Week - 7

List of Case Studies:

Choose any 2 case studies and Implement the experiments

1) ATM Application

2) Library Management System.

Develop class diagram and object diagram using Rational Rose

Description: (Analysis)

A class Diagram shows a set of classes, interfaces, and collaborations and their relationships. class Diagram that include active classes address the static process view of a system.

Object Diagram:

- Object diagrams represent static snapshots of instances of the things found in class diagrams.
- These diagrams address the static design view or static process view of a system.
- Rational Rose is a sophisticated CASE tool with a number of automated features, including code generation and reverse engineering. The version you will use is not the most recent version and there are limitations on the size of the diagrams you can store.

ATM application:

- The ATM application consists of ATM, customer and the Bank details

- The customer consists of account number, name, address and also personal details
- The ATM info consists location & the bank details managing the ATM
- Mainly the bank consists of customer details and the account details.
- There all are interlinked to each other. There will be savings and current account of a customer in the bank.
- The ATM can have withdraw, deposit, query & PIN validity.
- In this the person/ customer have a change to change the PIN, check the balance, deposit and withdraw.
- The class & object diagrams are as shown below.

Library Management System

Class Diagram

- A class diagram shows a set of classes, interfaces, and collaborations and their relationships.
- Class Diagram that include active classes address the static process view of a system.

Object Diagram

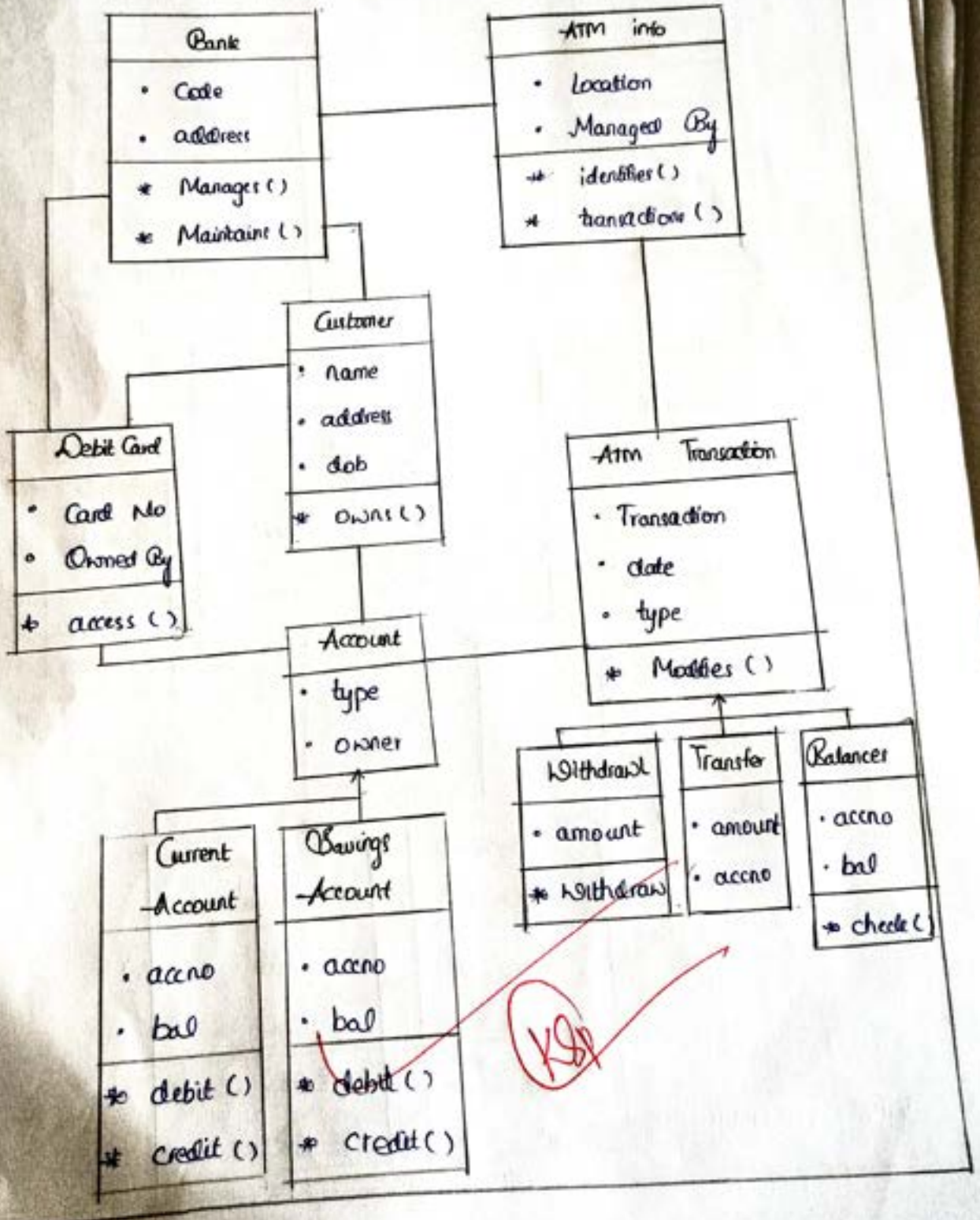
- Object diagrams represent static snapshots of instances of the things found in class diagrams.
- An object diagram shows a set of objects and their relationships
- These diagrams address the static design view & static process view of a system.

