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Subject: Introduction to software engineering

QUESTION NO:1

Describe Waterfall Model and list the stages of Waterfall Model for software development and list three of its advantages and disadvatages?

ANSWER:

The Waterfall Model is a classical model used in System Develop,emt Life Cycle to create a system with a linear and sequential approach. It is also referred to as a linear sequential life cycle model.

STAGES:

It has following stages:

1.Communication

2.Planning

3.Modeling

4.Construction

5.Deployment

.**COMMUNICATION**:

Requirements Gathering

.**PLANNING**:

Estimating/Scheduling/Tracking

.**MODELING**:

Analysis & Design

.**CONSTRUCTION**:

Coding/Implementation/Test

.**DEPLOYMENT**:

Delivery/Support/Feedback

ADVANTAGES:

1.Forces-structured,disciplined organization.

2.Is simple to understand,follow and arrange tasks.

3.Upfront documentation and planning stages allow for large or shifting teams to remain informed and move towards a common goal.

DISADVANTAGES:

1.Delays testing until the end of the development life cycle.

2.Does not consider error correction.

3.Design is not adaptive,often when a flaw is found,the entire process needs to start over.

QUESTION NO 2:

List the stages of the software development lifecycle(SDLC).Describe each stage in one phrase each?

ANSWER:

- Planning & Requirement Analysis phase
- Requirement Definition Phase
- Designing Phase
- Development Phase
- Test Phase
- Deployment & Maintenance Phase

Stage 1:Planning and Requirement:

Requirement analysis is the most important and fundamental stade SDLC.

Stage 2:Defining Requirement:

Once the requirement analysis is done the next step is to clear define and document the product requirements to get them approved from the customer

Stage 3:System Design:

Based on the requirements in SRS desired features and operation in detail are specified and documentated in a DDS.

Stage 4:Building or Developing Product:

In the stage of SDLC the actual development starts and the product is built.

Stage 5: Testing the product:

The stage refers to the testing of the product where products defects are reported,tracked,fixed and retested,until the product reaches the quality standards defined inn the SRS.

Stage 6: Deployment:

Once the product is tested and ready to be deployed it is released formally in the appropriate market(i.e.where the software is put into the production and runs actual business).

QUESTION NO 3:

ANSWER :

User level requirements:

A Library Management System is a software built to handle the primary housekeeping functions of a library. Library management systems help libraries keep track of the books and their checkouts,as well as member' subscriptions and profiles.

Library management system also involve maintaining the database for entering new books and recording books that have been borrowed.

System level requirements:

We will focus on the following set of requirements while designing the Library Management System:

1.Any library member should be able to search books by their title, author, subject category as well by the publication date.

2.Each book will have a unique identification number and other details including a rack number which will help to physically locate the book.

3.There could be more than one copy of a book, and library members should be able to check-out and reserve any copy.

4.There should be a maximum limit (5) on how many books a member can check-out.

5.The system should be able to retrieve information like who took a particular book or what are the books checked-out by a specific library member.

6.There should be a maximum limit (10) on how many days a member can keep a book.

7.The system should be able to collect fines for books returned after the due date.

8.Members should be able to reserve books that are not currently available.

