CS4125
SYSTEMS ANALYSIS
SPRING SEMESTER 2010-2011

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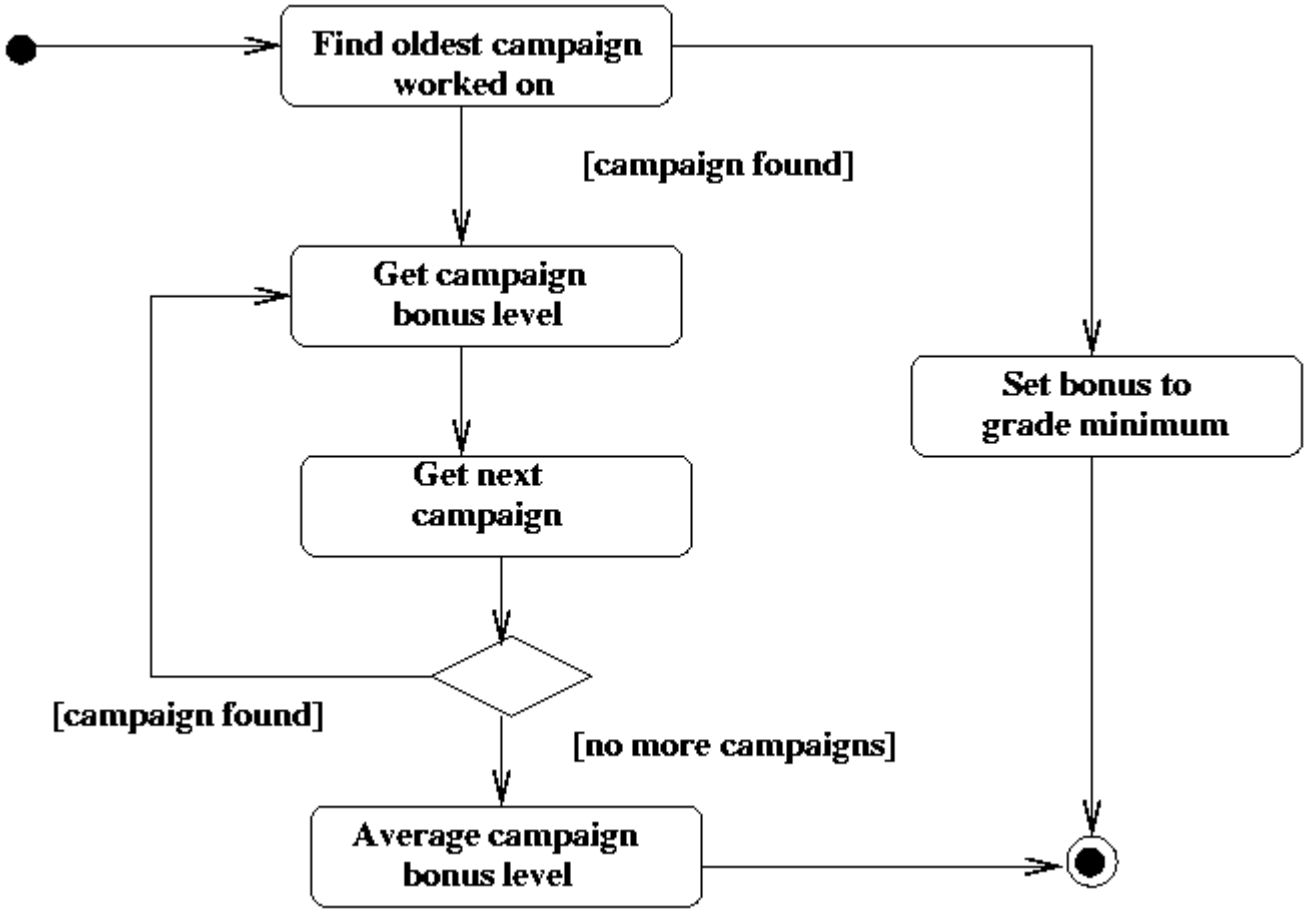
Lecture N
W8L2 / W9L1

