Object-Oriented Design

Lecturer: Raman Ramsin

Lecture 12:

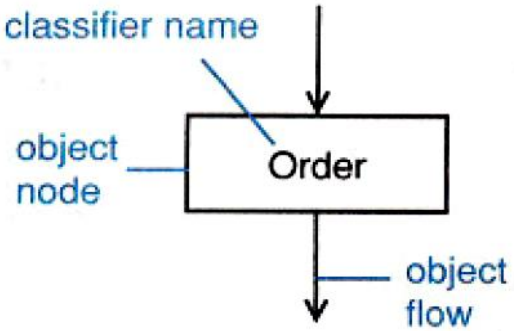
Activity Diagrams – Part 2

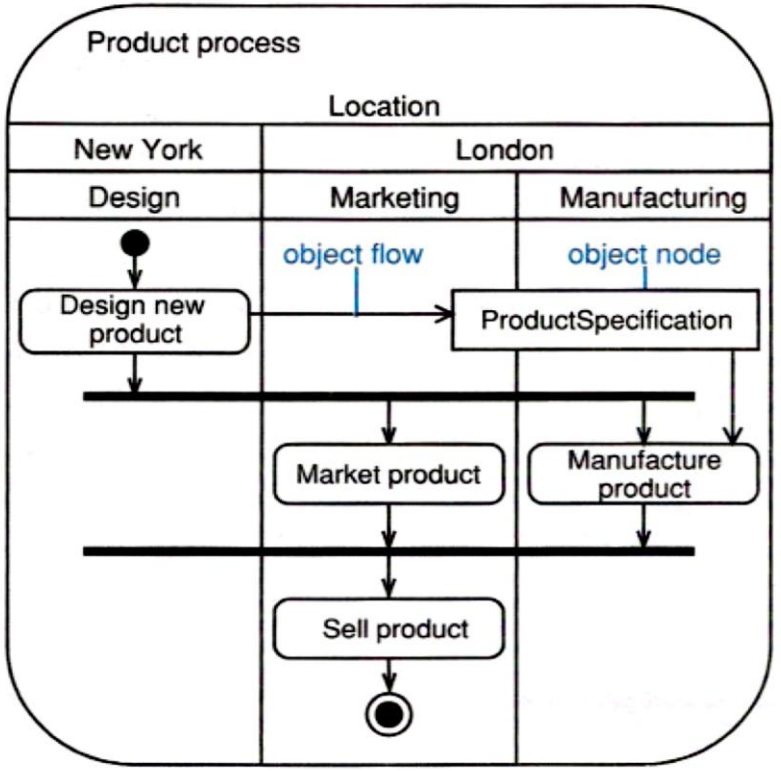
Analysis Workflow: *Analyze a Use Case*

- The *analysis workflow* consists of the following activities:
  - Architectural analysis
  - **Analyze a use case**
    - **Outputs:**
      - **analysis classes**
      - **use case realizations**
  - Analyze a class
  - Analyze a package

