Question-1

Waterfall Model: The Waterfall Model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

Stages of waterfall Model:

- Requirement Gathering and analysis
- Analysis
- System Design
- Coding and Implementation
- Testing
- Operation/Deployment
- Maintenance

Advantages of Waterfall Model:

i. Forces structured, disciplined organization.

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

iii. Clearly defines milestones and deadlines.

Disadvantages of Waterfall Model:

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

ii. Does not consider error correction.

iii. Reduces efficiency by not allowing processes to overlap.

Question-2

SDLC: Software Development Life Cycle (SDLC) is a framework that defines the steps involved in the development of software at each phase. It covers the detailed plan for building, deploying and

maintaining the software.

SDLC Phases:

1. Requirement Gathering
2. Defining requirements
3. Design
4. Implementation or Coding
5. Testing
6. Deployment
7. Maintenance

Requirement Gathering: Requirement analysis is the most important and fundamental stage in SDLC. It is permormed by the senior members of the team with inputs from the customer, the market surveys and domain experts in the industry.

Defining requirements: Once the requirement analysis is done the next step is to clearly define and document the product requirements and get them approved from the coustomer.

Desigining: Based on the requirements in SRS desired features and operation in detail are specified and documented in a DDS(Design Document Specification).

Implementation or Coding: In this stage of SDLC the actual development starts and the product is built. The programming code is generated as per DDS during this stage.

Testing: This is refers to the testing of the product where products defects are reported, tracked, fixed and retested, until the product reaches the quality standards defined in the SRS.

Deployment: Once the product is tested and ready to be deployed it is released formally in the appropriate market.

Maintenance: What happens during the rest of software's life: changes corrections, additions and more.

Question-3

Requirement for Library Management System:

User Level

i. Member can search the catalogue, as well as check-out, reserve, renew, and return a book.

System Leve

i. Librarian should be able to loggin.

ii. Librarian should be able to search books by their title, author, publication date.

iii. Each book will have a unique ISBN number.

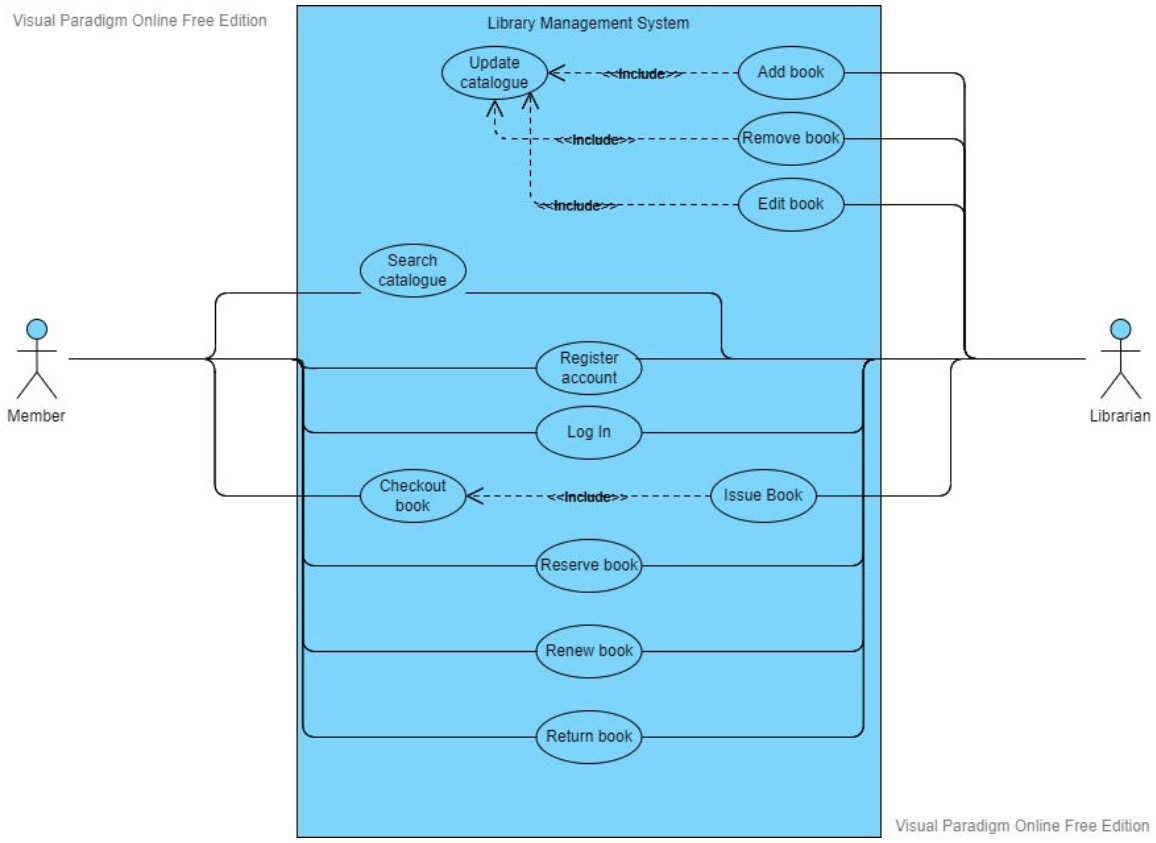
iv. There could be more than one copy of a book, and librarian should be able to check-out and reserve any copy.

