This programming project is due on Thursday, August 21, 2025. Notice that that is also the last day of the course. Therefore, the normal "late policy", as described in the course *Syllabus*, would not allow for any significantly late submissions.

Reminder: Do your own work on this project. Do not obtain any code from another student, from an AI-based code generator or from the Internet in general. Do not show your code to anyone except the instructor, or an official BHCC Tutor. Refer also to the last page of the course *Syllabus*, for details about the BHCC policy regarding academic dishonesty.

Be sure that you read and understand this entire document before you begin writing your code. Pay close attention to the **Project Deliverables** and **Grading Criteria** sections of this document. If you have **questions**, ask the instructor during class or contact the instructor by BHCC e-mail: pmorgan@bhcc.edu.

Table of Contents

Airplane Fleet Application Program

This project involves designing and creating a C++ program that contains three C++ classes and uses **inheritance**, as described below. The base class (parent class) is the **Airplane** class. The **CargoPlane** and **PassengerPlane** classes are derived classes (child classes) of the **Airplane** class. A UML diagram of this class relationship is shown below:
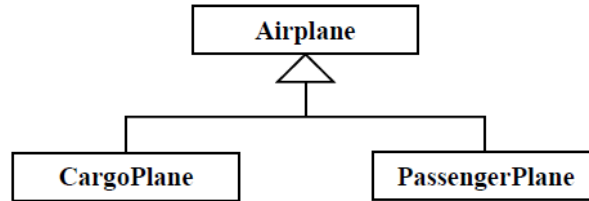
It is important to note that this is **NOT** multiple inheritance.

Design Requirements

1. The program **must** be designed using the three classes that are described in the previous section of this document. Any submission that does not conform to this requirement will receive a grade of ZERO.
2. The program **must** be organized as a "Command Loop" program, similar to the Command Loop sample program that we discussed during an earlier class. (Refer to the **Ch06_sample_code_CommandLoop…** resource in the **Sample Code** section of *Moodle*.)
3. The program **must** implement the following interactive commands:

a	**A**dd a new airplane to the fleet.
f	**F**ly a plane in the fleet.
h	print **H**elp text.
p	**P**rint current fleet information.
q	**Q**uit (end the program).
r	**R**emove airplane from the fleet.

   (Specific requirements for each command are stated in the **Requirements for Interactive Commands** section of this document.)

4. The program **must** create a **vector** of pointers to **Airplane** objects:
   the main function must have a local variable defined as shown here:

   ```
   vector<Airplane*> fleet;
   ```

   The **fleet** vector becomes an argument for the functions that process each of the user commands.

5. Each **Airplane** object must be *dynamically allocated* (using the C++ **new** operation) when the user executes the "**a**" command.
6. You are **NOT** allowed to use the **stringstream** class for any part of this assignment.

   If you submit a solution for this assignment that uses the **stringstream** class, the **basic_stringstream** class or *any* class associated with the **<sstream>** library, then your grade for the assignment will be ZERO.

Class Specification Files (provided with the assignment)

There are three class specification files (**Airplane.h**, **CargoPlane.h**, and **PassengerPlane.h**) provided to the student as part of the project assignment. *Ideally* the student should not need to modify these files in order to complete the project. Obviously, if the student does modify any of these files, then the modified versions must be submitted to *Moodle* with the rest of the source code files.

Airplane.h

This file *declares* the member variables and functions of the **Airplane** class. The <u>actual code</u> is included in this file for the destructor function <u>only</u>. The student must implement code for the constructor functions and for other member functions in the **Airplane.cpp** file.

CargoPlane.h

This file declares the member variables and functions of the **CargoPlane** class. The <u>actual code</u> is included in this file for the constructor and destructor functions <u>only</u>. The student must implement code for the other member functions in the **CargoPlane.cpp** file.

PassengerPlane.h

This file declares the member variables and functions of the **PassengerPlane** class. The actual code is included in this file for the constructor and destructor functions <u>only</u>. The student must implement code for other member functions in the **PassengerPlane.cpp** file.

Requirements for Interactive Commands

Command	Requirement

a	**Add** a new **Airplane** to the fleet**:**
	1. Output a prompt, asking the user to specify the type of airplane they wish to add (**c** = cargo, **p** = passenger)
	2. Ask the user to specify the various details about the airplane:
	   • Manufacturer
	   • Airplane **model**
	   • The **year** the airplane was built
	   • The total number of **hours** that the airplane has been flown.
	   • Cargo planes have a maximum cargo weight.
	   • Passenger planes have a maximum number of passengers.
	3. The constructor function for the **Airplane** class must assign to each new **Airplane** object a *unique* value for the
	 `int airplane_ID` member variable. For the lifetime of that particular **Airplane** object, its **airplane_ID** variable does not change after the constructor function has set it.
	Furthermore, once a particular *value* has been assigned for the **airplane_ID** member variable of some **Airplane** object, that value <u>cannot be re-used</u> as long as the program is running. The program keeps track of the **airplane_ID** values that have been assigned since the program started running. (An example of **how to do this** is available in the **Employee.h** source code provided with **Lab15a**, and is also discussed in Chapter 14 of the textbook.)
	
