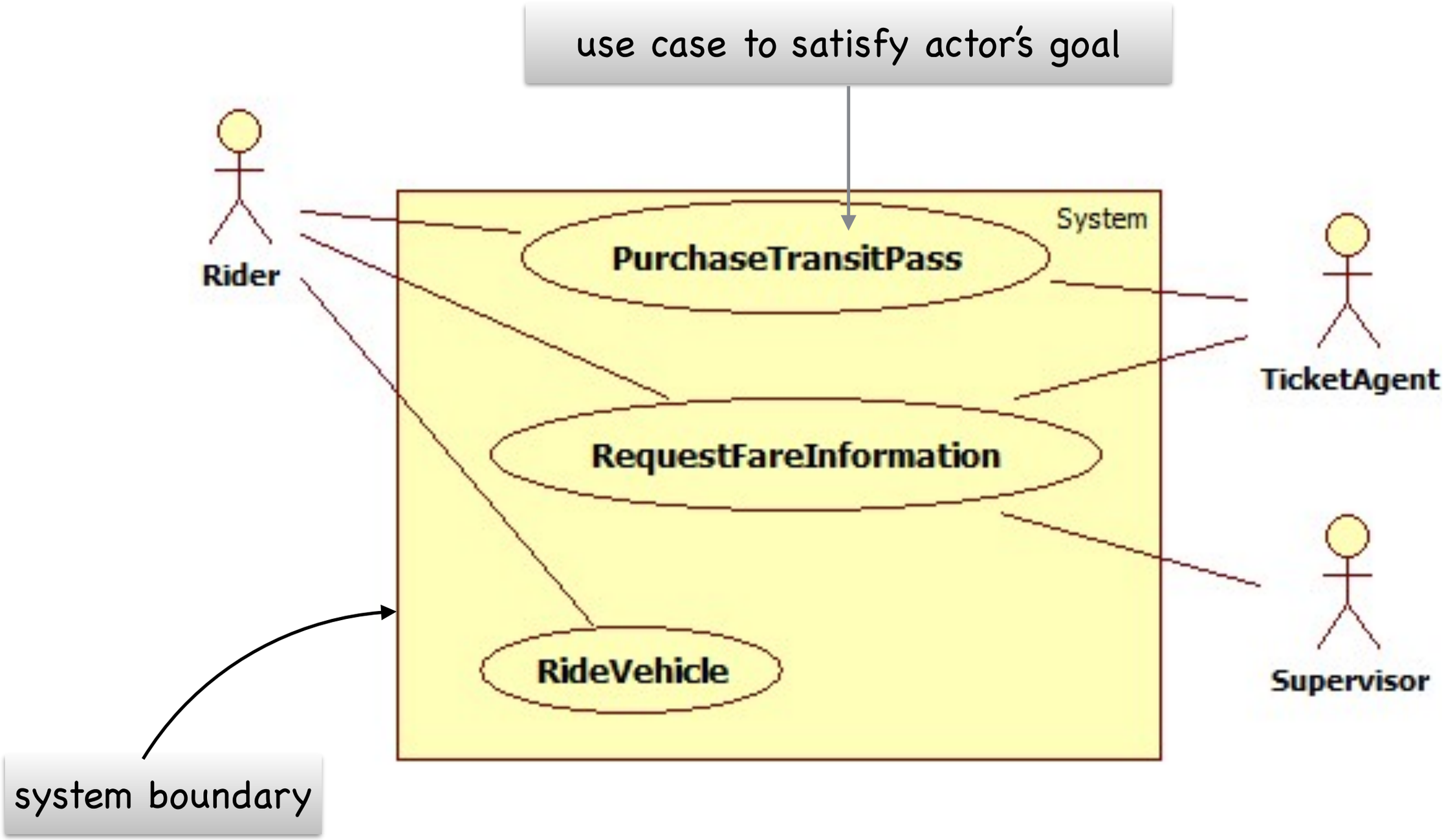
SYS466
Analysis and Design

Lecture 2 - Behavioural Modelling
School of Information and Communications Technology
Seneca College

“…capturing a description of how a system is expected to behave…”