Object Nodes

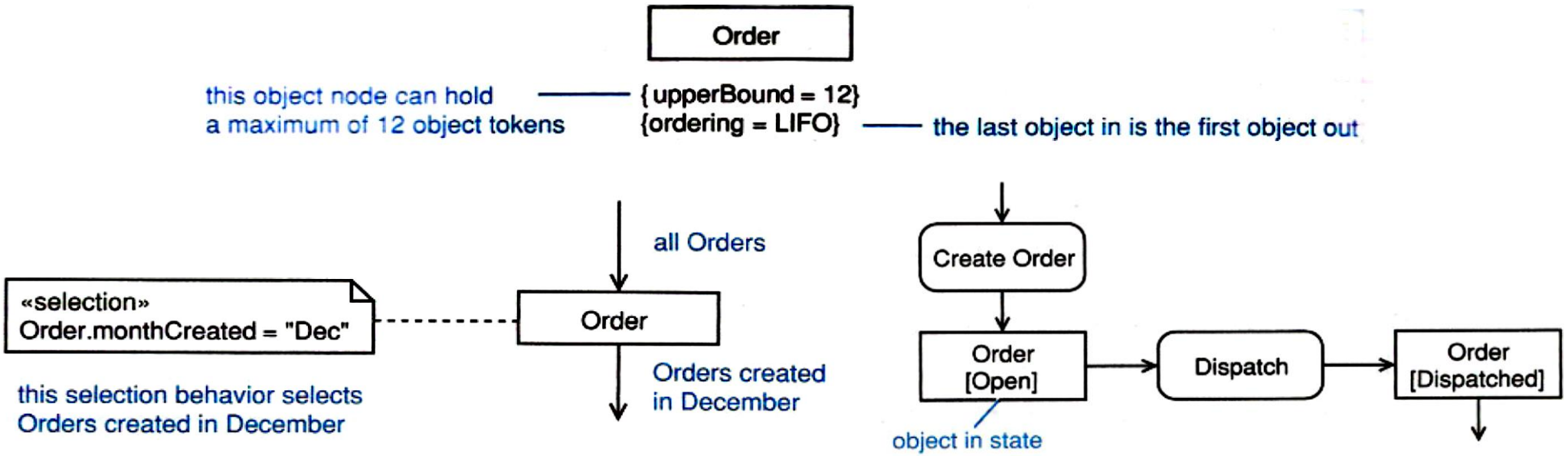
- Object nodes represent instances of a classifier.
- Input and output edges are object flows - represent the movement of objects.
- Object node output edges compete for each output token.





