



Software Engineering

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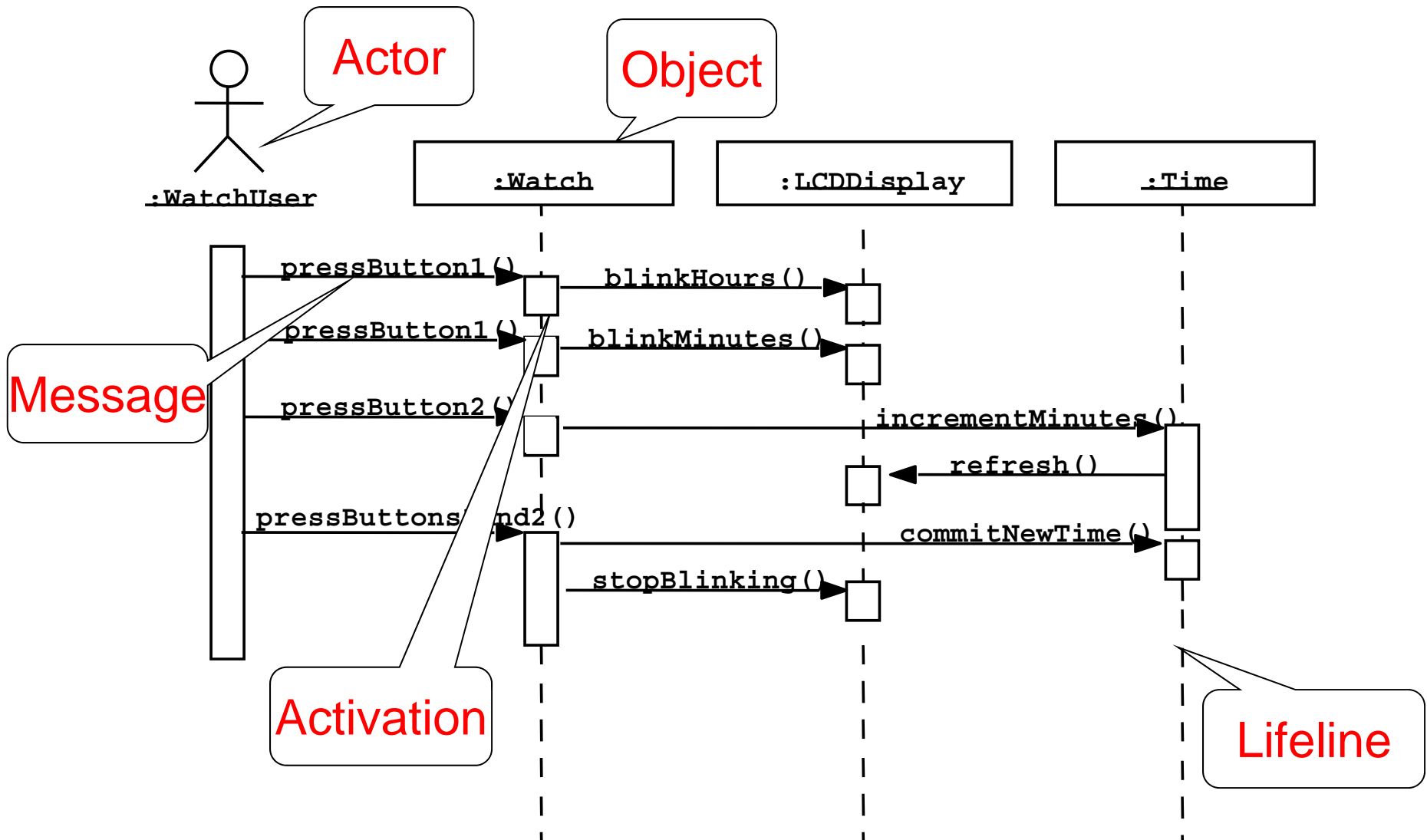
Lecture 6: UML Modeling: Interaction Diagrams