Steps:

* Library management is a vast n/w consits of various parts of compartments
* Mainly it consists of Books details & librarian details.
* Then next it contains members details like Student & faculty details.
* The library consists of various books. So, the books are divided into various categories based on their features & authors.
* The billing consists of bill no, fine, due date & also issue date.
* Based on the date of issue & return the fine will be applied.
* The bill will be issued when the student pays the fine.
* These are the basic details which are more important & plays a key role in the LMS.

ATM APPLICATION

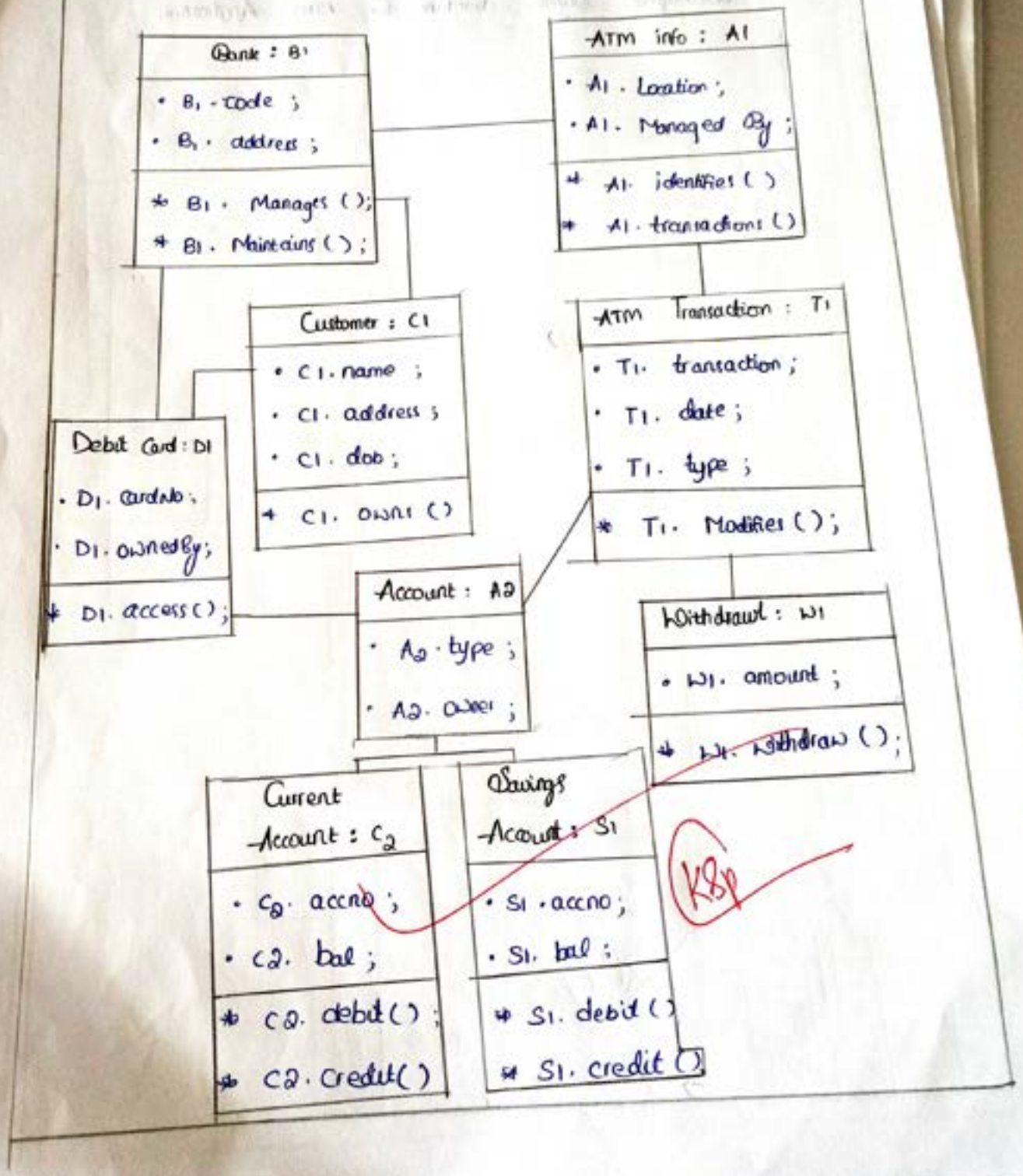
CLASS DIAGRAM



Result : Developed class diagram for ATM Application

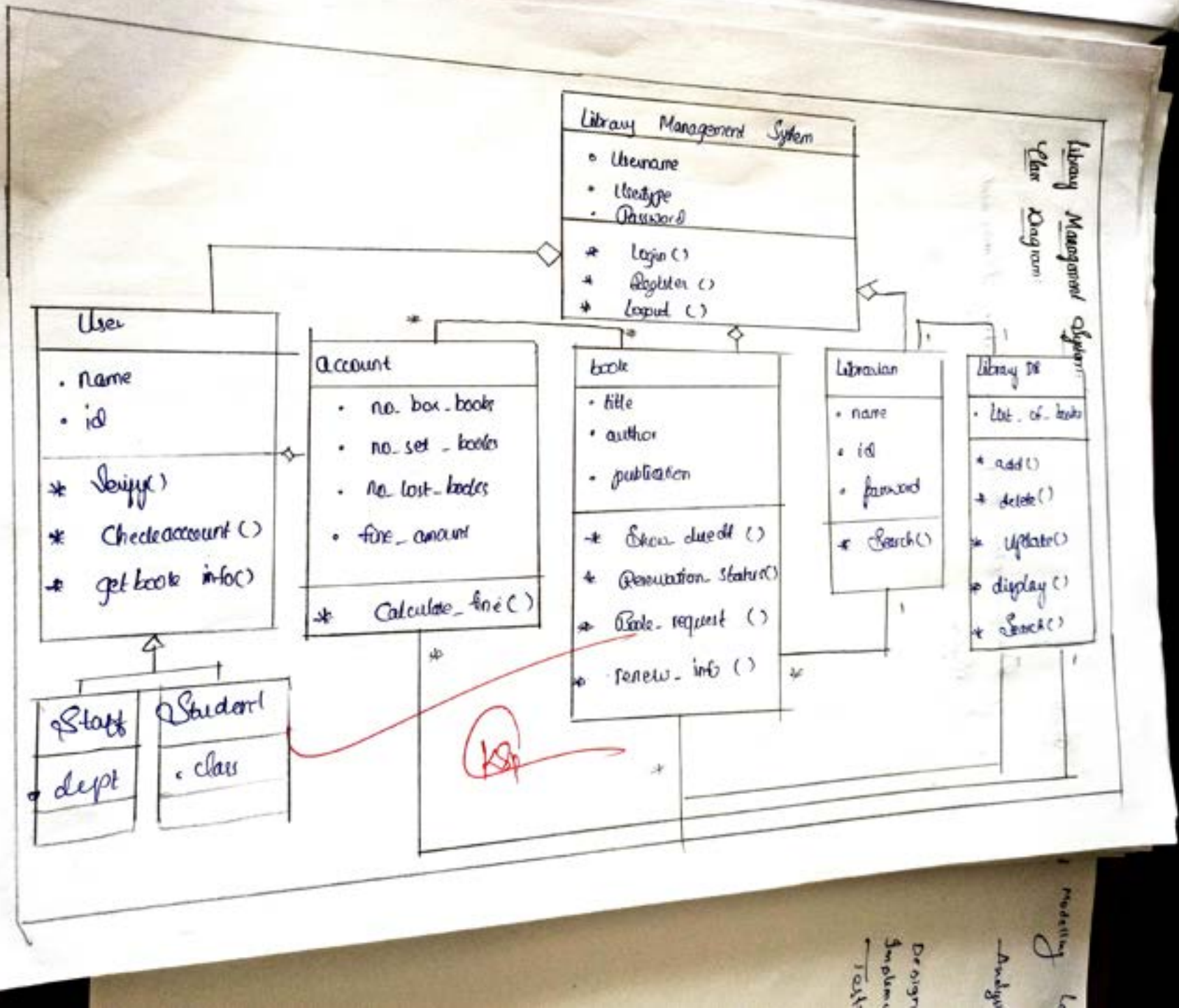
ATM -APPLICATION

OBJECT DIAGRAM



Result :

