



Department of Computer Science and Engineering

Project Report

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Course Title: Software Project VI

Project Title: Bus Management System

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BUS MANAGEMENT SYSTEM

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Bus Management System

2. Abstract:

Bus Management System (BMS) project is mainly developed for making our transport system more developed. In this digital era, this kind of digital system is really required. This project is mainly focused in digitalizing our bus management system (BMS). In this project customers have to register first. So the records of the customers can be kept. Then tickets can be booked using phone, computer, and some other devices by the account they have registered. In this project canceling ticket will also be included. Canceling tickets system will also be same as booking tickets. So, it won't be a hectic for the people to book or cancel a bus ticket. Choosing their destination won't be a problem too. Customers can also check another routes' ticket if there is any available. This project is secured too. The information of the bus can be installed. So, people won't have to worry and can review everything just by doing their other works. Storing data and the implementation of this developed system can do proper management and analysis.

3. Introduction:

Our country is over populated country. So, more transports are needed. But the transport system isn't very good in our country. This sector has many flaws which is hampering our economy and other social sectors. Bus is one of the most required transports in our country. But the system is not organized, not disciplined and in a bad a shape. So, to make the system a little bit more organized, we think our project is be helpful. This will be helpful for people to save their time and energy. The main objectives of our project on bus management system (BMS) are managing the details of the buses, booking ticket more easily, canceling ticket in an easy way, showing available bus routes, install bus information. This project carries the basic step for the people who travel by bus. This system contains booking a ticket by knowing the destination. A ticket can also be canceled. So, any company can handle this system easily. For an over populated country like us, we need more organized system for every step. But that's not happening. That's why we are lacking behind compared to other country. So if we start some new and digitalized system, we can progress. So by starting with improving the transport

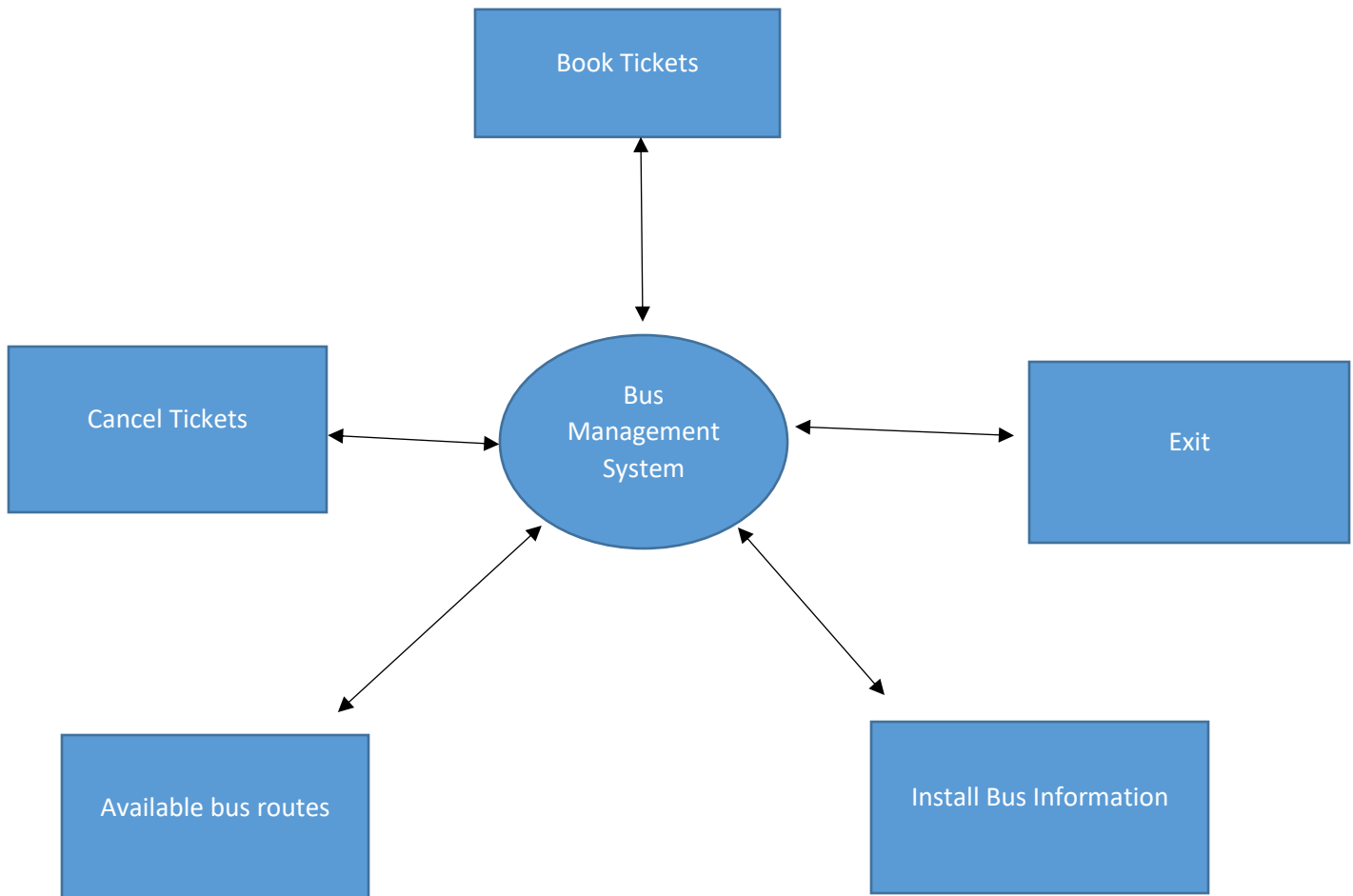
system means this bus management system, we can hope for some more organized system later.

If a company gives better service using this system, it can have good reviews and customer will like this system more. So, their management should be more organized and effective. They shouldn't do any unnecessary things using this system which will make customers feeling insecure. Then they won't believe this system and there won't be any response in this system. So, company representation will play a vital role in this system.

Therefore, this project is also a healthy way for booking and canceling tickets and minimize our time and energy. This can be hoped that this project will be a great help for the people.

