AMITY UNIVERSITY
UTTAR PRADESH

LAB RECORD

BACHELOR OF TECHNOLOGY

B.Tech. CS&E- Semester (VI)

Academic Session – (2023 -24)

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Enrollment No.	: A7605221191
Course Title	: Software Engineering
Course Code	: IT301
Date of Submission	: 1/5/24
Signature of Student	: Aman Gupta
Grade/Marks Obtained	:
Faculty Name & Signature	: Dr. Shikha Singh

UML Diagrams

Imagine a complex system with interconnected components and processes. UML diagrams translate this complexity into easy-to-understand visuals using standardized symbols and notations. They act as a shared language between developers, stakeholders, and analysts, fostering better communication and collaboration.

Two Main Categories:

Static Diagrams: These capture structural aspects of a system:

Class Diagrams: Illustrate classes, their attributes
Component Diagrams: Depict physical org of software
Deployment Diagrams: How software components are deployed

Dynamic Diagrams: These delve into dynamic behavior of a system.

Use Case: How actors interact with system
Sequence: Depict sequence of messages exchanged
Activity: Model flow of activities and decisions within a system.

Benefits of using UML Diagrams:

Improved Communication
Early Problem Detection
Standardized Documentation
Easier maintainability

IBM Rational Rose Software Architect

It is a visual modeling and design tool used to create software applications. It allows developers to create UML, Use Case Diagrams, Activity Diagrams, Sequence Diagrams, which helps in designing a software.

It is mainly used for developing object-oriented modeling and design. It also helps to generate code from these diagrams and manage the entire software development lifecycle.

It provides tools for visual modeling, code generation, and documentation. It also supports various programming languages and integrates with other development tools and environments.

Benefits:

Reduce development time and effort
Improve software quality
Increase communication and collaboration
Adapt to changing needs

Program - 1

Objective: Draw a UML Diagram having classes Bank, Customer, ATM, ATM Transaction, Account, Current and Savings Account.

Theory: Notations of the above UML Diagram:

Bank: Represents a banking institution. It has methods to create accounts, authenticate customers, and process transactions.

Customer: Represents a bank customer. It has methods to request cash and deposit money into their account.