Developed Object diagram for ATM Application

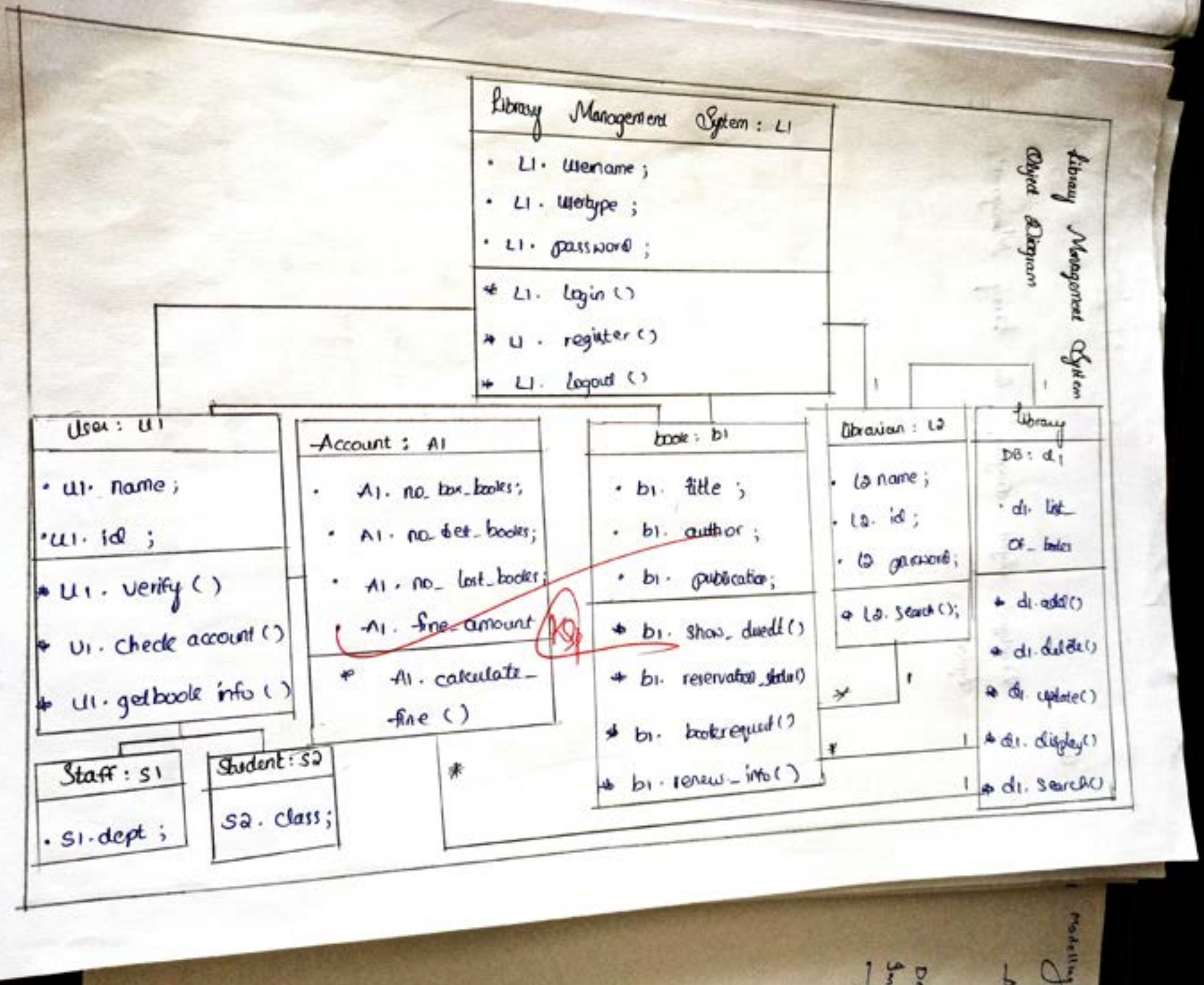

Library Management System
Class Diagram
Library Management System
- Username
- Usertype
- Password
* Login()
* Register()
* Logout()
User
- name
- id
* Issue()
* Checkaccount()
* get book info()
Account
- no. box_books
- no_set_books
- no_lost_books
- fine_amount
* Calculate_fine()
book
- title
- author
- publication
* Show_duedt()
* Reservation_status()
* Book_request()
* renew_info()
Librarian
- name
- id
- password
* Search()
Library DB
- List_of_books
* add()
* delete()
* Update()
* display()
* Search()
Staff
- dept
Student
- class

Result :

Developed class diagram for Library Management System.

Library Management System

Object Diagram



Result :

Developed Object diagram for Library Management System.

Week - 8

Develop Use case diagrams & Elaborate use case descriptions & Scenarios

Aim: To develop use case diagrams & Elaborate use case descriptions & Scenarios

Description (Analysis):

Use case - Behaviour of a system / subsystem (or) Dynamic Behaviour of a system.

Components of use-case

1) use-case : ⬭ (Ellipse)

2) Actor : 

3) Relationships: 1) Association : ——

2) Includes : - - - - -> (use case)

3) Extends : <- - - - -

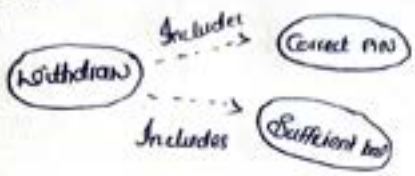
4) Generalization : ——▷ is-a-kind of Relationship

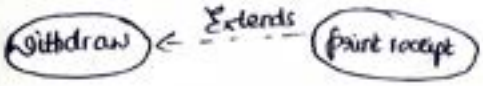
Actors are the users of a system. They can be people, organizations, or other systems.

An actor can be a primary user or a secondary user of a system.

Relationship is the connectivity between Actors and use cases. Includes is a mandatory relationship. Extends represents an optional behaviour.

Eg:





