S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.

Practical No. 5

Aim: Design the UML Sequence diagram for the given problem definition.

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AIM: Design the UML Sequence diagram for the given problem definition..

OBJECTIVE/EXPECTED LEARNING OUTCOME:
- Identify the logical sequence of activities undergoing in a system, and represent them pictorially

HARDWARE AND SOFTWARE REQUIRMENTS:
Hardware Requirement
- Processor: Dual Core
- RAM: 1GB
- Hard Disk Drive: > 80 GB

Software Requirement
- Operating System – Windows

THEORY

Sequence diagram
It represents the behavioral aspects of a system. Sequence diagram shows the interactions between the objects by means of passing messages from one object to another with respect to time in a system.

Elements in sequence diagram
Sequence diagram contains the objects of a system and their life-line bar and the messages passing between them
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Object
Objects appear at the top portion of sequence diagram. Object is shown in a rectangle box. Name of object precedes a colon ':' and the class name, from which the object is instantiated. The whole string is underlined and appears in a rectangle box. Also, we may use only class name or only instance name.
Objects which are created at the time of execution of use case and are involved in message passing, are appear in diagram, at the point of their creation.
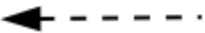
Life-line bar
A down-ward vertical line from object-box is shown as the life-line of the object. A rectangle bar on life-line indicates that it is active at that point of time.

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Messages

Messages are shown as an arrow from the life-line of sender object to the life-line of receiver object and labeled with the message name. Chronological order of the messages passing throughout the objects' life-line show the sequence in which they occur. There may exist some different types of messages:

- **Synchronous messages:** Receiver start processing the message after receiving it and sender needs to wait until it is made. A straight arrow with close and fill arrow-head from sender life-line bar to receiver end, represent a synchronous message.
- **Asynchronous messages:** For asynchronous message sender needs not to wait for the receiver to process the message. A function call that creates thread can be represented as an asynchronous message in sequence diagram. A straight arrow with open arrow-head from sender life-line bar to receiver end, represent an asynchronous message.
- **Return message:** For a function call when we need to return a value to the object, from which it was called, then we use return message. But it is optional, and we are using it when we are going to model our system in much detail. A dashed arrow with open arrow-head from sender life-line bar to receiver end, represent that message.
- **Response message:** One object can send a message to self. We use this message when we need to show the interaction between the same object.

| Message Type	Notation
Synchronous message	⟶
Asynchronous message	⟶
Response message	⬅ - - - - ·

Figure-01: Notation used in Sequence diagram

Benefits of sequence diagrams

Sequence diagrams can be useful references for businesses and other organizations. Try drawing a sequence diagram to:

1) Represent the details of a UML use case.
2) Model the logic of a sophisticated procedure, function, or operation.
3) See how objects and components interact with each other to complete a process.
4) Plan and understand the detailed functionality of an existing or future scenario

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Example:
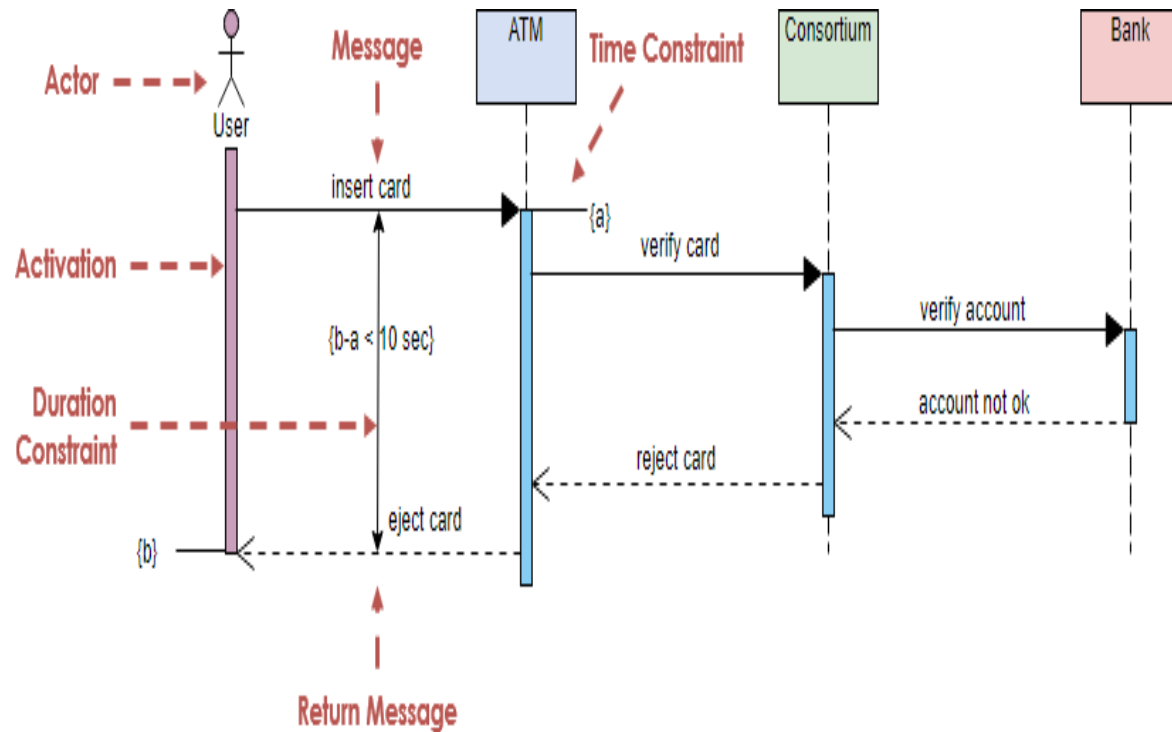
Fig 02 : Sequence diagram for Verification of Bank Account