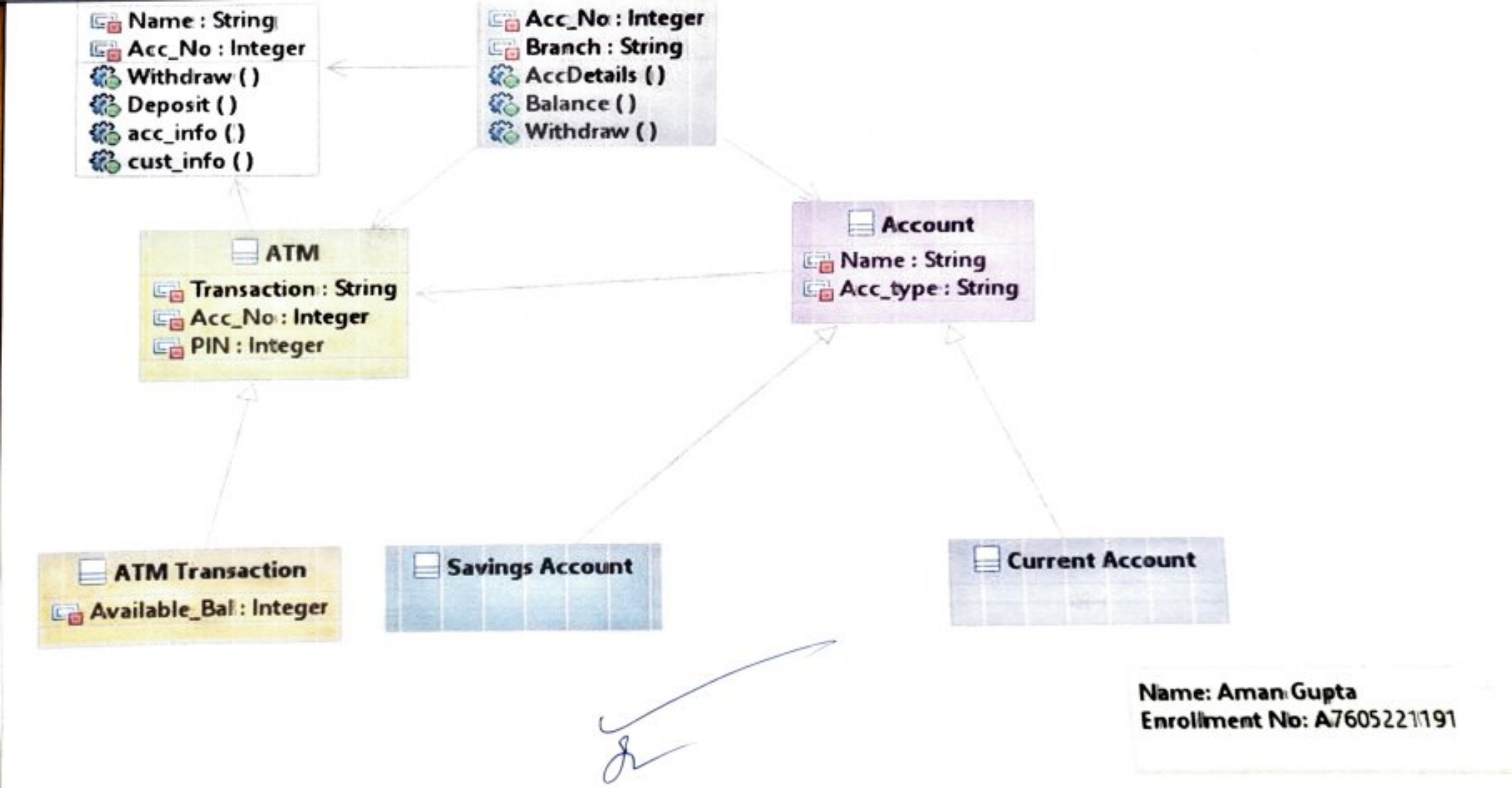
ATM: Represents an automated teller machine. It has methods to verify cards, dispense cash, and process transactions.

~~Account~~: ATM Transaction: Represents a transaction made at an ATM, including transaction ID, date/time, and amount.

Account: Represents a bank account. It has methods to check balance, deposit money, and withdraw money.

Current Account: A type of account that may have an overdraft limit.

Savings Account: A type of account that may earn interest.



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Program - 2

Objective: Draw a Use Case Diagram for a student management system with two actors named student and teacher and total five use cases: attendance, time table, test marks, update attendance & marks.

Theory:

Student: Represents an actor who interacts with the student management system. The student can perform three specific interactions: checking attendance, timetable, and test marks.

Teacher: Represents an actor who interacts with all functionalities of the system. The teacher can also update attendance & marks.