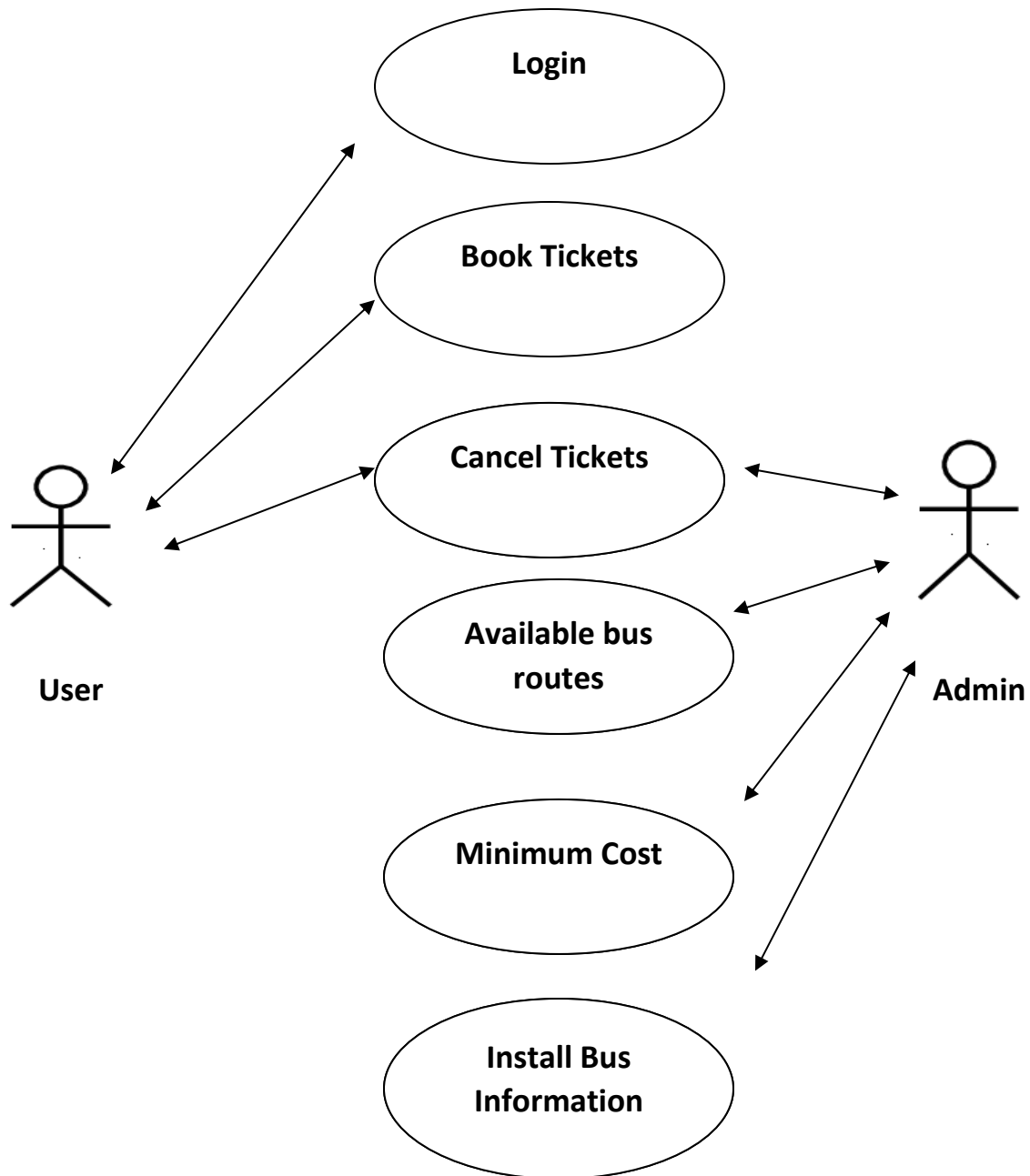
4.Design & Architecture:

Bus Management System Dataflow Diagram



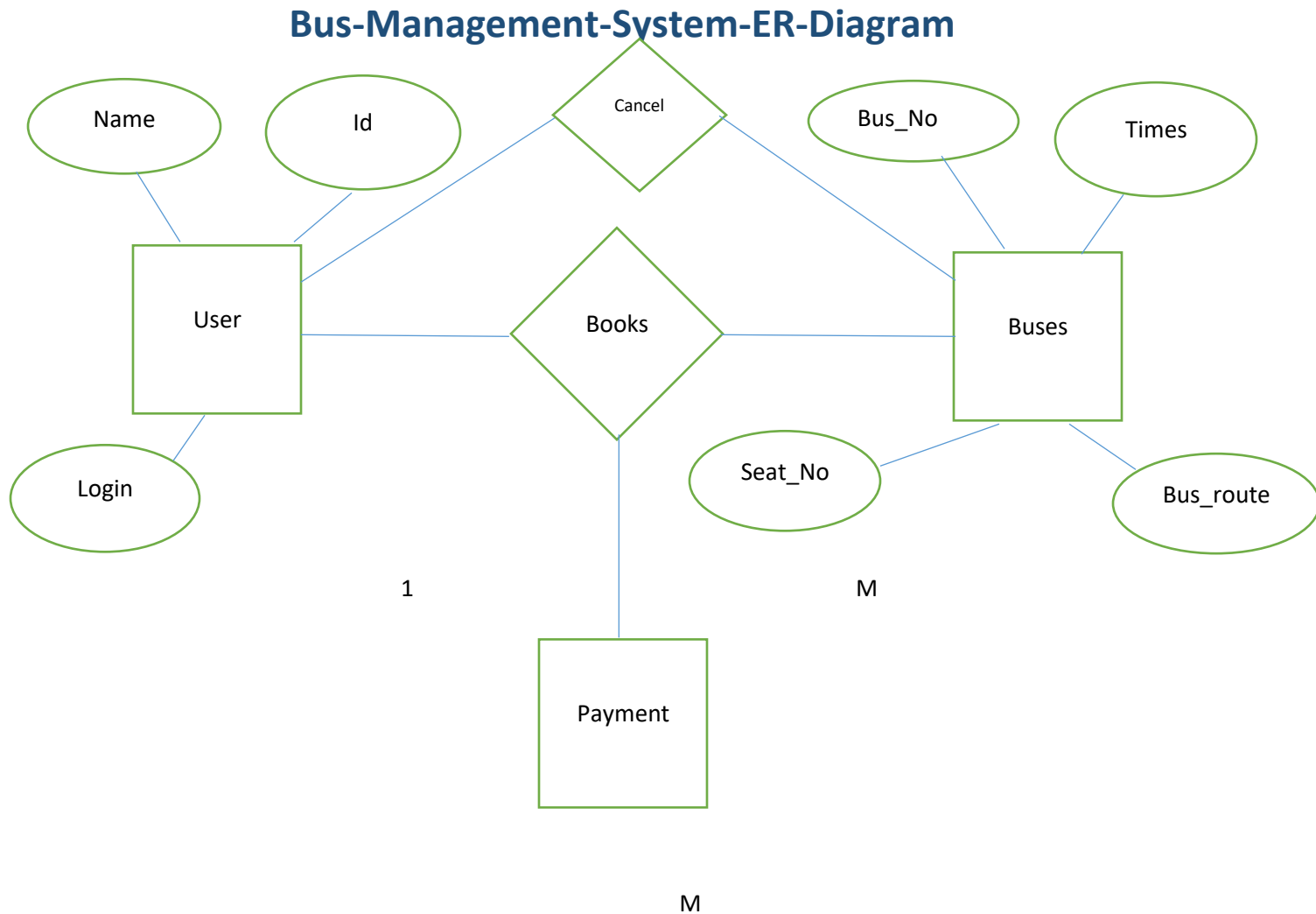
shows how the system is divided into sub-systems, each of which deals with one or more of the data flows to or from an external agent and which together provide all of the functionality of the bus booking system as a whole. It also identifies internal data stores of login, operating, ticket booking, sales, customer that must be present in order for the bus system to do its job, and shows the flow of the data between the various parts of bus, customer, log in. It provides a more detailed breakout of pieces of the level DFD.

Bus Management System Case-Diagram



This use case diagram is a graphic depiction of the interactions among the elements of bus ticket booking system. It represents the methodology used in the system analysis, clarify and organize system requirement of bus management system. The main actors of bus ticket booking system in

this use case diagram are: admin, user who perform the different types of use case such as booking ticket, Cancel Tickets, Available Bus Operators.



This ER (Entity Relationship) Diagram represents the model of Bus Management System. The (Entity-Relationship) Diagram of Bus Management System shows all the visual instrument of database table and the relations between booking

system. Bus route, seat etc.in this data is used define the relationships between structured data groups of Bus Management system functions. The main entities of the Bus Management system are Book Tickets, Cancel Tickets, Available Bus Operators, Exit.

