NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES

(KARACHI CAMPUS)

Department of Computer Science

Fall 2021

Data Structures(CS-2001) Project Report:

RAA RIDE HAILING SERVICE

Group Members:

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Background

Research:

During our research process we were mostly concerned with real-life problems and were focused on providing a solution. We chose a project that would be useful to not just a single group but the majority of people. In order to do that we also took into consideration the current ongoing increase in the demand for ride hailing services like Uber, Careem etc.
In today's world, people are relying more on their phones to get things hence such applications are gaining popularity and manual ride hailing is a thing of the past. Therefore, we took inspiration from such applications to develop a two-way application that can be used by both the driver and passenger using the app.

Project selection:

In order to provide a solution for the problems listed above, we created a program that eliminates all these loopholes, and is user friendly and time saving. We came up with ideas concerning the technology used in ride-hailing apps like Uber, Careem and InDriver. The data source we used was New York Yellow Taxi Trip Data obtained from Kaggle.
We chose this data set as it met the requirements of our project(>1 GB data). Moreover, we believe that regardless of the ongoing pandemic, ride hailing services is one sector that has remained unaffected by the Covid-19.

Introduction

RAA Ride Hailing Service is a console based program developed in c++ using DEV C++. In the proposed system, we aimed to design an automatic-digital program which provides a multi-user interface for the driver and passenger. The driver can find a ride in the location he is currently in, decide which passenger he wants to pick and whether he wants to share his location or not.
The passenger can book his ride after entering his Pickup and Drop off location ID along with the time at which he wants to book the ride. He can then choose his car type, payment option and whether he wants to share the ride or not. Upon successful booking, the trip, fare and driver details will be displayed and shared with the passenger.

Problem Analysis

We made use of the data available from the source and broke it down into smaller chunks to extract the required data for each function of the program. The idea was to use each data set according to the function and module accessing it. For example, we made use of the PICKUP ID,DROP OFF ID, PICKUP DATE AND TIME. DROPOFF DATE AND TIME in the passenger module and rest in the driver module.

Tasks to be performed by the system:

- The addition of a login feature to ensure data security and controlled accessibility by having a separate driver and passenger login mode.

Driver:

- Entering the current location ID he is in
- Find nearby passengers in that location
- Choose the passenger for his ride
- Display the passenger details and start the ride