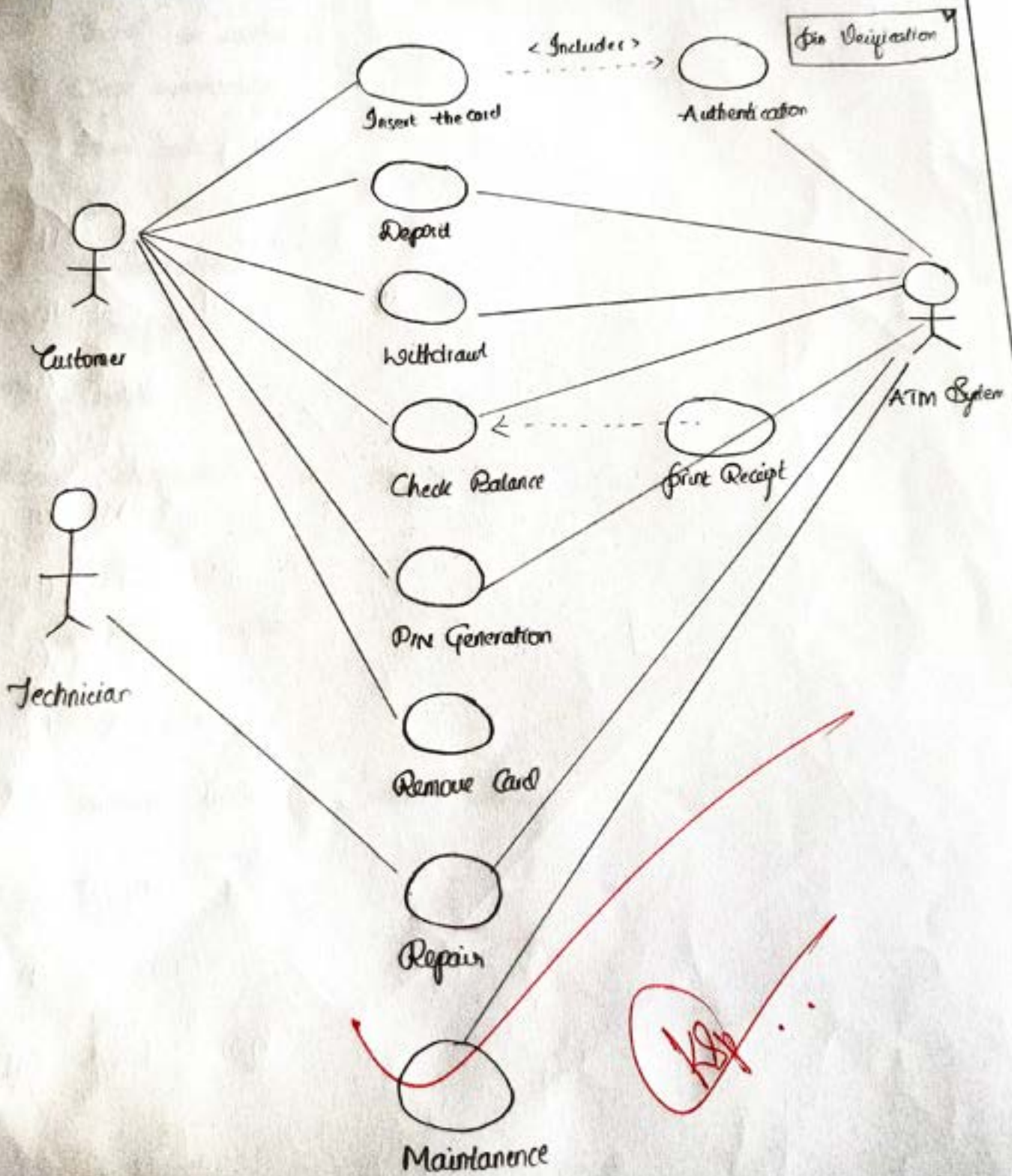
Use Case diagram for ATM

Use cases Identified in the ATM are

1) Insert the card
2) Deposit
3) Withdraw
4) Check balance
5) Pin Generation
6) Authentication
7) Remove Card
8) Repair
9) Maintanence
10) Print receipt

Actors Identified in the ATM are

1) Customer
2) ATM System
3) Technician.



Use Case diagram for LMS:

Use cases Identified in the LMS are

1) Login
2) Searching for book
3) Search the author
4) Check availability
5) Issue book
6) Due date
7) Authentication
8) Pay fine
9) Logout

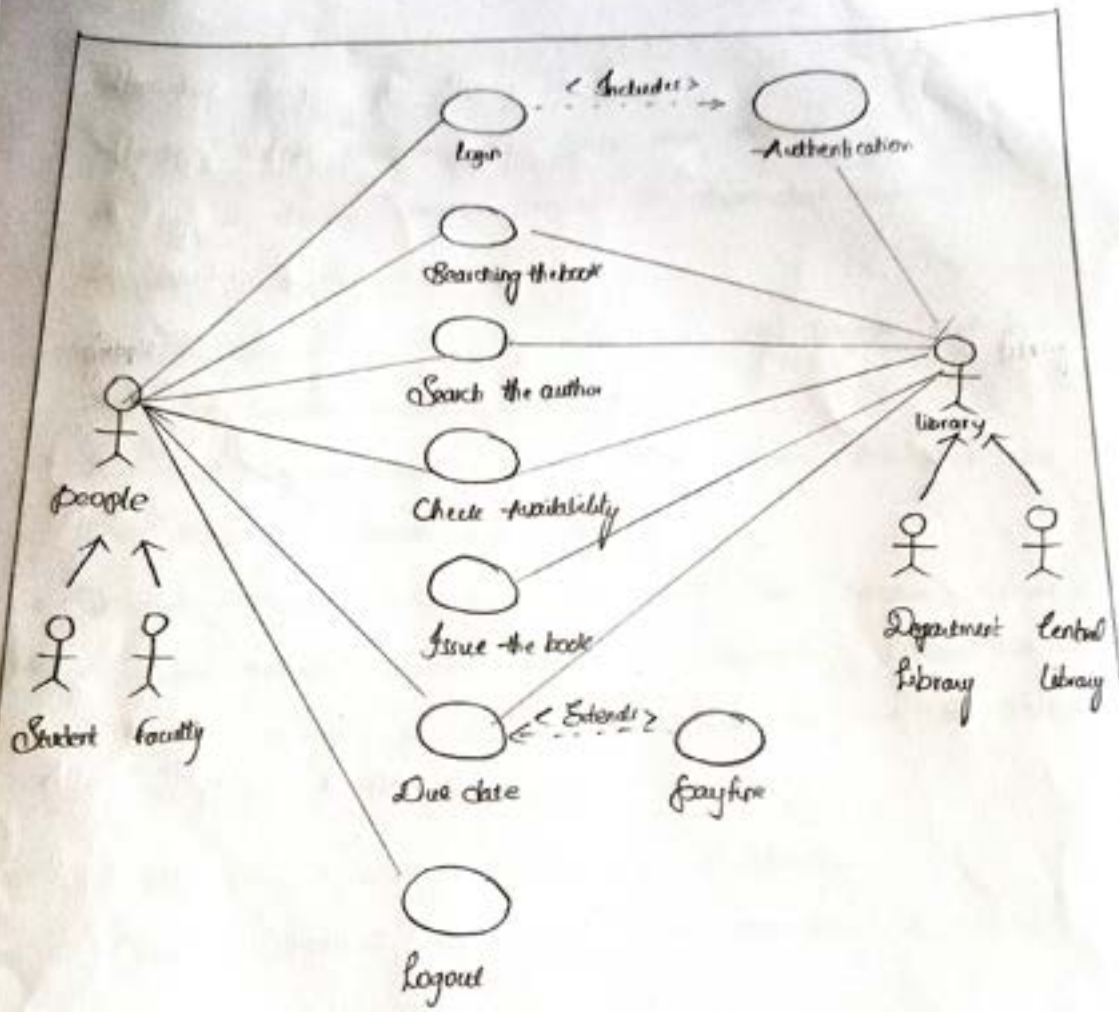
Actors Identified in the Use-case :

