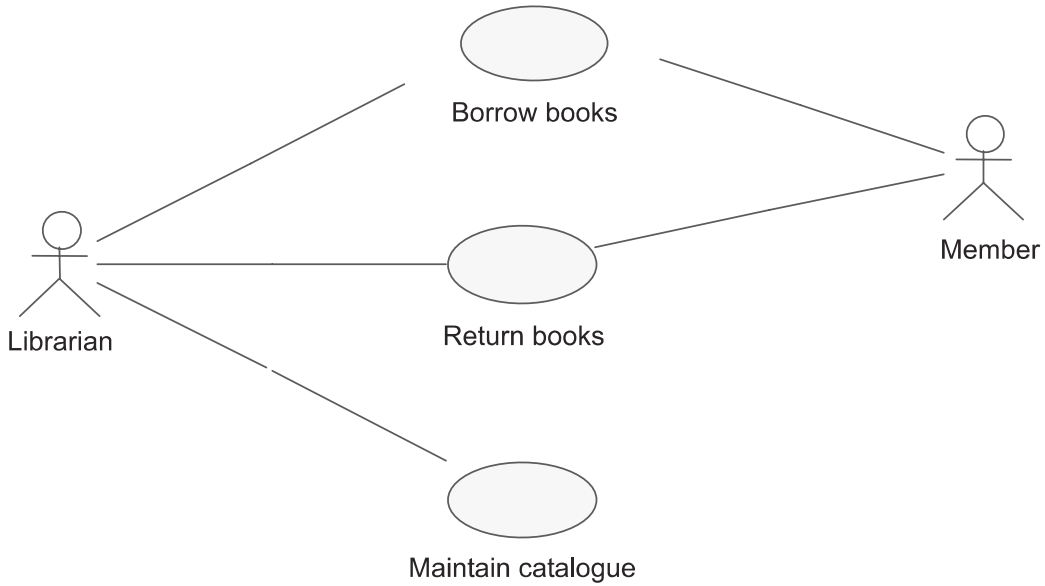
Exercise 1: Class Diagram Exercise
Module CSU22041

The use case diagram below shows the initial modelling for an information system for a library.
Draw a UML Class diagram including associations, cardinalities, roles and any derived attributes.
for a Library System including classes: Library, Loan, Catalogue, Member, Book, Librarian



Exercise 2: Use Case Diagram Exercise
Module CSU22041

From the problem statement below Identify Actors, Use Cases and draw use case diagram. Write a textual description for “Process Sale” use case, (a) for a normal scenario and (b) for an error scenario

PROBLEM STATEMENT

The standard procedure of using a cash register is as follows:

- A customer arrives at the checkout to pay for various items
- The cashier records the bar code number of each item, as well as the quantity if it is greater than one.
- The cash register displays the price of each item and its description.
- When all the purchases are recorded, the cashier indicates the end of the sale.
- The cash register displays the total cost of the purchases.
- The customer selects his or her payment method:
  - Cash: the cashier takes the money from the customer and puts it in the cash register, the cash register indicates how much change the customer is to be given;
  - Cheque: the cashier verifies that the customer is financially solvent by sending a request to an authorisation centre via the cash register;
  - Credit card: a banking terminal forms part of the cash register. It sends a request for authorisation to an authorisation centre, according to the card type.
- The cash register records the sale and prints a receipt.
- The cashier gives the receipt to the customer.

Once the items have been entered, the customer can present money-off vouchers for certain items to the cashier. When the payment transaction is finished, the cash register sends the information on the number of items sold to the stock management system.

Every morning, the shop manager initialises the cash registers for the day.

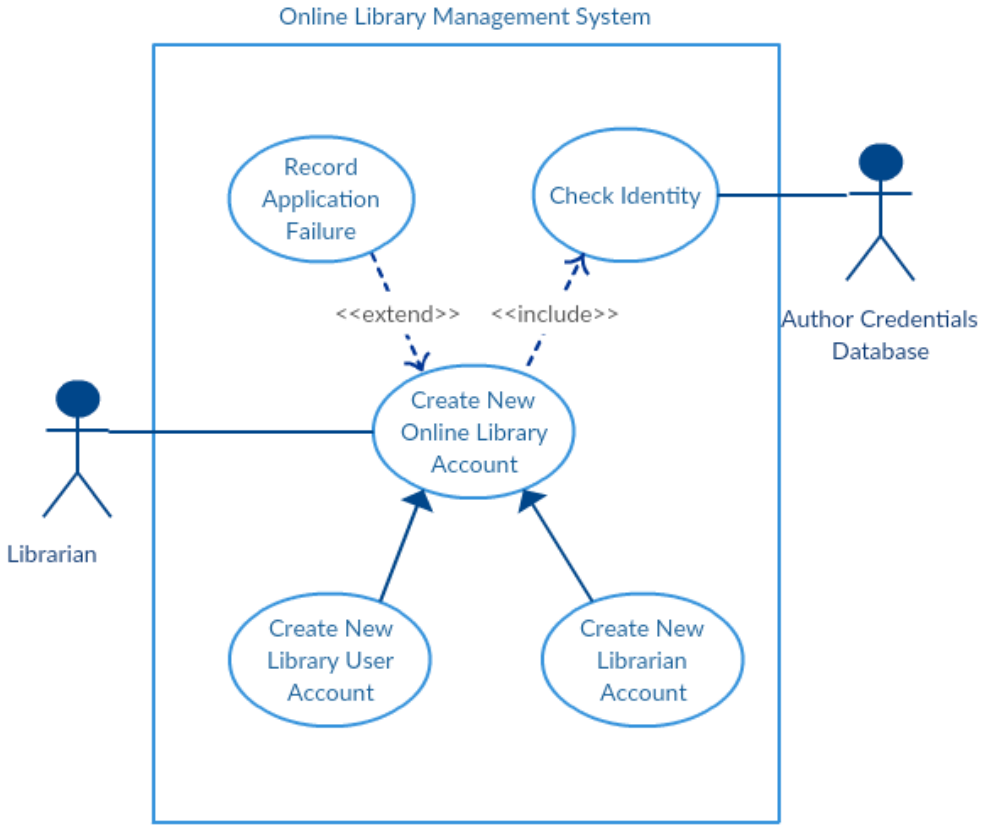
Exercise 3: Use Case Diagram and Class Diagram Exercise
Module CSU22041

