

1. Construct an activity diagram with swimlane for the following scenario.

This describes the business process to publish an academic paper. The author submits a paper to an editor of a journal. The editor first checks whether the paper fit the theme of the journal. If not, the editor rejects the paper. Otherwise, the editor assigns the paper to a number of reviewers. The reviewers review the paper, and write a review. The review is sent to the editor. The editor then assesses the quality of the paper with the help of reviewers' comments. If the quality is good, the paper will be accepted, and the author notified. Furthermore, the paper is forwarded to the publisher for publication. If the quality is bad, the editor rejects the paper. (Use paper as the object flow)

2. Construct a sequence diagram for the following "flight check in" use case.

When you go to airport and check in for a flight. You first show the agent the ticket and your ID. The agent then verifies your ticket information with the airline system. If confirmed, the agent will ask you for your seating preference. The agent then checks the system for availability. If your choice is not available, you will be asked again for a different choice. After your seat is chosen, the agent retrieves the gate information, and then proceeds to create a boarding pass which contains flight, gate, and seat information. The seat availability is updated, and the boarding pass is handed to you.

3. Construct a class diagram for the following scenario.

There is an online community to share jokes. The community consists of an admin and a number of members. There are two types of members: regular/ad hoc members and contributors. A contributor actively writes jokes, while regular members read jokes posted. A regular member can write a comment on a joke he/she read. The contributors can make use of these comments for improvements. The contributors are registered and issued passwords by the admin. They have to login to post jokes. The admin also manages the jokes posted, mainly to remove the old jokes when the space runs short.

4. Construct a use case diagram for the following scenario.

You propose to build an online textbook exchange system which allows students to trade their used textbooks. Students register to become users. The users can list their textbooks in the system. When a book is posted, a link is made to the university course system for the corresponding course information. There is a system administrator who manages user information and book listing. The system allows users to search for books; and advanced search with multi-criteria is also available. Finally, users will be able to use the system to exchange their books. User registration and information updating, book listing, and book exchange will require user to login first.

5. Construct a state machine diagram for the following "customer" class.

After a customer checks in for a flight, he/she joins a line to get through security check. Then he/she goes through the security check. If there are any problems, he/she has to go through the security check again, until everything clears. The customer will go to the gate and wait for boarding. When the boarding is called, he/she will board the plane. It may happen that the flight is cancelled. In this case, the customer will need to check in for a new flight at the gate. If there is no later plane or there are no seats available, the customer will leave the airport. After all the customers board the plane, the plane will take off.