1) People

   Student, Teachers

2) Library

   Department Library, Central Library.



Result:

Developed use-case diagrams for both ATM Application and LMS.

Week-10

Develop sample diagrams for State chart diagrams.

Aim: To develop sample diagrams for State chart diagrams.

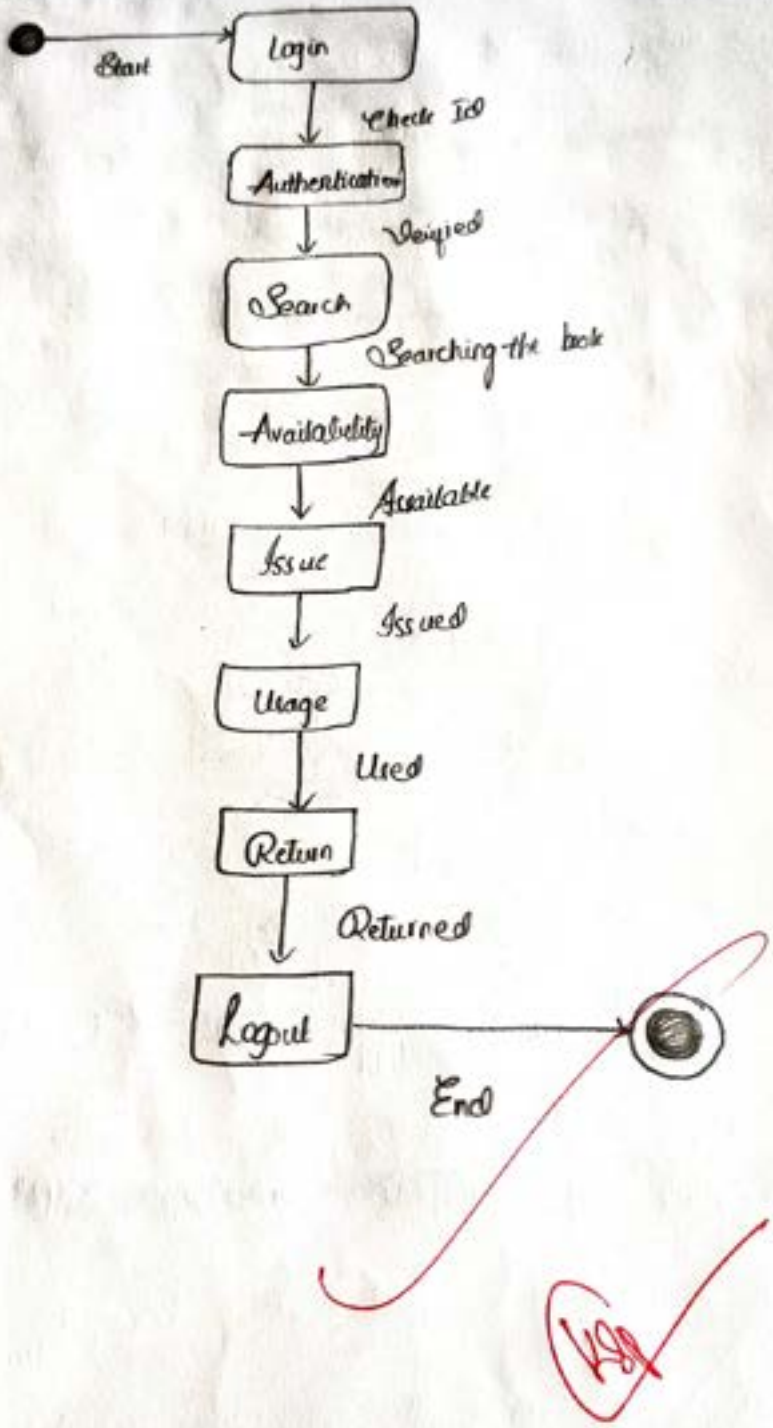
Description (Analysis):

* Statechart diagram is one of the five UML diagrams used to model the dynamic nature of a System.
* They define different states of an object during its lifetime and these states are changed by Events.
* Statechart diagrams are useful to model the reactive systems.
* A State-transition diagram presents a sequence of states that an object goes through during life cycle. It describes how the states of an object or, component change.
* A State is defined by its duration & stability
* A Transition represents the change from one State to another.

