Show of Force

Homework 6

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Handed out: 11 October 2017
Due: 29 October 2017 (>2 weeks to complete)

1. Description

The construction of the mightiest spacecraft of The Galactic Empire is almost complete with only a small part of the code missing. The demonstration of might with the new spacecraft nears, as Lord Vader has been reported of boarding the station accompanied by a Princess from The Galactic Republic.

You have got a nervous command from your superior officer to complete the task by making a program that consists of a new class declaration of Spacecraft for a new *Twin Ion Engine Flyer* and the class implementation.

Rewards:

On Success:	On Failure:
+200 XP	+100 XP
+5 Reputation increase with the Galactic Empire	-5 Reputation decrease with the Galactic Empire
+ A slight chance of increase in coding skill	+5 Reputation increase with the Galactic Republic
	+Title: "The Saboteur, Agent of Republic"

2. Getting started

Your mission is to make a C++ program that defines and implements a new class. Write a class named Spacecraft that has the member variables and member functions listed below. You can decide types yourself and even add your own member variables and functions.

Member variables:

- year: the spacecraft's model year
- speed: the spacecraft's current speed
- maxSpeed: the spacecraft's maximum speed
- model: the model of the spacecraft

Member functions:

- Accelerate that adds 10 to the speed each time it's called
- Brake that subtracts 10 from the speed each time it's called

- Hyperdrive [1] that changes the speed to maxSpeed
- + related accessors: allow values to be retrieved from an object's member variables

To test your spacecraft, make a program that creates a Spacecraft object. Then, call all the functions you created. After each function call, get the current speed or other associated member variable and print it.

Pay extra attention to the following guidelines:

- You should create both a header and a main code files (.h and .cpp)
- Use meaningful names for your variables!
- You can also add your own member variables and functions.
- Your code should be well readable, follow the best coding practices, be highly efficient, well structured and well commented!

3. Finalize the mission

Congratulations! You have now created a new class that will be used in a new, powerful spacecraft, in a galaxy far, far away...

You can now gain extra XP that translates into a better grade from this homework, but only under one condition. In addition to handing in your excellent code (see the procedure below), please answer the following questions. Short answers are ok.

- Why shouldn't you make all the member data public?
- Give an example of a base class from which the Spacecraft class could have inherited.
- Could there be another class that inherits from the Spacecraft class? If yes, what kind?
- What was the most difficult part in this exercise? What was the easiest?
- How would you make your program better?

Hand-in procedure

1. Save
Save your solution: both your code file(s) and another file with your answers. Make a single tar.gz file.

2. Time and collaboration info
At the start of the file, write down the time (approximately) you spent on this homework, and the names of students you may have collaborated with. You need to complete the homework independently but of course you may discuss and think about the problems together.

Example of the beginning of the code file:

[1] hyperdrive = to drive with the speed of light, and traverse the void between stars in the alternate dimension of hyperspace. (note: even *TIE flyer* can hyperdrive)

```
/*
Homework: Show of force
Name:
Collaborators:
Time:
*/
... your code...
```

3. **Submit your .tar.gz to Live@Lund by 29 October 2017!**
   Note: Homework is mandatory! Don't hesitate to ask help from teachers if you get stuck.