

Programming Requirements

- Submit your assignment into a **single CPP file**.
- You must write **your name** at the top of your assignment source listing.
- Write your **compiler version and operating system name** at the top of your assignment source list.
- Assignment that is **turned in late** will lose **one point per day** starting after the due date.
- Make sure that you do appropriate **error checking** in your program. (User-friendliness)
- Do not turn in **incomplete or crashing program**, you will receive **zero points**.
- Make sure to read **grading policy** carefully that will tell you how your assignment is graded.

Assignment #4 Grading Policy

Category	Points Possible	Points Received
Use of pure virtual functions	20	
Use of enum type, with meaningful names.	10	
Command line argument for input file	10	
Output format according to the specifications	15	
Error Checking (User-friendliness)	15	
Complete Source Code Documentation	10	
Correctness and Efficiency	10	
Meaningful variable names.	10	
Total	100	

Notes:

- Use data file that is provided for this assignment. Make sure file name is given as a command line argument.
- This assignment will **not be accepted** after the **last day** of the class.

C++ Programming, Comprehensive Assignment Description

Write a program that creates a class hierarchy that stores information about airships. Start with a general **base class called airship** that stores the number of passengers that can be carried and the amount of cargo (in pounds) that can be carried. Then create **two derived classes called airplane and balloon** from airship. Have airplane store the type of engine used (propeller or jet) and range, in miles; also give airplane a name. Have balloon store information about the type of gas used to lift the balloon (hydrogen or helium) and its maximum altitude (in feet). Also give balloon a name.

This program prints a report of airship data. It reads the data from the file “**airship.dat**”. Each line of data consists of a comma-separated list. An airship is either an airplane or a balloon. The **first field** in each line of input determines whether the line describes an airplane or a balloon.

The **airplane** data has these fields:
airshipType, airplaneName, maxPassengerCount, maxCargoWeight, engineType, range

The **balloon** data has these fields:
airshipType, balloonName, maxPassengerCount, maxCargoWeight, gasType, maxAltitude;

The program reads each line of input and checks the airship type for the data. If the line describes an airplane, the program creates an airplane object, and if the line describes a balloon, the program creates a balloon object. The program places the airplane and balloon objects in an array of pointer type airship.

The program then iterates through the array once to generate an airplane report and once to create a balloon report. **You must demonstrate the usage of pure virtual function and show run time polymorphism** in this program. There is no need for user interface. Your program should take a command line argument for the input file name.

Your program should read data from the file. Data file provides five records for airplane and five records for balloon.

Input File Data for Assignment #4

Use any text editor to enter the following data into a “**airship.dat**” file.

```
1,Blue Racer,10,10000,0,1000
0,SR-71 Blackbird,2,33000,0,80000
1,Desert Winds,20,20000,1,2000
0,U-2,4,22000,0,160000
1,Kaleidoscope,30,30000,1,3000
1,Desert Spirit,40,40000,0,4000
0,Boeing 747,300,11000,0,40000
0,McDonnell Douglas,225,11000,0,38000
0,Cessna 120,6,11000,1,10000
1,Painted Angel,50,50000,0,5000
```

Data fields Names

AirShipType {Airplane=0,Ballon=1}

AirShipName, NumberOfPassengers,AmountOfCargo

{Engine Type [Jet = 0, Propeller = 1] Gas Type [Helium = 0, Hydrogen = 1]}

Maximum Range/Altitude

Output for Assignment #4

Use following output format:

Listing of all Airplanes

Name	Engine Type	Maximum Range
SR-71 Blackbird	Jet	80000
U-2	Jet	160000
Boeing 747	Jet	40000
McDonnell Douglas	Jet	38000
Cessna 120	Propeller	10000

Listing of all Balloons

Name	Gas Type	Maximum Altitude
Blue Racer	helium	1000
Desert Winds	hydrogen	2000
Kaleidoscope	hydrogen	3000
Desert Spirit	helium	4000
Painted Angel	helium	5000