CS 542 HW Assignment 6 (Due by 12pm on April 19st)

1. [40 points] Use the **Observer Pattern** to improve the code in the hw6.cpp file.

   In hw6.cpp,

   Class **People** can be used to create a **People** object e.g. *People subscriber = new People("Mary")*.
   Class **Organization** can be used to create an **Organization** object e.g. *Organization subscriber = new Organization("UCLA")*.

   Class **FireDept** contains a data member *People *subscriber1*, a data member *Organization *subscriber2*, and a *notify()* function that sends message to subscriber1 and subscriber2 by calling their member function *action()*.
   Class **PoliceDept** contains a data member *People *subscriber1*, a data member *Organization *subscriber2*, and a *notify()* function that sends message to subscriber1 and subscriber2 by calling their member function *action()*.

   When the fire department **FireDept** and the police department **PoliceDept** receive alarms, they will notify their data member subscriber1 and subscriber2.

   Task:
   Use the Observer Pattern to improve the code in hw6.cpp so that:
   1). Make **People** and **Organization** to be observers/listeners/subscribers.
   2). Make **FireDept** and **PoliceDept** to be subjects/posters/publishers.
   3). **People** and **Organization** objects can subscribe themselves to either **FireDept** or **PoliceDept** or both at run time.
   4). **FireDept** and **PoliceDept** objects can send alarm messages to all their subscribers as run time.
   5). Clients can always create and subscribe more **People** and **Organization** objects to **FireDept** and **PoliceDept** objects at run time.

6). In the client code (the main function), create a **FireDept** object and a **PoliceDept** object.

Create a **People** object named "Sam" that subscribes to the **FireDept** object.

Create a **People** object named "Mary" that subscribes to the **PoliceDept** object.

Create an Organization object named "UCLA" that subscribes to both the **FireDept** object and the **PoliceDept** object.

Let both the **FireDept** object and the **PoliceDept** object broadcast alarm messages to their subscribers.

Hint:

You can create a **Subject** class as the base class for **FireDept** and **PoliceDept**.
You can create an **Observer** class as the base class for **People** and **Organization.**

Submission

SUBMIT ALL THE FILES IN A ZIP FILE TO COUGAR COURSES:

Always make sure the files you submit can be compiled on empress.csusm.edu.

- Program1: Submit **all the source code files** in a zip file to cougar course.

Note: Compress all the above files in a zip file, name it with your name, and submit the zip file on Cougar Course. For example, my first name is Xin and my last name is Ye, then I will name the zip file as XinYe.zip.

Grading

1. On Cougar Course, submit all the files in a zip file with your name. Otherwise, we will not grade it.
2. Your code should be compiled on Cougar Course. If there is a compilation error, you will get 0 points.
3. If your code fails in 1 test case, we will deduct 10% of the total points.
4. If your code fails in 2 test cases, we will deduct 20% of the total points.
5. If your code fails in 3 test cases, we will deduct 40% of the total points.
6. If your code fails in more than 3 test cases, we will deduct 90% of the total points.
7. The comments in your code count for 10% of the total points.
8. Additionally, we will deduct 10% points for each day after the due date.