Use Case Diagram

high level depiction of a system's interaction with its actors

Use Case Scenarios

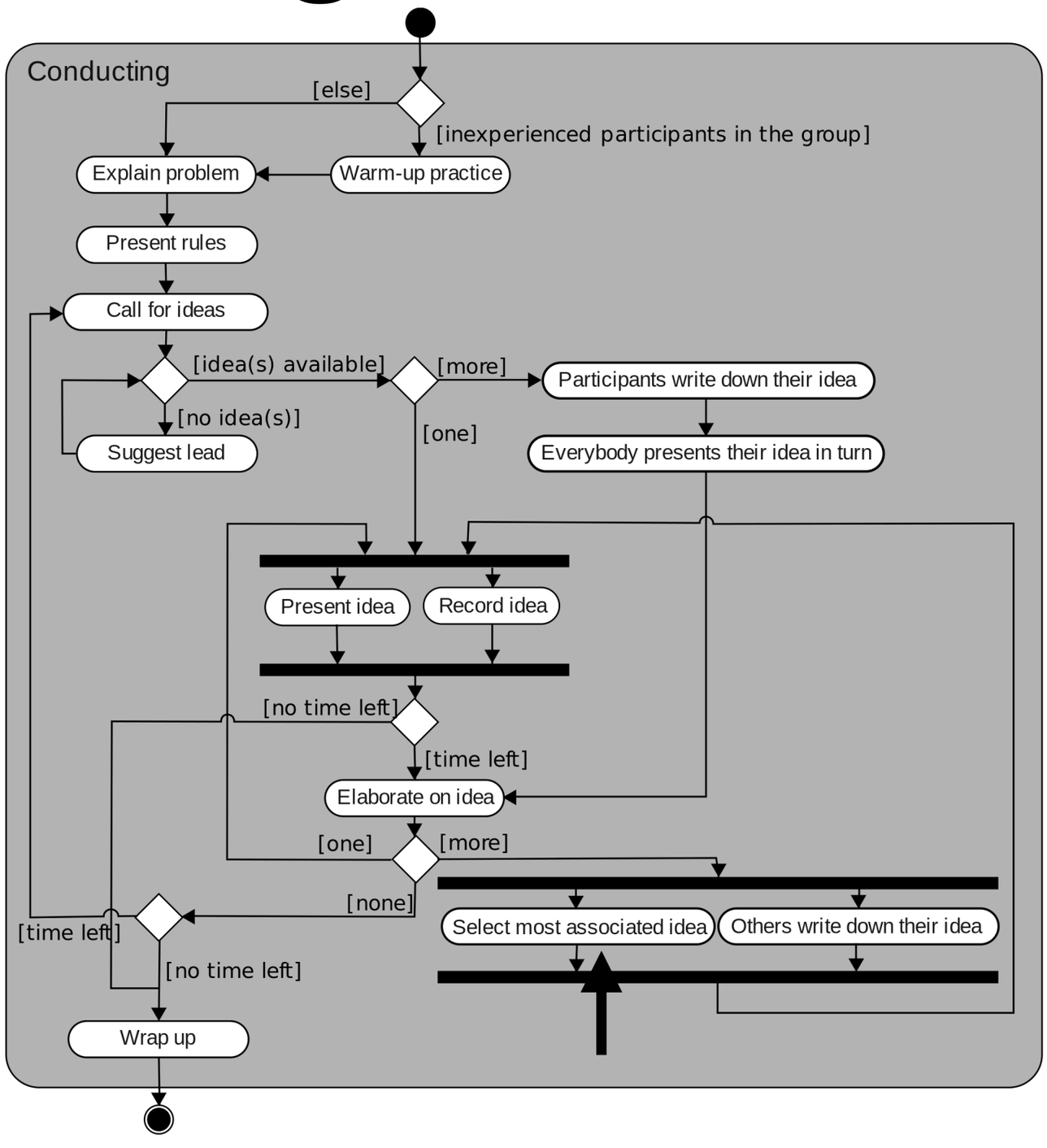
- ordered set of steps required to achieve goal
- both system/actor interaction is required
- *pre-condition*, condition(s) which must hold before steps taken
- *post-condition*, condition(s) which must hold after steps taken

