In this assignment, you will learn how to use **Design Patterns**. You are to develop a program that implements a portion of the **MISys** system in Java. The development of the system will be much easier if you carefully develop the design. You should use the UML artifacts that you have created thus far for MISys (taking into consideration any necessary corrections noted by the respective assessments from the TA), including the class diagram as your starting point. Then create a design-level class diagram that incorporates the design patterns as enumerated below. As stated in lecture, it is likely that you will need to make several iterations of the design model (e.g., class diagram) before all the necessary information is captured. At that point, you may start coding your system according to your design model. There should be traceability between your code and the design model. The following Design Patterns need to be included in your final implementation. You are to work in pairs on this assignment.

1. **Facade** :- You will provide a user (receptionist, nurse, doctor, etc) with a unified interface to the **MISys** subsystems such as patients records (clearly, each record includes diagnoses and prescription histories), login, and weekly schedule of each doctor.

2. **Iterator** :- You will provide a means for a user of **MISys** to access items in the database of records without exposing how items are stored in the database.

3. **Observer** :- You will use the observer design pattern to handle sending reminder e-mails to patients in case of follow-up appointments.

**Extra Credit : Additional pattern**

If you are able to identify other useful design patterns (e.g., security patterns) that would be appropriate for the implementation of the system, you will receive extra credit for each additional pattern beyond the three assigned patterns. Note that your pattern should be a *different* design pattern from the above listed patterns.
**Assignment Deliverables**

The deliverables for this assignment include the following:

1. Class diagram for the modified MISys system including data dictionary.

2. All files for testing your program, including the makefile for compiling and running your program. You must also include a README file describing how to use your program.

3. A written report on your work and result.

**Project Report**

Your project report will include the following sections (in the order specified):

1. Names of the group members.
2. A brief description of the design patterns implemented. Your description should include the potential benefits of including a design pattern at a particular location of your implementation.
3. Class Diagram of the **MISys** system created by argoUML. The class diagram should identify the design patterns implemented. This can be done by attaching an explanatory note (manually or by program) in the Class Diagram. Some data dictionary to clarify the role of each class must be included.
4. Any assumptions you made about the interpretation of specifications (according to Homework Assignments 2, 3, and 4) that might have been unclear.