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

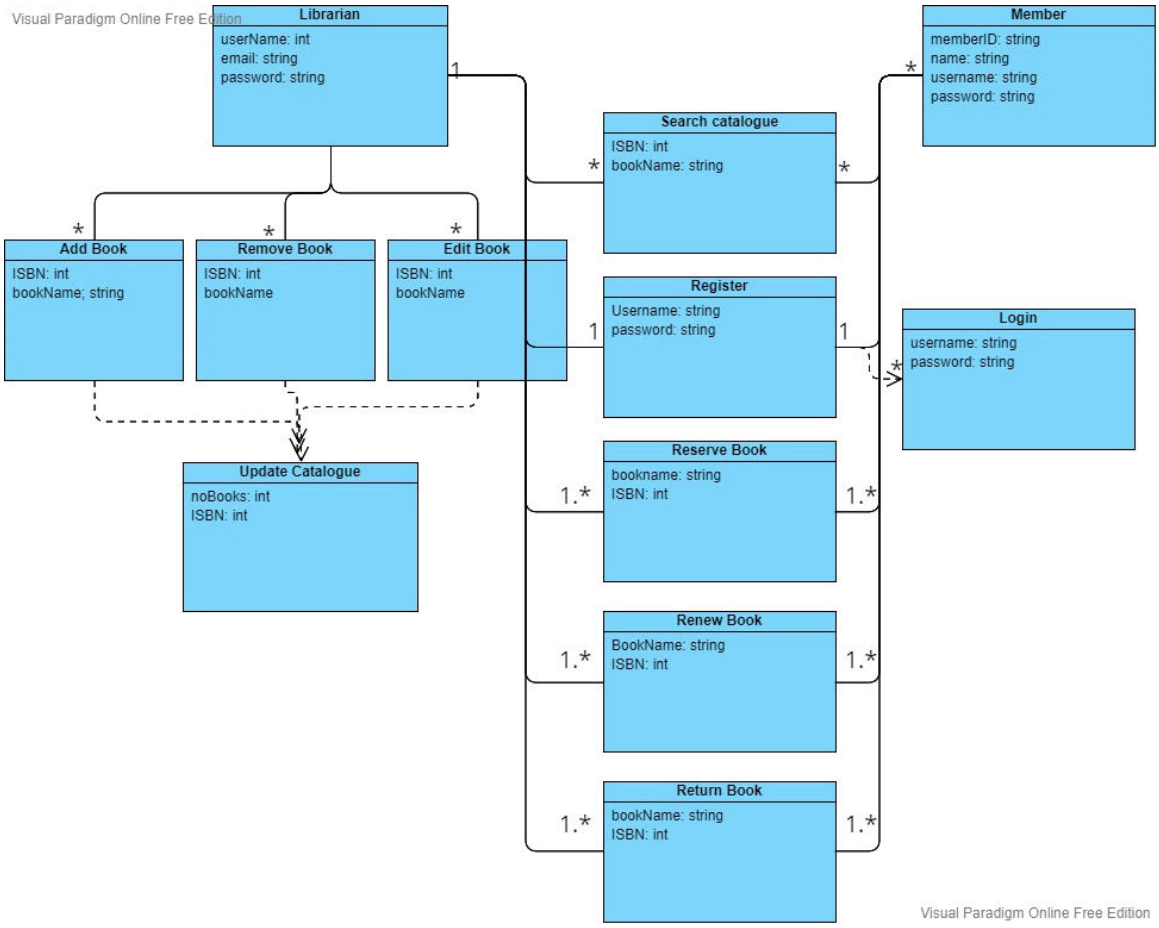
vi. There should be a maximum two weeks limit on how many days a member can keep a book.

Question-4

Use Case Diagram:



Domain Model:



Question-5

Non-functional requirement for:

Bike Racing Game

- **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
- **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.
- **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.
- **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.
- **Reliability :** Reliability reflects the capacity of the software to maintain its performance over the time. It implies how well the system performs in peak hours.

- **These are the non-functional requirements that the online banking should consist of.**

An Online Banking System

- **Security:** Security is the feature of the system which ensures that system must be protected from the unintentional or malignant harm; unauthorized access to the data is not permissible.
- **Availability :** The online banking should be available round the clock. It means for how long the system is available for its users or clients and for how long the system will be operational.
- **Usability :** online banking is carried by various types of clients i.e. whether they have knowledge of computers or not so the application designed for online baking must be easy to use and enable the client to manage their ccounts or transactions with simplicity.
- **Usability :** online banking is carried by various types of clients i.e. whether they have knowledge of computers or not so the application designed for online baking must be easy to use and enable the client to manage their ccounts or transactions with simplicity.
- **Reliability** : Reliability reflects the capacity of the software to maintain its performance over the time. It implies how well the system performs in peak hours.
- **Visibility :** It alludes to condition of having the capacity to see online banking empowers the client to see the login screen and the configuration of the online banking application as per the client desire.