station1”, “station2” and “line_id”.
- Three classes “Nodes”, “Edges” and “Graph” are created.
- In class “Graph” djs() function is coded which implements Dijkstra's algorithm, this algorithm helps in navigating through starting station to destination station through neighbouring stations in such a way that it gives the path which ensures that the user has to spend the least amount of time to travel.
- In class “Graph” draw_graphs() function is coded which draws the route using “matplotlib” library of the Python programming language.

- Finally a GUI is created using Tkinter in which function “func()” calls the djs() function to start the application execution.