Activity Diagrams

UML: Activity Diagrams

- Similar to flowcharts (Skidmore 1994).
- In UML 1.x, variation of statechart.
- In UML 2.0, separate from statecharts.
- Purpose:
  - Domain modelling - in business modelling i.e workflows
  - To describe a system function that is represented by a use case.
  - To describe the logic of an operation.
- For operation modelling, focuses on flow of activity driven by internal processing within an object, rather than by events that are external to it.
- Action states known as activities.
- Transition out of an action state is normally triggered by completion of an operation.

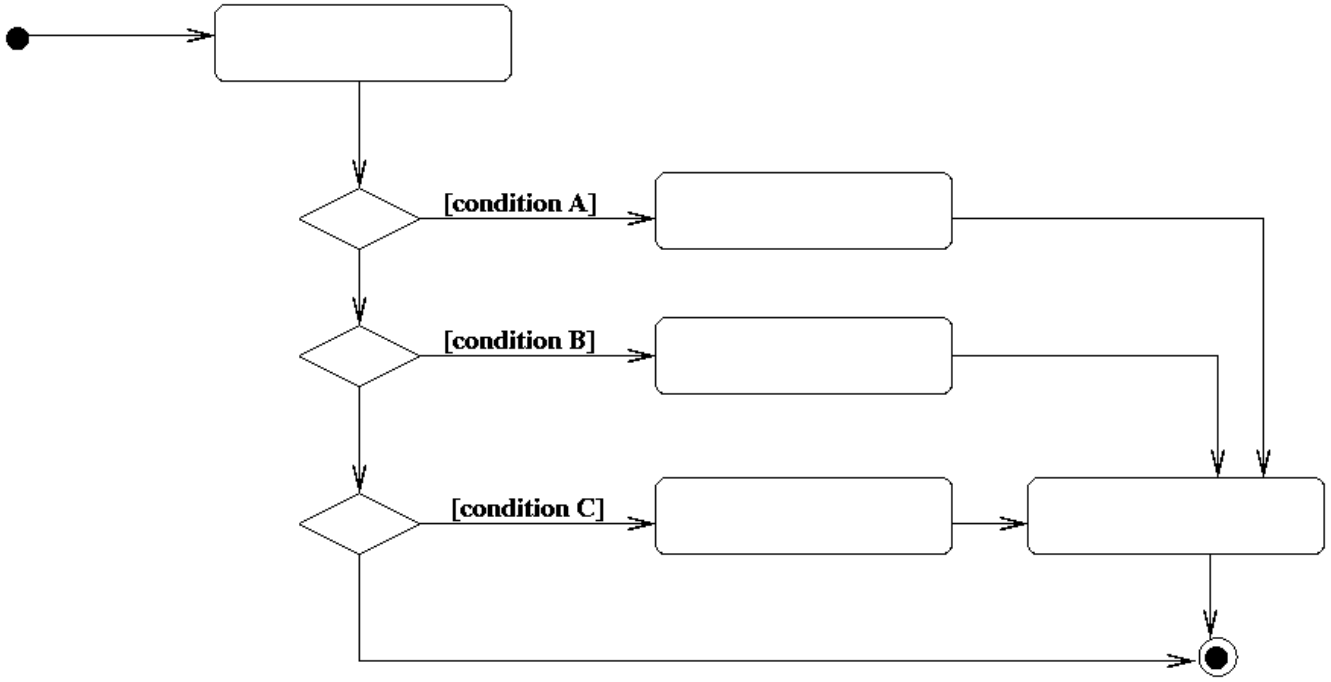
UML: Activity Diagrams



Activity diagram for operation CalculateBonus()

