

Sequence Diagram

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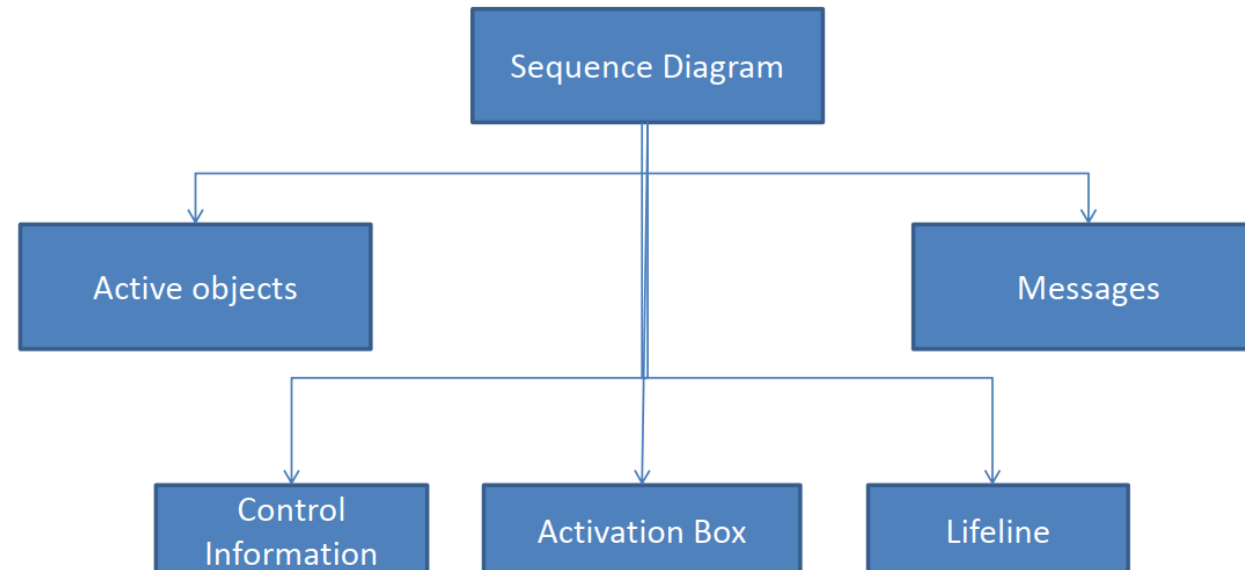
LECTURER

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What is Sequence Diagram ?

Sequence Diagram describe interactions among classes in terms of an exchange of *messages* over time. They are also called **event diagram**.





Notation

- ▶ Frame
- ▶ Life lines
- ▶ Activation or Execution Occurrence
- ▶ Messages
- ▶ Guards
- ▶ Alternatives (If - else)
- ▶ Option (If – then)
- ▶ Parallel (Two works together)
- ▶ Loop



