Statement of the problem

We were given a project under which we had to use our knowledge that we had attained regarding Data Structure and Algorithm and apply the concepts to make a working program which has an application real life scenario. We had to make the project in a group of 4 and use our minds and team effort to build this program .

Motivation to choose the topic

Our group has chosen to make a ride providing app, which helps you book ticket for multiple modes of transport such as bike, car, train or an aeroplane. We were motivated to choose this project as, we as students have to travel regularly to our colleges or to our homes etc. This is not only the case for the students but all the people in the world daily require transportation travel in the cities, from city to city, or outside the country for various reasons such as for work, to visit, or just to travel somewhere new. Not only this but travelling can cost a lot of money if not planned well, i.e. if you choose the wrong route to reach the destination where you will be cursing yourself for it

So we decided to build a small-scale app Wayfarer which help you book transportation for easy travelling without any hustle for getting tickets and it would provide you with the best route which help you save your money and reduce your time and stress of planning a short or a long trip.

Objective of the project

The objective is to create an app which helps in booking tickets for travelling using the best/shortest possible route from the user location to the destination set using our knowledge on Data Structure and Algorithms.

This will give us a clear understanding of how the Dijkstra algorithm works and to properly use it in a program.

Scope of the project

There is a lot of scope in this project, as we know people all over the world travel regularly for various reasons, the need for a really good app in which you can easily book ticket of all the modes of transportation and also provide you with shortest path which will not only be faster but would save a lot of money, is an app made for them and I believe will be used all over the world.

Methodology of Project

Data Structures used in this project are:

- Unordered map
- Priority Queue
- Graph

Algorithm Used

- Dijkstra Algorithm

Other Concepts used

- Class
- File Management

Class Graph()

We have created the graph by the adjacency list method inside the class

In the class, we have declared all the necessary functions required:

- addEdge() – Used to connect all the edges to form a weighted graph
- ShortestPath() – This is the most important function which traverses through the graph and gives the shortest distance from the departure city to destination city which the user has entered.
- Display() – It displays all cities that are available to be selected by the user according to the first letter entered.

- Price() – It's a function which gives the fare of the ride which depends upon the distance the transport has to travel

Inside the int main()

- File Management has been used, where it uses a "project.txt" file as its database which contains the names of the cities along with distance between them which will used as the weights. We read the .txt file line by line, word by word to take in the individual data's as departure city, destination city and the distance in the order.
- Than we have also added a feature where the user will be asked to enter the first letter of the departure/destination city so as to make the program more user friendly and the user could easily view and find the city he/she wants to select.
- The user would next be able to select the mode of transportation he/she want to select.
- At the end the program will display the minimum distance between cities i.e. the user has to travel and also give the fare of the transportation.

To summarize our project, the app first asks the user the departure and destination city. It then calculated the minimum distance between them to give the user the fastest (shortest/best) route. The user than gets to choose the mode of transport he/she wants to travel in. At the end the user will be provided with all the information regarding the travel i.e.

the distance to be travelled and the cost of the trip.

Contribution that the project will be able to make

This project has helped us in strengthening our concepts in Data Structure and Algorithms and also in general regarding a project from scratch.

Further, this is a ride providing and ticket booking app, it will contribute in making the life of each person easier by easy booking and travelling of the people's choice.