

Assume that we have a data file named “**airplane.dat**” that contains information regarding the characteristics of “world war II” airplanes.

The structure of the data file is:

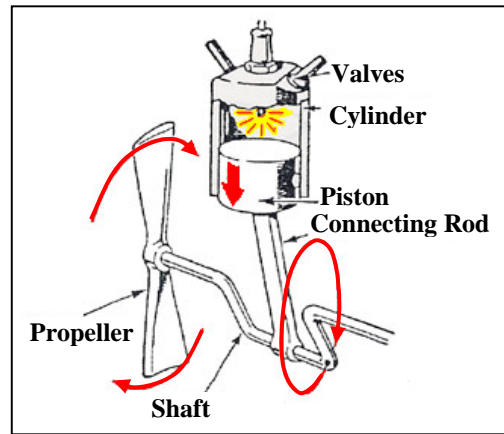
- Airplane identification number (integer)
- Airplane name (Maximum 30 characters)
- Wingspan in meters (double)
- Weight in Kilograms (integer)
- Propeller diameter in meters (double)



Assume that we have another data file name “**exp.dat**” that contains some data collected from experiments done on the airplanes.

The structure of the data file is:

- Airplane identification number (integer)
- The rotation of the shaft in “Revolution per Minute” (integer)



Knowing that the equation to compute the tip speed of a propeller “**v**”, is:

$$v = \frac{\omega d}{2}$$

Where:

d is the diameter of the propeller in meters.

ω is the angular velocity in radian per second : $\omega = \frac{2\pi s}{60}$

s is the rotation of the shaft in “revolution per Minute” (rpm).

Write a C++ program to do the following:

- a) Read the records from the “**exp.dat**” file. For each record, calculate “**v**” by finding the associated propeller diameter from the “**airplane.dat**” file.
- b) The records that result in a “**v**” that is greater than **399.0** meter /sec. should be stored in a data file called “**danger.dat**”
- c) The generated data file “**danger.dat**”, should have the following structure:
 - Airplane name.
 - Propeller diameter.
 - The rotation of the shaft.
 - “**v**”, the tip speed of a propeller.

Note:

- Modular programming technique should be used. Thus **your program should be divided into functions**. (Some grades will be allocated to the efficient choice of functions)
- You are not allowed to use global variables... Communication between the function and the caller should be done through parameters passing.

Due date: Friday, January 25, 2008

No Late Assignment will be accepted after the date mentioned above...