Software Engineering Workshops

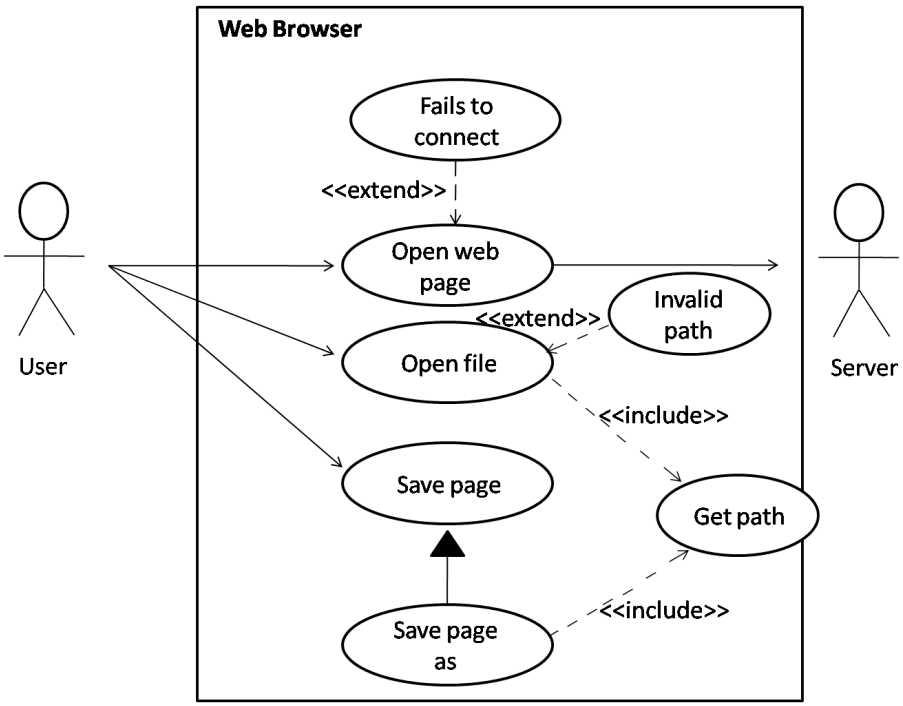
Worksheet 3: Working with Requirements–Use Case Diagram (Part 2)

Objective

The objective of today's session is to familiarize yourself with the different types of relationships used in use case diagrams, namely, the *inclusion*, *extension* and *generalization* relationships. As you cover these concepts, you should be ready to draw your first complete use case diagram. You will be guided throughout the process with some tips which will help you create any use case diagram in the future.

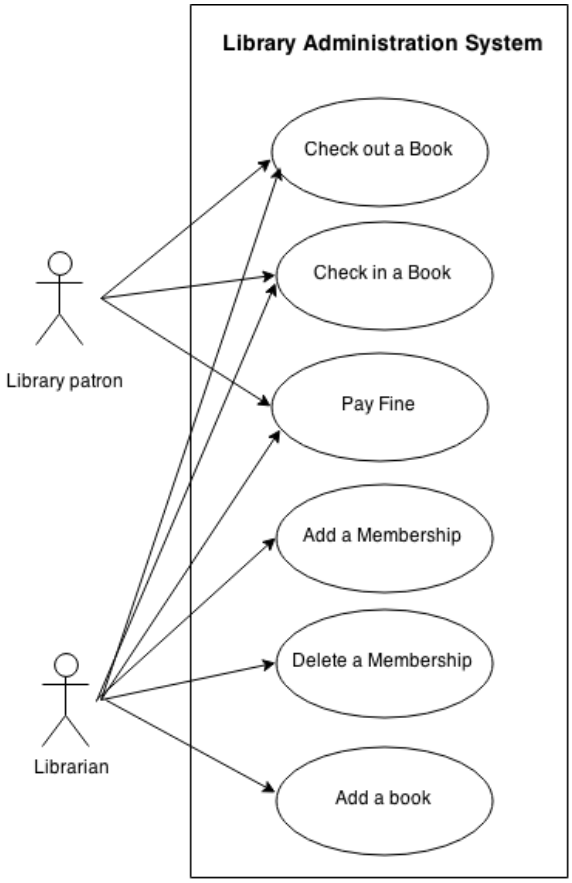
Exercise 1:

Provide a textual/oral description of the following system (a simple web browser) given in the use case diagram below. In describing the system identify all the components found in the diagram.



Exercise 2:

In the previous use case diagram you created for the Library Administration System, what type of relationship can you use to show that the librarian can do whatever a library patron can (with some extra additions)? Show that relationship and refine the diagram accordingly.



Exercise 3:

Imagine that you have been assigned to a team that will develop an ATM (**A**utomated **T**eller **M**achine) system. As part of the project startup, your manager has asked you to specify the system requirements during the requirements specification phase.

Each ATM machine has a **card reader**, a **cash dispenser**, a **keyboard/display**, and a **receipt printer.**

By using the ATM machine, a customer can **withdraw cash**, **query the balance** of an account, or **transfer funds from one account to another.**
A transaction is initiated when a customer inserts an ATM card into the card reader.

Encoded on the magnetic strip on the back of the ATM card are the card number, the start date, and the expiration date.

If the PIN entered by the customer is validated satisfactorily, the customer is prompted for a withdrawal, query, or transfer transaction. If not, the ATM will report that the PIN is not valid and will ask the customer to enter it once again.

An ATM operator may start up and close down the ATM to replenish the ATM cash dispenser and for routine maintenance. [1]

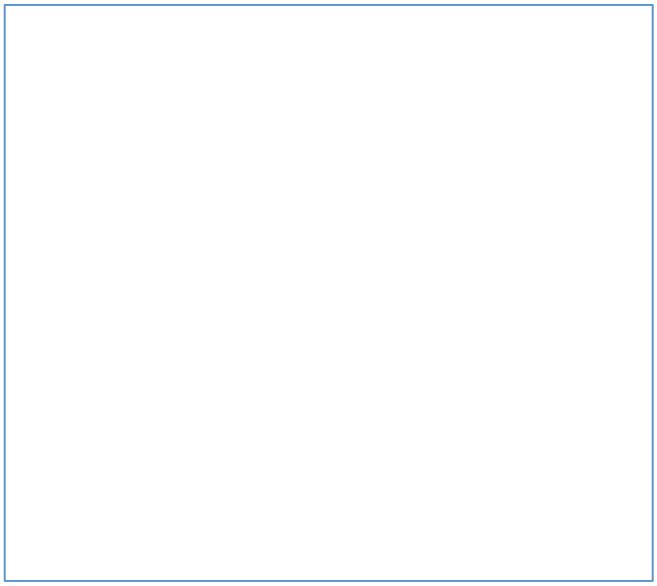
Depending on this written description, draw up a use case diagram for the ATM System. Below are some hints to help you through the process.

STEP 1: Identify the actors (show the passive ones as well)

STEP 2: Identify the use cases

[1] *Adapted from http://ocw.kfupm.edu.sa/ocw_courses/phase3/SWE311-Offering-072/Exams/Final.doc*

STEP 3: Define the relationships between the actors and the use cases and draw your initial diagram



STEP 4: Refine your diagram using *generalization*, *inclusion* and *extension* where possible.

Use the following questions as hints

1. Are there any duplicate behaviors between actors or between use cases? (generalization)
2. Did you notice any common steps between use cases? (<<include>> relationship)
3. Are there any additional functionalities that can be added to a use case to enhance it in some special cases? (<<extend>> relationship)

Draw your final diagram.