1ICPC317

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SDLC Laboratory

Quality Laboratory Manual

Experiment No. 07

To draw the behavioral diagram: Sequence diagram, Collaboration diagram.

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Experiment No. 07

Title of Experiment: To draw the behavioral diagram: Sequence diagram, Collaboration diagram.

Aim of Experiment: To understand the behavior of a system and sequence of activities between its objects also to understand the collaboration between objects to accomplish a task.

System Requirements – Win 10 and above OS, 4GB RAM, 2.33 GHz Processor

Software/s Requirement – StarUML

Experiment Objectives:

- Model Object Interactions Over Time
- Visualize the Flow of Logic
- Clarify Roles of Objects
- Support Use Case Realization
- Aid in Design and Debugging
- Document System Behaviour
- Improve Communication
- Support Testing and Validation

Experiment Outcomes:

- Clear Visualization of Object Interactions
- Accurate Representation of Process Flow
- Improved System Design and Communication.

Theory:

Sequence Diagram:

A Sequence Diagram is a key component of Unified Modeling Language (UML) used to visualize the interaction between objects in a sequential order.
It focuses on how objects communicate with each other over time, making it an essential tool for modeling

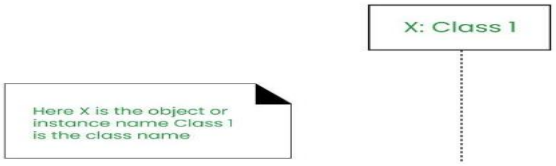
dynamic behavior in a system. Sequence diagrams illustrate object interactions, message flows, and the sequence of operations, making them valuable for understanding use cases, designing system architecture, and documenting complex processes.

Notations of Sequence Diagram:

Actors
An actor in a UML diagram represents a type of role where it interacts with the system and its objects. It is important to note here that an actor is always outside the scope of the system we aim to model using the UML diagram.

Lifelines

A lifeline is a named element which depicts an individual participant in a sequence diagram. So basically each instance in a sequence diagram is represented by a lifeline. Lifeline elements are located at the top in a sequence diagram.



Messages

Communication between objects is depicted using messages. The messages appear in a sequential order on the lifeline.

- We represent messages using arrows.
- Lifelines and messages form the core of a sequence diagram.

Guards

To model conditions we use guards in UML. They are used when we need to restrict the flow of messages on the pretext of a condition being met. Guards play an important role in letting software developers know the constraints attached to a system or a particular process.

