TASK -5

Interaction Diagram (UML Sequence & Communication Diagram)

Aim:

The aim is to find the interaction between objects and represent them using UML Sequence and Communication Diagrams for the Online Banking System.

Interaction Diagrams:

Interaction diagrams depict the interactions between objects and their relationships. They also include the messages passed between them.

There are two types of interaction diagrams:

- Sequence Diagram
- Collaboration (Communication) Diagram

Interaction diagrams are used for modeling:

- The control flow by time ordering using sequence diagrams.
- The control flow of organization using collaboration (communication) diagrams.

Sequence Diagram:

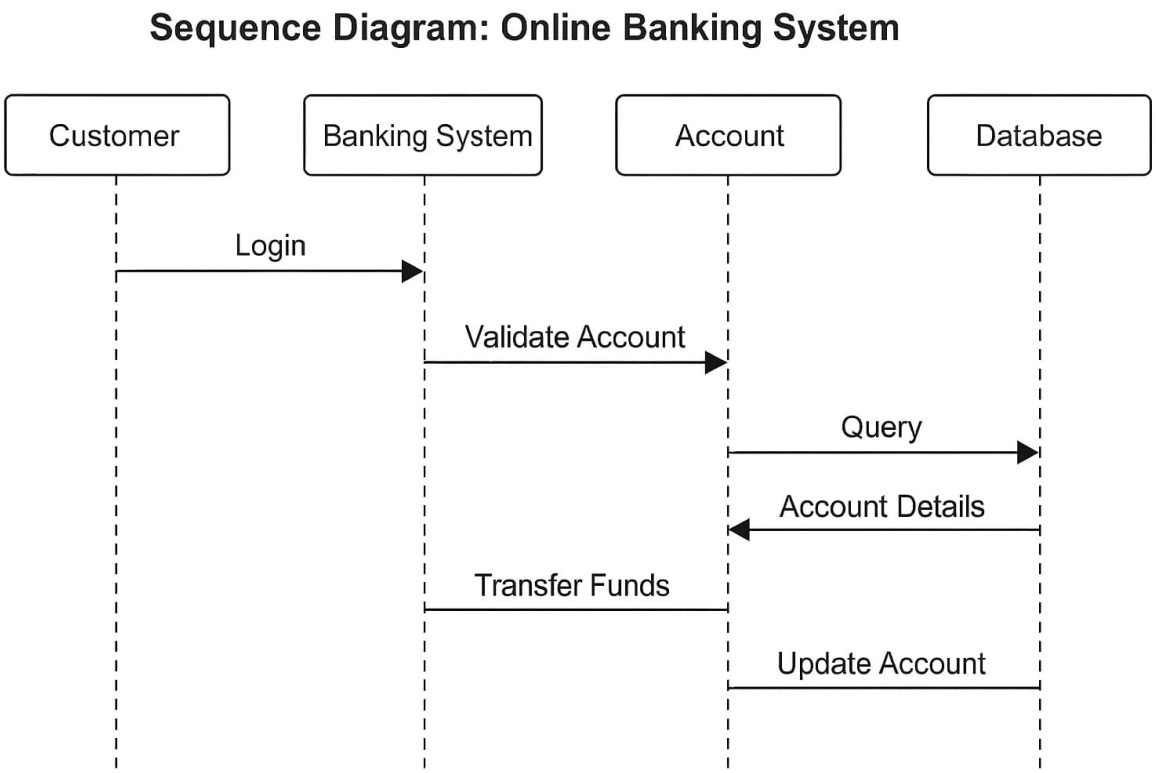
A Sequence Diagram is a type of interaction diagram that describes how—and in what order—a group of objects works together.
It shows the time order of messages exchanged among the system's components (objects or actors).

Drawing a sequence diagram helps to:

- Represent the details of a UML use case.
- Model the logic of a transaction or operation.
- Understand how system components collaborate to complete a process.
- Plan and verify the functionality of existing or future scenarios.

Notations:

1. Object
2. Actor
3. Lifeline



SEQUENCE DIAGRAM

Description:

In the Online Banking System, the process of a customer transferring funds can be illustrated.

1. The Customer initiates a *fund transfer request* through the online portal or mobile app.
2. The System verifies the customer's login credentials and authentication (e.g., OTP validation).
3. The Account object checks the *available balance* to ensure sufficient funds.
4. If the balance is sufficient, the Transaction object processes the *transfer* to the recipient's account.
5. The Database records the transaction details and updates the *account balances* for both sender and receiver.
6. The Notification system sends a *confirmation message* (SMS/email) to the customer.
7. The customer receives confirmation that the transfer was successful.