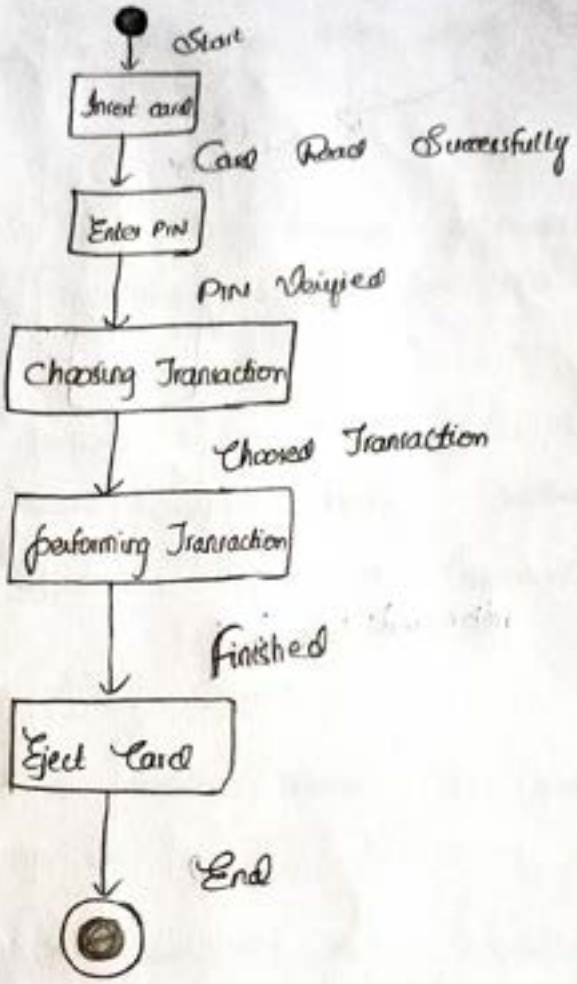
Elements in a State-transition diagram

- State : Represents the value of the object attributes at a given time
- Transition : Represents the change from one State to another.
- Initial State : Represents the state when the System is started.
- Final State : Represents the State of the System at the end of the Operation.

Statechart diagram for LMS:



Statechart diagram for ATM:



Result:

Developed State chart diagrams for ATM application and UMs.

Week -11

Develop Detailed design using activity diagrams.

Aim: To Develop detailed design using activity diagrams.

Description (Analysis):

Activity Diagram: Set of activities can be represented. It is a basically flowchart to represent the flow from one activity to another activity.

* The activity can be described as an operation of the System.
* The control flow is drawn from one operation to another.
* This flow can be sequential, branched & Concurrent

Basic components of an Activity Diagram:

Action: A step in the activity wherein the user or, software performs a given task. ▭

Control flows: The flow between the steps. Represented by →

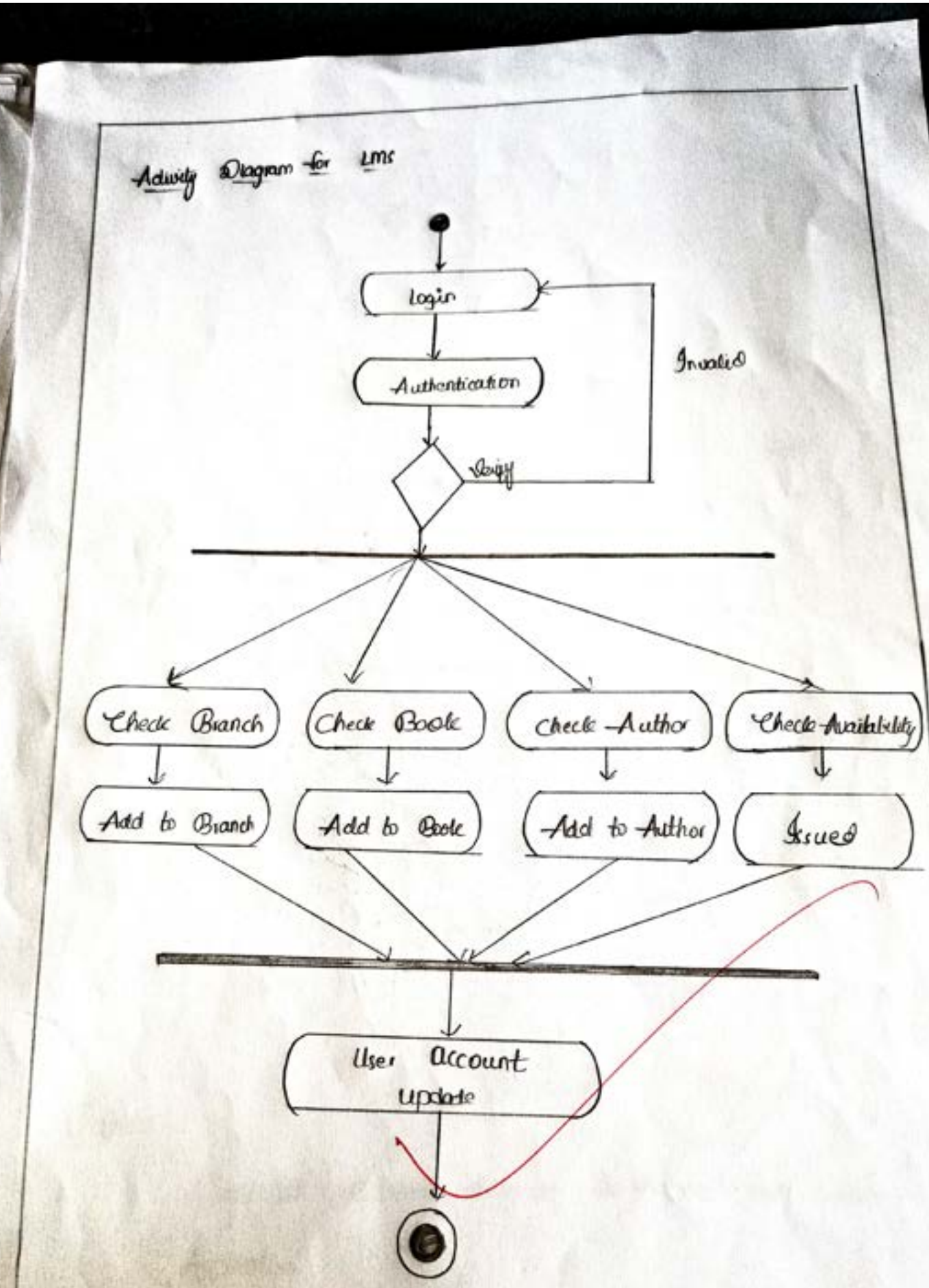
Start node: Symbolizes the beginning of the activity ●