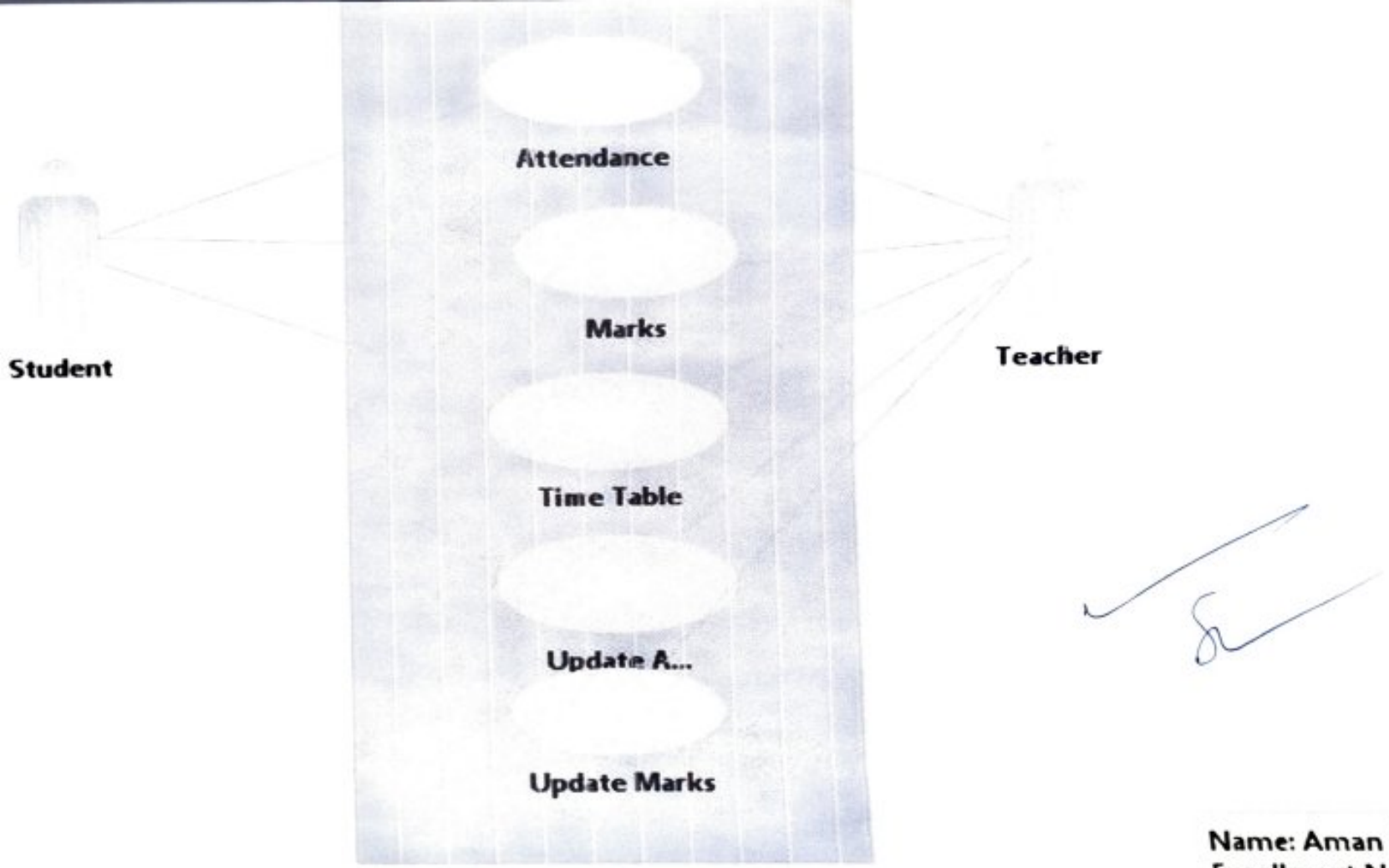
Check Attendance: Use case where a student checks their timetable.

Check Timetable: Use case where a student checks their timetable.

Check Test Marks: Use case where a student checks their timetable.

Update Attendance: Use case where a teacher updates attendance record of a student.

Update Marks: Use case where a teacher updates marks of a student.



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Program - 3

Objective: Draw an activity diagram for admit card generation having two actors: student and faculty and one portal Amizone.

Theory:

Student Login: The student logs into Amizone portal.

Display Dashboard: Amizone displays student's dashboard.

Check Attendance: The student checks their attendance record.

Display Attendance: Amizone displays student's attendance.

Check faculty Feedback Status: The student checks if they have filled the faculty feedback.

Display feedback Status: Amizone displays status of faculty feedback.