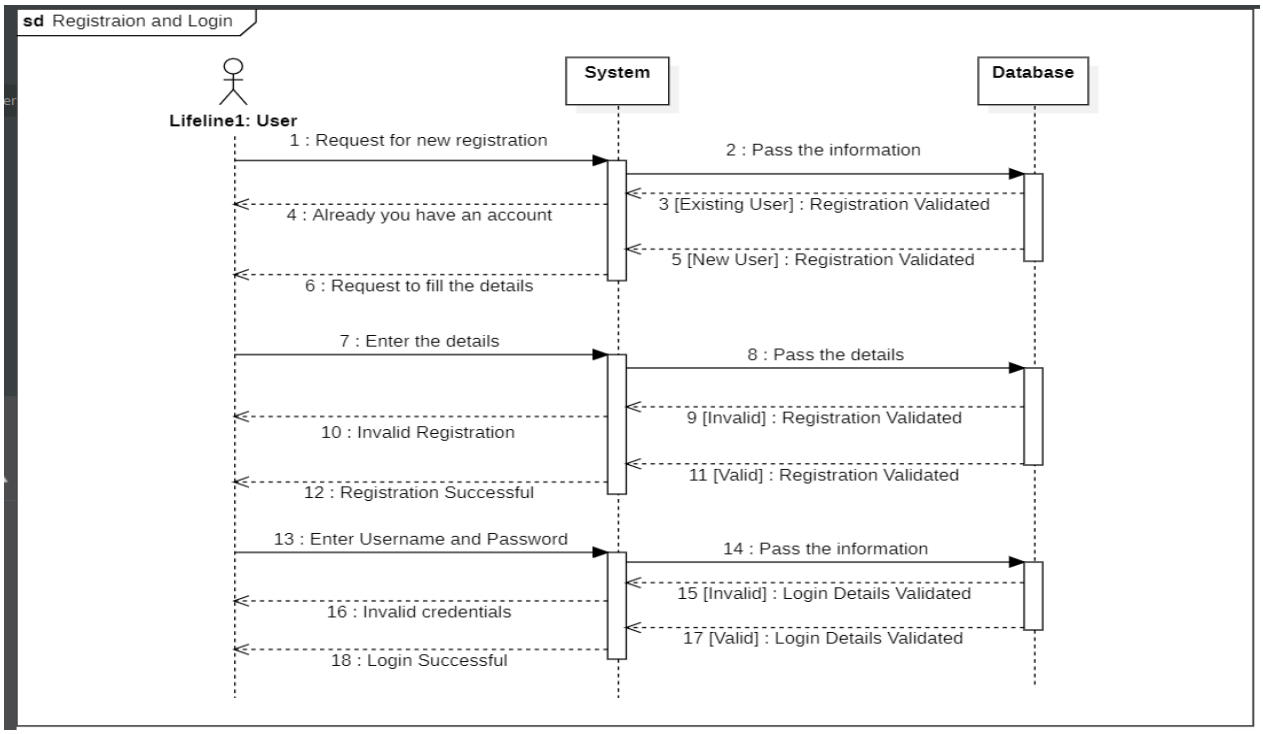
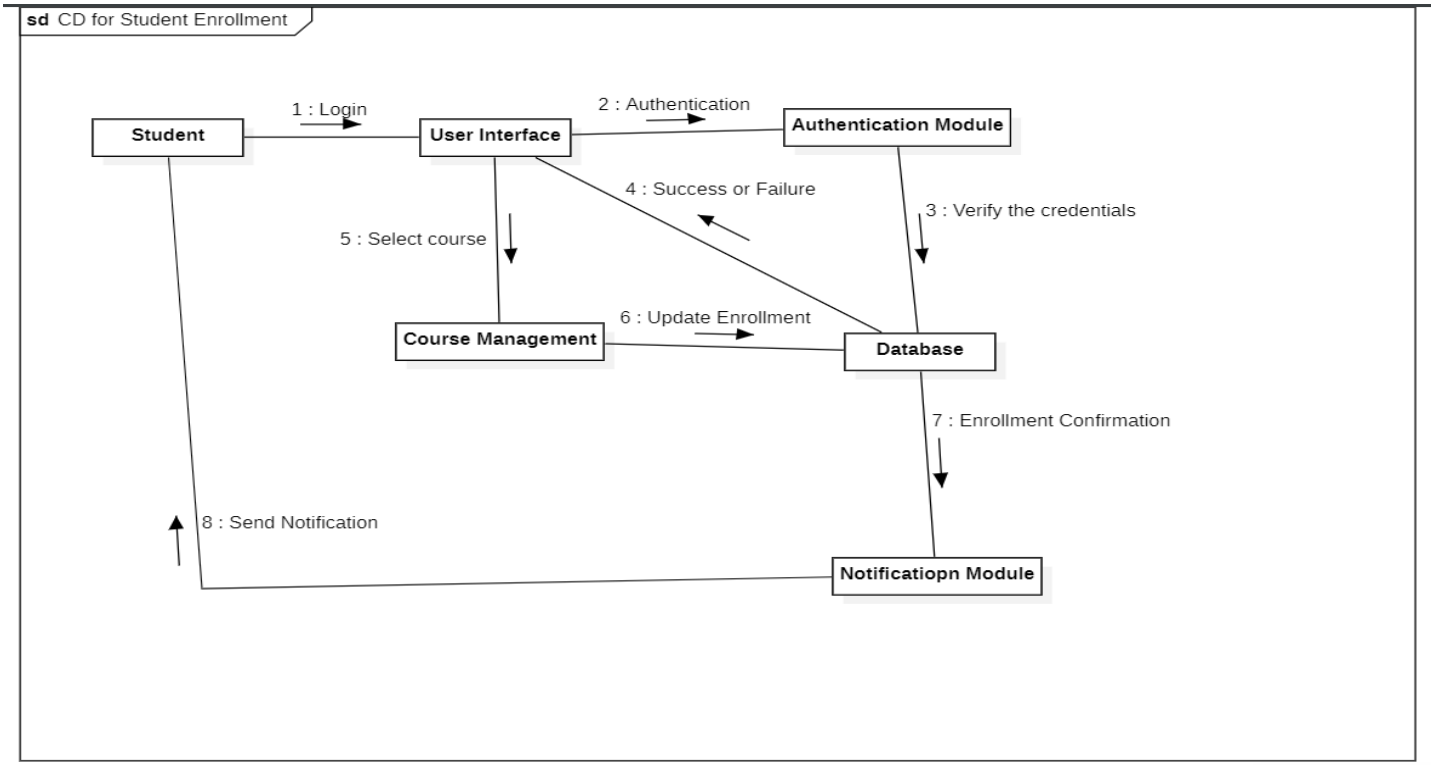