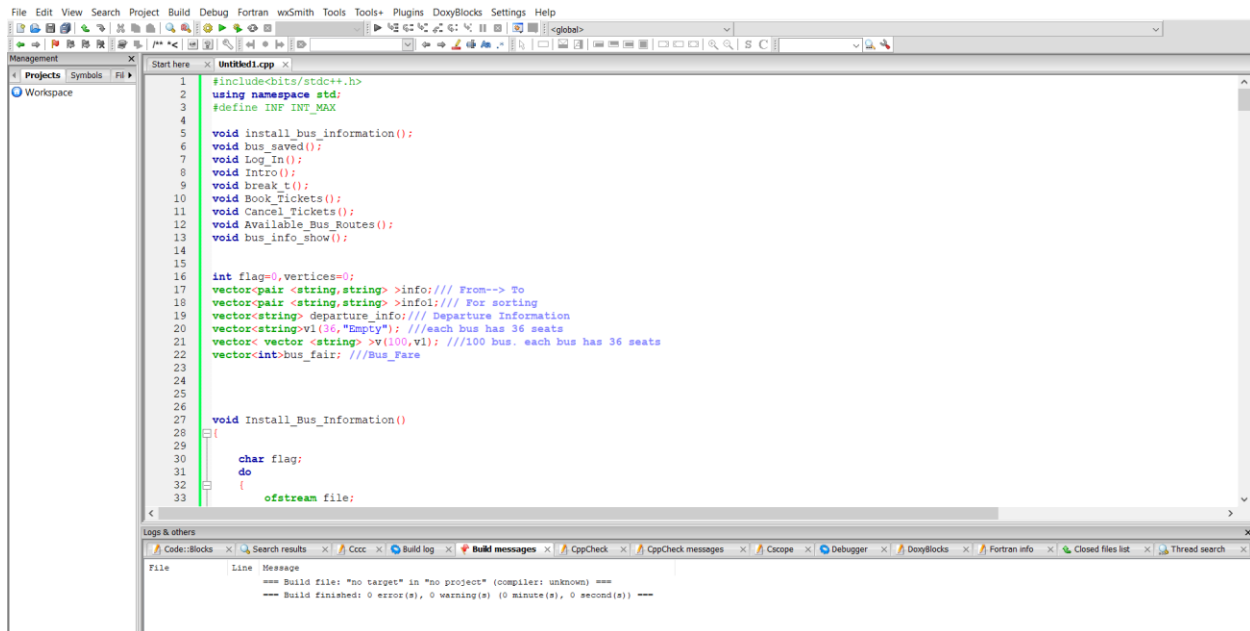
Bus Route Entity: Attributes of bus management system are bus_route, bus_no, seat_no, times.

Booking Entity: User, payment, Buses.

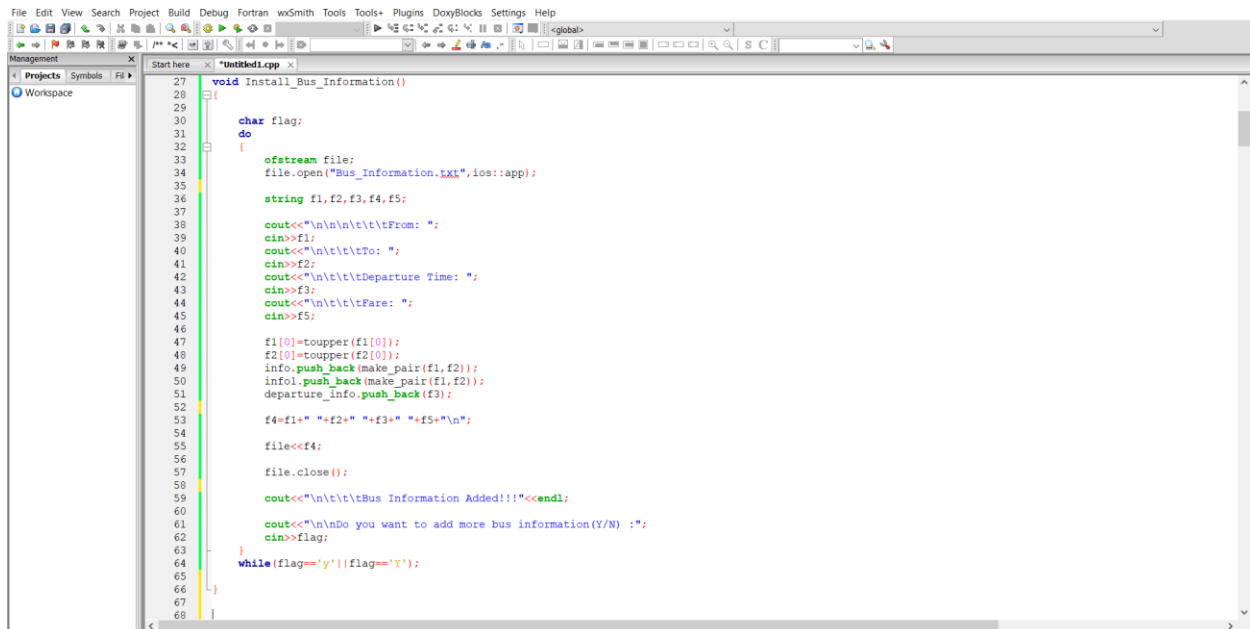
User Entity: Name, id, login.

Bus Entity: attributes of Bus are bus_id, bus_no, bus_seat, bus_ticket, bus_description.

5.Source Code



```
1 #include<bits/stdc++.h>
2 using namespace std;
3 #define INF_INT_MAX
4
5 void install_bus_information();
6 void bus_saved();
7 void Log_In();
8 void Intro();
9 void break_t();
10 void Book_Tickets();
11 void Cancel_Tickets();
12 void Available_Bus_Routes();
13 void bus_info_show();
14
15
16 int flag=0,vertices=0;
17 vector<pair<string,string>>info; // From-> To
18 vector<pair<string,string>>infol; // For sorting
19 vector<string>departure_info; // Departure Information
20 vector<string>v1{"", "Empty"}; //each bus has 36 seats
21 vector<vector<string>>v(100,v1); //100 bus. each bus has 36 seats
22 vector<int>bus_fair; //Bus_Fare
23
24
25
26
27 void Install_Bus_Information()
28 {
29
30     char flag;
31     do
32     {
33         ofstream file;
```



```
27 void Install_Bus_Information()
28 {
29
30     char flag;
31     do
32     {
33         ofstream file;
34         file.open("Bus_Information.txt", ios::app);
35
36         string f1,f2,f3,f4,f5;
37
38         cout<<"\n\n\n\t\t\tFrom: ";
39         cin>>f1;
40         cout<<"\n\n\t\t\tTo: ";
41         cin>>f2;
42         cout<<"\n\n\t\t\tDeparture Time: ";
43         cin>>f3;
44         cout<<"\n\n\t\t\tFare: ";
45         cin>>f5;
46
47         f1[0]=toupper(f1[0]);
48         f2[0]=toupper(f2[0]);
49         info.push_back(make_pair(f1,f2));
50         infol.push_back(make_pair(f1,f2));
51         departure_info.push_back(f3);
52
53         f4=f1+" "+f2+" "+f3+" "+f5+"\n";
54
55         file<<f4;
56
57         file.close();
58
59         cout<<"\n\n\t\t\tBus Information Added!!!"<<endl;
60
61         cout<<"\n\nDo you want to add more bus information(Y/N) :";
62         cin>>flag;
63     }
64     while(flag=='y' || flag=='Y');
65
66 }
67
68 }
```

