Faculty of Engineering, Alexandria University — Year: 2nd year
Object-Oriented Programming — Duration: 180 Minutes
Dept. of Computer and Systems Engineering — Final Exam: 2007

Read the following scenario CAREFULLY then answer ALL the following questions:

A publishing house wishes to build a system for managing its scientific publications. A scientific publication is usually composed of several scientific articles. The publishing house requests from well-known authors to write their contributions to a specific topic in form articles. The article is then in the *authoring* state. Upon submission, the publishing house assigns this article to one reviewer and the paper remains *under review* until the reviewer either approves or rejects the article. Upon rejection, the coordinator of the publishing house sends it back to the author for modifications. An approved article has the status *ready for publishing*. Periodically, a new publication is compiled by an editor using a subset of the ready for publishing articles. These articles should not be published again since they are already *published*.

The publishing house keeps record of the name, address, telephone and email of the authors, reviewers and editors. Note that one person can play more than one role. i.e., author of article *x* can be the reviewer of article *y*. The system keeps track of the content of the article, such as the title, the textual abstract and the PDF content, and a list of keywords already defined in the system. It also keeps track of the list of authors and the reviewer for each article. The system keeps track also of the state of each article. Each publication in the system has an ISBN, a publication and list of editors and list of articles.

Question 1:

Construct a simple use case diagram involving the author, the coordinator in the publishing house, the reviewer and the editor.

Question 2:

Draw the state diagram for an article.

Question 3:

Draw the UML sequence diagram for the following scenario concerning an author, a reviewer, and the coordinator in the publishing house:

- The coordinator asks the author to write an article.
- The author sends the article to the coordinator.
- The coordinator asks the reviewer to judge the article.
- The reviewer rejects the article.
- The coordinator sends the rejection reason to the author.
- The author sends a new version of the article to the coordinator.
- The coordinator asks the reviewer to re-judge the article.
- The reviewer approves the article.

Question 4:

Identify the state design pattern in your solution.
Zoom in its class diagram and describe the operation of this set of interrelated classes.

Question 5:

Draw the UML class diagram for the system. All attributes mentioned in the scenario must be present in the diagram. All operations needed in Question 2 and 3 as well as any obvious methods must be included in the diagram. Make the necessary assumption.

Question 5:

Map the UML class Diagram of Question 4 into a code **skeleton** written in JAVA. All associations between classes must be present in the code. Make all necessary assumptions.

Question 6:

a. draw the UML class diagram of the *observer* design pattern
b. draw the UML class diagram of the *factory* design pattern.

GOOD LUCK