**FATIMA JINNAH WOMEN UNIVERSITY**

***Department of Software Engineering***

Submitted by: Samra Faisal Khan

Subject: Object Oriented Programming

PART I- INTRODUCTION

The Rawalpindi-Islamabad Metrobus is a 22.5 km (14.0 mi) [bus rapid transit](https://en.wikipedia.org/wiki/Bus_rapid_transit) system operating in the [Islamabad Rawalpindi metropolitan area](https://en.wikipedia.org/wiki/Islamabad_Rawalpindi_metropolitan_area) of [Pakistan](https://en.wikipedia.org/wiki/Pakistan). The Metrobus network’s first phase was opened on 4 June 2015, and stretches 22 kilometres between [Pak Secretariat](https://en.wikipedia.org/wiki/Pak_Secretariat), in [Islamabad](https://en.wikipedia.org/wiki/Islamabad), and [Saddar](https://en.wikipedia.org/wiki/Saddar,_Rawalpindi) in [Rawalpindi](https://en.wikipedia.org/wiki/Rawalpindi). The second stage is currently under construction, and stretched 25.6 kilometres between the [Peshawar Morr Interchange](https://en.wikipedia.org/wiki/Peshawar_Morr_Interchange) and [New Islamabad International Airport](https://en.wikipedia.org/wiki/New_Islamabad_International_Airport).[[2]](https://en.wikipedia.org/wiki/Rawalpindi-Islamabad_Metrobus#cite_note-2) The system uses e-ticketing and an [Intelligent Transportation System](https://en.wikipedia.org/wiki/Intelligent_Transportation_System), and is managed by the [Punjab Mass Transit Authority](https://en.wikipedia.org/wiki/Punjab_Mass_Transit_Authority).

The system uses e-ticketing and [Intelligent Transportation System](https://en.wikipedia.org/wiki/Intelligent_Transportation_System) wand. The system is managed by the Punjab Metrobus Authority (PMBA) with the IT part is being carried out in coordination with Punjab IT Board. Functional elements at the stations include ticketing booths, concourse level passenger transfer, escalators, platform screen. toliterities, doors turnstiles for automatic fare collection and all other amenities for passenger convenience. A central ITS control room is also included in the project to control the whole operation of the Metro Bus system.

It has low cost that anyone can afford. It is money saving and metro bus definitely lower compared to gas, car maintenance and amortization. It's most important advantage is that it is environmental friendly .less traffic and your share in saving the earth from pollution emitted from your car. It is also convenient that you can reach your destination on time and without any problem.

The program created by me is focused on bringing easiness to the people who wants to travel through metro bus service. This program enables the users to see which busses are going and at what time and at which place. Also whether there is a seat available in the bus or not. This helps the passengers to book their seats in advance and check the availability of the seat.

The code is in C++ programming language and have been executed in the software of Turbo C.

PART II- CODE

**METRO BUS SYSTEM**

**CODE:** (the program is written in C++)

#include "stdafx.h"

#include<iostream>

#include<string>

using namespace std;

classsch

{

protected:

int p;

public:

sch()

{

p = 0;

}

sch(int a)

{

p = a;

}

voidtime\_disp()

{

cout<< "\t" << "SCEDULE" << endl;

cout<< "Opening Time:" << endl;

cout<< "6:15 A.M" << endl;

cout<< "Closing Time:" << endl;

cout<< "10:00 P.M" << endl;

cout<< "Days a week:" << endl;

cout<< "Seven Days" << endl;

cout<< "Ticket Price:" << endl;

cout<< "Rs. 20" << endl;

cout<<endl<<endl;

}

};

classstation:publicsch

{

protected:

int a;

public:

station()

{

a=0;

}

station(int n)

{

a=n;

}

public:

void route()