Frame

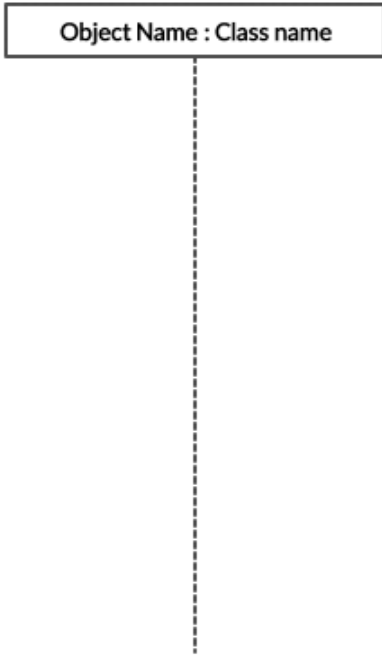




Life lines

- Denotes the life of actors/objects over time during a sequence

Object Name : Class name





Activation or Execution Occurrence



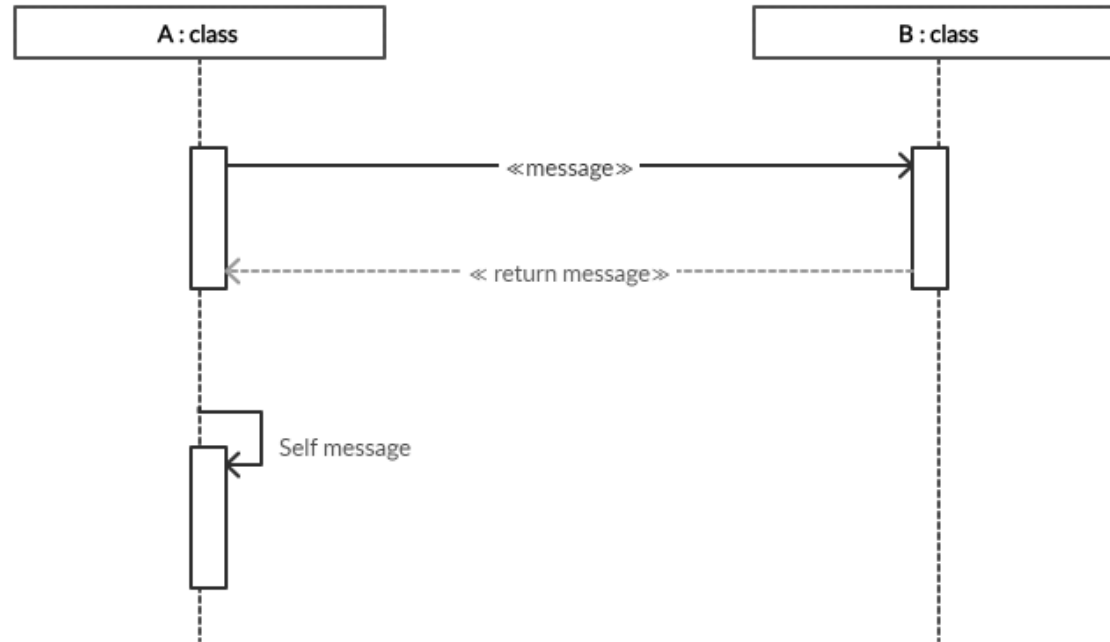


Message

- ▶ Used to illustrate communication between different activeobjects.
- ▶ Used when an object needs
 - ▶ to activate a process of a different object
 - ▶ to give information to another object



Messages





Guards

- ▶ Guard is a condition, that must be met for a message to be sent to the object.
- ▶ Guards are used throughout UML diagrams to control flow
- ▶ Place the guard element above the message line being guarded and in front of the message name.

- ▶ The notation of a guard is very simple; the format is:

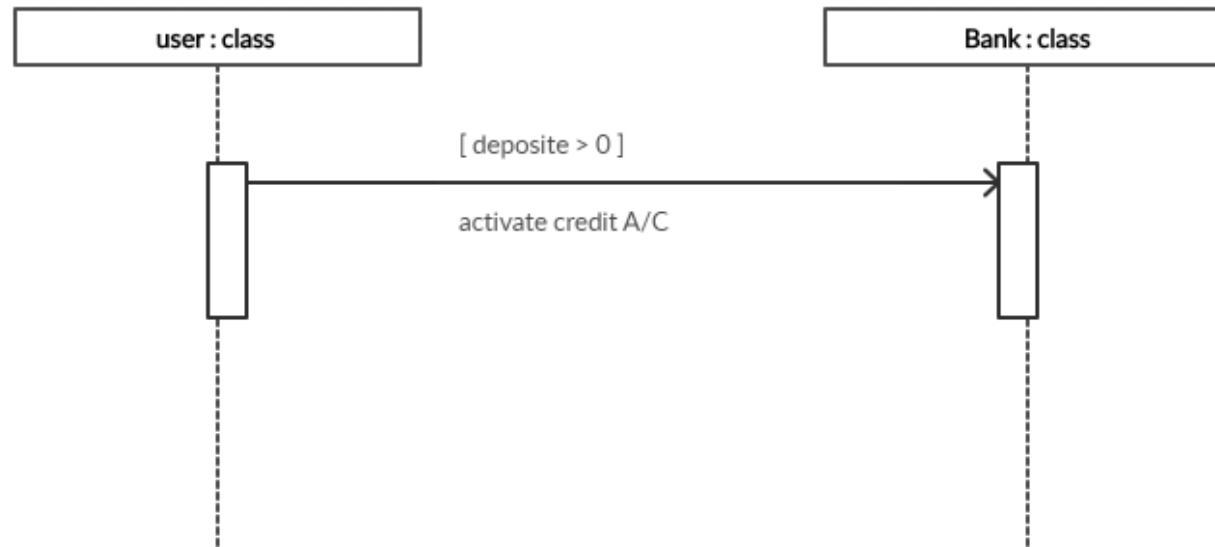
[Boolean Test]

- ▶ For example,

[pastDueBalance = 0]