UML First Pass

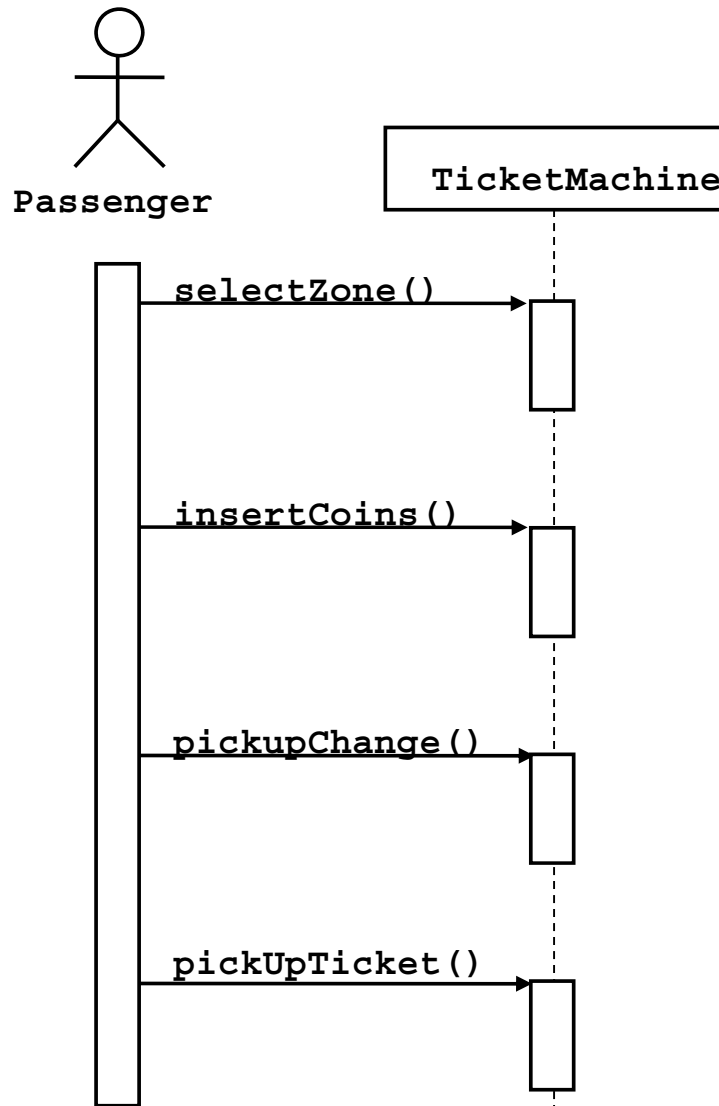
- Use case Diagrams
 - Describe the functional behavior of the system as seen by the user.
- Class diagrams
 - Describe the static structure of the system: Objects, Attributes, Associations
- Sequence diagrams
 - Describe the dynamic behavior between actors and the system and between objects of the system
- Statechart diagrams
 - Describe the dynamic behavior of an individual object (essentially a finite state automaton)
- Activity Diagrams
 - Model the dynamic behavior of a system, in particular the workflow (essentially a flowchart)

UML first pass: Sequence diagram



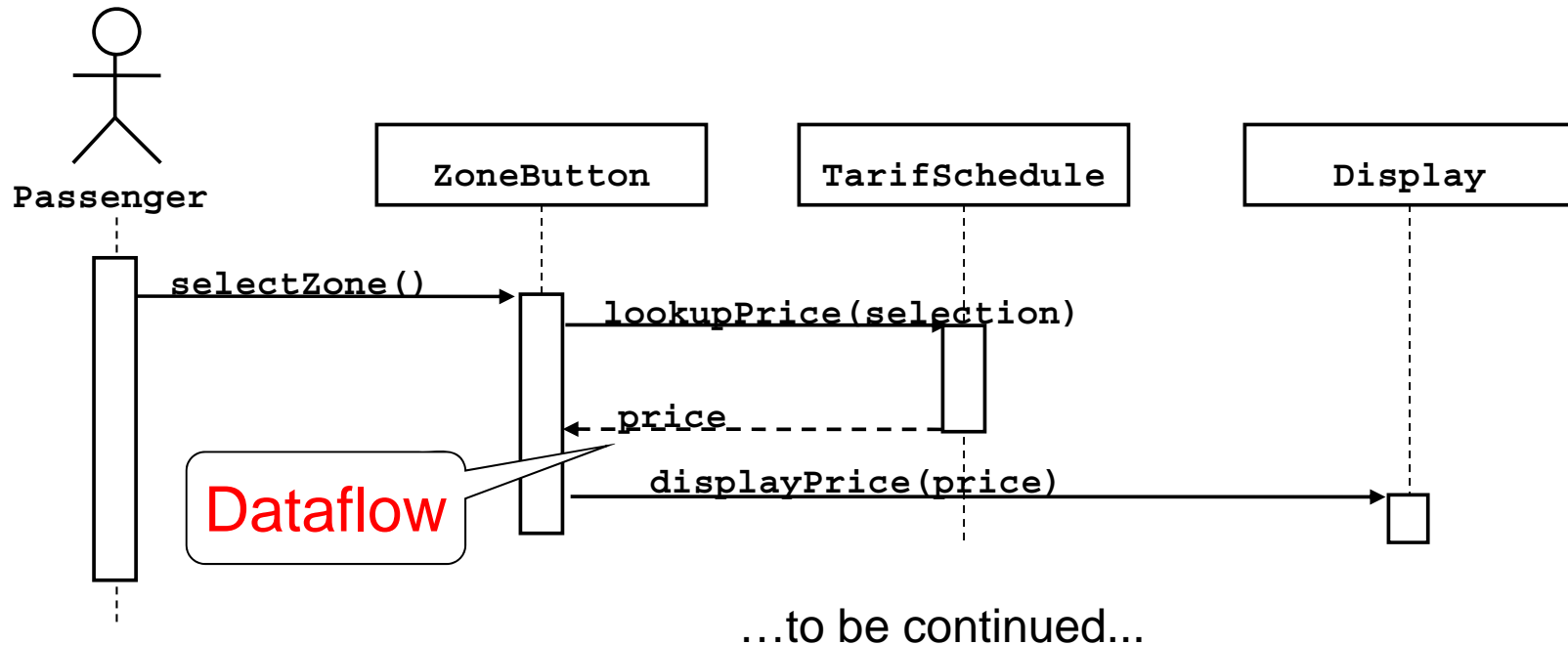
Sequence diagrams represent the behavior as interactions

