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ASSIGNMENT #02

Introduction to Software Engineering

Question No: 1

Describe the Waterfall Model and list the stages of Waterfall Model for Software Development and three of its advantages and disadvantages?

Ans:

Waterfall Model:-

It is a classical model used in **SDLC** to create a system with a **linear** and **sequential** approach. It is also referred to as a **linear – sequential** life cycle model.

Stages of Waterfall Model:

1. Requirement
2. Planning
3. Modeling (Design)
4. Coding
5. Deployment

Advantages	Disadvantages
• Before the next phase of development, each phase must be completed.	• Error can be fixed only during the phase.
• Suited for smaller projects where requirements are well defined.	• Not desirable for large projects where requirement are changed frequently.
• Any changes in software is made during the process of the development	• Delays testing until the end of the development life cycle.

Question No: 2

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

Ans:

Stages of SDLC and their definition:-

- **Planning and Requirement analysis:**
  Planning for the quality assurance requirements and identification of the risks associated with the project .
- **Requirement definition:**
  In this phase we clearly define and document the product requirements and get them approved from the customer.
- **Designing phase:**
  Design the system according to its **requirement.** Like **screen layout, process diagram** and other **documentation.**
- **Development phase:**
  Coding the program according to its requirements in any programming language.
- **Test Phase:**
  Test the program if **errors** occur then **retest** it until problems are not fixed and its work properly.
- **Deployment and Maintenance phase:**
  After implementation solve error and **addition** of some more things.

Question No: 3

Using a natural language format write **one user level** and **several system level requirements** to describe a function to allow a librarian to record a book loan. In the system, a book has an ISBN and may have multiple copies. Each copy has a number (1, 2, 3, ...) and is either available or has a due date and the id of the current borrower. Books are loaned for two weeks at a time. Assume the librarian is logged in and has already indicated they want to record a book loan. Assume that the borrower knows the ISBN of the book they want to borrow, and that the librarian will retrieve it from the stacks. Consider what information must be gathered, what conditions must be checked, and what information must be recorded or changed ?

Ans:

User level requirement:-

User can burrow the books from library by showing **Library ID card** to librarian.

System level requirement:-

1.1: Any library member should be able to search books by their ISBN.

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

1.3: The system should able to check the user library card number.

1.4: The system should be able to retrieve information like who took a particular book.

1.5: There should be a maximum two weeks limit that a member can keep a book.

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

1.7: Each book and member card will have a unique number or ISBN.

1.8: The system should be able to collect books returned after the due date.

1.9: There should be a maximum limit that how many books a member can check-out.

Question No: 5

Write Non-functional requirement for the following two projects.

1. **Bike racing Game**
2. **An online banking system**

Ans:

Bike racing Game

- **Speed**
  Speed of game is different in different devices like in Android, iso, iphone, laptop etc.
- **Capacity**

Minimum requirement needs to run that game. For example Ram=2GB, Rom=1GB . Requirement are different for laptop and Android etc.

- **Portability**
  Game interface and format is different in different devices. In window the game login and open design is different than Android and iso devices etc.
- **Localization**
  Localization mean the graphic or UX design of game. In high graphic devices the game view is good, clear and game run smoothly.

An online banking system

- **Speed**
  Speed of system is different in different devices like in Android, iso, iphone, laptop etc.
- **Security**
  It provide security to a user. Each person data is secured no one will check user saved data.
- **Reliability**
- **Maintainable**
  Each of the modules should be designed in such a way that a new module can easily be integrated with it.
- **Usability**

Question No: 4

Draw Use Case diagram and Domain model of a function to allow a librarian to record a book loan. In the system, a book has an ISBN and may have multiple copies. Each copy has a number (1, 2, 3, ...) and is either available or has a due date and the id of the current borrower. Books are loaned for two weeks at a time. Assume the