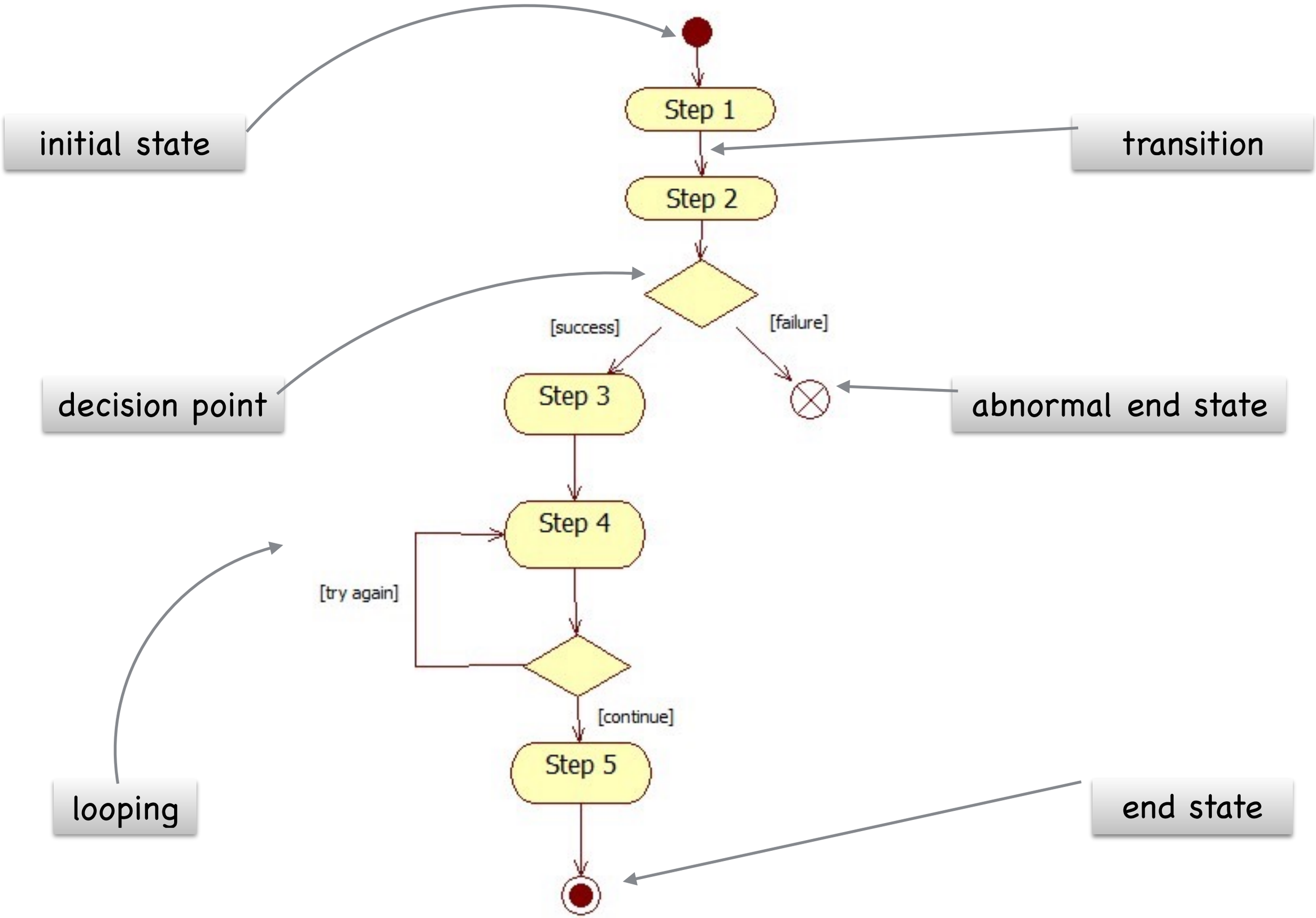
Purchase Transit Pass

Actor's Action	System Response
request to purchase pass	display different pass types requests pass type selection
provide pass type	…
…	…

Activity Diagrams

- visual representation of steps for a single scenario
- focus on logical flow
- sequential, iteration (loops) and conditional (guarded) steps
- support for parallel execution