Guards



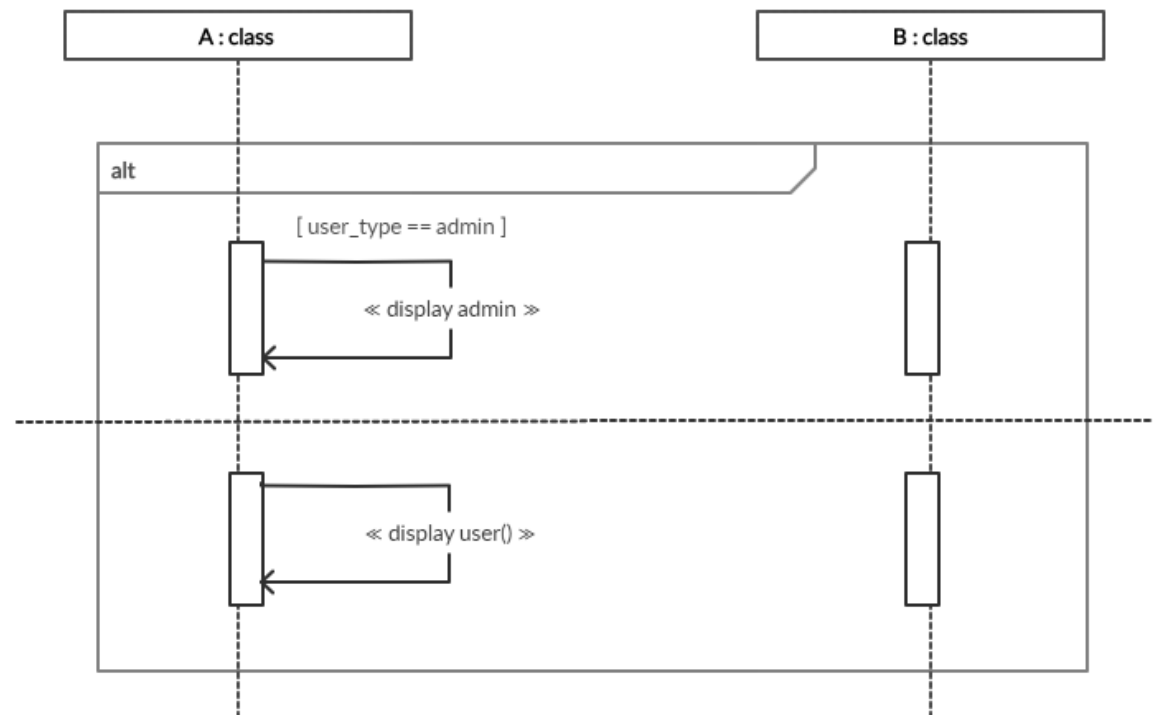


Alternatives

- ▶ A combined fragment is used to group sets of messages together to show conditional flow in a sequence diagram.
- ▶ Alternatives are used to designate a mutually exclusive choice between two or more message sequences.
- ▶ Alternatives allow the modeling of the classic "if then else" logic (e.g., if I buy three items, then I get 20% off my purchase; else I get 10% off my purchase).