	CAUTION: Do not confuse the **airplane_ID** variable of an **Airplane** object with the current index into the **fleet** vector. Once an object is created, its **airplane_ID** variable will never change, but the contents of the vector may change depending on the sequence of user commands.

f	**Fly** a particular plane in the fleet. The user specifies the **airplane_ID** and flight length (hours). The software adds that time to the total **flightHours** for that particular **Airplane** object. The software also reports the updated description to the console.
h	Print **Help** text**:** Output a brief summary of the user commands.
p	**Print** the **fleet** data to screen**:** Output the description for all **Airplane** objects currently in the **fleet** vector.
q	**Quit** (exit) the program

Command	Requirement
r	**Remove** an Airplane from the fleet: • Ask the user to specify the **Airplane ID** number of the plane they wish to remove. • If there is a matching **Airplane ID** number in the **fleet** vector, then that object is removed from the **fleet** vector. • The program also returns the dynamic memory for the removed **Airplane** object to the memory management system. (That is, the program executes a **delete** operation for the **Airplane** object.) • If the user specifies an **Airplane ID** number that is *not* in use (no matching **Airplane ID** present in the vector), output an error message.

Sample Interactive Session

In the sample data on the next several pages, what the user types is shown in **bold** font. In actuality, what the user types would have the same text format as the rest of the output.

Sample Interactive Session

```
Enter command (or 'h' for help): h
Supported commands:
        a               add a new airplane to the fleet.
        f               fly a plane in the fleet.
        h               print help text.
        p               print fleet information.
        q               quit (end the program).
        r               remove airplane from the fleet.

Enter command (or 'h' for help): p
Current fleet contains 0 airplane(s):
Enter command (or 'h' for help): f
Which airplane do you want to fly? 3
Length of flight (hours)? 25
Airplane 3 not found.
Enter command (or 'h' for help): f
Which airplane do you want to fly? 0
Length of flight (hours)? 12
Airplane 0 not found.
Enter command (or 'h' for help): a
Enter type of airplane (c = cargo, p = passenger): c
Enter name of manufacturer: Boeing
Enter model: B747-400F
Enter year built: 1996
Enter flight hours: 73200
```

Sample Interactive Session

```
Enter maximum cargo weight: 102500
New airplane : ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996,
hours: 73200, max cargo: 102500
addNewAirplane:  Size of fleet = 1
```

```
Enter command (or 'h' for help): p
Current fleet contains 1 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
```

```
Enter command (or 'h' for help): a
```

```
Enter type of airplane (c = cargo, p = passenger): p
```

```
Enter name of manufacturer: Lockeed
```

```
Enter model: L-1011
```

```
Enter year built: 1992
```

```
Enter flight hours: 85300
```

```
Enter maximum Passenger count: 160
New airplane : ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992,
hours: 85300, max passengers: 160
addNewAirplane:  Size of fleet = 2
```

```
Enter command (or 'h' for help): p
Current fleet contains 2 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85300, max
passengers: 160
```

```
Enter command (or 'h' for help): a
```

```
Enter type of airplane (c = cargo, p = passenger): p
```

```
Enter name of manufacturer: Airbus
```

```
Enter model: A-350
```

```
Enter year built: 2004
```

```
Enter flight hours: 53200
```

```
Enter maximum Passenger count: 205
New airplane : ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours:
53200, max passengers: 205
addNewAirplane:  Size of fleet = 3
```

```
Enter command (or 'h' for help): p
Current fleet contains 3 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85300, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53200, max
passengers: 205
```

```
Enter command (or 'h' for help): a
```

```
Enter type of airplane (c = cargo, p = passenger): c
```

```
Enter name of manufacturer: Boeing
```

Sample Interactive Session

```
Enter model: B777-200F
Enter year built: 2008
Enter flight hours: 44607
Enter maximum cargo weight: 225000
New airplane : ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008,
hours: 44607, max cargo: 225000
addNewAirplane:  Size of fleet = 4
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85300, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53200, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
Enter command (or 'h' for help): a
Enter type of airplane (c = cargo, p = passenger): p
Enter name of manufacturer: Cessna
Enter model: C-185
Enter year built: 2003
Enter flight hours: 8500
Enter maximum Passenger count: 6
New airplane : ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours:
8500, max passengers: 6
addNewAirplane:  Size of fleet = 5
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85300, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53200, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8500, max
passengers: 6
Enter command (or 'h' for help): f
Which airplane do you want to fly? 3
Length of flight (hours)? 34
Choosing airplane: ID#: 3, manufacturer: Airbus, model: A-350, year: 2004,
hours: 53200, max passengers: 205
Flight complete: ID#: 3, manufacturer: Airbus, model: A-350, year: 2004,
hours: 53234, max passengers: 205
Enter command (or 'h' for help): p
```