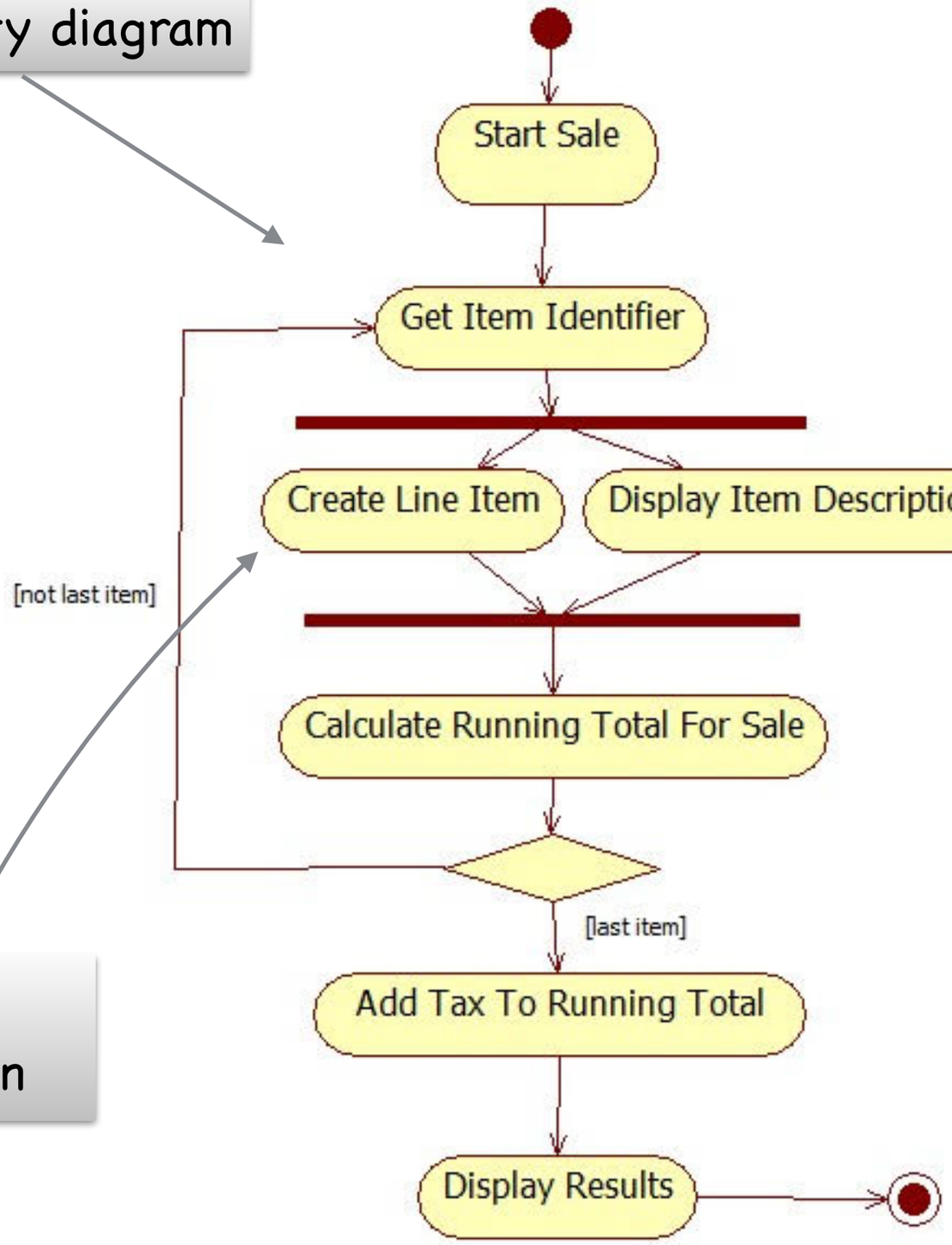


Basic Activity Diagram Notation

scenario

Actor (cashier)	System
Cashier starts a new sale	Displays a transaction entry area.
Cashier enters item identifier	System creates a line item record and retrieves and presents item description (including price) and running total for the transaction.
The above step is repeated until the cashier signals that the transaction is complete.	The system calculates total with taxes and presents the results.