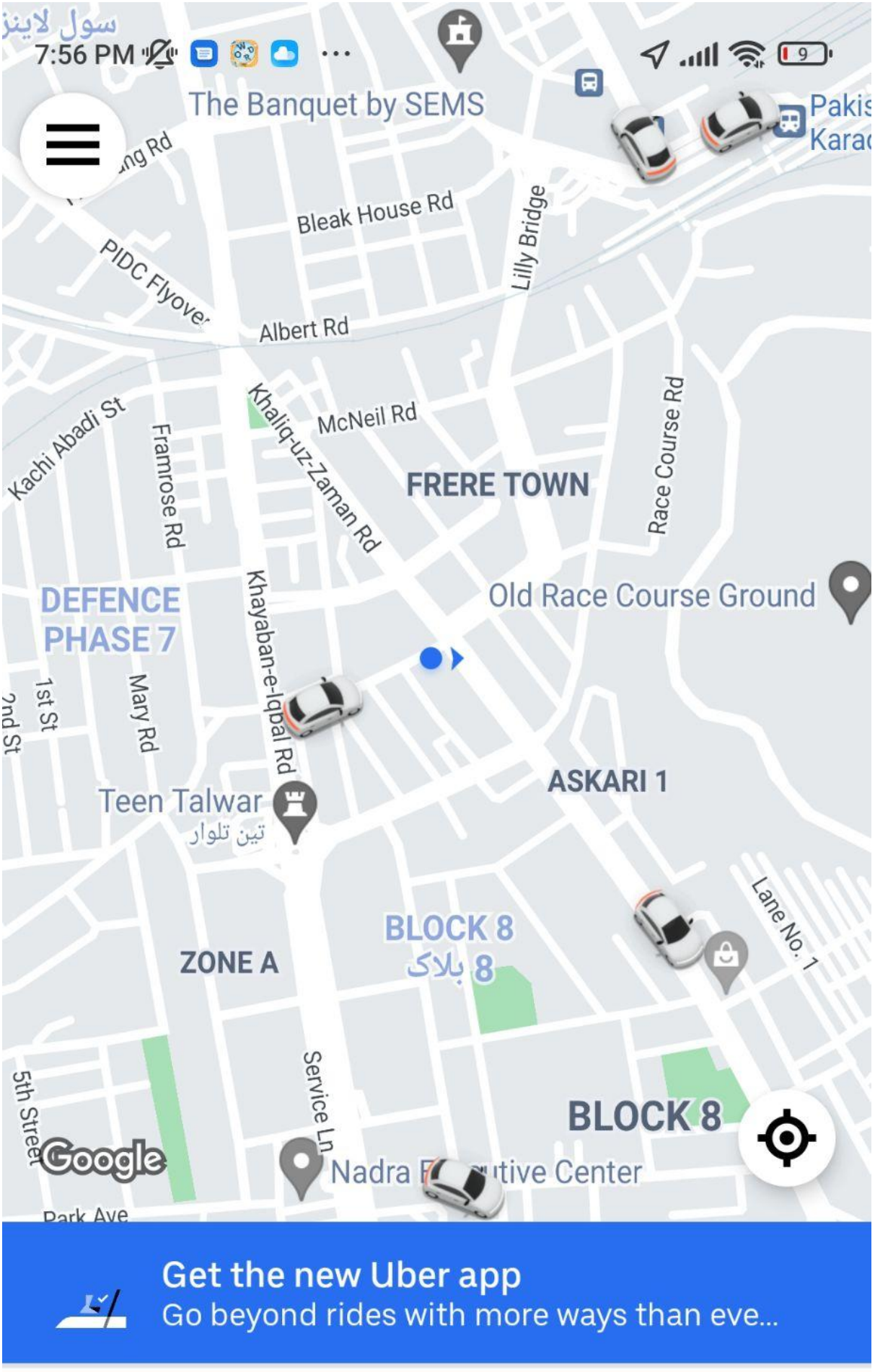
Passenger:

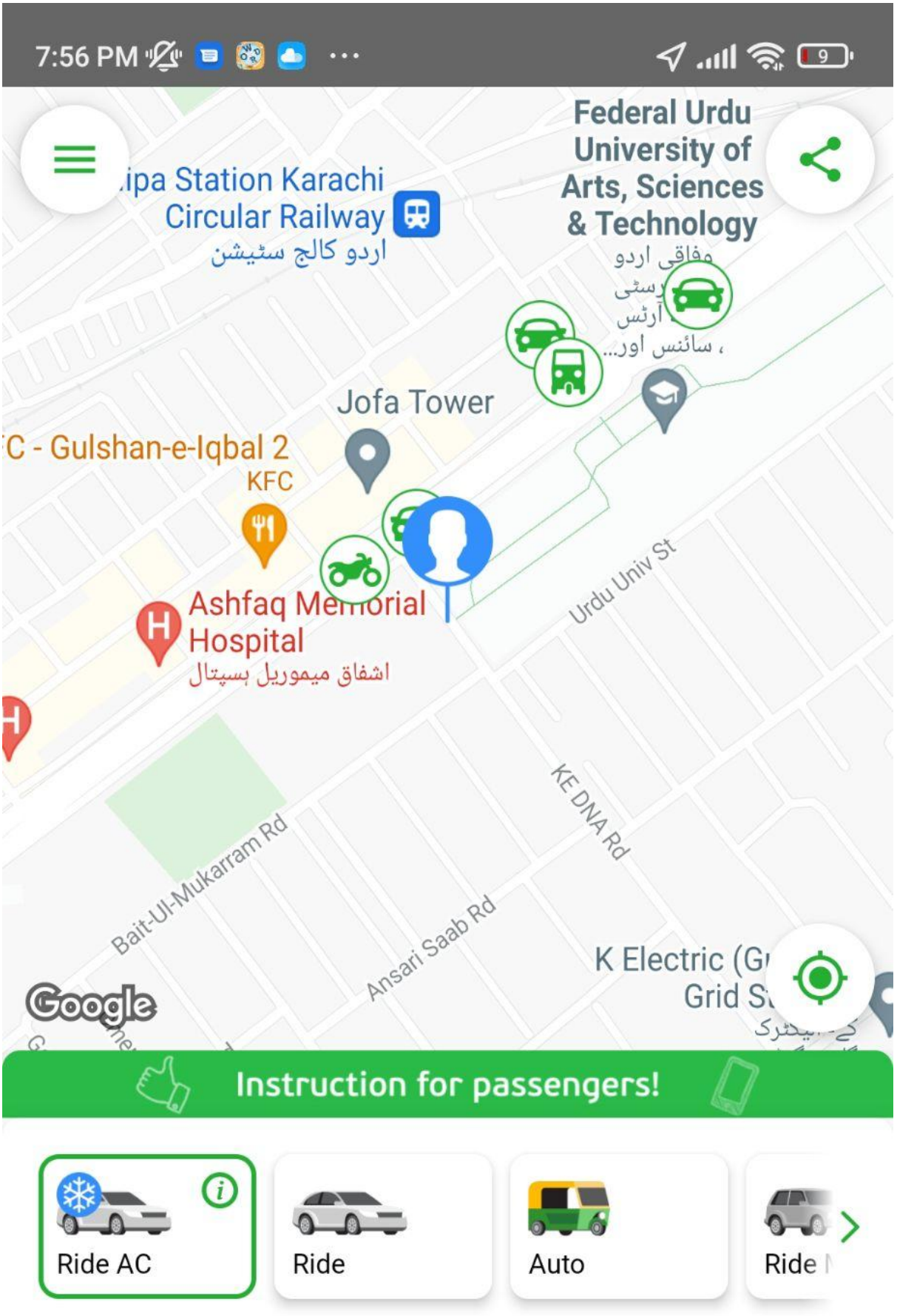
- Enter PickUp ID, Drop Off ID and PickUp Date and Time
- Choose the car type for the ride
- Choose the payment method
- Choose if the passenger wishes to carpool or not
- Display the trip details, fare details and the driver details of the ride

To put all these features into effect, we divided them into separate classes and then used different features and techniques of Data Structures and Object Oriented Programming and the C++ language (which will be discussed in detail in the methodology section). The main data structure used was Linked Lists and Binary Search Trees.

Existing Solutions

Following are some of the popular ride hailing services available locally in Pakistan:


7:56 PM
The Banquet by SEMS
Bleak House Rd
PIDC Flyover
Albert Rd
Lilly Bridge
Kachi Abadi St
Framrose Rd
Khaliq-uz-Zaman Rd
McNeil Rd
FRERE TOWN
Race Course Rd
Old Race Course Ground
DEFENCE PHASE 7
Khayaban-e-Iqbal Rd
1st St
Mary Rd
Teen Talwar
تین تلوار
ASKARI 1
Lane No. 1
BLOCK 8
بلاک 8
ZONE A
Service Ln
5th Street
Google
BLOCK 8
Park Ave
Get the new Uber app
Go beyond rides with more ways than eve...
Where to?
Now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Federal Urdu University of Arts, Sciences & Technology
اردو کالج سٹیشن
Jofa Tower
KFC
Ashfaq Memorial Hospital
اشفاق میموریل ہسپتال
Urdu Univ St
KE DNA Rd
Bait-Ul-Mukarram Rd
Ansari Saab Rd
Google
Instruction for passengers!
Ride AC
Ride
Auto
Pickup location
Destination

Methodology:

➢ **LIBRARIES:**

The program uses the following built-in libraries of DEV C++:

- #include<iostream>
- #include<fstream>
- #include<iomanip>
- #include<ctime>
- #include<process.h>
- #include<cstring>
- #include<conio.h>
- #include<stdlib.h>
- #include<windows.h>
- #include<cstring>