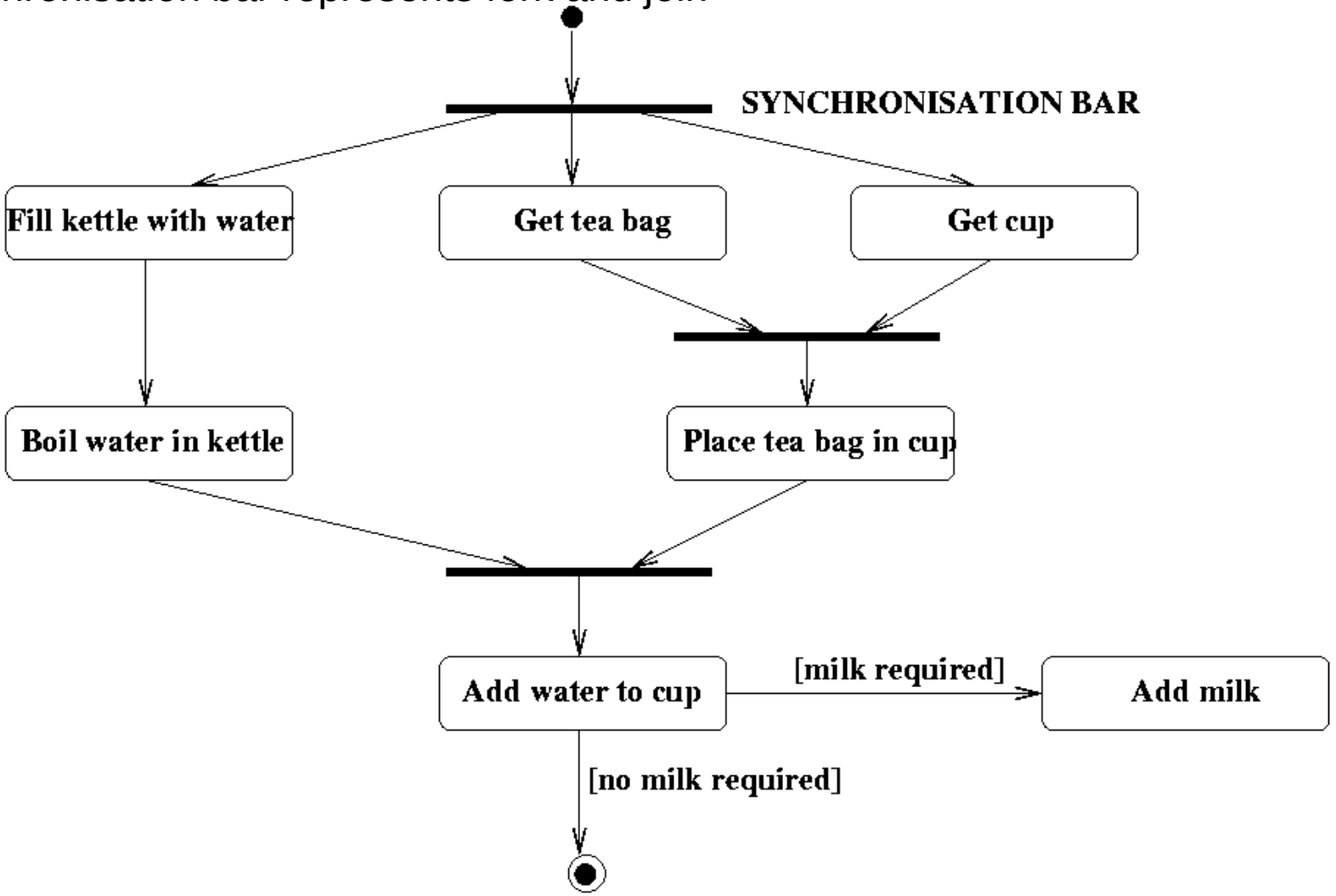
UML: Activity Diagrams

- Nested decisions
- Diamond represents decision and merge
  - UML 1.x, not necessary to use diamond node explicitly. Not so for UML 2.0
  - In UML 1.x, multiple flows out of same node treated as OR
  - In UML 2.0, multiple flows treated as AND
- Initial and final pseudostates.