The screenshot shows a C++ IDE with a menu bar (File, Edit, View, Search, Project, Build, Debug, Fortran, wsSmith, Tools, Plugins, DoxyBlocks, Settings, Help) and a toolbar. The left sidebar has tabs for Projects, Symbols, and File, with 'Workspace' selected. The main editor window is titled 'untitled1.cpp' and shows the following code:

```
69
70 void bus_saved()
71 {
72
73     int c=0;
74     ifstream file;
75     string word;
76     file_name="Bus_Information.txt";
77     file.open(file_name.c_str());
78     while(file>>word)
79     {
80
81         c++;
82         if(c==1)
83             s1=word;
84         if(c==2)
85             s2=word;
86         if(c==3)
87         {
88             s1[0]=toupper(s1[0]);
89             s2[0]=toupper(s2[0]);
90             departure_info.push_back(word);
91             info.push_back(make_pair(s1,s2));
92             info1.push_back(make_pair(s1,s2));
93         }
94         if(c==4)
95         {
96
97             stringstream ss(word);
98             int fair;
99             ss>>fair;
100             bus_fair.push_back(fair);
101             c=0;
102         }
103     }
104 }
105
106
107
108
109
110
```

The screenshot shows the same C++ IDE with the 'untitled1.cpp' file. The code shown is:

```
107
108
109
110
111 void bus_info_show()
112 {
113
114
115     cout<<"Bus Information: "<<endl<<endl;
116     cout.width(15);
117
118     cout<<"From:";
119     cout.width(12);
120     cout<<"To:";
121     cout.width(19);
122     cout<<"Departure_Time"<<endl<<endl;
123
124     for(int i=0; i<info.size(); i++)
125     {
126
127         cout.width(3);
128         cout<<i<<endl;
129         cout.width(12);
130         cout<<info[i].first;
131         cout.width(12);
132         cout<<info[i].second;
133         cout.width(12);
134         cout<<departure_info[i]<<endl;
135     }
136 }
137
138
139
140
141
142
143
144
145
146
147
148
```


A screenshot of a C++ IDE window titled "Untitled1.cpp". The code implements a bubble sort algorithm. It starts with a function signature `void Available_Bus_Routes()`, followed by system headers and a namespace declaration. A vector of pairs is populated with bus route information. The sorting logic uses nested loops: an outer loop from 0 to size-1, and an inner loop from 0 to size-i-1. Inside the inner loop, it compares the first elements of adjacent pairs and swaps them if they are out of order. After each pass, it prints the current state of the vector. Finally, it prompts the user to enter a search value and checks if it exists in the sorted array.

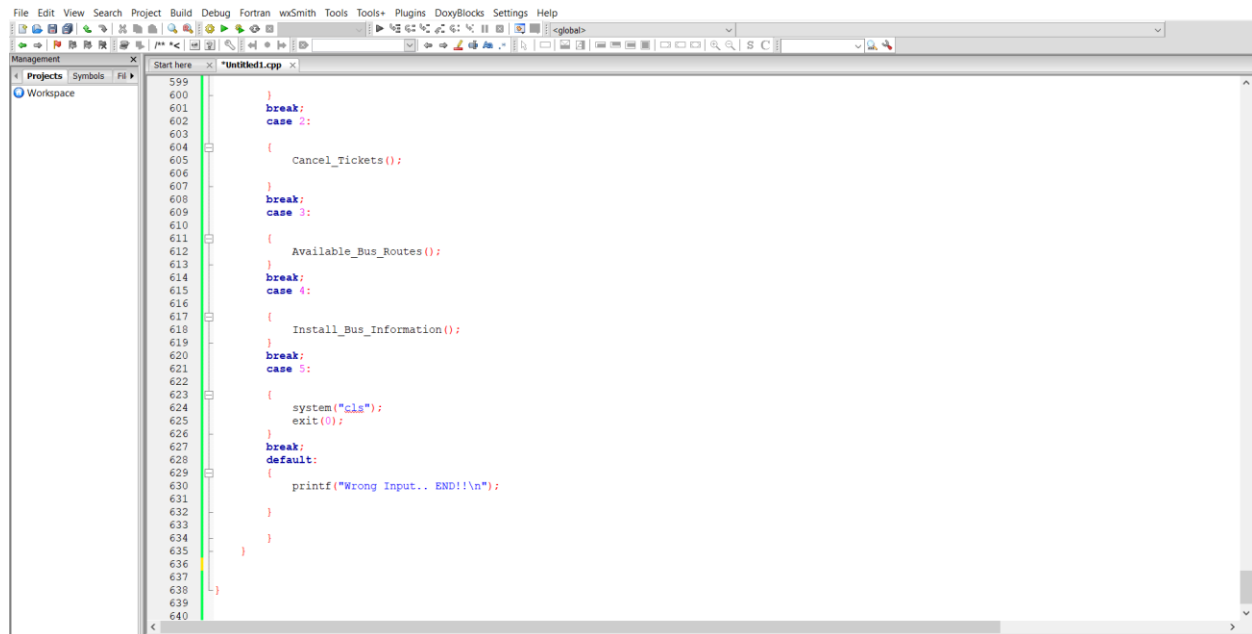
```
367 void Available_Bus_Routes()  
368 {  
369     system("cls");  
370     cout<<"\n\n\t\t\tAvailable Bus Routes"<<endl<<endl<<endl;  
371  
372     //Bubble sort  
373  
374     for(int i=0; i<infol.size()-1; i++)  
375     {  
376         for(int j=0; j<infol.size()-1-i; j++)  
377         {  
378             if(infol[j].first>infol[j+1].first)  
379             {  
380                 swap(infol[j].first,infol[j+1].first);  
381                 swap(infol[j].second,infol[j+1].second);  
382             }  
383         }  
384         cout<<endl<<endl;  
385     }  
386     for(int i=0; i<infol.size(); i++)  
387     {  
388         cout<<infol[i].first<<" to "<<infol[i].second<<endl<<endl;  
389     }  
390  
391     int flag=0;  
392     cout<<"\n\n\t\t\tEnter 1 to search bus routes: ";  
393     cin>>flag;  
394     if(flag==1)
```

```
File Edit View Search Project Build Debug Fortran wsSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Management
Projects Symbols File
Workspace
Start here x Untitled1.cpp x
444 void break_t(unsigned int t)
445 {
446     clock_t tym=t+clock();
447     while(tym>clock());
448 }
449
450
451 void Log_In()
452 {
453     while(!)
454     {
455         int u,p;
456         system("cls");
457         Intro();
458
459         if(p==1&&u==1)
460             cout<<"\n\n\t\t\tWrong username and password!! ,Try again"<<endl;
461         else if(u==1)
462             cout<<"\n\n\t\t\tWrong username!! ,Try again"<<endl;
463         else if(p==1)
464             cout<<"\n\n\t\t\tWrong password!! ,Try again"<<endl;
465         else
466             u=0,p=0;
467
468         string user_name,password,user="",pass="";
469         cout<<"\n\n\t\t\tUsername:";
470         cin>>user_name;
471         cout<<"\n\n\t\t\tPassword:";
472         cin>>password;
473
474         fstream new_file1,new_file2;
475         new_file1.open("username.txt",ios::in);
476         new_file2.open("password.txt",ios::in);
477
478         char a,b;
479         while(!new_file1.fail())
480         {
481             new_file1>>a;
482             if (new_file1.eof())
483                 break;
484             user+=a; ///user=user+a;
485         }
486         while(!new_file2.fail())
487         {
488             new_file2>>b;
489             if (new_file2.eof())
490                 break;
491             pass+=b; ///pass=pass+b
492         }
493         if(user==user_name&&pass==password)
494         {
495             system("cls");
496             cout<<"\n\n\n\n\t\t\tWelcome to Bus Management system";
497             for(int i=0; i<=7; i++)
498             {
499                 break_t(125);
500                 cout<<" ";
501             }
502             break;
503         }
504         else
505         {
506             if(user!=user_name)
507                 u=1;
508             if(pass!=password)
509                 p=1;
510         }
511     }
512 }
```

```
File Edit View Search Project Build Debug Fortran wsSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Management
Projects Symbols File
Workspace
Start here x Untitled1.cpp x
480 char a,b;
481 while(!new_file1.fail())
482 {
483     new_file1>>a;
484     if (new_file1.eof())
485         break;
486     user+=a; ///user=user+a;
487 }
488 while(!new_file2.fail())
489 {
490     new_file2>>b;
491     if (new_file2.eof())
492         break;
493     pass+=b; ///pass=pass+b
494 }
495 if(user==user_name&&pass==password)
496 {
497     system("cls");
498     cout<<"\n\n\n\n\t\t\tWelcome to Bus Management system";
499     for(int i=0; i<=7; i++)
500     {
501         break_t(125);
502         cout<<" ";
503     }
504     break;
505 }
506 else
507 {
508     if(user!=user_name)
509         u=1;
510     if(pass!=password)
511         p=1;
512 }
```

```
527
528
529 void Intro()
530 {
531     cout<<endl<<endl<<endl;
532     cout<<"\t\t\t\tBUS MANAGEMENT SYSTEM"<<endl;
533 }
534 void Save()
535 {
536
537     ofstream User_Name,Password;
538     User_Name.open("username.txt",ios::out);
539     Password.open("password.txt",ios::out);
540     User_Name<<"admin";
541     Password<<"admin";
542     User_Name.close();
543     Password.close();
544 }
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
```

```
569 int main()
570 {
571     bus_saved(); //Store bus information from file
572     Intro(); //Title print
573     Save(); //Read username & password from file
574     Log_In(); //Log in
575
576     while(1)
577     {
578         system("cls");
579
580         int press;
581         Intro();
582
583         cout<<endl<<endl;
584         cout<<"\t\t\t\t1. Book Tickets"<<endl;
585         cout<<"\t\t\t\t2. Cancel Tickets"<<endl;
586         cout<<"\t\t\t\t3. Available Bus Operators"<<endl;
587         cout<<"\t\t\t\t4. Install Bus Information"<<endl;
588         cout<<"\t\t\t\t5. Exit"<<endl;
589
590         cout<<"\n\t\t\t\tEnter option:--> ";
591         cin>>press;
592
593         switch(press)
594         {
595             case 1:
596             {
597                 Book_Tickets();
598             }
599             break;
600             case 2:
601             {
602                 Cancel_Tickets();
603             }
604             break;
605             case 3:
606             {
607                 Exit();
608             }
609             break;
610         }
```