activity diagram

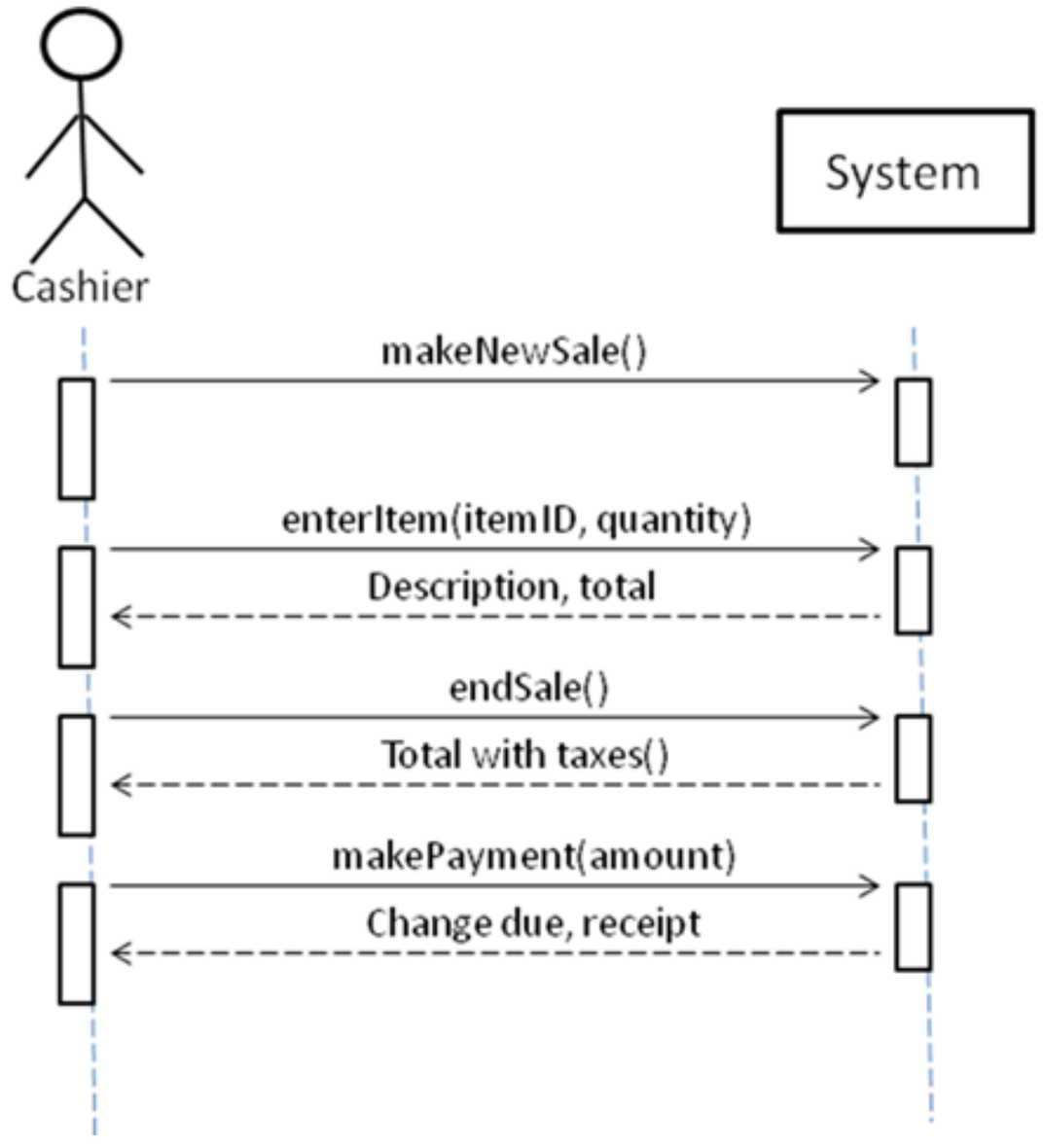


parallel execution

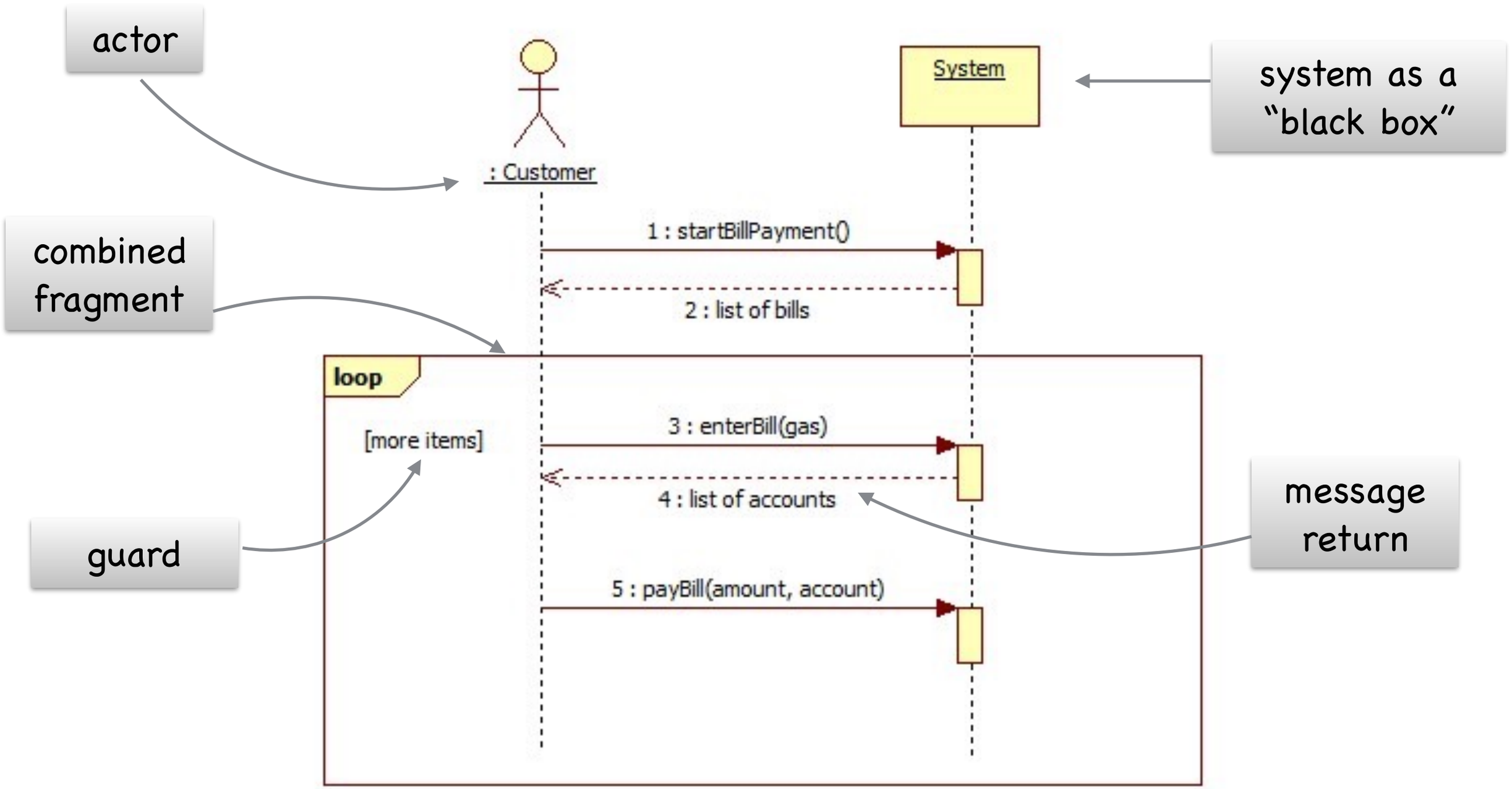
Activity Diagram Example

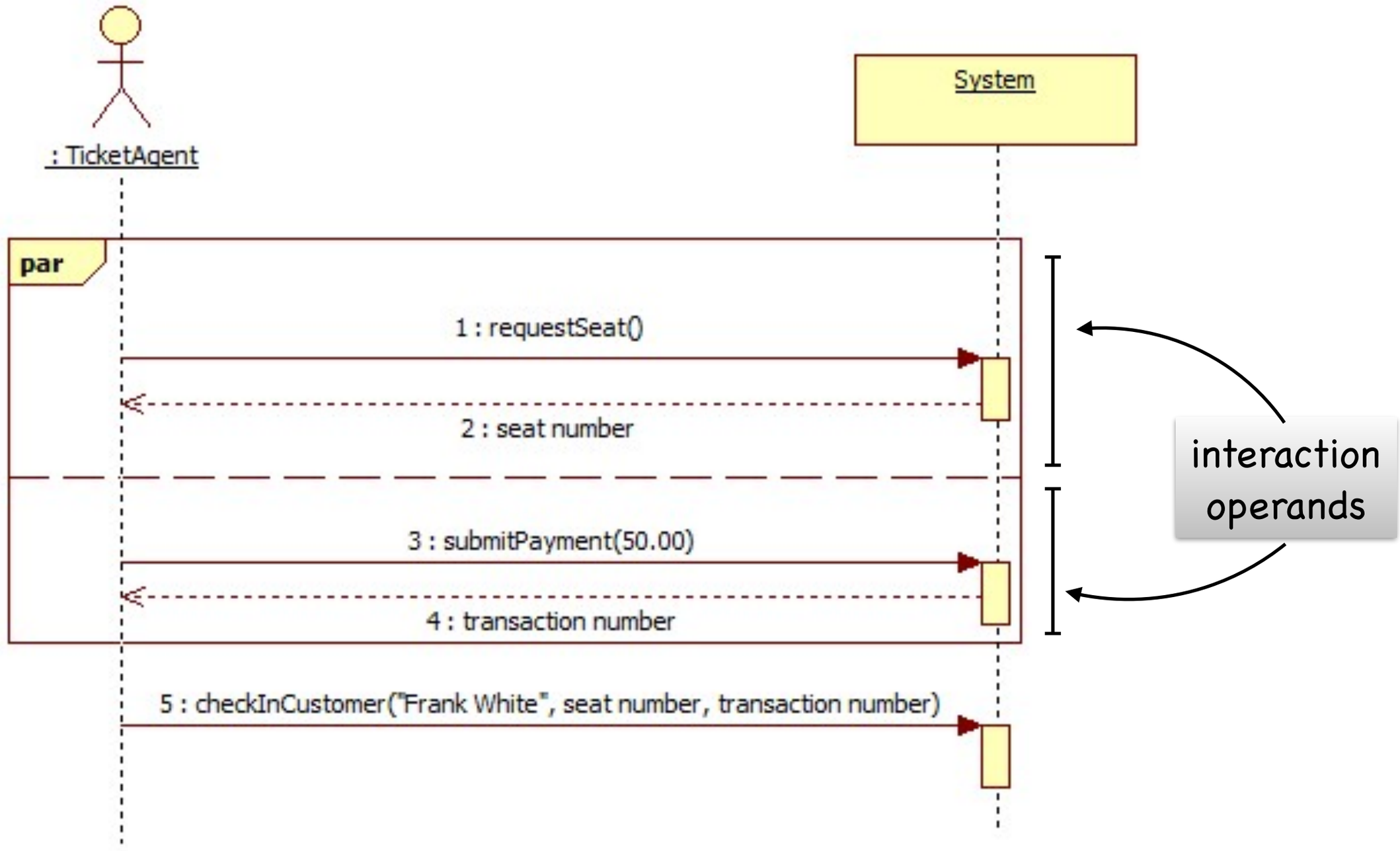
System Sequence Diagrams

- focuses on how actors interact with system
  - actor generates system events
  - system receives/handles event.
- covers one scenario
- order of events can be derived from diagram