This sequence diagram clearly represents the step-by-step process of how a customer interacts with the Online Banking System to perform a secure fund transfer.

Communication (Collaboration) Diagram:

The Communication Diagram shows the relationship and message flow between the objects in the system.
It represents the structure of object interactions rather than the sequence of messages.

Both the sequence and communication diagrams describe the same functionality but from different viewpoints — the communication diagram focuses on object links and message exchange.

Notations Used:

- Rectangles represent objects that make up the system.
- Lines represent relationships between class instances.
- Arrows indicate messages sent between objects.
- Numbering indicates the order of message flow.

Description:

In the Online Banking System, a typical communication scenario for fund transfer can be described as follows:

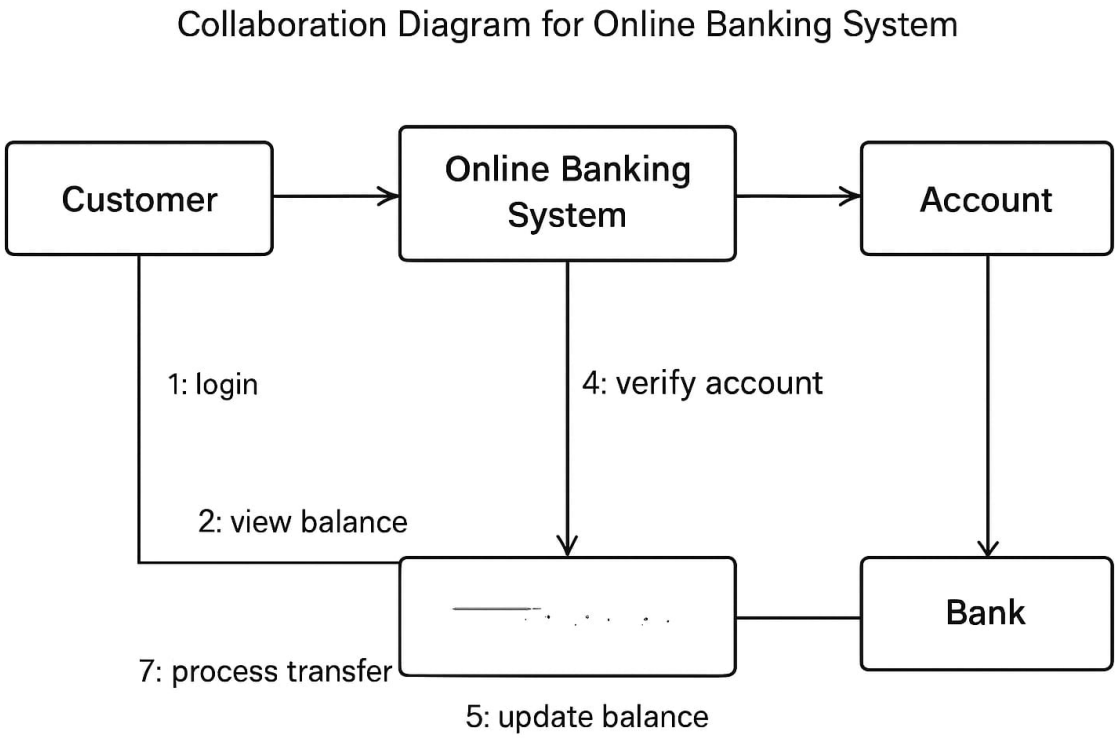
1. The Customer sends a *transfer request* to the System.
2. The System verifies the Customer's credentials and validates the transaction through the Authentication module.
3. The System communicates with the Account to check for *available balance*.
4. The Transaction module initiates the fund transfer process if the balance is sufficient.
5. The Database updates both the sender's and receiver's account balances.
6. The Notification system sends a confirmation message to the customer.
7. Finally, the Customer receives acknowledgment of the completed transfer.

This communication diagram illustrates the interaction and message exchange among various system components during an online fund transfer process.

Example Message Flow:

Step	Sender	Receiver	Message / Action
1	Customer	System	Initiate transfer
2	System	Authentication	Verify credentials
3	System	Account	Check balance

Step	Sender	Receiver	Message / Action
4	Account	Transaction	Process fund transfer
5	Transaction	Database	Update account balances
6	Database	Notification	Generate confirmation
7	Notification	Customer	Send confirmation



COMMUNICATION DIAGRAM

Result:

Thus, the interaction between objects has been identified, and the UML Sequence Diagram and Communication Diagram for the Online Banking System have been designed successfully.