UML: Activity Diagrams

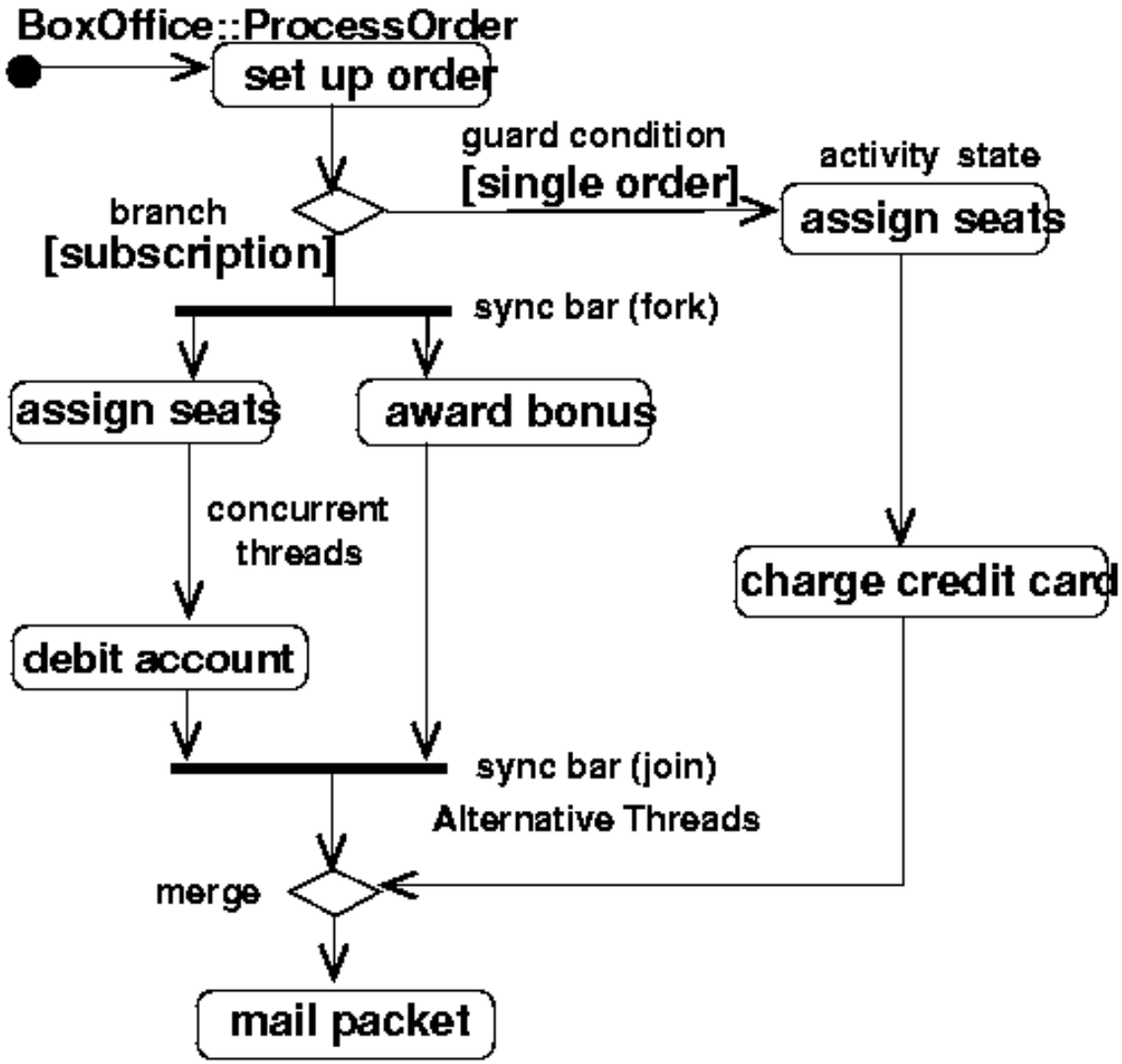
- Synchronisation bar represents fork and join



