Requirements and Specification, ESOF 328, Spring 2021
Exam 2, March 19 **Name _____**

This exam is to be completed individually without the use of the text, notes, the Internet, or any other items.

1. Select the most common role of a product champion. (4 pts.)
    a. Help provide system requirements
    b. Manage requirements elicitation
    c. Manage system development
    d. Lead elicitation meetings
    e. Document system requirements

2. A context-diagram can also be called a level-0 _____. (4 pts.)
    a. Sequence diagram
    b. Entity-Relationship diagram
    c. State transition diagram
    d. Data flow diagram
    e. Dialog map

3. Select the reason LEAST likely to be the purpose of a software prototype.
    a. To grow into the eventual system (4 pts.)
    b. Clarify requirements
    c. Verify requirements
    d. Validate requirements
    e. Explore design alternatives

4. A functional requirement is mapped to the use case from which it came. This would most likely be consider what type of link? (4 pts.)
    a. Forward to
    b. Forward from
    c. Backward to
    d. Backward from
    e. None of the above

5. Graduating students cannot create profiles until the semester before the semester in which they plan to graduate. (4 pts.)
    a. Business rule
    b. User requirement
    c. Functional requirement
    d. Quality attribute
    e. Design constraint

6. Each of the user roles (Graduating Student and Alumni) represent stakeholders of Tech Connect. Describe three other stakeholders for Tech Connect. These other stakeholders should be distinct from the user stakeholders and from each other. (5 pts.)

- Tech Connect developers
- Tech Connect testers
- Montana Tech IT
- Montana Tech administrators responsible for FERPA
- Montana Tech lawyers

7. Five activities are given. Tell the phase: elicitation, analysis, specification, validation or management, to which this activity most likely belongs. (5 pts.)

   a. Tracing individual requirements to their corresponding designs, source code, and tests
      Management

   b. Deriving functional requirements from other requirements information
      Analysis

   c. Identifying the product's expected user classes and other stakeholders
      Elicitation

   d. Looking for user feedback on a prototype of aspects of a proposed system
      Validation

   e. Documenting use cases.
      Specification

8. Describe the use of “includes” and “extends” in a use case diagram. (5 pts.)

A use case “includes” another use case, if every time the use case is executed, the included use case is also executed.

A use case “extends” another use case, when the use case may or may not include the extended use case.

9. List the 5 major sections of the Montana Tech SRS template and describe the purpose of each of these sections (i.e. explain what a reader can expect to find in each section). (5 pts.)

Introduction – the reader will get a high level introduction to the system and this SRS including the business objectives and mission, also the purpose of the document

General factors – the reader will learn more about the system being specified, the features of the system and its environment

User cases/ user stores – the reader will learn about the roles that will interact with the system and how those user interactions will occur

Functional and Non-functional requirements – the reader will learn the specific requirements of the system, both what exactly it will do and how well it will do it

Future enhancements – the reader will learn about ideas which were discussed, but will not be part of this delivery of the system

10. Imagine that you have become a business analyst for a software development company. A new business analyst was hired. Since you are a senior member of the staff, you are to help this new person get "on board". Describe to this person how to write good use cases. (5pts.)

    Use cases capture user interactions with the system. They express the back and forth between user and system. List this back and forth interaction in steps.

    In addition to the normal flow, give steps of any alternate and exceptional flows, telling precisely when the new flow would break off and return.

    Use cases aren't used to express behavior that the system does on its own. They also don't include design detail. Don't make them too large and attempt to make each use case independent of others (except for the use of "includes" and "extends" which we can go over later).

