UML Use Case Diagram

Formative Exercise with Feedback

This is a practice assignment, to help you learn UML. You will have a couple of days to complete each practice assignment, after which the solutions will be revealed on MOLE, so that you can check your attempt. **This is not the assessed assignment**.

Read the scenario carefully, and then create **a UML use case diagram** that faithfully captures the information requested in the instructions after the scenario. The objective of this exercise is to assess *how accurately* you can develop a structured model from unstructured requirements. There is an exact answer.

You may use any drawing package, or CASE tool, to develop the diagram, so long as you conform to the UML 2 standard notation (avoid non-standard, or out of date UML tools).

Scenario: The Applied Science Library

The Applied Science Library needs a new computer system to manage the circulation of books and periodicals in the library. The librarian decides how the annual budget may be spent. Technical services first acquire the books and periodicals from the publisher and then catalogue them on a separate database. After this, reader services manage the circulation system. Their activity consists of issuing, discharging and renewing loans to borrowers and calculating when loans are overdue. To be issued with a loan or renew a loan, a borrower must present a UCard to the reader services clerk with the item to be loaned. A scanner is used to scan both the barcode on the item and the barcode on the UCard, after which the loan may be issued. To discharge a loan, the borrower need only present the item, which is scanned, before the loan is discharged. If any barcode scan fails, then the task cannot be completed. A borrower can ask to reserve an item, or cancel a reservation. If a book or periodical on loan has been reserved by another borrower, then it cannot be renewed. Overdue loans are calculated daily by reader services. For each loan that has fallen overdue, a message is sent by email to the borrower. If a loan is overdue when it is discharged, the borrower must pay a fine, before the loan can be discharged. If a borrower has any overdue loans, no further loan can be issued or renewed to that borrower.

In phase 1, the new circulation system will allow reader services to handle all circulation-related tasks from computer terminals on the front desk, including issuing, discharging and renewing loans, and determining when loans are overdue. In phase 2, the extended system will also allow borrowers to reserve books and cancel reservations, using other computer terminals in the library.

Use Case Diagram

Create a use case diagram describing the *circulation system in the context of the whole business* of the Applied Science Library. It is recommended that you prepare your model after first determining the following kinds of information:

- Establish who the main actors are in this business (all of them).

- Identify each main use case (ignoring sub-cases) performed by each actor.
- Identify which use cases fall inside the system boundary for each phase.
- Identify the sub-cases of some use cases (as mentioned in the scenario).
- Sketch the use case diagram, using associations to link actors to the main use cases in which they participate.
- Link any component sub-cases using «include» dependencies and any optional sub-cases using «extend» dependencies.
- Draw one or more system boundaries to identify the functionality present in different phases of development.