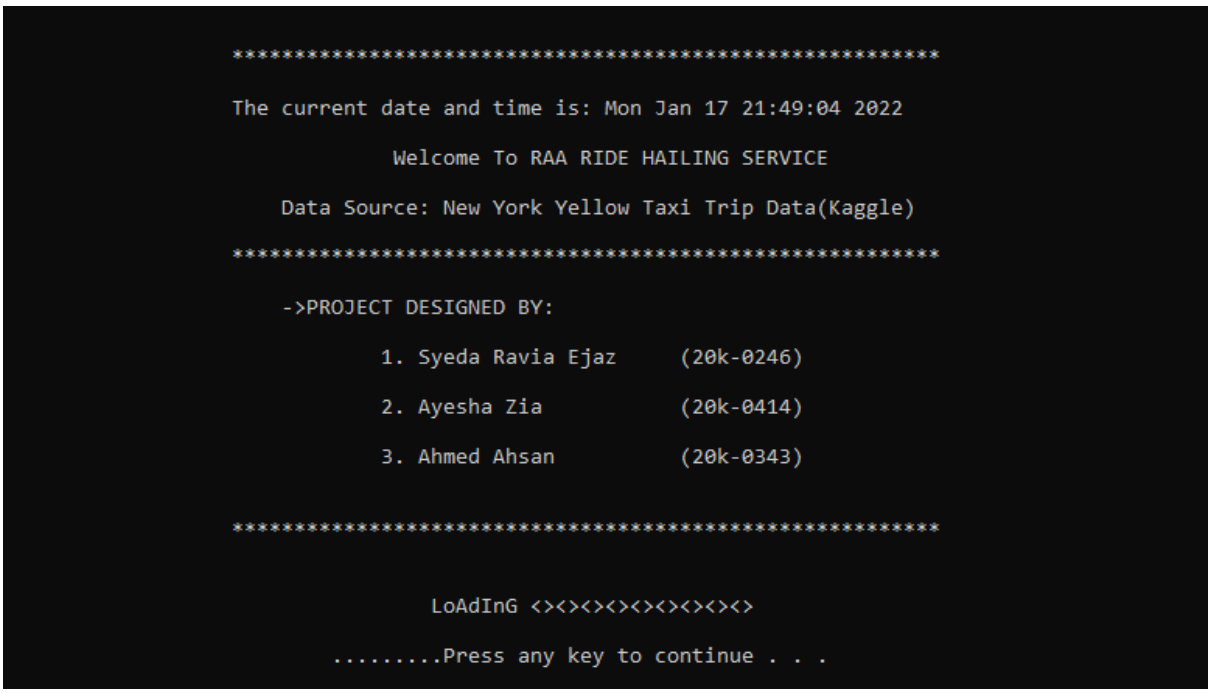
➢ **TOOLS:**

The program uses the following tools taught in the Data Structures and OOP course:

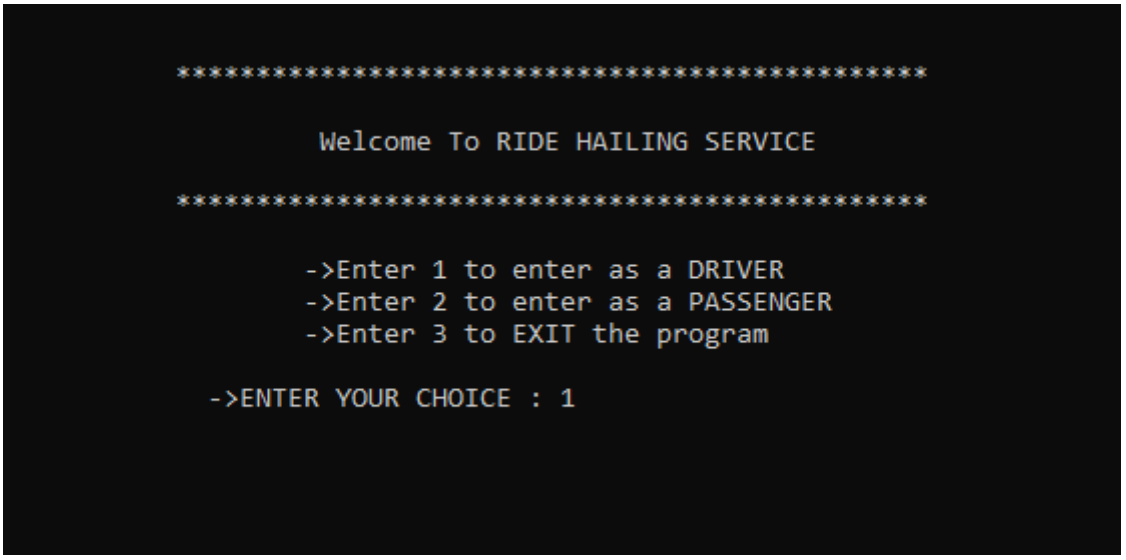
- Filing
- Constructors (copy, default and parameterized)
- Switch and Conditional statements(If/else/else-if)
- Loops (for, while and do-while)
- Binary Search Trees
- Linked Lists
- Static Variables
- Global Functions