Fill faculty feedback: If feedback is not filled, th

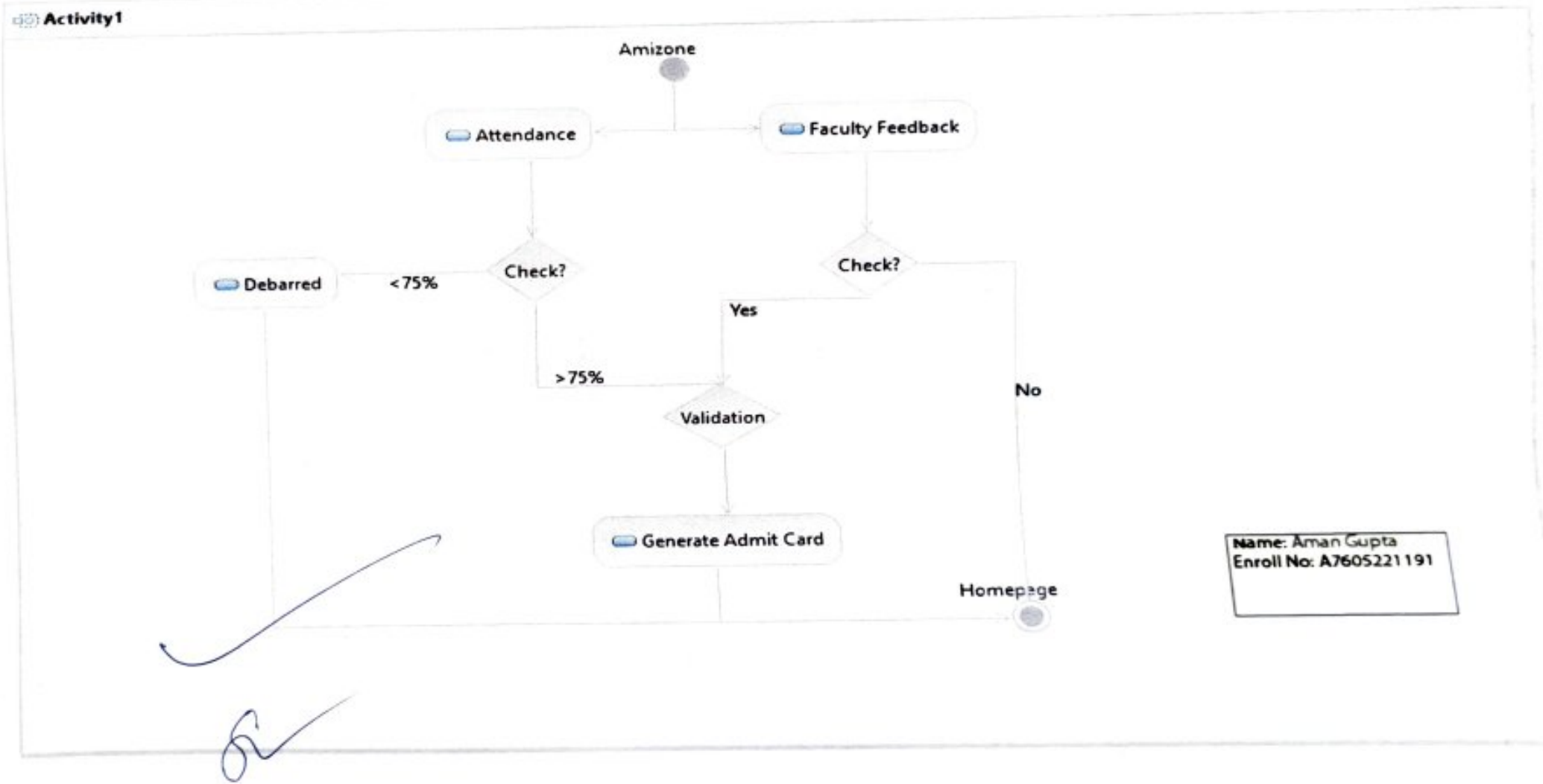
Request Admit Card: The student requests generation of admit card.

Verify conditions: Amizone verifies if conditions for admit card generation are met.

Meet Conditions: If attendance above 75% & faculty feedback is filled, the student meets the conditions.

Generate Admit Card: Amizone generates admit card for student

End: The process ends.