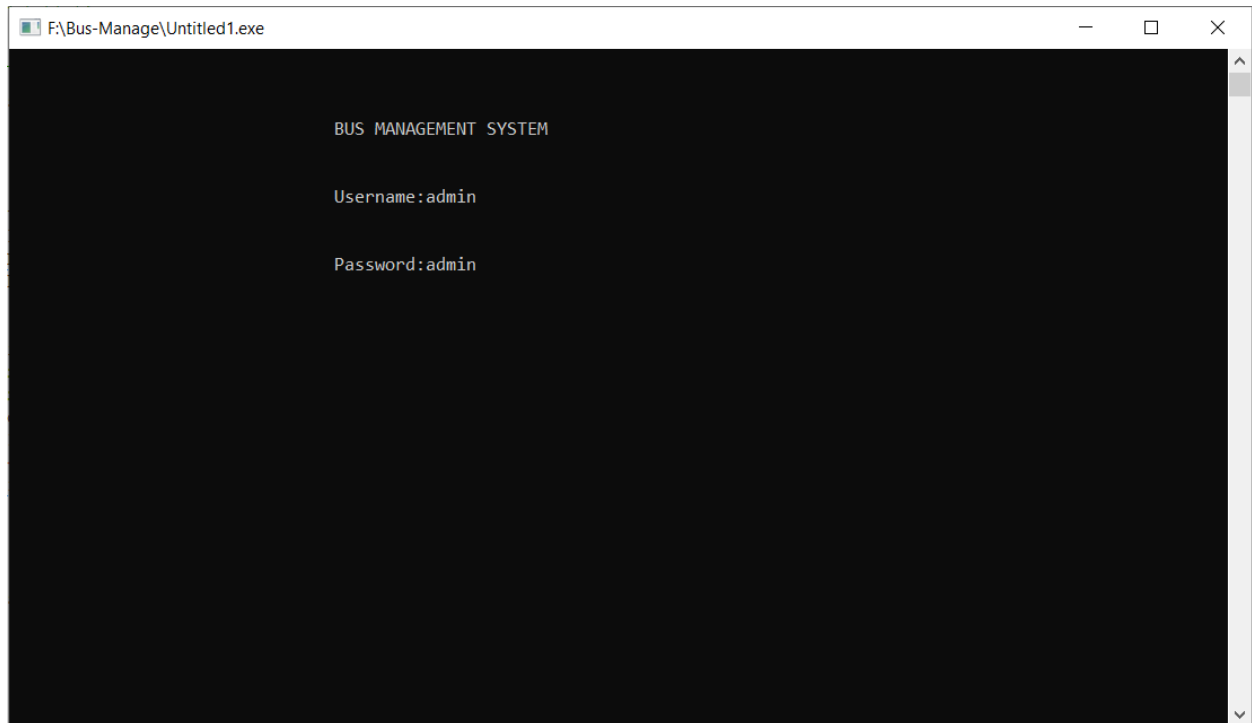


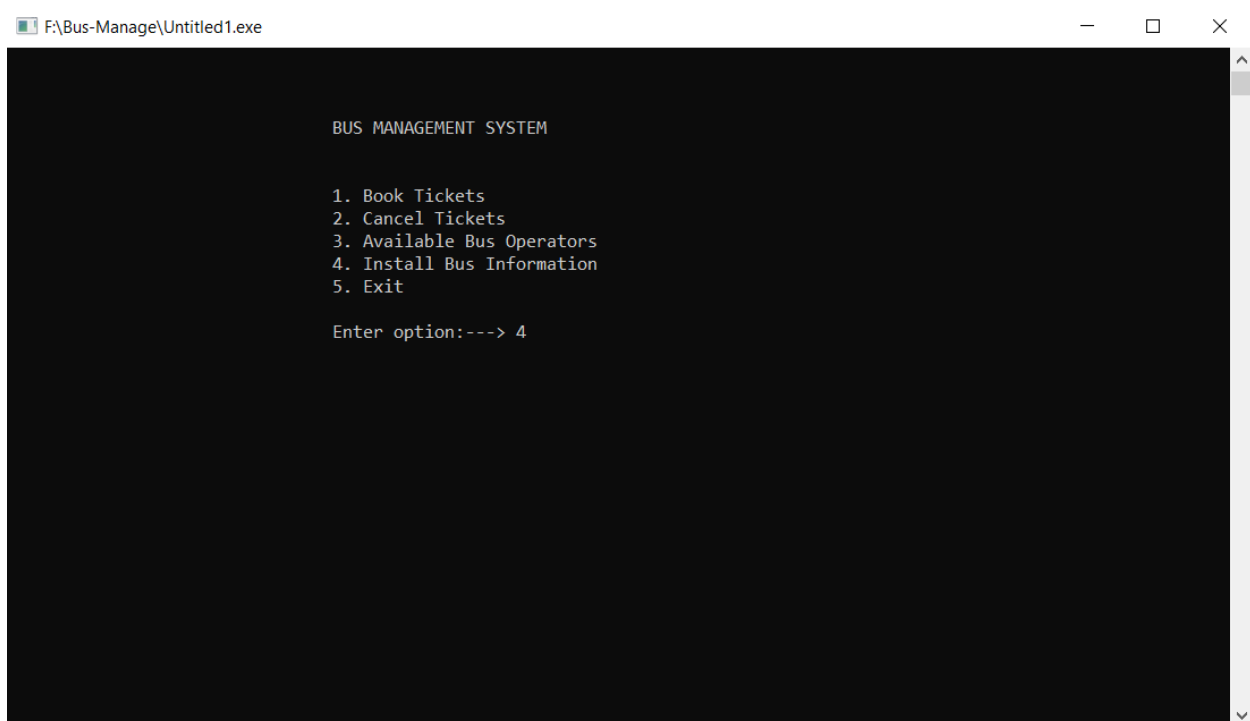
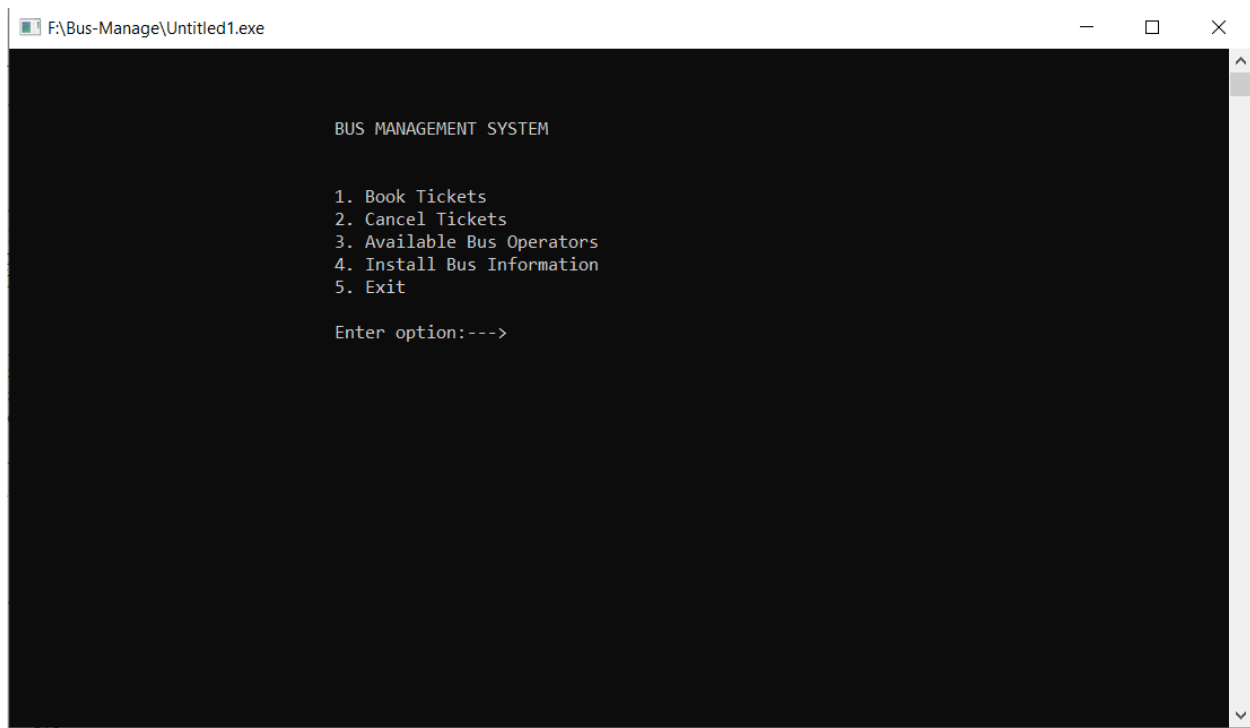
The image shows a screenshot of a C++ IDE. The main window displays a code file named "untitled1.cpp" with a switch-case statement. The code is as follows:

```
599  
600  
601     }  
602     break;  
603     case 2:  
604     {  
605         Cancel_Tickets();  
606     }  
607     break;  
608     case 3:  
609     {  
610         Available_Bus_Routes();  
611     }  
612     break;  
613     case 4:  
614     {  
615         Install_Bus_Information();  
616     }  
617     break;  
618     case 5:  
619     {  
