

In the following problems, you may run

```
$ sh build.sh
```

to build the programs (tested on MacOS 10.6 with GCC and Ubuntu 14.04). You may modify build.sh if necessary.

P1. This is a simple program creating and using simplified widgets. From client/Client.cpp you can see that it's dependent on the implementation. Please use the abstract factory and rewrite Client.cpp so that it doesn't instantiate the concrete widgets directly (see the TODO comments in Client.cpp).

P2. This is a simple program demonstrating the use of the observer pattern. Observer.h and Subject.h contain the interfaces of the Observer and the Subject. InputReader.h and InputReader.cpp contain a concrete Subject that notifies the registered observers on input from stdin. Client.cpp creates a thread to run InputReader.

Please implement a concrete observer named InputObserver that is registered to InputReader and prints out the the observed data when it receives notification form the InputReader.

P3. Suppose another client needs to use the InputReader in P2. Please implement the adapter pattern to make Client.cpp build and run.