End node: Represents the final step in the activity ◉

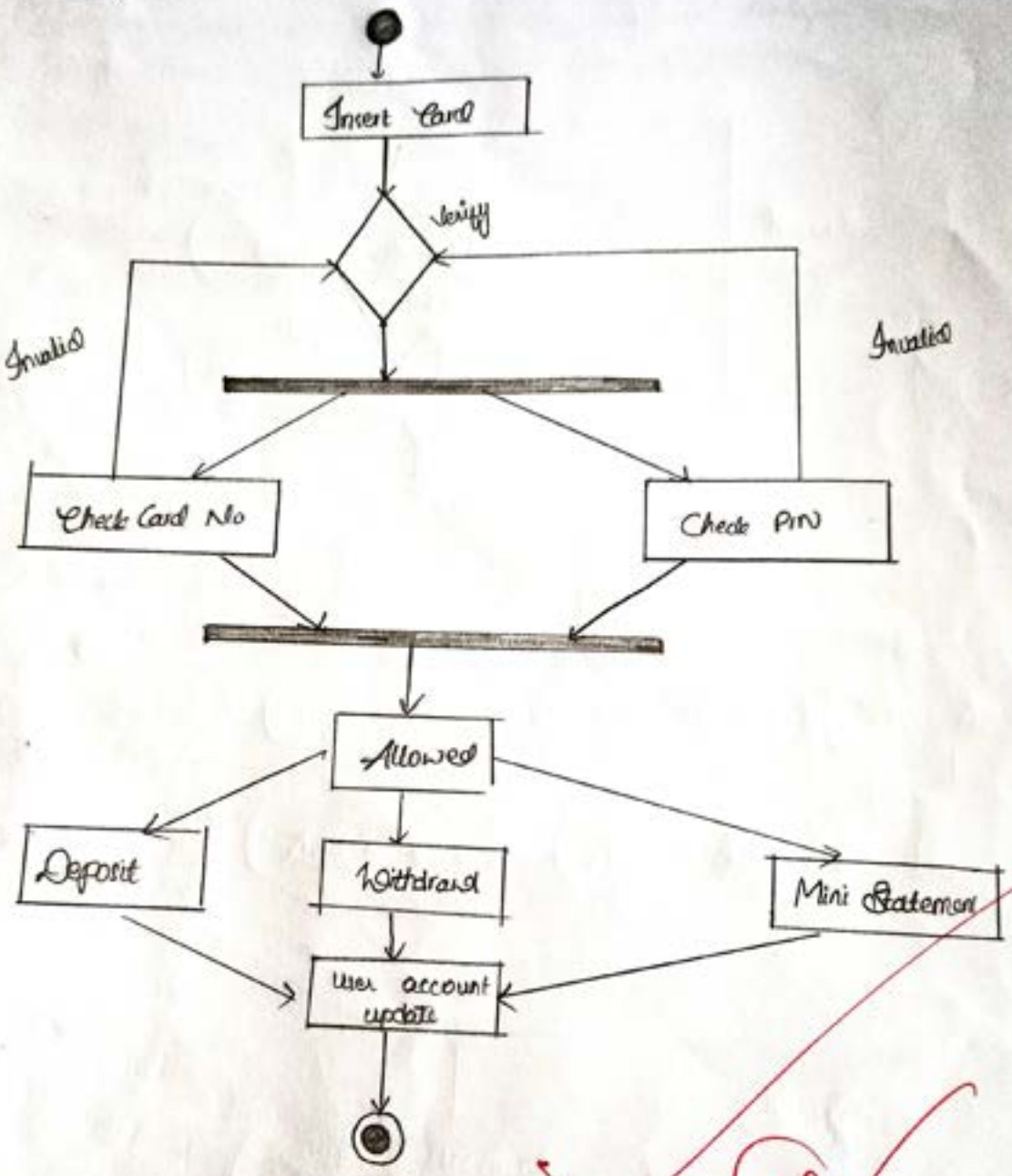
Join: Combines 2 concurrent activities and re-introduces them to flow where only 1 activity occurs at a time ⏚

Fork: Splits a single activity flow into 2 concurrent activities.

Condition: Represents a decision & always has atleast 2 paths branching out to allow users to view options. ◇


Activity Diagram for LMS
Login
Authentication
Verify
Invalid
Check Branch
Check Book
Check Author
Check Availability
Add to Branch
Add to Book
Add to Author
Issued
User Account update

Activity Diagram for ATM :



Result:

Developed activity diagrams for LMS and ATM Application.