Sample Interactive Session

```
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85300, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8500, max
passengers: 6
Enter command (or 'h' for help): f
Which airplane do you want to fly? 8
Length of flight (hours)? 18
Airplane 8 not found.
Enter command (or 'h' for help): f
Which airplane do you want to fly? 2
Length of flight (hours)? 100
Choosing airplane: ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992,
hours: 85300, max passengers: 160
Flight complete: ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992,
hours: 85400, max passengers: 160
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73200, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85400, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8500, max
passengers: 6
Enter command (or 'h' for help): f
Which airplane do you want to fly? 1
Length of flight (hours)? 7
Choosing airplane: ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996,
hours: 73200, max cargo: 102500
Flight complete: ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996,
hours: 73207, max cargo: 102500
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85400, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
```

Sample Interactive Session

```
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8500, max
passengers: 6
Enter command (or 'h' for help): f

Which airplane do you want to fly? 5

Length of flight (hours)? 4
Choosing airplane: ID#: 5, manufacturer: Cessna, model: C-185, year: 2003,
hours: 8500, max passengers: 6
Flight complete: ID#: 5, manufacturer: Cessna, model: C-185, year: 2003,
hours: 8504, max passengers: 6
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85400, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
Enter command (or 'h' for help): r

Which airplane do you want to remove? 6
Airplane 6 not found.
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992, hours: 85400, max
passengers: 160
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
Enter command (or 'h' for help): r

Which airplane do you want to remove? 2
Choosing airplane: ID#: 2, manufacturer: Lockeed, model: L-1011, year: 1992,
hours: 85400, max passengers: 160
Destructor for PassengerPlane 2
Destructor for Airplane 2
Removal complete: Airplane [ID#: 2, manufacturer: Lockeed, model: L-1011,
year: 1992, hours: 85400, max passengers: 160] has been removed.
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
```

Sample Interactive Session

```
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53234, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
Enter command (or 'h' for help): f
Which airplane do you want to fly? 2
Length of flight (hours)? 8
Airplane 2 not found.
Enter command (or 'h' for help): f
Which airplane do you want to fly? 3
Length of flight (hours)? 12
Choosing airplane: ID#: 3, manufacturer: Airbus, model: A-350, year: 2004,
hours: 53234, max passengers: 205
Flight complete: ID#: 3, manufacturer: Airbus, model: A-350, year: 2004,
hours: 53246, max passengers: 205
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
Enter command (or 'h' for help): a
Enter type of airplane (c = cargo, p = passenger): p
Enter name of manufacturer: Boeing
Enter model: B757-200
Enter year built: 2009
Enter flight hours: 35200
Enter maximum Passenger count: 185
New airplane : ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009,
hours: 35200, max passengers: 185
addNewAirplane:  Size of fleet = 5
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
```

Sample Interactive Session

```
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009, hours: 35200, max
passengers: 185

Enter command (or 'h' for help): f

Which airplane do you want to fly? 6

Length of flight (hours)? 16
Choosing airplane: ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009,
hours: 35200, max passengers: 185
Flight complete: ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009,
hours: 35216, max passengers: 185

Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009, hours: 35216, max
passengers: 185

Enter command (or 'h' for help): f

Which airplane do you want to fly? 0

Length of flight (hours)? 10
Airplane 0 not found.

Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009, hours: 35216, max
passengers: 185

Enter command (or 'h' for help): a

Enter type of airplane (c = cargo, p = passenger): c

Enter name of manufacturer: Airbus

Enter model: A-360

Enter year built: 2007

Enter flight hours: 38500

Enter maximum cargo weight: 300000
```