620         system("cls");  
621         exit(0);  
622     }  
623     break;  
624     default:  
625     {  
626         printf("Wrong Input.. END!!\n");  
627     }  
628 }  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640
```


6. Validation, verification and Testing:

➤ Validation, verification :





```
F:\Bus-Manage\Untitled1.exe

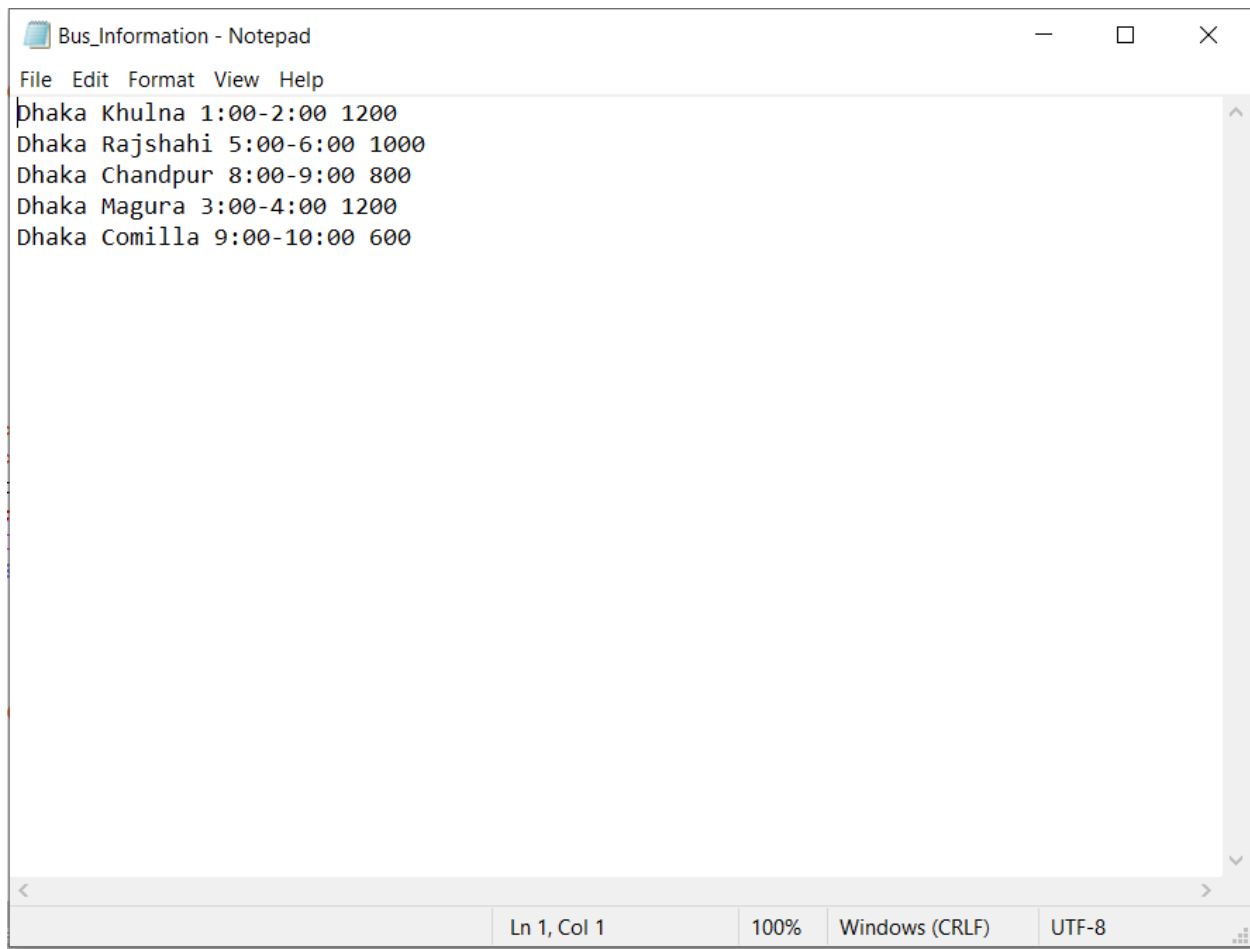
BUS MANAGEMENT SYSTEM

1. Book Tickets
2. Cancel Tickets
3. Available Bus Operators
4. Install Bus Information
5. Exit

Enter option:---> 4

From: Dhaka
To: Khulna
Departure Time: 1:00-2:00
Fare: 1200
Bus Information Added!!!

Do you want to add more bus information(Y/N) :y
```