Alternatives



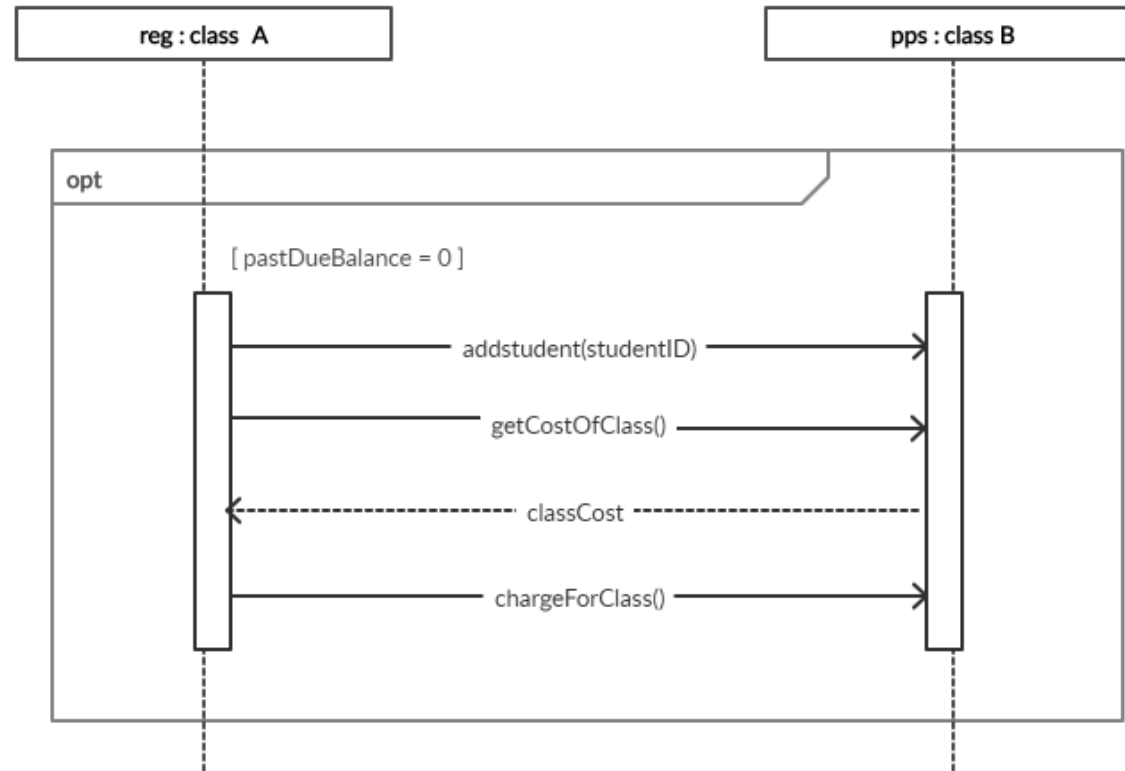


Option

- ▶ The option combination fragment is used to model a sequence that will either occur or will not occur.
- ▶ An option is used to model a simple "if then" statement (i.e., if there are fewer than five donuts on the shelf, then make two dozen more donuts).
- ▶ It only has one operand and there never can be an "else" guard.
- ▶ To draw an option combination you draw a frame – text "opt" is placed inside the frame's namebox, and in the frame's content area the option's guard is placed towards the top left corner on top of a lifeline.
- ▶ Then the option's sequence of messages is placed in the remainder of the frame's content area.