OBSERVATION:(Students should attach screenshot of given problem statement)
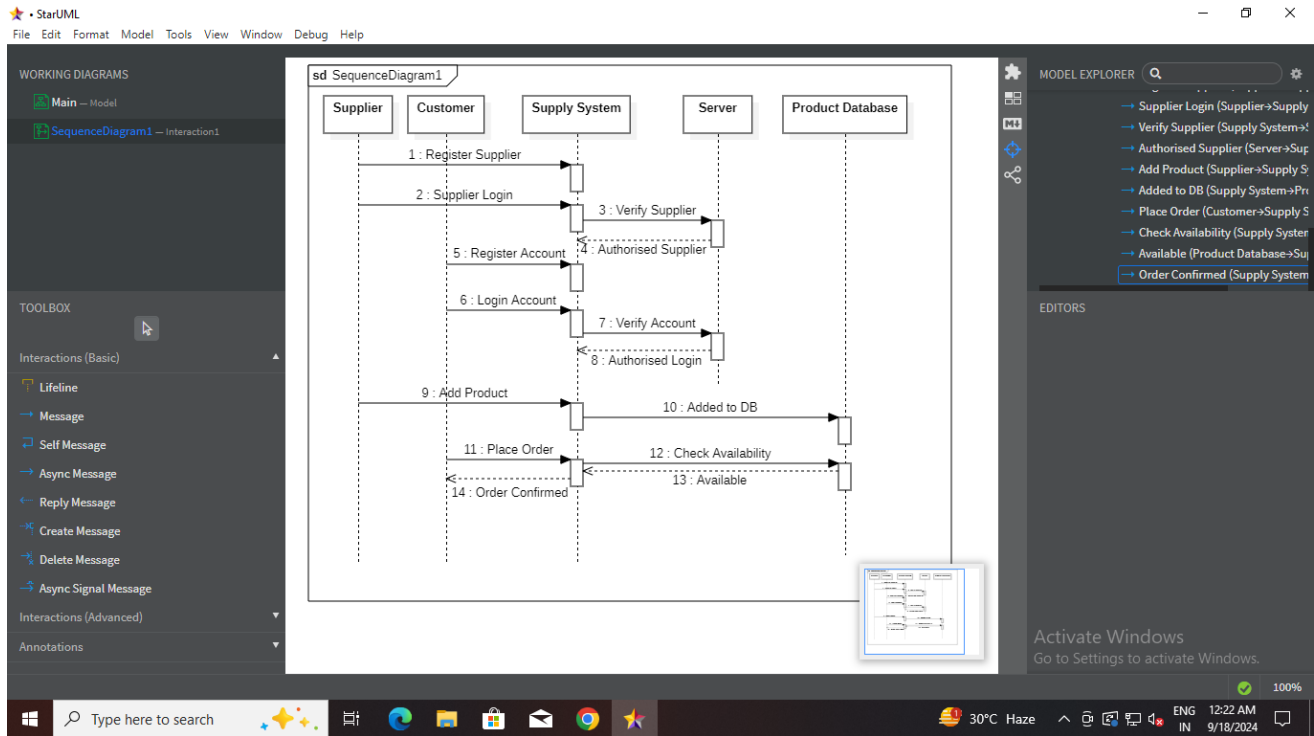
CONCLUSION:

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DISCUSSION QUESTIONS?

1. What is the purpose of sequence diagram and class diagram?

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2. How does the UML model use sequence diagrams?

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3. What are the symbols used in sequence diagram?

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REFERENCES:
- http://vlabs.iitkgp.ernet.in/se/1/
- https://sites.google.com/view/ait-se/Home/practicals
- https://www.javatpoint.com/software-requirement-specifications