UML: Activity Diagrams

Two ways in which objectcs can be shown in activity diagrams:

1. The operation name and class
2. Object can be shown as providing input to or receiving output from an actions

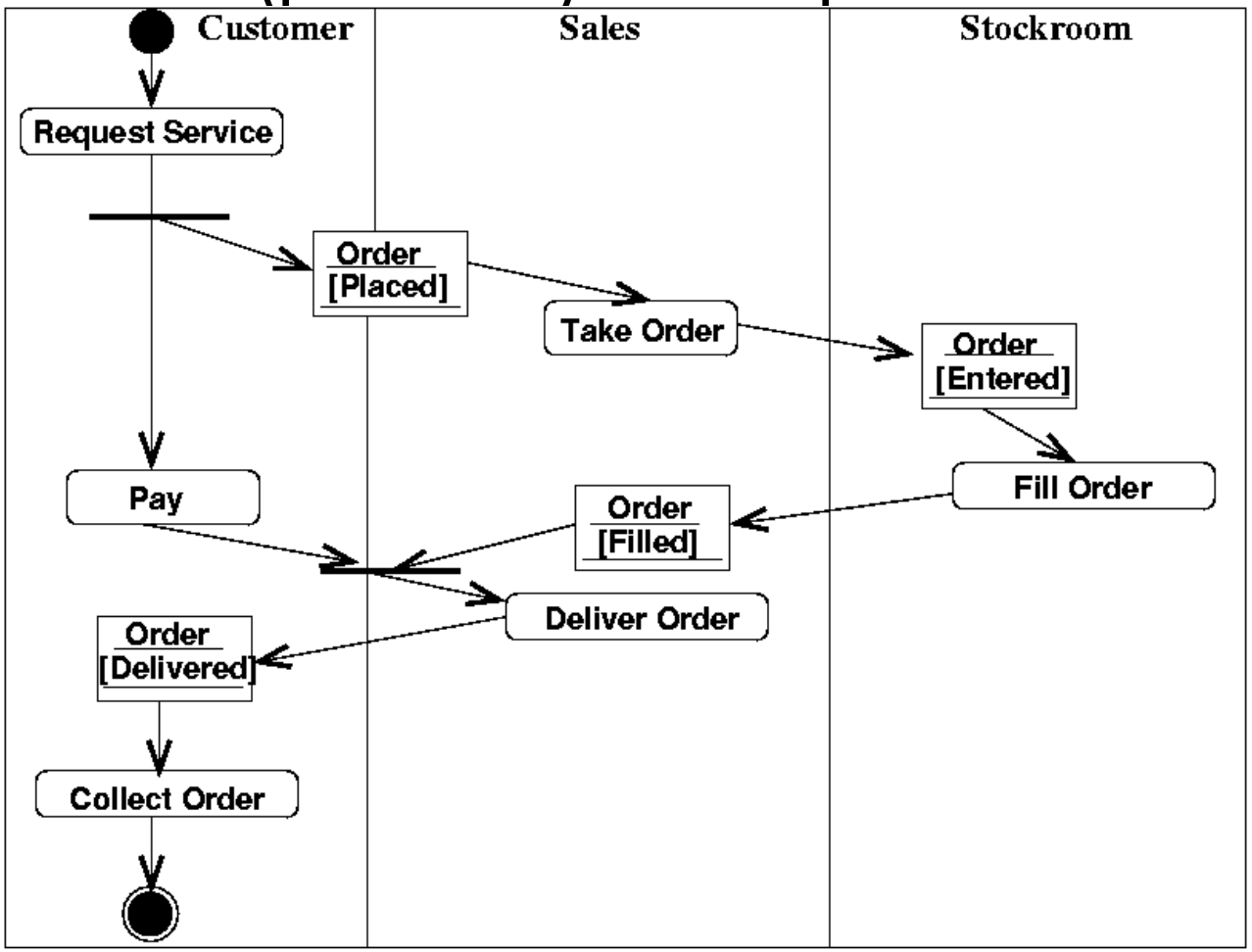


UML: Activity Diagrams

- In addition:
- An activity diagram can be divided into swimlanes.
- Each swimlane represents one focus of responsibility in the activity and may be handled by a distinct operation in one or more objects.