{

cout<<"\t\t\t"<<"The bus will arrive after each 30 minutes"<<endl;

cout<<"\t\t\t"<<"The time of arrival of next 24 buses is following:"<<endl;

cout<< "\t\t\t" << " Total routes of metro bus: 6 " << endl;

cout<< "Select your route" << endl;

cout<<"BUS#NO From TO TIME DATE "<<endl;

cout<< " 0 SaddarMarrirChowk 06:00AM 17-5-2017"<< endl;

cout<<" 02 MarrirChowkLiaquatBagh 06:30AM 17-5-2017" << endl;

cout<<" 03 LiaguatBagh Committee Chowk 07:00AM 17-5-2017" << endl;

cout<<" 04 Committee ChowkWaris Khan 07:30AM 17-5-2017" << endl;

cout<<" 05 Waris Khan ChandniChowk 08:00AM 17-5-2017" << endl;

cout<<" 06 ChandniChowkRehmanabad 08:30AM 17-5-2017" << endl;

cout<< " 07 SaddarMarrirChowk 09:00AM 17-5-2017"<< endl;

cout<<" 08 MarrirChowkLiaquatBagh 09:30AM 17-5-2017" << endl;

cout<<" 09 LiaquatBagh Committee Chowk 10:00AM 17-5-2017" << endl;

cout<<" 10 Committee ChowkWaris Khan 10:30AM 17-5-2017" << endl;

cout<<" 11 Waris Khan ChandniChowk 11:00AM 17-5-2017" << endl;

cout<<" 12 ChandniChowkRehmanabad 11:30AM 17-5-2017" << endl;

cout<< " 13 MarrirChowkSaddar 06:15AM 17-5-2017"<< endl;

cout<<" 14 LiaquatBaghMarrirChowk 06:43AM 17-5-2017" << endl;

cout<<" 15 CommiteeChowkLiaquatBagh 07:16AM 17-5-2017" << endl;

cout<<" 16 Waris Khan Committee Chowk 07:48AM 17-5-2017" << endl;

cout<<" 17 ChandniChowkWaris Khan 08:11AM 17-5-2017" << endl;

cout<<" 18 RehmanabadChandniChowk 08:15AM 17-5-2017" << endl;

cout<< " 19 MarrirChowkSaddar 09:15AM 17-5-2017"<< endl;

cout<<" 20 LiaquatBaghMarrirChowk 09:43AM 17-5-2017" << endl;

cout<<" 21 Committee ChowkLiaquatchowk 10:17AM 17-5-2017" << endl;

cout<<" 22 Waris Khan Committee Chowk 10:46AM 17-5-2017" << endl;

cout<<" 23 ChandniChowkWaris Khan 11:11AM 17-5-2017" << endl;

cout<<" 24 RehmanabadChandniChowk 11:45AM 17-5-2017" << endl;

}

void wait()

{

cout<<"\t\t\t"<<"At each stop the bus will stop for almost 14 to 18 minutes depending upon the time required to reach next station"<<endl;

cout<<"At SADDAR: Bus will stop for 15 minutes"<<endl;

cout<<"At MARRIR CHOWK: Bus will stop for 13 minutes"<<endl;

cout<<"At LIAQUAT BAGH: Bus will stop for 17 minutes"<<endl;

cout<<"COMMITTEE CHOWK: Bus will stop for 16 minutes"<<endl;

cout<<"At WARIS KHAN: Bus will stop for 18 minutes"<<endl;

cout<<"At CHANDNI CHOWK: Bus will stop for 11 minutes"<<endl;

cout<<"At REHMANABAD: Bus will stop for 15 minutes"<<endl;

}

void dis()

{

cout<<"1.From Saddar to MarrirChowk: (15 minutes)"<<endl;

cout<<"2.From MarrirChowk to LiaquatBagh: (15 minutes)"<<endl;

cout<<"3.From LiaguatBagh to Committee Chowk: (15 minutes)"<<endl;

cout<<"4.From Committee Chowk to Waris Khan: (15 minutes)"<<endl;

cout<<"5.From Waris Khan to ChandniChowk: (15 minutes)"<<endl;

cout<<"6.From ChandniChowk to Rehmanabad: (15 minutes)"<<endl;