UML sequence diagrams



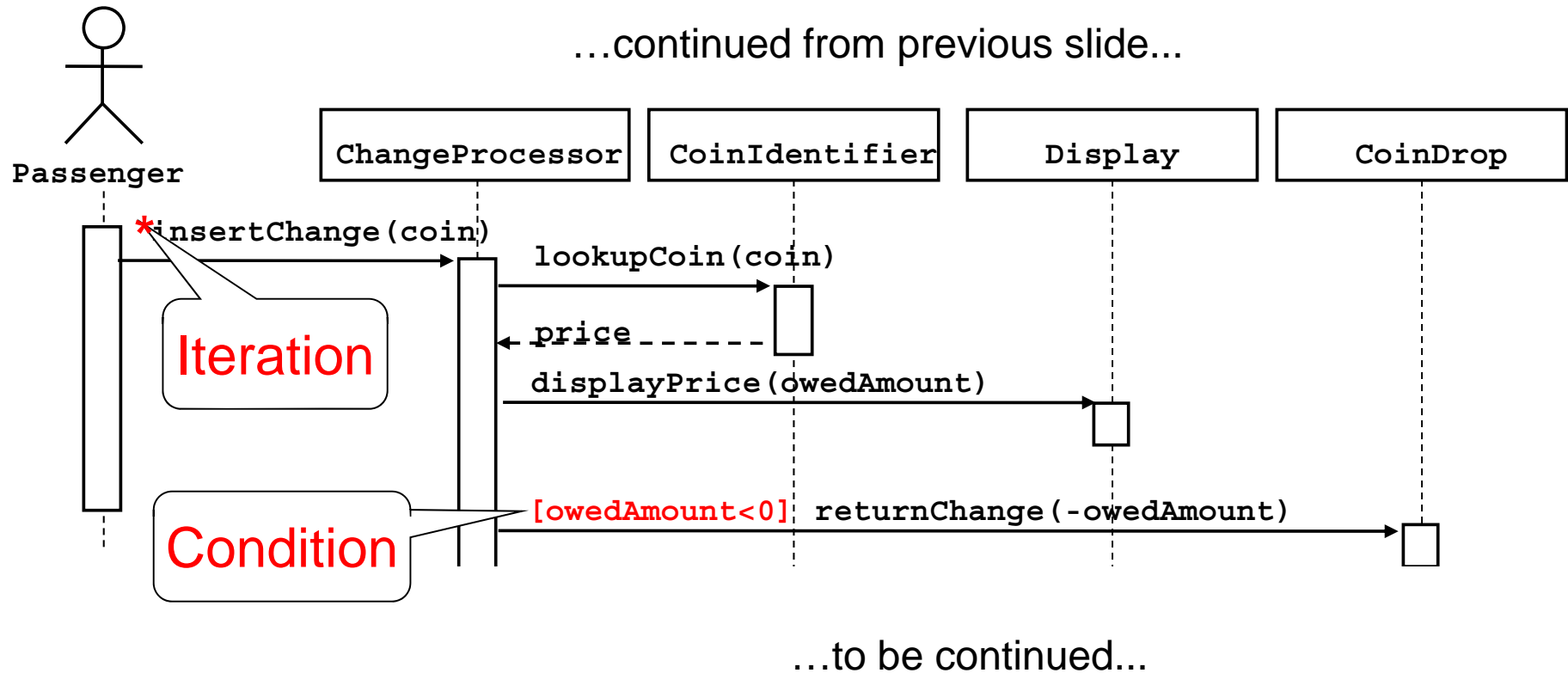
- Used during requirements analysis
 - To refine use case descriptions
 - to find additional objects (“participating objects”)
- Used during system design
 - to refine subsystem interfaces
- **Classes** are represented by columns
- **Messages** are represented by arrows
- **Activations** are represented by narrow rectangles
- **Lifelines** are represented by dashed lines