Results:

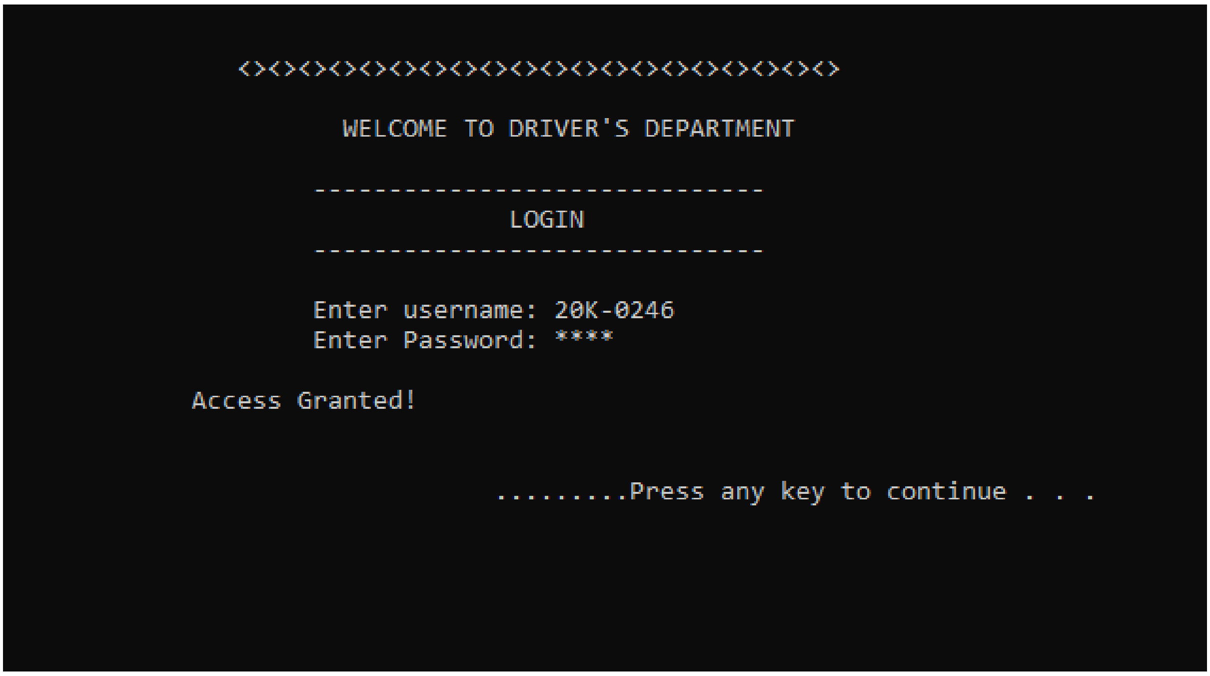
MAIN SCREEN



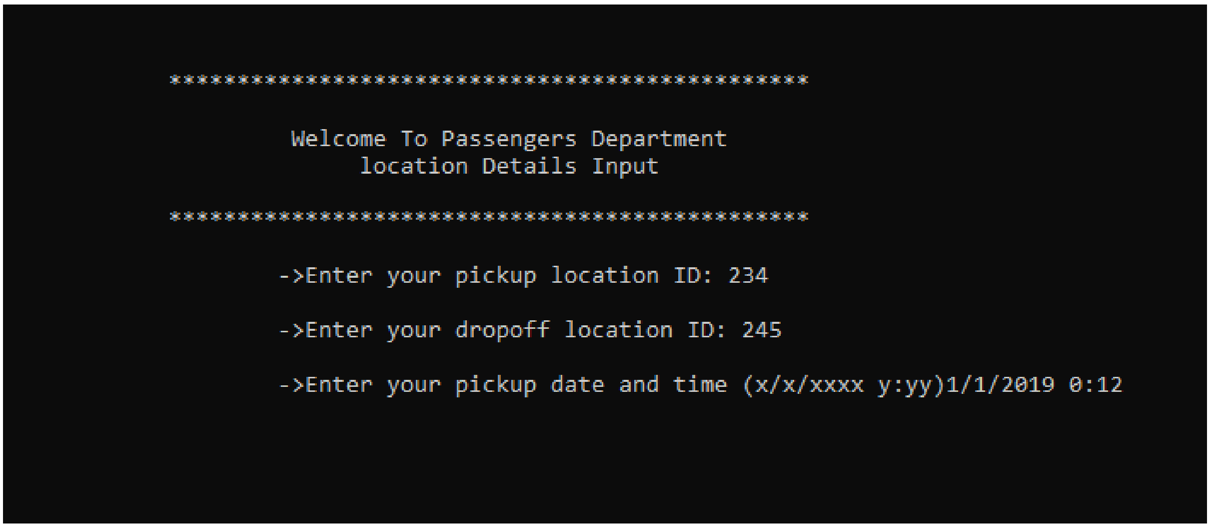
SECOND SCREEN



LOGIN SCREEN IN DRIVER MODULE



PASSENGER SCREEN



CAR TYPE

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                Select Car Type

**************************************************

        ->Enter 1 for Mini
        ->Enter 2 for UberGo
        ->Enter 3 for UberX
        ->Enter 4 for UberBlack
 ->Wrong input will cause the program to decide on its own

   ->ENTER YOUR CHOICE : 3
```

RIDESHARE

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                Ride Share

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        ->Do you want to share the ride: (Y/N): y
           ->No of seats available: 3
```

PAYMENT OPTION FOR PASSENGER

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**************************************************

               Payment Option

**************************************************

        ->Enter 1 for Cash
        ->Enter 2 for Card
->Wrong input will cause the program to decide on its own

  ->ENTER YOUR CHOICE : 2
```

TRIP DETAILS

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**************************************************

                  TRIP DETAILS

**************************************************

        ->Pickup Location ID : 234
        ->Dropoff Location ID : 245
        ->Pickup Date & Time : 1/1/2019 0:12
        ->Dropoff Date & Time : 1/1/2019 1:20
        ->Trip Distance : 10.15
        ->Car Type : UberX
        ->Payment Option : Card

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FAIR DETAILS

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**************************************************

                  FARE DETAILS

**************************************************

        ->Tip Amount : $3.35
        ->Tolls Amount : $0
        ->MTA Tax : $0.5
        ->Improvement Surcharge : $0.3
        ->Extra : $0.5
        ->Total Fare : $15.5
        ->Amount payable to driver : $20.15


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DRIVER DETAIL

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**************************************************

                  DRIVER DETAILS

**************************************************

       -> Driver Name: Ahmed
       -> Rating: 4/5
       -> Total trips completed: 30
       -> Contant Number: 0311-21020135

    .........Press any key to continue . . .
```

PASSENGERS REQUEST:

1. FILE:

File Edit Format View Help

1. Passenger 1
    -> Name: Sara Bilal
    -> Contact: 0333-2222555
    -> Rating: 5/5
    -> Location: 850 meteres away from your location
2. Passenger 2
    -> Name: Umer Danish
    -> Contact: 0333-5552222
    -> Rating: 4/5
    -> Location: 750 meteres away from your location
3. Passenger 3
    -> Name: Ammar Ahsan
    -> Contact: 0321-2225555
    -> Rating: 4.5/5
    -> Location: 100 meters away from your location
4. Passenger 4
    -> Name: Zia-Ur-Rehman
    -> Contact: 0345-3337777
    -> Rating: 3/5
    -> Location: 250 meteres away from your location
5. Passenger 5
    -> Name: Ali Khan
    -> Contact: 0300-5552222
    -> Rating: 3/5
    -> Location: 50 meteres away from your location

2. CONSOLE:

```
          ********************************************************

                              Passengers Request

          ********************************************************

          1. Passenger 1
                 ->  Name: Sara Bilal
                 ->  Contact: 0333-2222555
                 ->  Rating: 5/5
                 ->  Location: 850 meteres away from your location
          2. Passenger 2
                 ->  Name: Umer Danish
                 ->  Contact: 0333-5552222
                 ->  Rating: 4/5
                 ->  Location: 750 meteres away from your location
          3. Passenger 3
                 ->  Name: Ammar Ahsan
                 ->  Contact: 0321-2225555
                 ->  Rating: 4.5/5
                 ->  Location: 100 meters away from your location
          4. Passenger 4
                 ->  Name: Zia-Ur-Rehman
                 ->  Contact: 0345-3337777
                 ->  Rating: 3/5
                 ->  Location: 250 meteres away from your location
          5. Passenger 5
                 ->  Name: Ali Khan
                 ->  Contact: 0300-5552222
                 ->  Rating: 3/5
                 ->  Location: 50 meteres away from your location


     ->Enter the Passenger Number To Accept Ride :
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TRIP DETAILS FOR DRIVER

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              ***********************************************

                              TRIP DETAILS

              ***********************************************


                      -> Name: Haris Hussain

                      -> Contact: 0333-5552222

                      -> Rating: 4/5

                      -> Location: 750 meteres away from your location

              ***********************************************
          ........Drive safely and don't forget to wear your mask!.......

              ***********************************************
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DRIVERS INFORMATION

1. FILE

File Edit Format View Help

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Welcome Bilal

-> Your Rating: 3/5

-> Total trips completed: 120

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2. CONSOLE:

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**********************************************************

                      Welcome Bilal

                     -> Your Rating: 3/5

                  -> Total trips completed: 120

**********************************************************

->Enter Your Location ID to View Passengers Requests : 234
```

ENDING SCREEN

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  THANK YOU FOR VISITING THE RIDE HAILING SERVICE

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  ->PROJECT DESIGNED BY:

        1. Syeda Ravia Ejaz     (20k-0246)

        2. Ayesha Zia           (20k-0414)

        3. Ahmed Ahsan          (20k-0343)

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Conclusion:

The implementation from a concept to a real application was extremely challenging but it was very effective and full of experience, the final application turned out to be very professional and organized, it contained all necessary features to make both the Driver and the Passenger feel comfortable using it.We have implemented all functional needs and non-functional needs and some of the optional needs, some additional features were added to make the application more usable but the core concept stayed the same since it offers all the mentioned features and needs in the project description it also respects the optimization needs such as good code design style, large data size (1.2Gb). Building the application from the ground up was a great experience and we have achieved all the outcomes that we had previously stated as problems in our proposal. This ride hailing application is an application designed to be performing, scalable, extensible, and highly available. It also ensures the privacy of the users' data and secures its access. Given that it may be improved in many ways, the application is also easily maintainable.This ride hailing application connects car owners to people in their vicinity who need a vehicle.It is a platform which acts as a link between supply and demand. The ride fare is fixed by the car owner within the range of kilometers traveled.Our aim was to create a program with an easily understandable UI for the ride hailing service so that it could easily provide quality services to the passengers. By using all the tools and libraries available and by using all knowledge of Data Structures and Object-oriented programming we were able to make a well-designed application that could be used with no problems and didn't lack any important features, this implementation was definitely helpful to our career since implementing a concept into a real Application gives good knowledge of the development environment.