Activity1
Amizone
Attendance
Faculty Feedback
Debarred
<75%
Check?
Check?
Yes
>75%
No
Validation
Generate Admit Card
Homepage
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Program - 4

Objective: Draw a sequence diagram for an ATM, having one actor Customer and 3 classes ATM, server and account.

Theory:

The sequence begins with the customer inserting their card into the ATM.

The ATM sends a request to server to verify the card.

The server retrieves the account information associated with the card.

The ATM prompts the customer to enter their PIN.

The entered PIN is sent to server for verification.

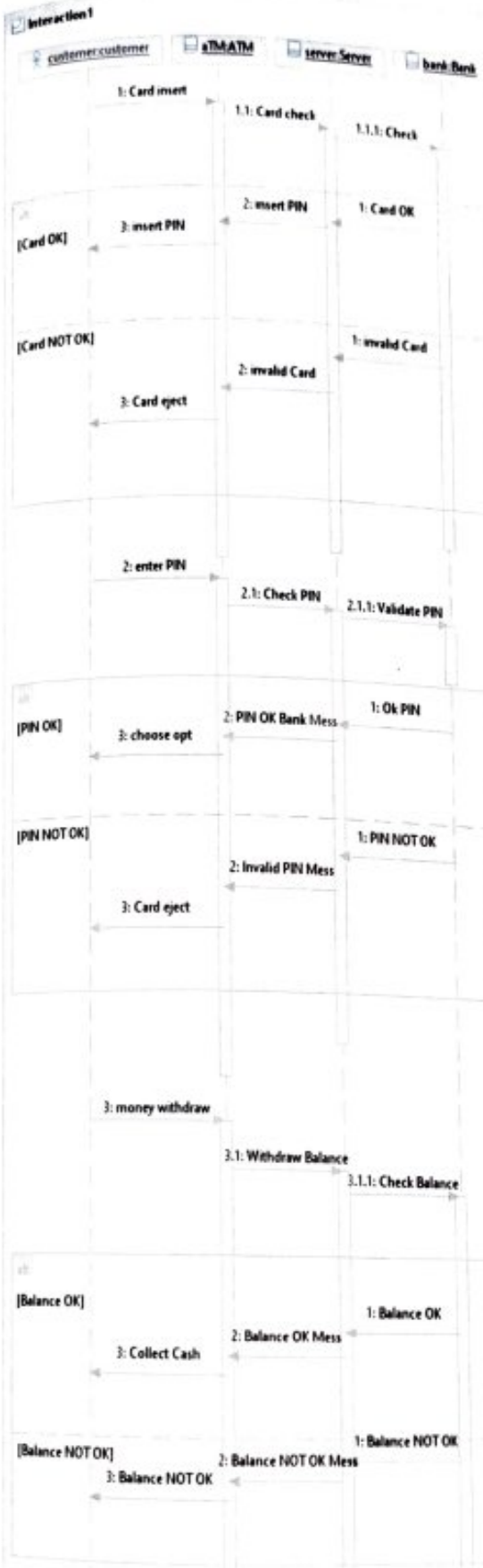
The server verifies the PIN and sends a transaction request to account associated with the card.

The account processes the transaction.

If transaction involves dispensing cash, the ATM sends a request to dispense cash.

After processing ~~inform~~ the transaction, the server updates account information.

Finally, the ATM ejects the card, and the sequence ends.



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Program - 5

Objective: Draw a state chart diagram representing user authentication process. There are total 2 states first state indicates that OTP has to be entered first After that, OTP is checked in decision box, if it is correct then only state transition will occur and user will be validated.