- The order of swimlanes has no significance.
- Activity diagrams that use swimlanes reminiscent of system flowcharts.

UML: Activity Diagrams

- Swimlanes (partitions) and object flows.



Examle of swimlanes and object flows

UML: Activity Diagrams

- Signals

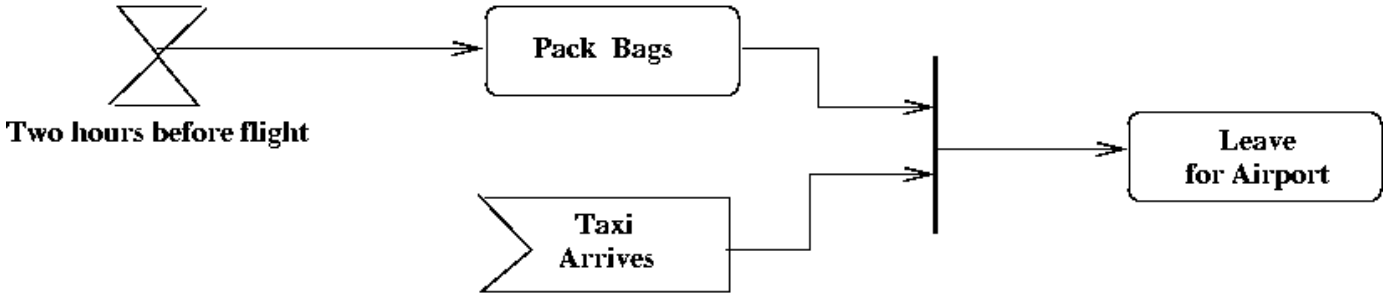


Illustration of Time and Accept Signals

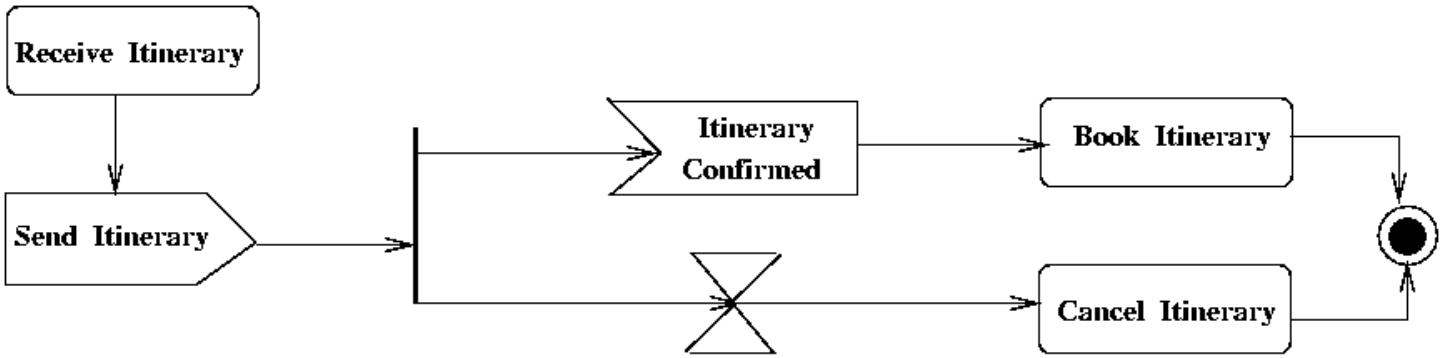
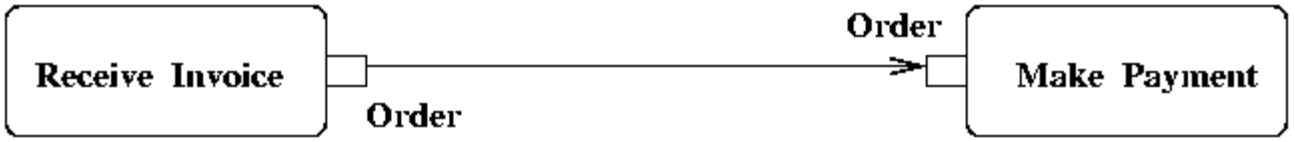