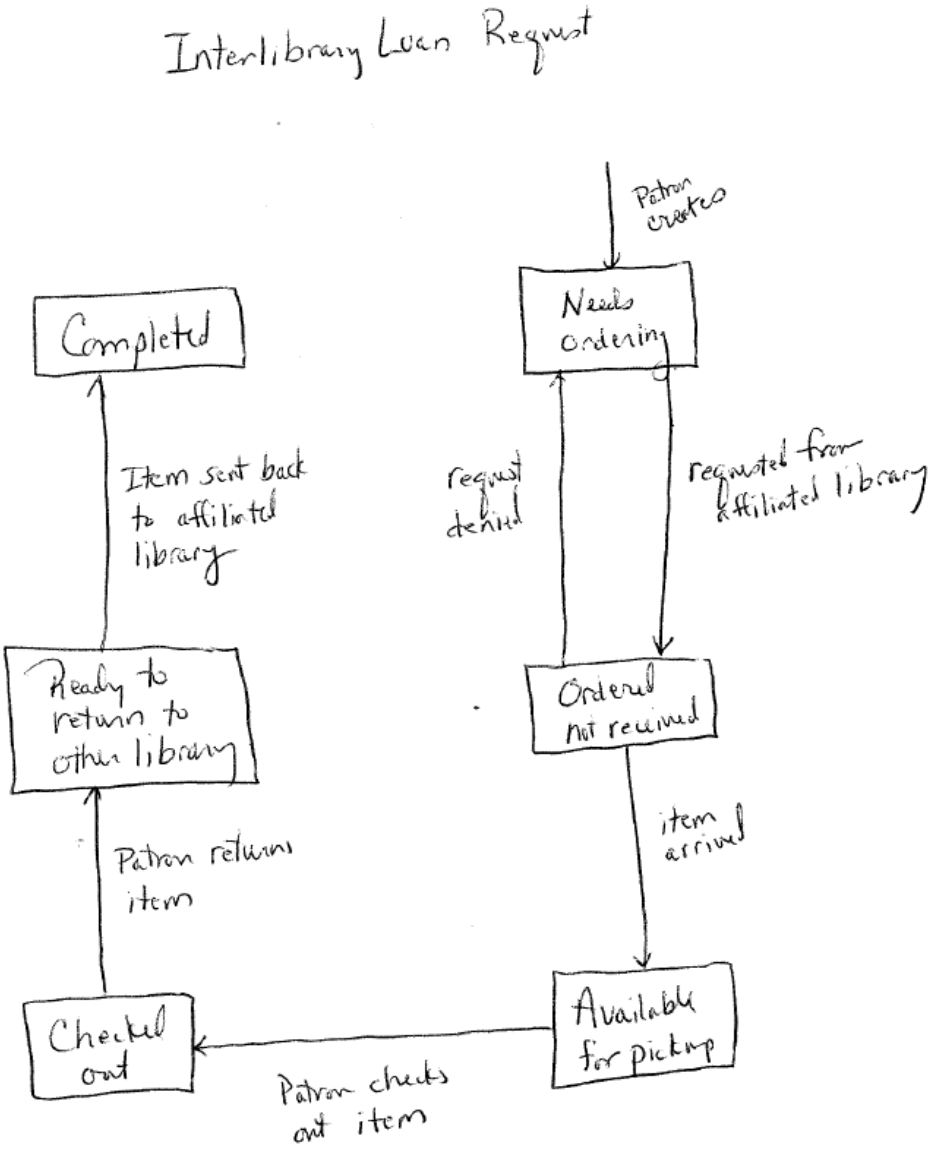
Imagine that you are developing requirements for a web-based interlibrary loan system for the Whitehall Public Library called *Trojan Books*. Following is a description of this system.

When library patrons discover that the Whitehall Library does not have a book that the patron wants they can go to *Trojan Books* on the web and request that book. If the patron creates an account with *Trojan Books* the patron can go to *Trojan Books* at any time and see the status of their book request. If that patron adds their email address to the account, email messages will be sent when the status of the book request changes.

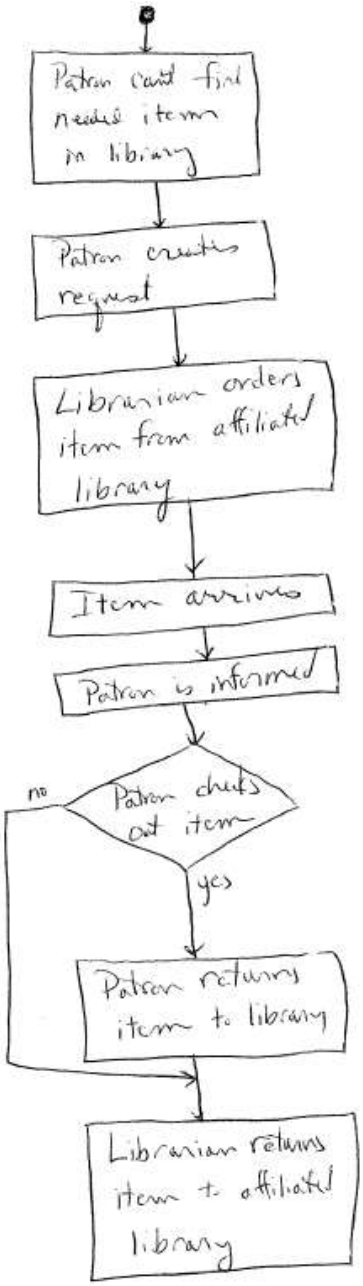
When a book is requested, *Trojan Books* accesses a database (outside *Trojan Books*) to determine if the book exists and reports to the user if the book does not exist.

A Whitehall librarian uses *Trojan Books* to see what book requests have been made and to make updates to the status of the book request. Updates include: when the book was ordered from a library participating in the interlibrary loan system; that the book has arrived and is ready to be picked up by the patron; and that the book was returned by the patron and has been sent to the book's home library. The librarian uses an interlibrary loan database (outside *Trojan Books*) to determine the best library to request the book from and to make the book request. When a book arrives, if the patron has entered an email address into *Trojan Books*, the library sends an email notification to the patron, otherwise the librarian calls the patron to tell them that the book has arrived.

