ENSF 337– Programming Fundamentals
Term Project Instruction

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Objectives:

The objective of this term project is to give you an opportunity to apply the principles of C++ programming and some of its fundamental concepts of object-oriented programming in an application that is relatively close to a real-world example, but still in much smaller scale and without many real-world software features such as client-server, or web based programming.

Due Date:

The project is due on Friday December 1st, 2023 at 11:59 PM. The source codes (.cpp and .h files) and the executable files (a.exe or a.out for Mac users) must be wrapped in a zip file using the following naming rule and post it on into a Dropbox on the D2L

`YourLastName_Term_Project.zip`

Project Description:

In this project you are going to develop a small "Flight Management Program" in C++ that its overall functionalities are as follows:

- The program starts with a title as follows:

```
Version: 1.0
Term Project – Flight Management Program in C++
Produced by: Student Name

<<< Press Return to Continue>>>>
```

- When the user presses return the program reads a file that contains the a Flight number (a combination of letters and numbers , for example `WJ1145` stands for `WestJet 1145`), followed by the number of rows and the number of seats per row in an aircraft (for example `24` rows and `6` seats per row), and the rest of the file is filled with the passengers information, which includes: first name, last name, phone number, assigned seat (for example `6A` that stands for row number `6` and seat `A`), and the last field is an id number for each passenger. Here is the example of such a file:

```
WJ1145   24    6
Tom                Harris              403-100-0000        6A  10000
Tim                Moore               403-020-0000        5B  10001
Jim                Li                  403-003-0000        23C 10002
```

  The data from this file must be read into an array of object of a class that you should develop and is called class `Passenger`. You have also the option of creating your own Linked List of `Passenger` objects, if you want. The other option is to use a C++ library class called vector. The last one (mean using vectors) is a preferred option as it is more powerful, easier to use, and saves you lots of time. For names and string types also preferred tool to use is C++ library class `string` instead of c-string.

  When reading the data from file you should save the data about each passenger's seat inside another object of a class called `Seat`, which is accessible form class `Passenger` through a Seat Pointer. Moreover, another class called Flight should use class Passenger, and forms the list of passengers.

- Once the data from file is read into your program, your program should be able to:
  - Show the flight seat map on the screen
  - Show the passenger information on the screen
  - Add a new passenger to the list
  - Remove an existing passenger from the list
  - Save the passenger information from list back into the file
  - Terminate the program when user wishes

Here is a snapshot of a sample run of the expected program:

Note: the text in RED is the user input

```
Version: 1.0
Term Project – Flight Management Program in C++
Produced by: Student Name
Year: 2023

<<< Press Return to Continue>>>>
<<< Press Return to Continue>>>>

Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 1

      Aircraft Seat Map
     A   B   C   D   E   F
   +---+---+---+---+---+---+
0  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
1  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
2  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
3  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
4  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
5  |   | X |   |   |   |   |
   +---+---+---+---+---+---+
6  | X |   |   |   |   |   |
   +---+---+---+---+---+---+
7  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
8  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
9  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
10 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
11 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
12 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
13 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
14 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
15 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
16 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
17 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
18 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
19 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
20 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
21 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
22 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
23 |   |   | X |   |   |   |
   +---+---+---+---+---+---+
24 |   |   |   |   |   |   |
   +---+---+---+---+---+---+

<<< Press Return to Continue>>>>
```

```
Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 2

First Name       Last Name        Phone          Row   Seat  ID
 ---------------------------------------------------------------
Tom              Harris          403-100-0000    6     A     10000
 ---------------------------------------------------------------
Tim              Moore           403-020-0000    5     B     10001
 ---------------------------------------------------------------
Jim              Li              403-003-0000    33     C    10002
 ---------------------------------------------------------------

<<< Press Return to Continue>>>>

Please select one the following options:

1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 3

Please enter the passenger id: 10005
Please enter the passenger first name: Mariam
Please enter the passenger last name: Wright
Please enter the passenger phone number: 403 000 1234

Enter the passenger's desired row:  23
Enter the passenger's desired seat: D

Please select one the following options:
1. Display Flight Seat Map.
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3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 2

First Name       Last Name        Phone          Row   Seat  ID
 ---------------------------------------------------------------
Tom              Harris          403-100-0000    6     A     10000
 ---------------------------------------------------------------
Tim              Moore           403-020-0000    5     B     10001
 ---------------------------------------------------------------
Jim              Li              403-003-0000    33     C    10002
 ---------------------------------------------------------------
Mariam           Wright          403-000-1234    23     D    10005
 ---------------------------------------------------------------

<<< Press Return to Continue>>>>

Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 3

Please enter the passenger id: 10006
Please enter the passenger first name: Emily
Please enter the passenger last name: Norman
Please enter the passenger phone number: 403 111 1234

Enter the passenger's desired row:  22
```

```
Enter the passenger's desired seat: D

Please select one the following options:

1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5 or 6) 2

First Name       Last Name        Phone          Row   Seat  ID
 ---------------------------------------------------------------
Tom              Harris          403-100-0000    6     A     10000
 ---------------------------------------------------------------
Tim              Moore           403-020-0000    5     B     10001
 ---------------------------------------------------------------
Jim              Li              403-003-0000    33     C    10002
 ---------------------------------------------------------------
Mariam           Wright          403-000-1234    23     D    10005
 ---------------------------------------------------------------
Emily           Norman           403-111-1234    22     D    10006
---------------------------------------------------------------

<<< Press Return to Continue>>>>

Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5, or 6) 4

Please enter the id of the passenger that needs to be removed: 10005

Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5, or 6) 2

First Name       Last Name        Phone          Row   Seat  ID
 ---------------------------------------------------------------
Tom              Harris          403-100-0000    6     A     10000
 ---------------------------------------------------------------
Tim              Moore           403-020-0000    5     B     10001
 ---------------------------------------------------------------
Jim              Li              403-003-0000    33     C    10002
 ---------------------------------------------------------------
Emily           Norman           403-111-1234    22     D    10006
 ---------------------------------------------------------------

<<< Press Return to Continue>>>>

Please select one the following options:
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5, or 6) 5

Do you want to save the data in the "flight_info.txt"? Please answer <Y or N> Y

All the data in the passenger list was saved into the flight_info.txt.

<<< Press Return to Continue>>>>

Please select one the following options:
```

```
1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5, or 6) 1

Aircraft Seat Map
     A   B   C   D   E   F
   +---+---+---+---+---+---+
0  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
1  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
2  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
3  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
4  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
5  |   | X |   |   |   |   |
   +---+---+---+---+---+---+
6  | X |   |   |   |   |   |
   +---+---+---+---+---+---+
7  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
8  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
9  |   |   |   |   |   |   |
   +---+---+---+---+---+---+
10 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
11 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
12 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
13 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
14 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
15 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
16 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
17 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
18 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
19 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
20 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
21 |   |   |   |   |   |   |
   +---+---+---+---+---+---+
22 |   |   |   | X |   |   |
   +---+---+---+---+---+---+
23 |   |   | X |   |   |   |
   +---+---+---+---+---+---+
24 |   |   |   |   |   |   |
   +---+---+---+---+---+---+

<<< Press Return to Continue>>>>

Please select one the following options:

1. Display Flight Seat Map.
2. Display Passengers Information.
3. Add a New Passenger.
4. Remove an Existing Passenger
5. Save data
6. Quit.

Enter your choice: (1, 2, 3, 4, 5, or ) 6

Program terminated.
```

MORE DETAILS AND HELP WLL BE PROVIDED DUIRING THE LECTURES.