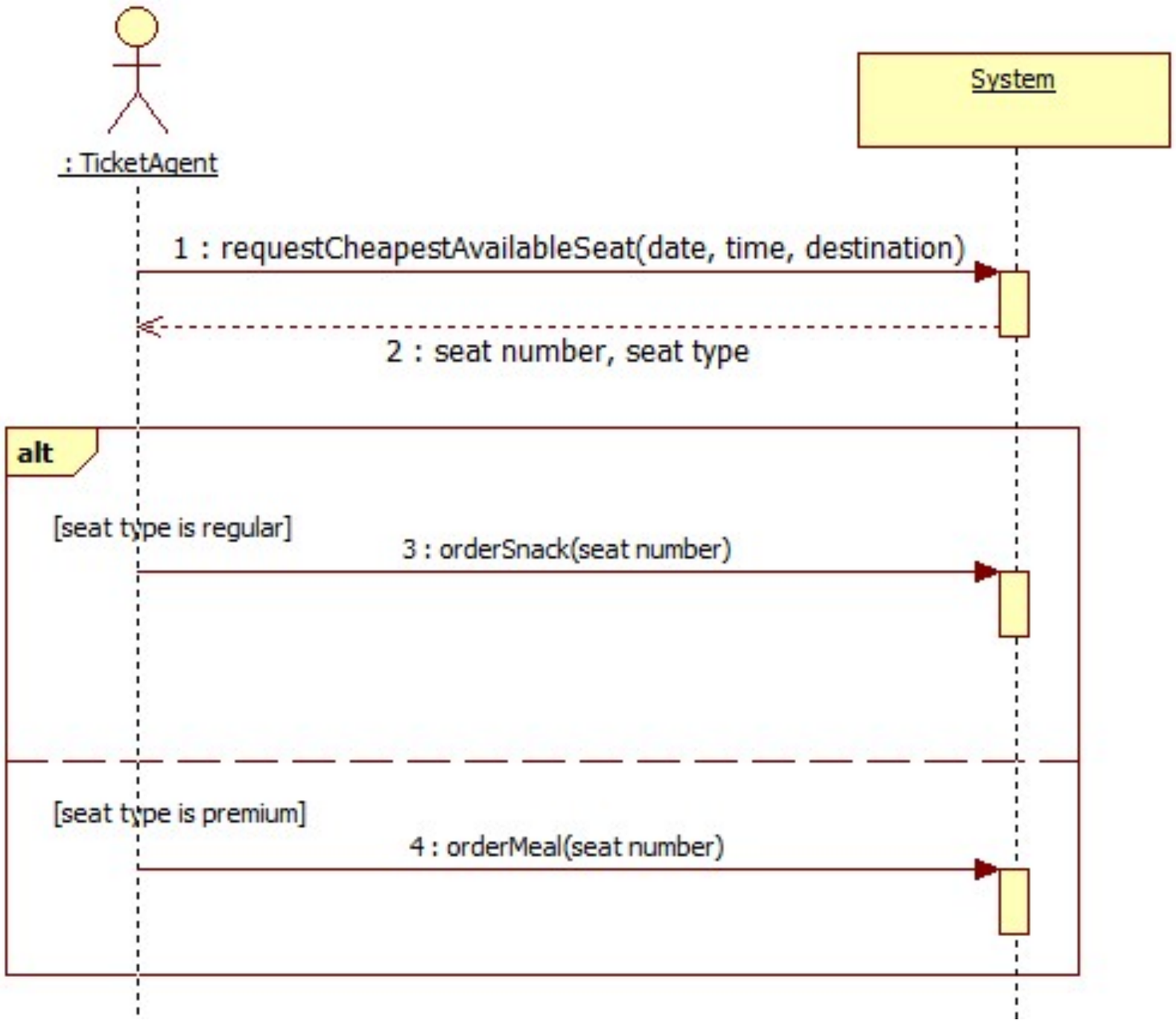
System Sequence Diagram Notation





Parallel Interaction Frame

Interaction operands can execute in any order



Alternate Interaction Frame

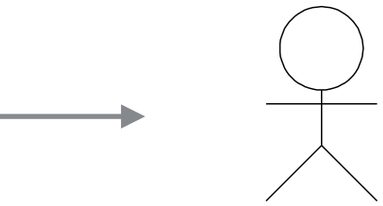
Operand executes depending on the guard

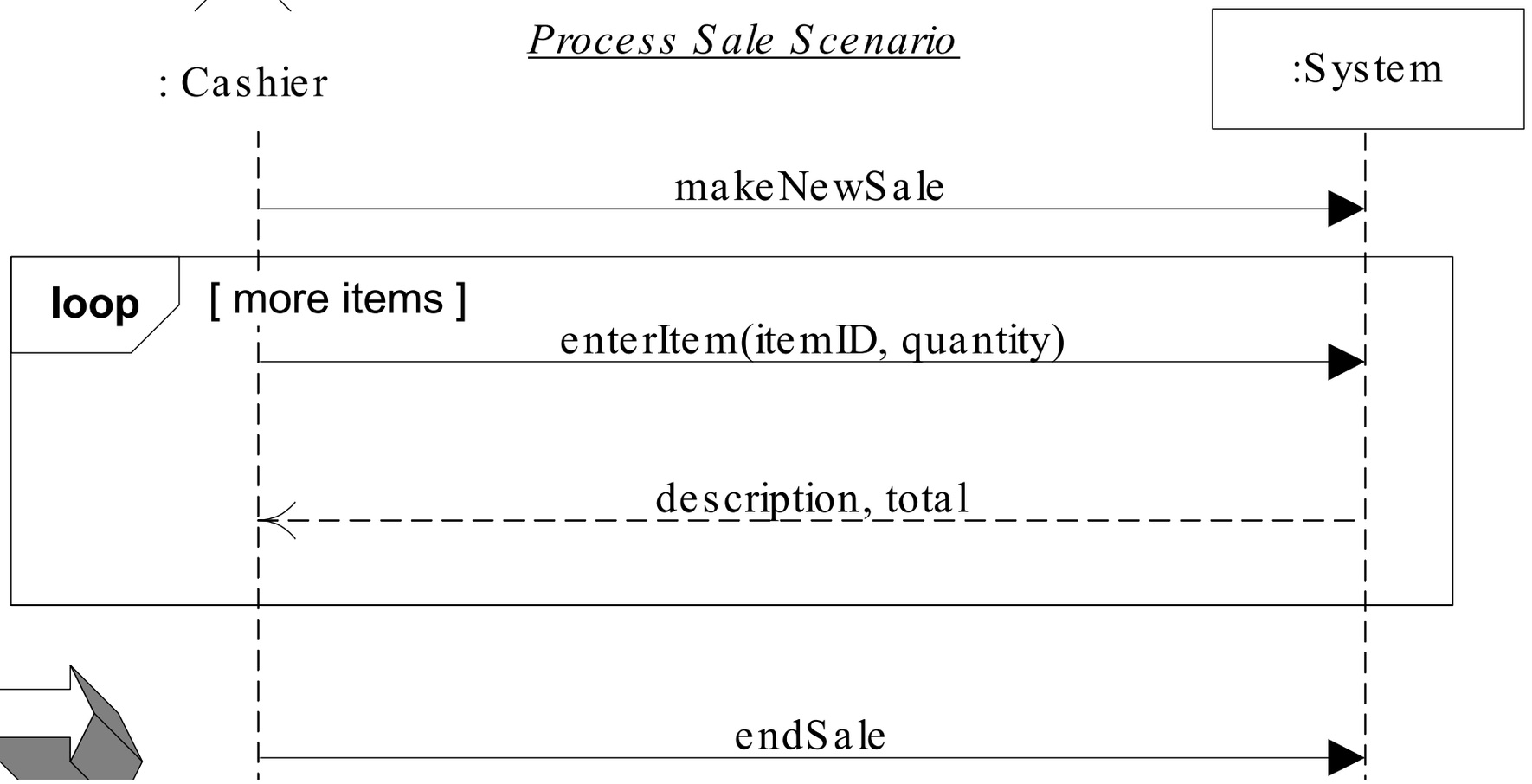
Notes About SSD

- use descriptive terms
  - verbs for message names
  - nouns for return values
- show abstract intentions
  - do not think of user i/o interfaces for message exchange

system sequence diagram

scenario





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SSD Example

Summary

- behavioural modelling captures how the system is intended to run
- use cases give textual description (scenarios)
- UML provides the following means of visually describing scenarios
  - activity diagrams, describe steps needed to satisfy goal
  - system sequence diagrams, illustrate actor/system interaction