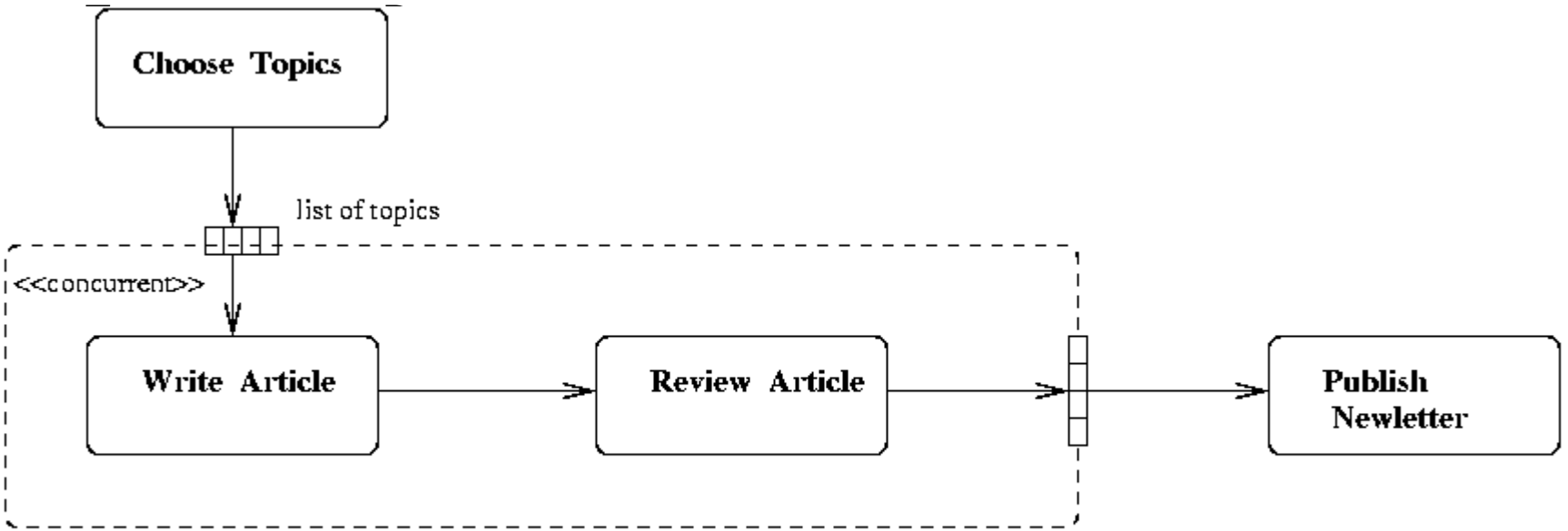
Illustration of Sending and Receiving Signals

UML: Activity Diagrams

- Parameterising Flows



UML: Activity Diagrams



Expansion region and list box pin

Reading

- Bennett, McRobb, and Farmer: section 5.3
- AND/OR
- Stevens and Pooley: section 11.2

Reading

- Chapter 11 in Bennett et al. or
- Chapters11 and 12 in Stevens and Pooley