Theory:

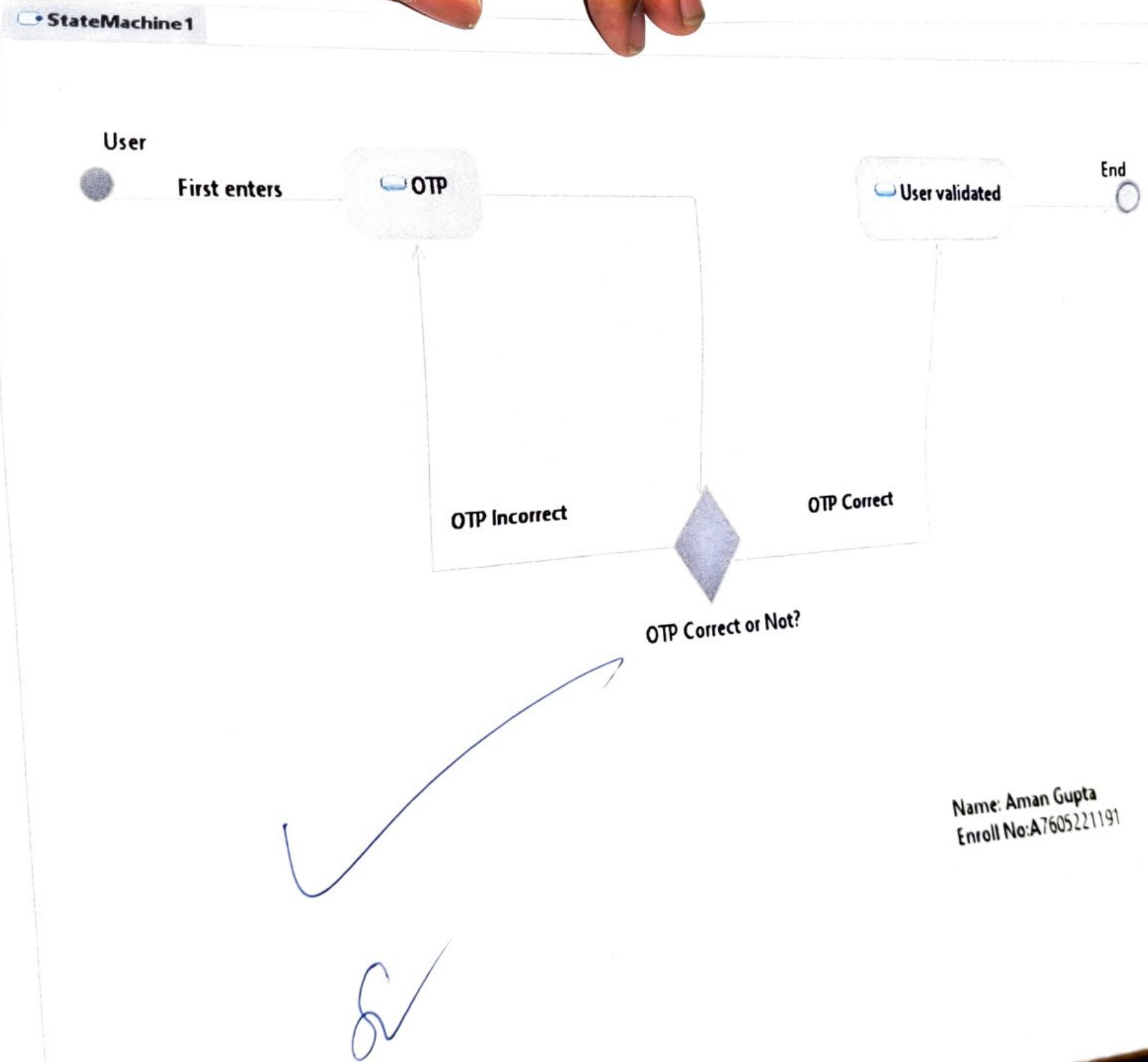
Start: Initial state where authentication process begins The user is prompted to enter OTP.

OTP: Represents state where user enters OTP.

Valid: Indicates that OTP entered is correct. The user is validated and authentication process is successful.

Retry: Represents the state where user needs to retry entering OTP because entered OTP was incorrect.

Invalid: Indicates that OTP entered by user is incorrect. If OTP is incorrect, the user is not validated, and authentication process returns to beginning state, prompting user to enter OTP again.