Option

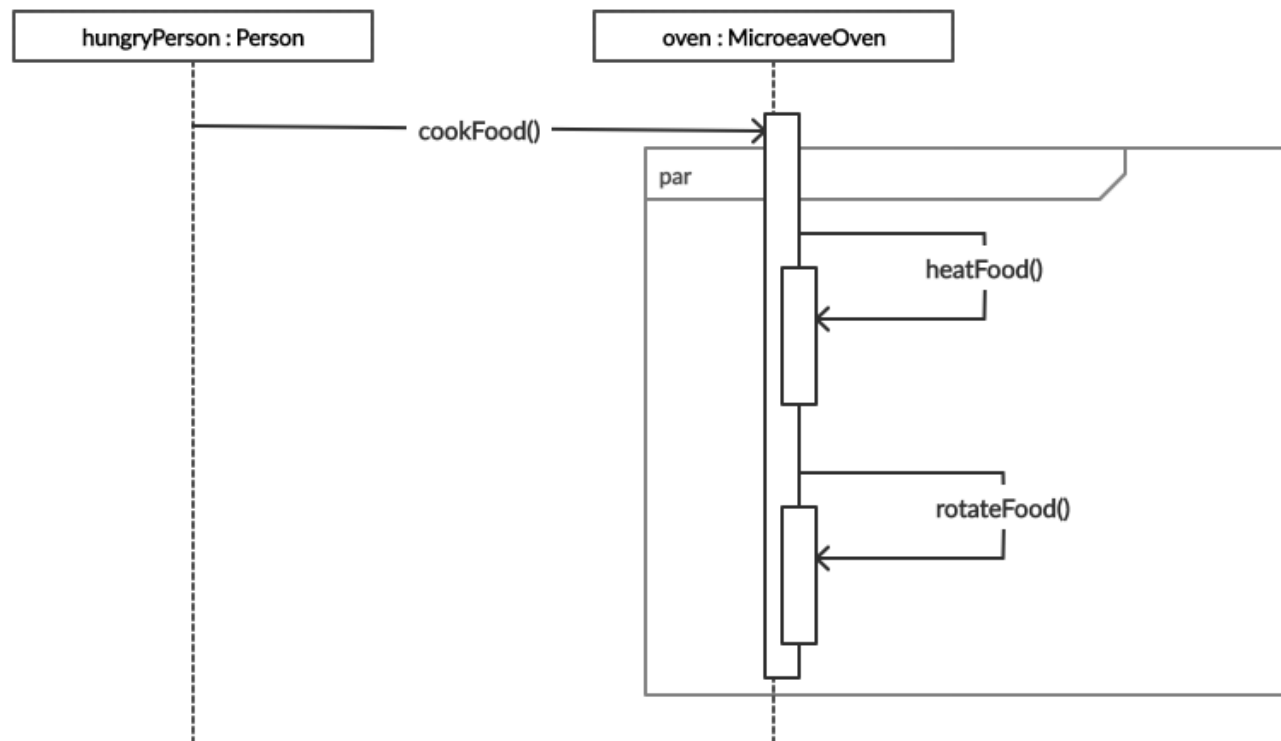




Parallel

- ▶ Modern computer systems are advancing in complexity and at times perform concurrent tasks.
- ▶ Parallel element is used for creating a sequence diagram that shows parallel processing activities.
- ▶ Drawn using a frame and place the text "par" in the frame's namebox.
- ▶ Break up the frame's content section into horizontal operands separated by a dashed line.
- ▶ Each operand in the frame represents a thread of execution done in parallel.

Parallel

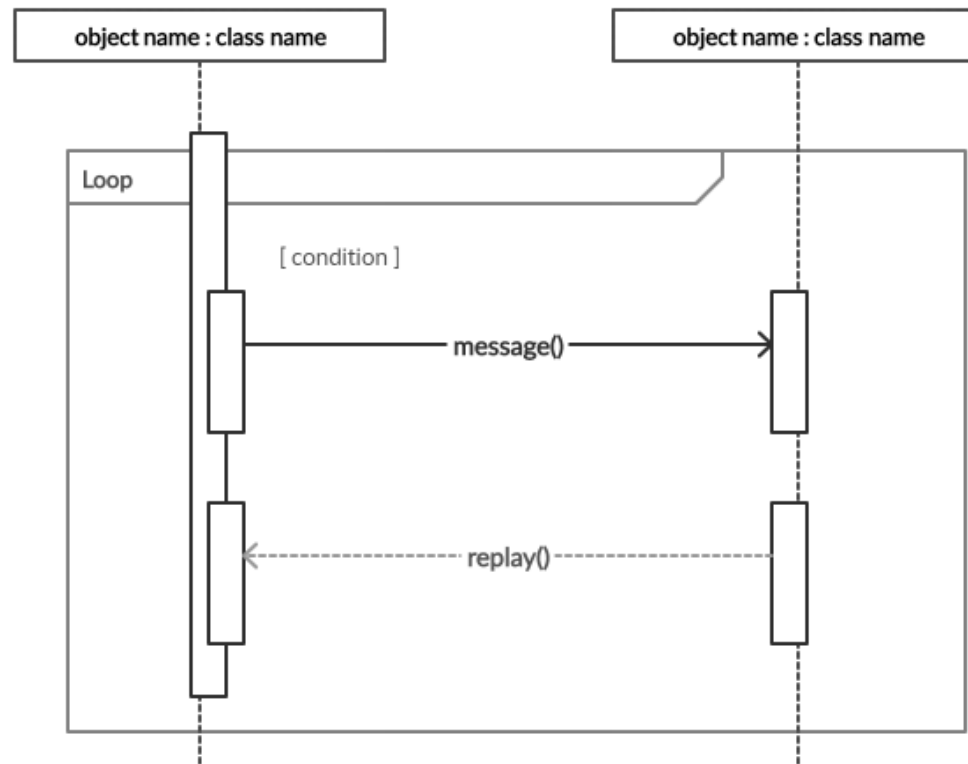




Loop

- ▶ To model a repetitive sequence.
- ▶ In frame's namebox the text "loop" is placed.
- ▶ Inside the frame's content area the loop's guard is placed.
- ▶ Then the loop's sequence of messages is placed in the remainder of the frame's content area.
- ▶ In a loop, a guard can have two special conditions tested against, in addition to the standard Boolean test.
- ▶ The special guard conditions are minimum iterations written as "minint = [the number]" (e.g., "minint = 1") and maximum iterations written as "maxint = [the number]".
- ▶ With a minimum iterations guard, the loop must execute at least the number of times indicated, whereas with a maximum iterations guard the number of loop executions cannot exceed the number.

Loop



Log-in Scenario