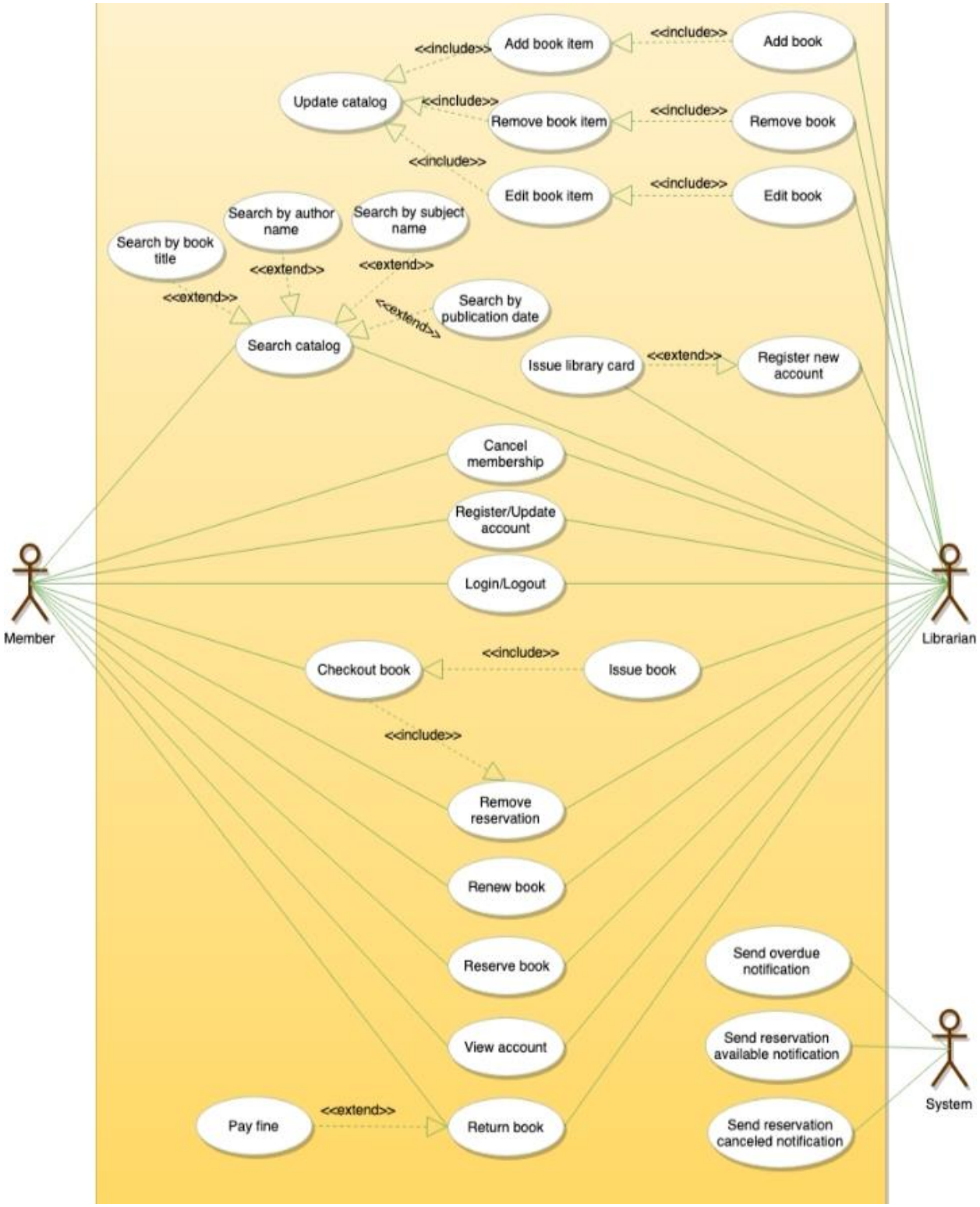
9.The system should be able to send notifications whenever the reserved books become available, as well as when the book is not returned within the due date.

QUESTION NO 4:

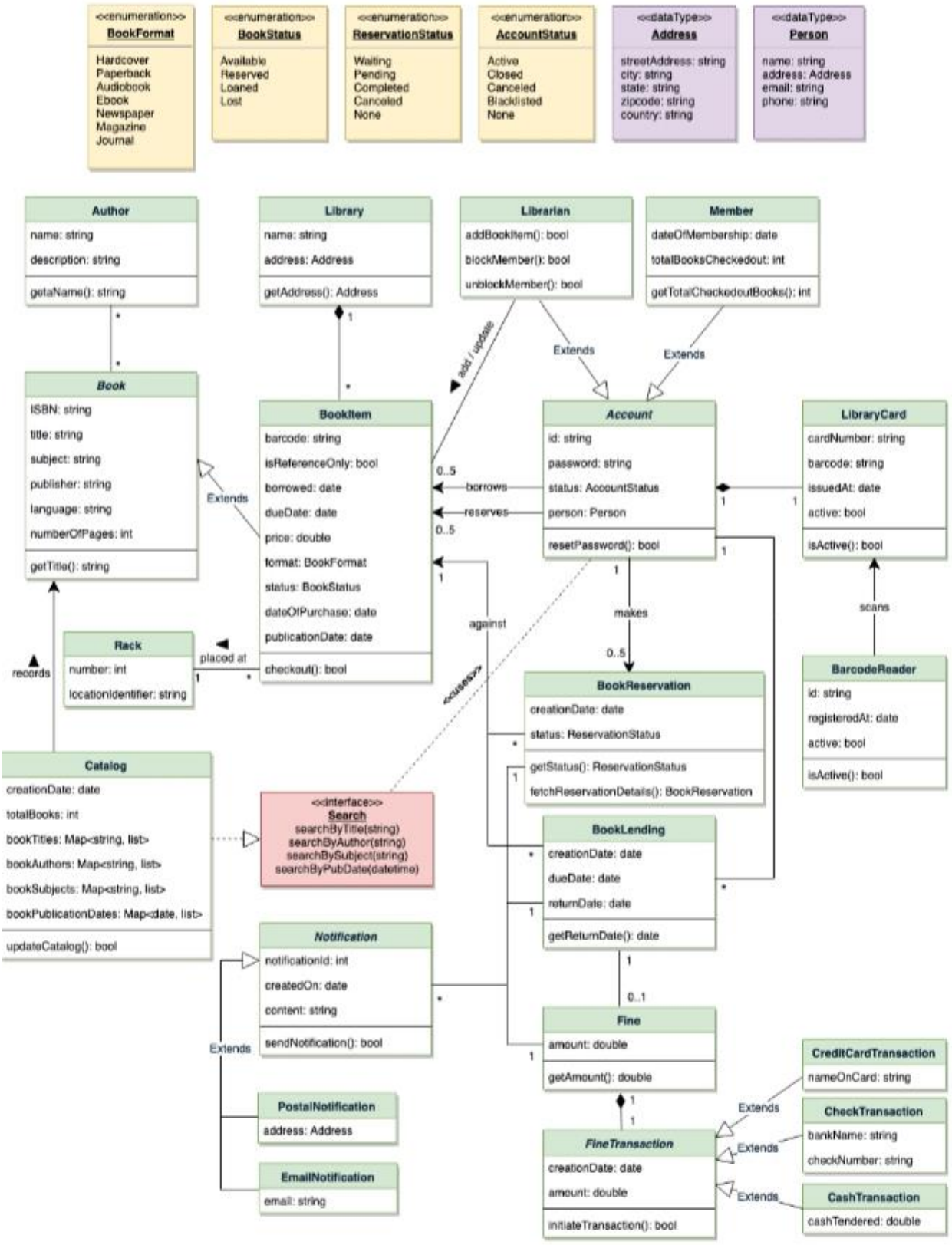
Draw a Use Case Diagram and Domain Model for the problem mentioned in Q3?

ANSWER:

USE CASE:



DOMAIN MODEL: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publisher: string
language: string
numberOfPages: int
getTitle(): string
BookItem
barcode: string
isReferenceOnly: bool
borrowed: date
dueDate: date
price: double
format: BookFormat
status: BookStatus
dateOfPurchase: date
publicationDate: date
checkout(): bool
Account
id: string
password: string
status: AccountStatus
person: Person
resetPassword(): bool
LibraryCard
cardNumber: string
barcode: string
issuedAt: date
active: bool
isActive(): bool
Rack
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locationIdentifier: string
BookReservation
creationDate: date
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getStatus(): ReservationStatus
fetchReservationDetails(): BookReservation
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registeredAt: date
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isActive(): bool
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EmailNotification
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FineTransaction
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CheckTransaction
bankName: string
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CashTransaction
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QUESTION NO 5:

Write the Non-functional requirements for the following projects?

1.An online banking system

2.Bike racing system

ANSWER:

An online banking system:

Performance:

The bank management system is a multi-client system that must reach response time targets for each of the clients during simultaneous calls and must be able to run a target number of

transactions per second without failure. The system must effectively utilize the hardware and energy resources to minimize operational costs.

Availability:

The system must be available during bank working hours. The mobile banking and ATM must be available round-the-clock with minimal maintenance times, reaching 99.999% availability time per year.

Usability:

The system must provide different graphical interfaces for customers, tellers, and admins. All system interfaces must be user-friendly and simple to

learn, including helping hints and messages and intuitive workflow, especially in a client interface: the client must be able to fast learn and use the interface without prior knowledge of banking terminology or rules.

Security:

Bank management systems are notorious for being subject to malicious attacks, so security is the major requirement for the system. Unauthorized access to the data is not permissible. The data must be backed up daily and stored in a secured location, at a distance from different facilities of the system.

BIKE RACING GAME:

Randomly made up, high level, each functional requirement would need to be more logically categories and broken down much to be worked upon.

1.It will be 3D open-world.

2.You will be able to customise your character.

3.You will be able to crawl, crouch walk, walk, run and jump.

4.You will be able to drive vehicles.

Non-functional requirements:

1.The user must experience a strong story.

2.The game must be fun.

3.The game must be atmospheric.

4.The game must not crash.

5.The game must be accessible for all user segments.