Sample Interactive Session

```
New airplane : ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours:
38500, max cargo: 300000
addNewAirplane:  Size of fleet = 6
Enter command (or 'h' for help): p
Current fleet contains 6 airplane(s):
ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996, hours: 73207, max
cargo: 102500
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009, hours: 35216, max
passengers: 185
ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours: 38500, max
cargo: 300000
Enter command (or 'h' for help): r

Which airplane do you want to remove? 1
Choosing airplane: ID#: 1, manufacturer: Boeing, model: B747-400F, year: 1996,
hours: 73207, max cargo: 102500
Destructor for CargoPlane 1
Destructor for Airplane 1
Removal complete: Airplane [ID#: 1, manufacturer: Boeing, model: B747-400F,
year: 1996, hours: 73207, max cargo: 102500] has been removed.
Enter command (or 'h' for help): p
Current fleet contains 5 airplane(s):
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009, hours: 35216, max
passengers: 185
ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours: 38500, max
cargo: 300000
Enter command (or 'h' for help): r

Which airplane do you want to remove? 6
Choosing airplane: ID#: 6, manufacturer: Boeing, model: B757-200, year: 2009,
hours: 35216, max passengers: 185
Destructor for PassengerPlane 6
Destructor for Airplane 6
Removal complete: Airplane [ID#: 6, manufacturer: Boeing, model: B757-200,
year: 2009, hours: 35216, max passengers: 185] has been removed.
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
```

Sample Interactive Session

```
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours: 38500, max
cargo: 300000
Enter command (or 'h' for help): f
Which airplane do you want to fly? 1
Length of flight (hours)? 7
Airplane 1 not found.
Enter command (or 'h' for help): f
Which airplane do you want to fly? 7
Length of flight (hours)? 9
Choosing airplane: ID#: 7, manufacturer: Airbus, model: A-360, year: 2007,
hours: 38500, max cargo: 300000
Flight complete: ID#: 7, manufacturer: Airbus, model: A-360, year: 2007,
hours: 38509, max cargo: 300000
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8504, max
passengers: 6
ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours: 38509, max
cargo: 300000
Enter command (or 'h' for help): c
Invalid command:  c
Enter command (or 'h' for help): f
Which airplane do you want to fly? 5
Length of flight (hours)? 10
Choosing airplane: ID#: 5, manufacturer: Cessna, model: C-185, year: 2003,
hours: 8504, max passengers: 6
Flight complete: ID#: 5, manufacturer: Cessna, model: C-185, year: 2003,
hours: 8514, max passengers: 6
Enter command (or 'h' for help): p
Current fleet contains 4 airplane(s):
ID#: 3, manufacturer: Airbus, model: A-350, year: 2004, hours: 53246, max
passengers: 205
ID#: 4, manufacturer: Boeing, model: B777-200F, year: 2008, hours: 44607, max
cargo: 225000
ID#: 5, manufacturer: Cessna, model: C-185, year: 2003, hours: 8514, max
passengers: 6
ID#: 7, manufacturer: Airbus, model: A-360, year: 2007, hours: 38509, max
cargo: 300000
Enter command (or 'h' for help): q
Are you sure that you want to exit the program? y
```

Project Deliverables

The project source file(s) must be submitted to *Moodle*, using the *Moodle* Activity:

CSC237_Project3

Submit your `.cpp` file(s) <u>and</u> any `.h` file(s) that you create or modify. I will need to compile your code on my home computer in order to grade it. If you are submitting more than one file (`.cpp` and/or `.h`), do **not** enclose the files in a ZIP file or any other collection file. *Moodle* will allow you to submit multiple source files. Do *not* include any project folders, or any binary files.

Grading Criteria

The project will be graded according to the following grading criteria:

<u>Feature</u>	<u>Portion of grade</u>
1. The program functions correctly.	65%

2.   In the **main** function of the program, there is a loop that contains code to support the following input commands:
 	
`a        add a new airplane to the fleet.`
`f        fly a plane in the fleet.`
`h        print help text.`
`p        print fleet information.`
`q        quit (end the program).`
`r        remove airplane from the fleet.`
	3%

3. The "command loop" in the **main** function must continue until the user enters a '**q**' command.	2%
4. Each of the commands (except the '**q**' command) must call a separate function. That is, the "**main**" function must not be excessively long. The **main** function must be primarily a loop that inputs each user command and calls other functions to implement those commands. Each user command (inside the "main" function) must call a function that implements that particular command. Do **NOT** put an excessive amount of code in the **main** function or any other function. Each function must be designed to perform one task, and to perform it well.	10%
5. The program is clearly organized and **commented** so that it is easy to read and understand. At a <u>minimum</u>, there must be a comment **at the beginning of each function** that explains what that function does. Use your judgement regarding any additional comments that may be needed to make the program easy to understand, without over-commenting the program. (As you get more experience, your judgement about this will improve.)	5%

Feature	Portion of grade
6. Use good variable names and function names: • A variable name or function name must indicate something about what that variable or function does in the program. • Variable names and function names must be not too short and not too long.	5%
7. Place a brief summary of the program in comments at the beginning of each source file. Also be sure these comments have your name and the due-date for the project.	5%
8. Cleanup any unused portions of code, such as "failed attempts" that you later replaced.	3%
9. Cleanup any irrelevant comments	2%
Total:	100%