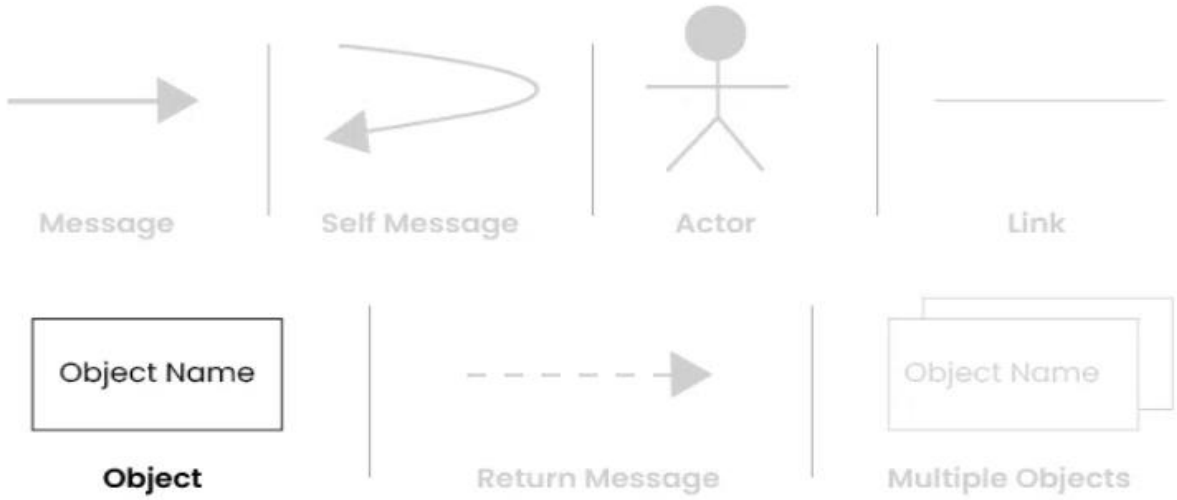
Fig: Sequence Diagram for Registration and Login

Collaboration (Communication) Diagram:

A collaboration diagram is a behavioural UML diagram which is also referred to as a communication diagram. It illustrates how objects or components interact with each other to achieve specific tasks or scenarios within a system.



Notations of Collaboration Diagram:



Observations:

- Clear Visualization of Time-Based Interactions
- Good for Complex Scenarios
- Supports Use Case Realization
- Easy to Understand

Conclusion:
The experiment successfully demonstrated, the way of representing the behavioral view of a software application for better understanding of the system.

Expected Oral Questions:

1. What is sequence diagram?
2. What is collaboration diagram?
3. Is collaboration diagram different from communication diagram?
4. What is Guard in sequence diagram?
5. Define lifeline?

FAQs in Interview:

1. What is lifeline?
2. How sequence diagram helps to understand the application?
3. Name the components of sequence diagram?
4. List out the components of communication diagram?