

# Sequence Diagram

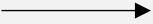
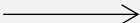
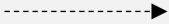
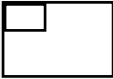
Sequence Diagram is mainly used to describe scenarios, use case flows, and system behavior. It shows how objects interact **over time**. It focuses on:

- Objects (Participants).
- Messages exchanged between them.
- The order (sequence) of these messages

Sequence diagram Represent the flow of events in one single use case

## Main Elements of a Sequence Diagram :

Basic symbols and components of sequence diagram are :

| Element                                                                                                                                                                                            | Meaning                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Actor</b>  / <b>Object</b>  | The participants in the interaction (e.g., user, system, database).                                        |
| <b>Lifeline</b>                                                                                                 | A vertical dashed line showing the existence of an object over time.                                       |
| <b>Activation Bar</b>                                                                                           | A thin rectangle on the lifeline showing when an object is active (performing an action).                  |
| <b>Synchronous message</b><br>                                                                                  | Communication between objects (method call, data, etc.). The sender waits for a response before continuing |
| <b>Asynchronous message</b><br>                                                                                 | The sender sends the message and continues immediately                                                     |
| <b>Return (reply) Message</b><br>                                                                               | Dashed arrow showing the return of control or data.                                                        |
| <b>Reflexive (self) message</b>                                                                                 | Message sent from an object to itself                                                                      |
| <b>Loop / Condition fragment</b><br>                                                                            | Frame (fragment) indicating repetition or condition (e.g., loop, alt, opt).                                |

### Fragment in a Sequence Diagram

A **fragment** (Interaction Fragment) helps describe **complex scenarios** in a structured way, it is used to represent **control logic** such as:

- **loop (Loop)** : Used to repeat messages.optional behavior.
- **alt (Alternative)** : Used for **if / else** behavior.
- **opt (Optional)** : Used for **if only** (no else). Runs only if the condition is true.

It's drawn as a **big rectangle** that encloses messages and has a **label** in the top-left corner.