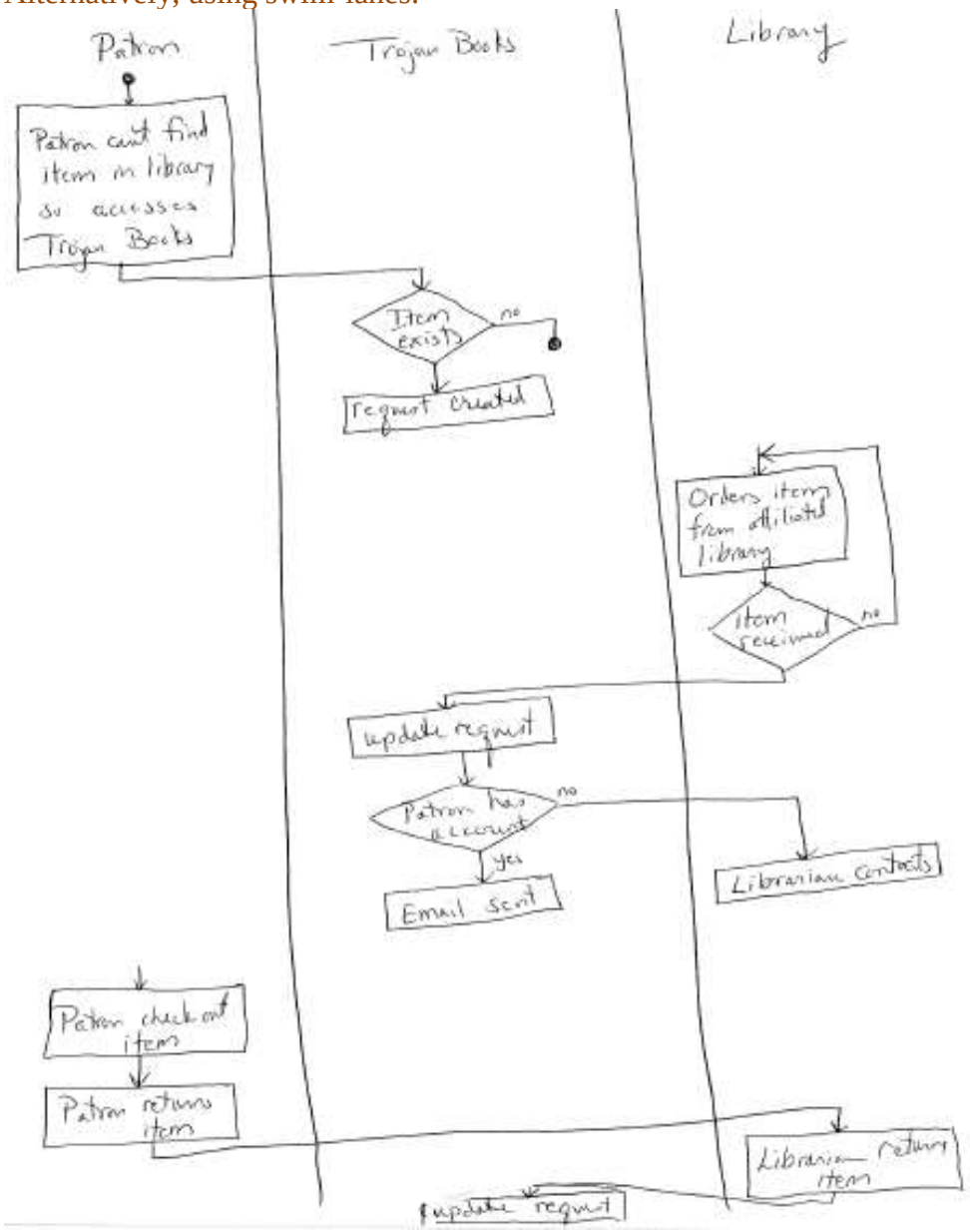
11. Create a state-transition diagram that describes the states of an interlibrary loan book request and how the request transitions from one state to another. (10 pts.)