Nested messages



- The source of an arrow indicates the activation which sent the message
- An activation is as long as all nested activations
- Horizontal dashed arrows indicate data flow
- Vertical dashed lines indicate lifelines

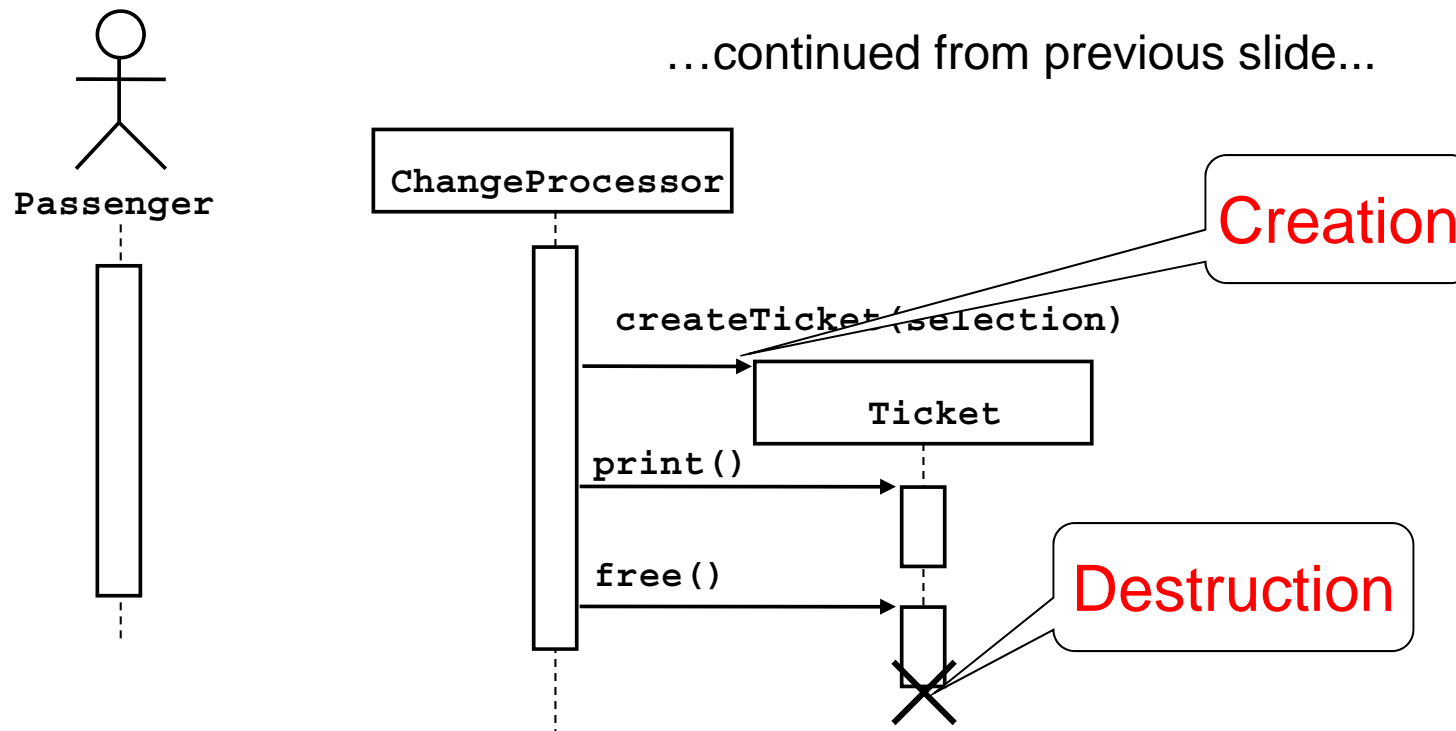
Iteration & condition



- Iteration is denoted by a * preceding the message name
- Condition is denoted by boolean expression in [] before the message name

Creation and destruction

...continued from previous slide...



- Creation is denoted by a message arrow pointing to the object.
- Destruction is denoted by an X mark at the end of the destruction activation.
- In garbage collection environments, destruction can be used to denote the end of the useful life of an object.



Sequence Diagram Summary

- UML sequence diagram represent behavior in terms of interactions.
- Useful to find missing objects.
- Time consuming to build but worth the investment.
- Complement the class diagrams (which represent structure).