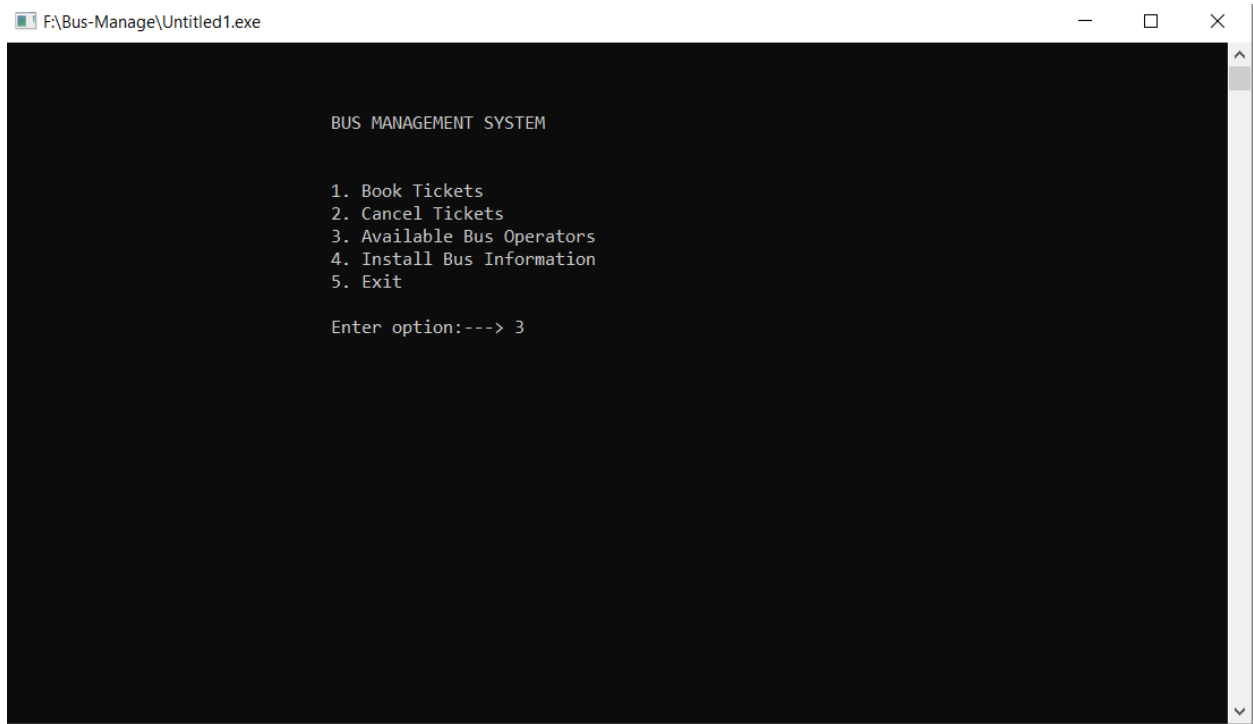


Bus_Information - Notepad

File Edit Format View Help

Dhaka Khulna 1:00-2:00 1200
Dhaka Rajshahi 5:00-6:00 1000
Dhaka Chandpur 8:00-9:00 800
Dhaka Magura 3:00-4:00 1200
Dhaka Comilla 9:00-10:00 600