}

};

classtick:public station

{

charbusn[5], driver[10], arrival[5], depart[5], from[10], to[10],

seat[8][4][10];

public:

void install();

void allotment();

void empty();

void show();

void position(int i);

}

bus[10];

voidvline(char ch)

{

for (int i = 80;i>0;i--)

cout<<ch;

}

void tick::install()

{

cout<< "Enter bus no: ";

cin>> bus[p].busn;

cout<< "\nEnter Driver's name: ";

cin>> bus[p].driver;

cout<< "\nArrival time: ";

cin>> bus[p].arrival;

cout<< "\nDeparture: ";

cin>> bus[p].depart;

cout<< "\nFrom: \t\t\t";

cin>> bus[p].from;

cout<< "\nTo: \t\t\t";

cin>> bus[p].to;

bus[p].empty();

p++;

}

void tick::allotment()

{

int seat;

char number[5];

top:

cout<< "Bus no: ";

cin>> number;

int n;

for (n = 0;n <= p;n++)

{

if (strcmp(bus[n].busn, number) == 0)

break;

}

while (n <= p)

{

cout<< "\nSeat Number: ";

cin>> seat;

if (seat>32)

{

cout<< "\nThere are only 32 seats available in this bus.";

}

else

{

if (strcmp(bus[n].seat[seat / 4][(seat % 4) - 1], "Empty") == 0)

{

cout<< "Enter passanger's name: ";

cin>> bus[n].seat[seat / 4][(seat % 4) - 1];

break;

}

else

cout<< "The seat no. is already reserved.\n";

}

}

if (n>p)

{

cout<< "Enter correct bus no.\n";

goto top;

}

}

void tick::empty()

{

for (int i = 0; i<8;i++)

{

for (int j = 0;j<4;j++)

{

strcpy\_s(bus[p].seat[i][j], "Empty");

}

}

}

void tick::show()

{

int n;

char number[5];

cout<< "Enter bus no: ";

cin>> number;

for (n = 0;n <= p;n++)

{

if (strcmp(bus[n].busn, number) == 0)

break;

}

while (n <= p)

{

vline('\*');

cout<< "Bus no: \t" << bus[n].busn

<< "\nDriver: \t" << bus[n].driver << "\t\tArrival time: \t"

<<bus[n].arrival << "\tDeparture time:" << bus[n].depart

<< "\nFrom: \t\t" << bus[n].from << "\t\tTo: \t\t" <<

bus[n].to << "\n";

vline('\*');

bus[0].position(n);

int a = 1;

for (int i = 0; i<8; i++)

{

for (int j = 0;j<4;j++)

{

a++;

if (strcmp(bus[n].seat[i][j], "Empty") != 0)

cout<< "\nThe seat no " << (a - 1) << " is reserved for " <<

bus[n].seat[i][j] << ".";

}

}

break;

}

if (n>p)

cout<< "Enter correct bus no: ";

}

void tick::position(int l)

{

int s = 0;p = 0;

for (int i = 0; i<8;i++)

{

cout<< "\n";

for (int j = 0;j<4; j++)

{

s++;

if (strcmp(bus[l].seat[i][j], "Empty") == 0)

{

cout.width(5);

cout.fill(' ');

cout<< s << ".";

cout.width(10);

cout.fill(' ');

cout<< bus[l].seat[i][j];

p++;

}

else

{

cout.width(5);

cout.fill(' ');

cout<< s << ".";

cout.width(10);

cout.fill(' ');

cout<< bus[l].seat[i][j];

}

}

}

cout<< "\n\nThere are " << p << " seats empty in Bus No: " << bus[l].busn;

};

classticket\_fare:public tick

{

protected:

stringcurrent\_stop;

string destination;

inttotal\_ticket;

intticket\_totalcost;

int price;

public:

ticket\_fare()

{

current\_stop = "";

destination = "" ;

total\_ticket = 0;

}

ticket\_fare(string m, string n, int s)

{

current\_stop= m;

destination = n;

total\_ticket = s;

}

voiddsp()

{

cout<< "Enter the stop at which you are standing:" << endl;

cin>>current\_stop;