Draw a UML Use Case diagram and Class diagram including associations, cardinalities, roles and any derived attributes for a Theatre Ticket Booking Information System

- Customers may have many reservations
- Each reservation is made by one customer through a box office
- Reservations are of two kinds – subscription series and individual
- Each reservation is associated with a ticket or tickets
- Each ticket is either associated with a subscription series reservation or an individual reservation but not both
- A subscription series comprises at least 3 but not more than 6 tickets
- Each ticket or subscription must be paid for
- Customers can pay by credit card or cash
- Tickets are issued from a kiosk
- Every performance has many tickets available each with a unique seat number.
- A performance can be identified by a show, date and time.
- A performance schedule is a list of performances for a particular show.
- A cast and a reserve cast is associated with each show
- A cast is composed of a group of actors

Exercise 4: Sequence Diagram Exercise
Module CSU22041

DRAW A SEQUENCE DIAGRAM TO DESCRIBE THE FLOW OF ACTIVITY FOR THE "CREATE NEW ONLINE LIBRARY ACCOUNT" USE CASE



Here are the steps that occur in the use case named 'Create New Library User Account'.

- The librarian request the system to create a new online library account
- The librarian then selects the library user account type
- The librarian enters the user's details
- The user's details are checked using the user Credentials Database
- The new library user account is created
- A summary of the of the new account's details are then emailed to the user

https://creately.com/blog/diagrams/sequence-diagram-tutorial/

Exercise 5: Activity Diagram Exercise
Module CSU22041

Draw an activity diagram that describes the dynamics of the process below. Use swimlanes to assign responsibilities to the actors.

Let's suppose that an organisation wants to improve its information system and, first of all, wishes to model the training process of its employees so that some of their tasks may be computerised.

1. The training process is initialised when the training manager receives a training request on behalf of an employee. This request is acknowledged by the person in charge who qualifies it and then forwards his or her agreement or disagreement to the person who is interested.
2. In the case of agreement, the person in charge looks in the catalogue of registered courses for a training course, which corresponds to the request. He or she informs the employee of the course content and suggests a list of subsequent sessions to him or her. When the employee has reached a decision, the training manager enrols the entrant in the session with the relevant training body.
3. If something crops up, the employee must inform the training manager as soon as possible in order to cancel the enrolment or application.
4. At the end of the employee's training, he or she must submit an assessment to the training manager on the training course that he or she completed, as well as a document proving his or her attendance.
5. The training manager then checks the invoice that the training body has sent him or her before forwarding it to the bookkeeper of purchases.

Exercise 6: Class Diagram Exercise
Module CSU22041

From the problem statement below, draw a UML Class diagram.

This case study concerns a simplified flight booking system for a travel agency.
The interviews that we had with domain experts enabled us to summarise their knowledge of the field in the form of the following sentences:

1. Airline companies offer various flights.
2. A flight is open to booking and closed again by order of the company.
3. A customer can book one or more flights and for different passengers.
4. A booking concerns a single flight and a single passenger.
5. A booking can be cancelled or confirmed.
6. A flight has a departure airport and an arrival airport.
7. A flight has a departure day and time, and an arrival day and time.
8. A flight may involve stopovers in airports.
9. A stopover has an arrival time and a departure time.
10. Each airport serves one or more cities.

Exercise 7: Use Case Diagram Exercise
Module CSU22041

- From the statement below
  1. Identify Actors, Use Cases and draw use case diagram
  2. Write a textual description for the “withdraw money using a visa card” use case [where the visa customer is not a customer of the bank], (a) for a normal scenario and (b) for an error scenario

This case study concerns a simplified system of the automatic teller machine (ATM). The ATM offers the following services:

1. Distribution of money to every holder of a smartcard via a card reader and a cash dispenser.
2. Consultation of account balance, cash and cheque deposit facilities for bank customers who hold a smartcard from their bank.

Do not forget either that:

3. All transactions are made secure.
4. It is sometimes necessary to refill the dispenser, etc.