Ln 1, Col 1 100% Windows (CRLF) UTF-8



```
F:\Bus-Manage\Untitled1.exe

Search bus routes that available or not??

From: Dhaka

To: Khulna

Bus is Available

From: Dhaka

To: Khulna

Press any key to continue . . .
```

```
F:\Bus-Manage\Untitled1.exe

BUS MANAGEMENT SYSTEM

1. Book Tickets
2. Cancel Tickets
3. Available Bus Operators
4. Install Bus Information
5. Exit

Enter option:---> 1
```

```
F:\Bus-Manager\Untitled1.exe

Bus Information:

      From      To      Departure_Time
1.      Dhaka      Khulna      1:00-2:00
2.      Dhaka      Rajshahi      5:00-6:00
3.      Dhaka      Chandpur      8:00-9:00
4.      Dhaka      Magura      3:00-4:00
5.      Dhaka      Comilla      9:00-10:00

Enter Bus No: 1
```

```
F:\Bus-Manager\Untitled1.exe

Bus Information:

      From      To      Departure_Time
1.      Dhaka      Khulna      1:00-2:00
2.      Dhaka      Rajshahi      5:00-6:00
3.      Dhaka      Chandpur      8:00-9:00
4.      Dhaka      Magura      3:00-4:00
5.      Dhaka      Comilla      9:00-10:00

Enter Bus No: 1

Enter Passenger name: Faysal

The number of seat [1-36]: 1

Enter seat no that you want to book: 1
```

```
F:\Bus-Manage\Untitled1.exe

Bus no: 1
Departure time: 1:00-2:00
From: Dhaka to Khulna
Passenger name: Faysal
Seat fare: 1200
*****

1.    Faysal    2.    Empty    3.    Empty    4.    Empty
5.    Empty    6.    Empty    7.    Empty    8.    Empty
9.    Empty    10.   Empty    11.   Empty    12.   Empty
13.   Empty    14.   Empty    15.   Empty    16.   Empty
17.   Empty    18.   Empty    19.   Empty    20.   Empty
21.   Empty    22.   Empty    23.   Empty    24.   Empty
25.   Empty    26.   Empty    27.   Empty    28.   Empty
29.   Empty    30.   Empty    31.   Empty    32.   Empty
33.   Empty    34.   Empty    35.   Empty    36.   Empty

The seat no: 1 is reserved for Faysal
Total Fair: 1200.00 tk

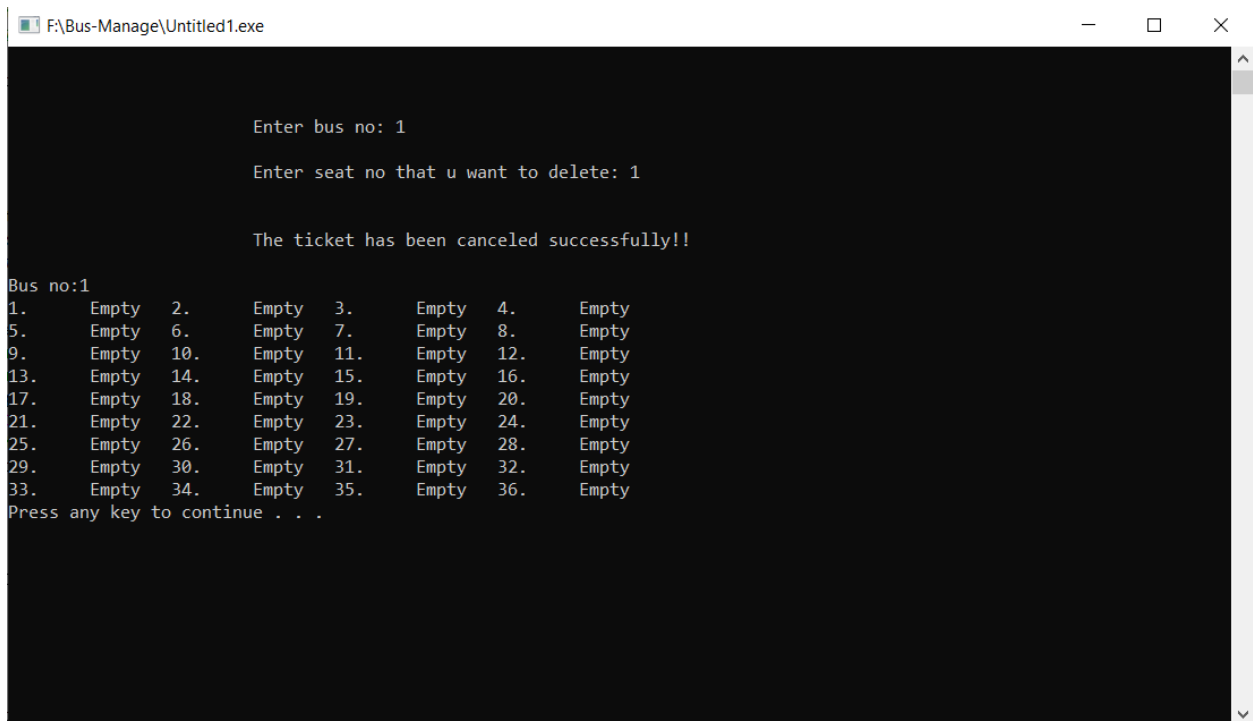
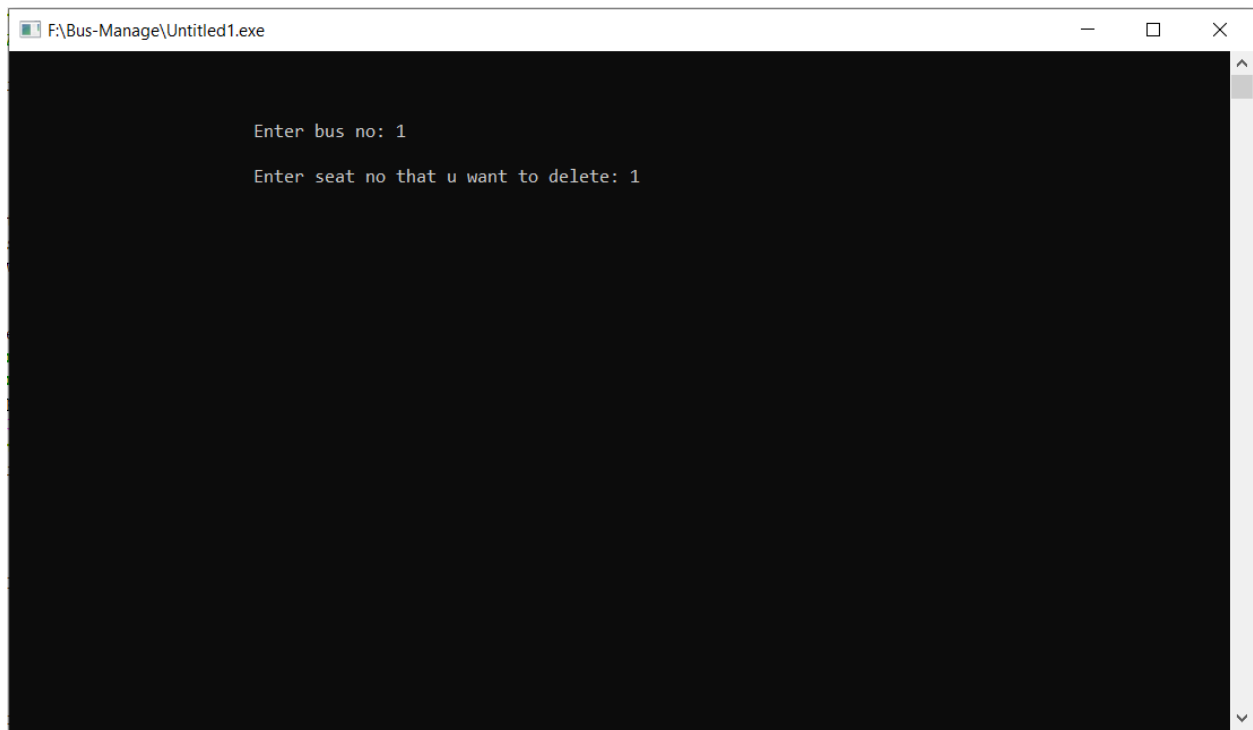
Do you want to buy more tickets(Y/N) :n
```

```
F:\Bus-Manage\Untitled1.exe

BUS MANAGEMENT SYSTEM

1. Book Tickets
2. Cancel Tickets
3. Available Bus Operators
4. Install Bus Information
5. Exit

Enter option:---> 2
```

➤ Testing:

Here we are doing testing to check software adaptability, to avoid risks and to identify errors. We know there are four types of testing but for our software, we are doing unit testing.

Reason behind choosing unit testing:

Basically, our software has four different functions and here we want to test them individually. So, unit testing will be perfect for that.

Unit testing

There are two kinds of unit testing but for our software we will choose white box testing.

White box testing allows to find the hidden errors, to find internal errors because it checks and works by internal functionality.

It helps to find issues and optimize code to adopt different techniques of White Box Testing to test a developed application or website.

It requires internal knowledge to do testing that's why it helps in maximum coverage of the code. White Box test requires programming knowledge.

Log In page testing: In our log in page we will enter the username and password. If both are correct, the dashboard page will open. Otherwise, if any data is incorrect, it will be redirected to the login page. And again, ask for the username and password.

So basically, if we enter wrong password or username or both wrong and then if our software doesn't show any errors, that's mean our testing is failed but if it shows error that's mean testing is successful.

7. Maintenance or Help Guide

- **Maintenance:** Basically, Software maintenance is part of the software development life cycle. The purpose of the service is to modify and continuously update software applications to eliminate all possible errors, malfunctions, to improve work efficiency and better system.
- **Corrective maintenance:** It is essential either to rectify some bugs observed while the system is in use.
 - **Seat Issue:** In our system seat issue is creating bugs. When two customers with the same name using book tickets, some problems arise. Again, if one of them cancels the ticket, it may confuse the other one and also cancel the other's one ticket.
- **Adaptive maintenance:** This includes modifications and updations when the customers need the product to run on new platforms.
 - **Running this project on flutter:** We are trying to make our software android based. So, our next target is to run this software on flutter.
- **Perfective maintenance:** It supports new features that the users want or to change different types of functionalities of the system according to the customer demands. So we are using two new features.
 - **Forgot Password:** Our software still doesn't have this "[Forgot Password](#)" feature. As some customers can forget their password, this feature is actually an important feature for a software. So, this new feature will be added.
 - **Online Payment:** Now everything has been digitalized and many people feel very comfortable with online payment. And online payment also saves times and energy. So our next target is to build this feature.
- **Preventive maintenance:** This type of maintenance includes modifications and updations to prevent future problems of the software.
 - **Update seat Issue:** So basically, as there is an issue about seat, we will update this feature.

➤ **Help Guide:**

We want you to have an easy and safe journey and you can get that experience by using our software.

For you to know how to use our software, we are giving the guidelines you need to know.

- Login to dashboard
- From navigation bar press "3" to find Available Bus Operators.
- Press "1" for Book Tickets & seat reservation
- Press "2" for Cancel Tickets