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Program - 6

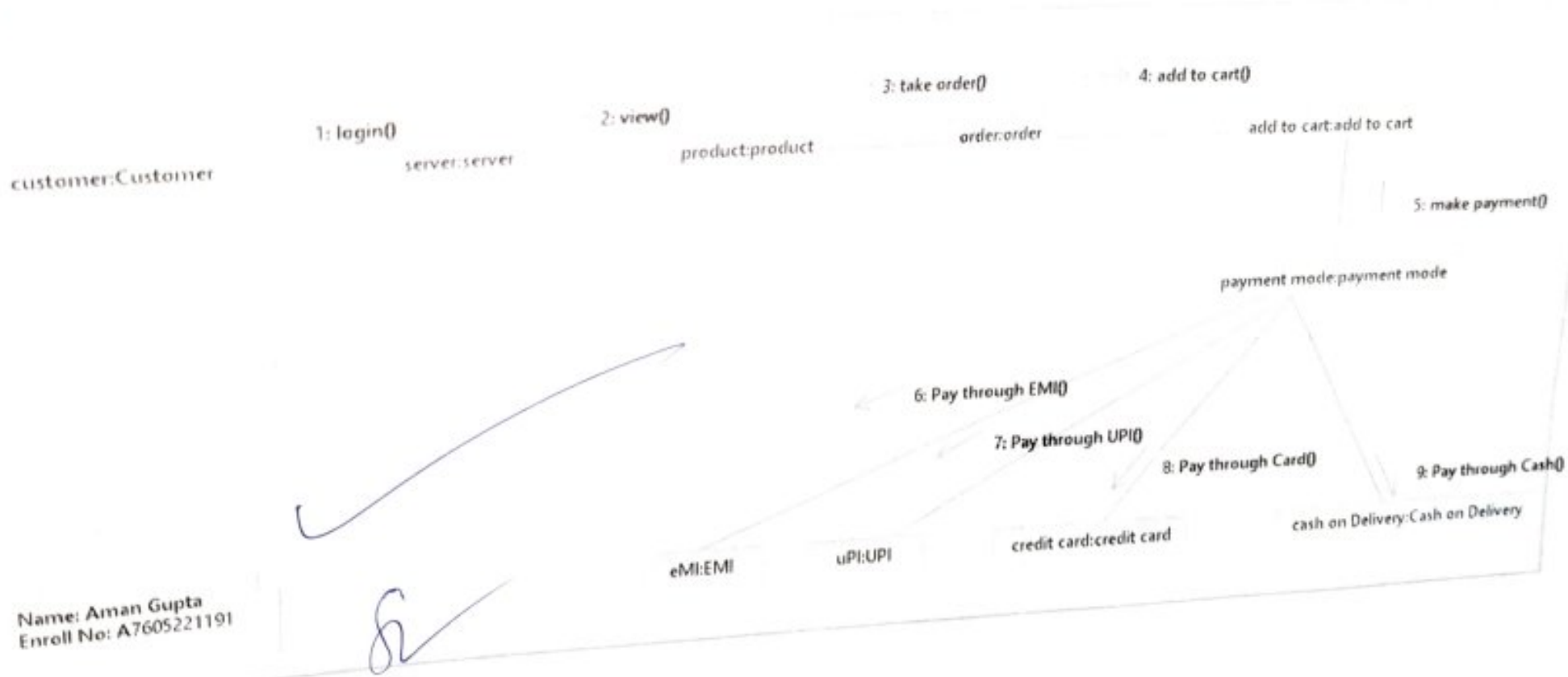
Objective: Draw a collaboration diagram to represent online shopping.

Theory:

login: The customer logins into the portal.
view: Customer views product of his/her choice.
take order: The customer now starts ordering the items.
add to cart: The customer adds to cart the items.
payment mode: Now he/she has been given the option of selecting his/her payment preference.
Options: The customer can pay through either cash, upi, credit card, emi.

The collaboration diagram depicts the interactions between the customer, browser, website, payment gateway and cart during the online shopping process.

EMI



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