}

voidddp()

{

cout<< "Enter your last stop:" << endl;

cin>> destination;

}

voiddpp()

{

cout<< "Enter total number of ticket you want to buy:" << endl;

cin>>total\_ticket;

}

intticket\_price()

{

ticket\_totalcost=20;

price = ticket\_totalcost\*total\_ticket;

return price;

}

intremaining\_money()

{

inttotal\_amount;

cout<< " \n enter your amount: " << endl;

cin>>total\_amount;

intleft\_behind\_money;

left\_behind\_money = total\_amount - price;

returnleft\_behind\_money;

}

};

int \_tmain(int argc, \_TCHAR\* argv[])

{

cout<< endl;

cout<< "\t \t \t \t" << "\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*" << endl;

cout<< "\t \t \t \t" << "METRO BUS PROJECT" << endl;

cout<< "\t \t \t \t" << "\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*" << endl;

cout<< endl;

cout<< endl;

cout<< " \t \t SUBMITTED TO: MA'AM " << endl;

cout<< " \t \t SUBMITTED BY:" << endl;

cout<< " \t \t SAMRA FAISAL KHAN << endl;

cout<< " \t \t SADIA AHMED " << endl;

cout<< " \t \t SOBIA SAJID" << endl;

cout<< endl;

cout<< endl;

cout<< endl;

cout<< endl;

sch t1;

stationst;

ticket\_fare t2;

int p=0;

while (1)

{

cout<< "Enter your choice from 1 to 5" << endl;

cout<< "1) Open the schedule" << endl;

cout<< "2) Show the availabilty of some next rides(with time and date tags)" << endl;

cout<< "3) Want to book a ticket" << endl;

cout<< "4) Calculate the ticket price considering the origin and destination also return the remaining money" << endl;

cout<< "5) Exit"<<endl;

cout<<endl<<endl;

int a;

cout<< "Enter your choice: ";

cin>> a;

switch (a)

{

case 1:

t1.time\_disp();

break;

// scedule at any station

case 2:

cout<< "\t\t\t" << "Scedule at any station:" << endl;

intss;

while (1)

{

cout<<"Enter your choice from 1 to 5"<<endl;

cout<<"1.Show the routes"<<endl;

cout<<"2.Show the time for which bus stop at any station"<<endl;

cout<<"3.Show the time required by bus to travel between any two stations"<<endl;

cout<<"4.Exit"<<endl;

cout<<endl<<endl;

cin>>ss;

switch(ss)

{

case 1:

st.route();

cout<<endl<<endl;

break;

case 2:

st.wait();

cout<<endl<<endl;

break;

case 3:

st.dis();

cout<<endl<<endl;

break;

case 4:

exit(0);

default:

cout<<"Invalid Choice"<<endl;

}

}

break;

case 3:

cout<< "\t\t\t" << "Ticket Booking" << endl;

int w;

while (1)

{

cout<<endl;

cout<< "\t\t"<<"1.Install"<<endl;

cout<< "\t\t"<<"2.Reservation"<<endl;

cout<<"\t\t"<<"3.Show"<<endl;

cout<<"\t\t"<<"4.Exit"<<endl;

cout<< "\n\t\t\tEnter your choice:-> ";

cin>> w;

switch (w)

{

case 1: bus[p].install();

break;

case 2: bus[p].allotment();

break;

case 3: bus[0].show();

break;

case 4: exit(0);

}

}

break;

case 4:

{

t2.dsp();

cout<< endl;

t2.ddp();

cout<< endl;

t2.dpp();

cout<< endl;

t2.ticket\_price();

cout<< "Tickets are of " << t2.ticket\_price() << " rupees. " <<endl;

cout<< "Your left behind money are: " << t2.remaining\_money() << endl;

cout<<endl<<endl;

}

break;

case 5:

exit(0);

default:

cout<< "Invalid Choice" << endl;

}

}

system("pause");

return 0;

}

PART III- OUTPUT

Screenshots

OUTPUT: (the code is executed on Turbo C)