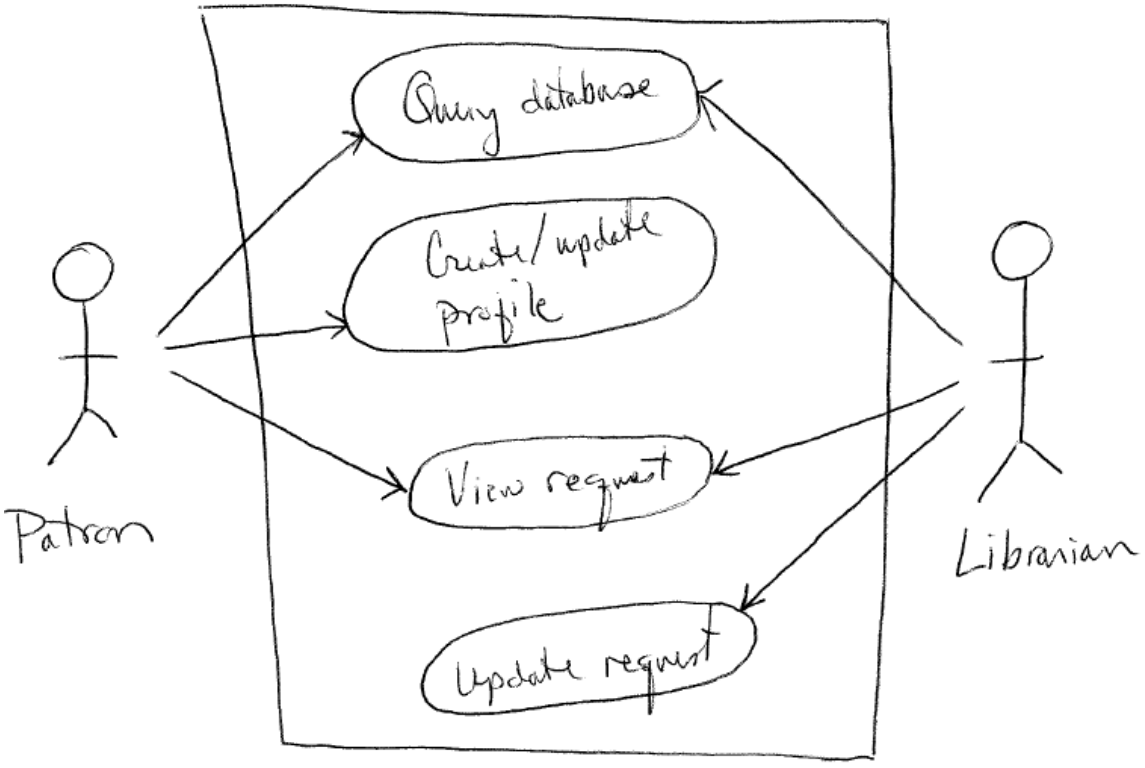
12. Create an activity diagram (possibly using swim lanes) that models how patrons request books from *Trojan Books*, how library personnel obtain those books, and lets the patron know that the book is available. (10 pts.)



Alternatively, using swim-lanes:



13. Create a use-case diagram for *Trojan Books*, showing any roles and use cases which are likely to be needed. (10 pts.)



14. Create the use case “Request book” which describes the process of creating a request for an interlibrary loan book. Include the option of creating an account and entering an email address into that account in your use case. (25 pts.)

Use Case Name:	Request book		
Created By:	You	Last Updated By:	You
Date Created:	March 19, 2021	Date Last Updated:	March 19, 2021

Actors:	(2 pts.) Patron
Description:	(2 pts.) Patron request a book
Trigger:	(2 pts.) User discovers that the book they want is not in the Whitehall library.
Preconditions:	(4 pts.) None
Postconditions:	(5 pts.) A book request has been created.
Normal Flow:	(5 pts.) **1.0 User requests a book.** 1. User accesses *Trojan Books*. 2. System displays book search form. 3. User enters search information. 4. System displays book information. 5. User logs into their *Trojan Books* account. 6. System displays form for collecting request information. 7. User completes request information form and submits. 8. System informs user that the book request has been created.

Alternative Flows:	(5 pts.) **1.1 User does not have a *Trojan Books* account and creates one** (branch after step 4) 1. User request the creation of an account. 2. System displays form for the user to enter a username, password and to confirm their password. 3. User completes information. 4. System informs user that the account has been created. (Return to step 5). **1.2 User does not have a *Trojan Books* account and does not create an account** (branch after step 4) 1. User request to create the request without an account. (Return to step 6.) **1.3 User updates their *Trojan Books* account information** (branch after step 5 or step 7) 1. User request updating their account information. 2. System displays form for updating account information, which includes a field to enter or update an email address. 3. User completes information. 4. System informs user that the account has been updated. (Return to step 5 or 7).
Exceptions:	(5 pts.) **1.0.E.1 User decides not to request book** (branch after step 2, 3, 4 or 7) 1. User cancels item request of exits from *Trojan Books*.
Includes:	(5 pts.) Login

Priority:	(1 pts.) High
Frequency of Use:	(1 pts.) 3 times per working day
Business Rules:	(1 pts.) Whitehall library works with affiliated libraries in order to provide better service to their customers.
Special Requirements:	(1 pts.)
Assumptions:	(1 pts.) None
Notes and Issues:	

Extra Credit:

Create a data model depicting the combined data for the Tech Connect frontend, and the GIT Webservice. (5 pts.)