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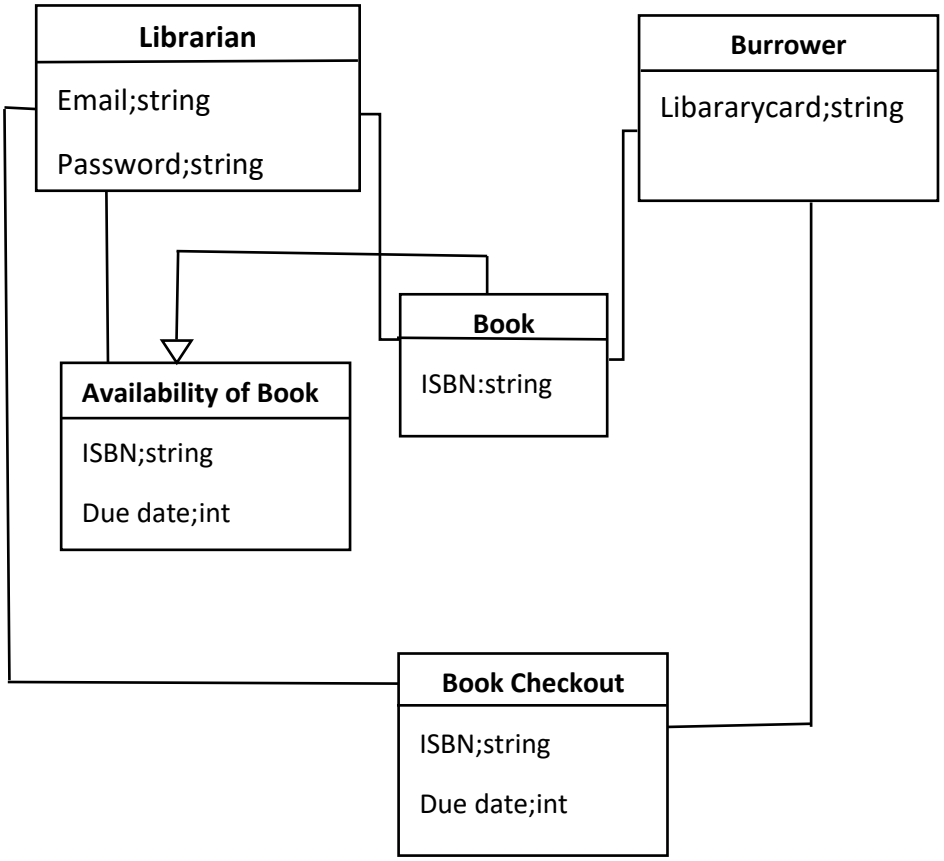
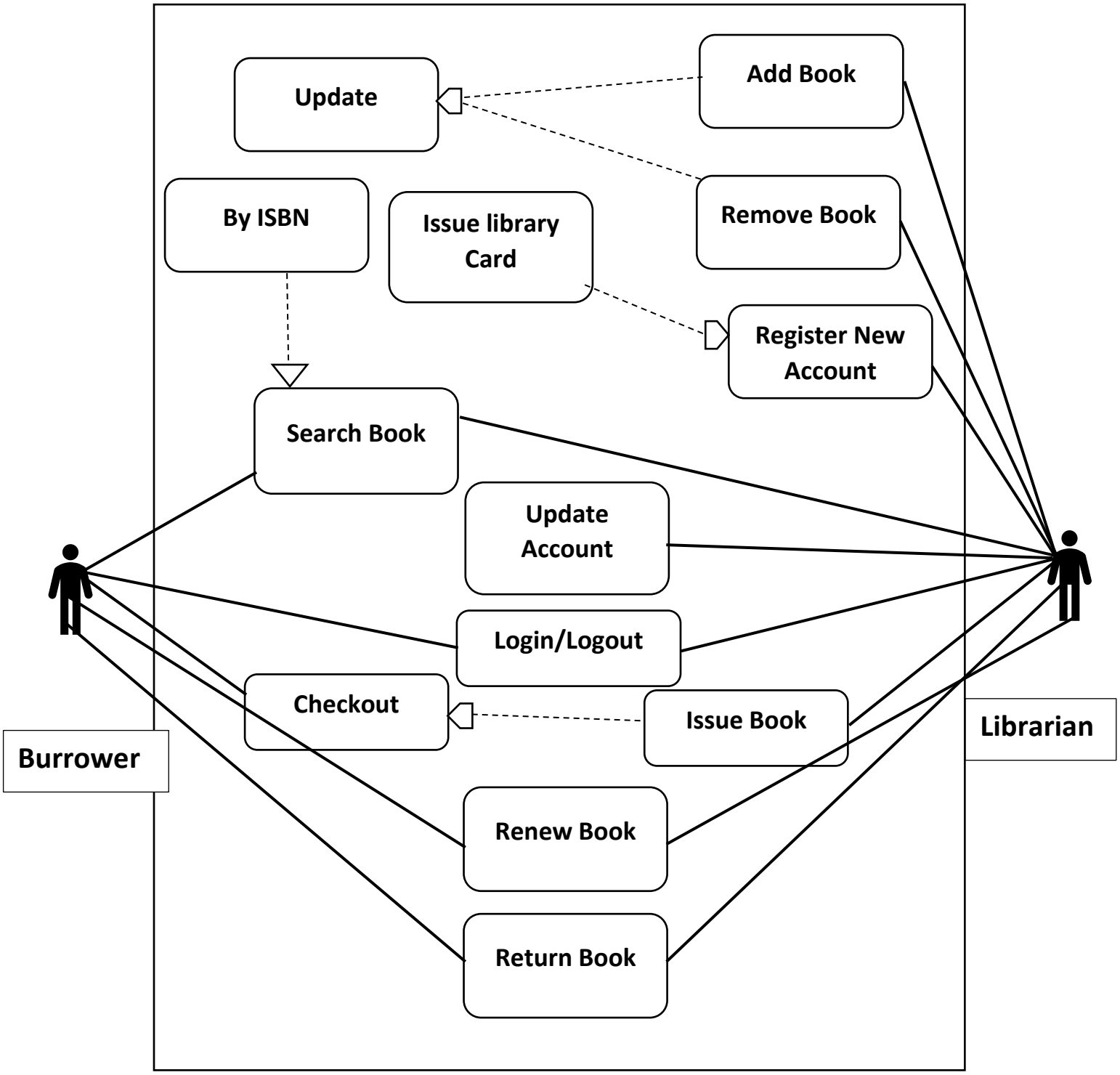
Domain Model



Case Diagram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Remove Book
Register New Account
Search Book
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Login/Logout
Checkout
Issue Book
Renew Book
Return Book
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