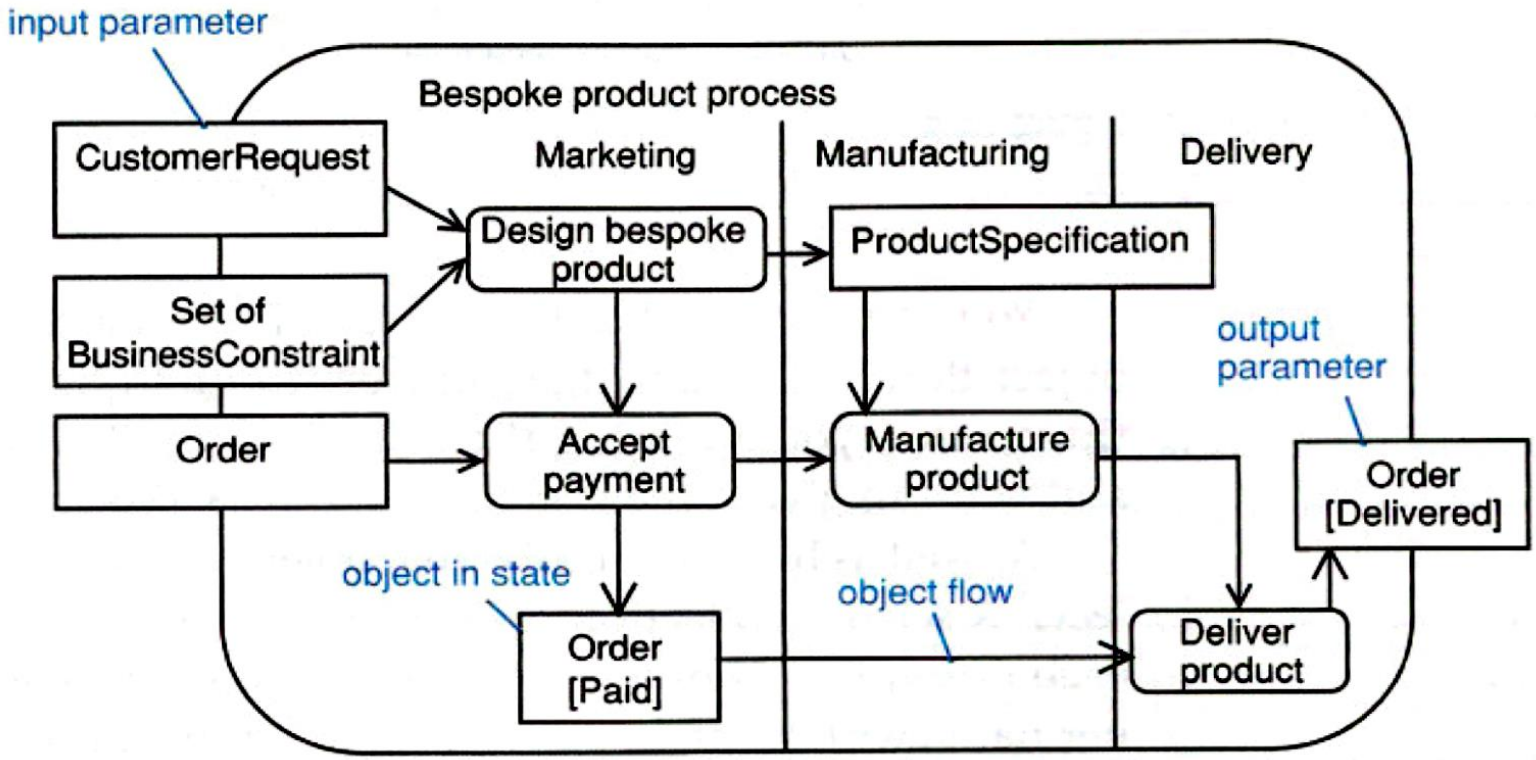
Object Nodes: Buffer Semantics

- Object nodes act as buffers:
  - {upperBound= n};
  - {ordering= FIFO} XOR {ordering= LIFO};
  - {ordering= FIFO} is the default;
  - may have a «selection».
- Object nodes can represent objects in a particular state.



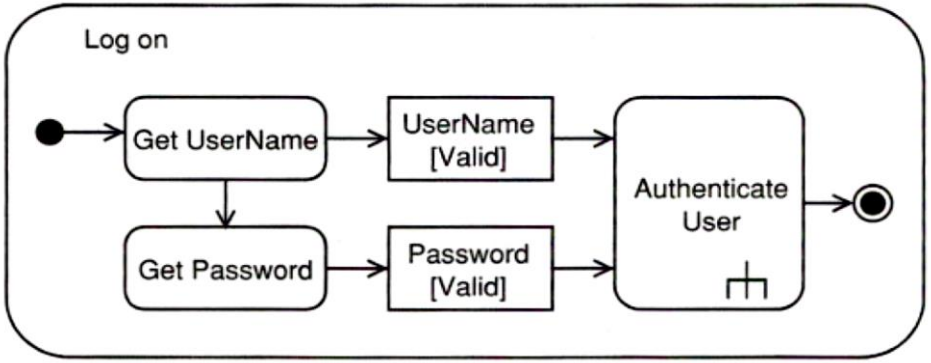
Object Nodes: Activity Parameters

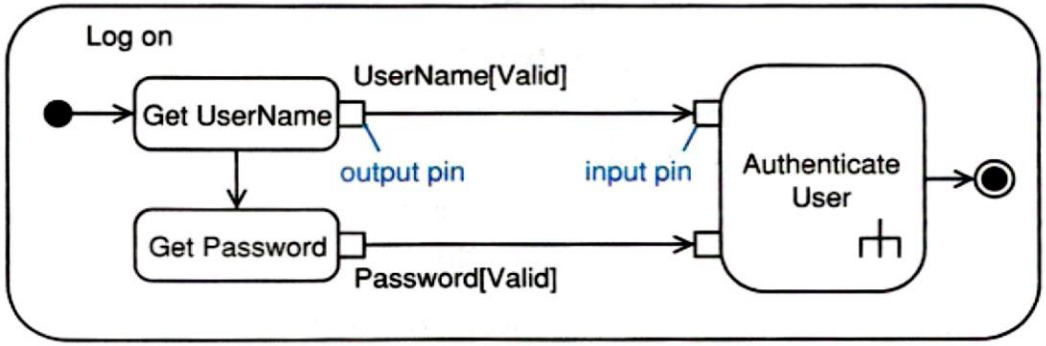
- Activity parameters are object nodes input to or output from an activity:
  - drawn overlapping the activity frame;
  - input parameters have one or more output edges *into* the activity;
  - output parameters have one or more input edges *out of* the activity.



Pins

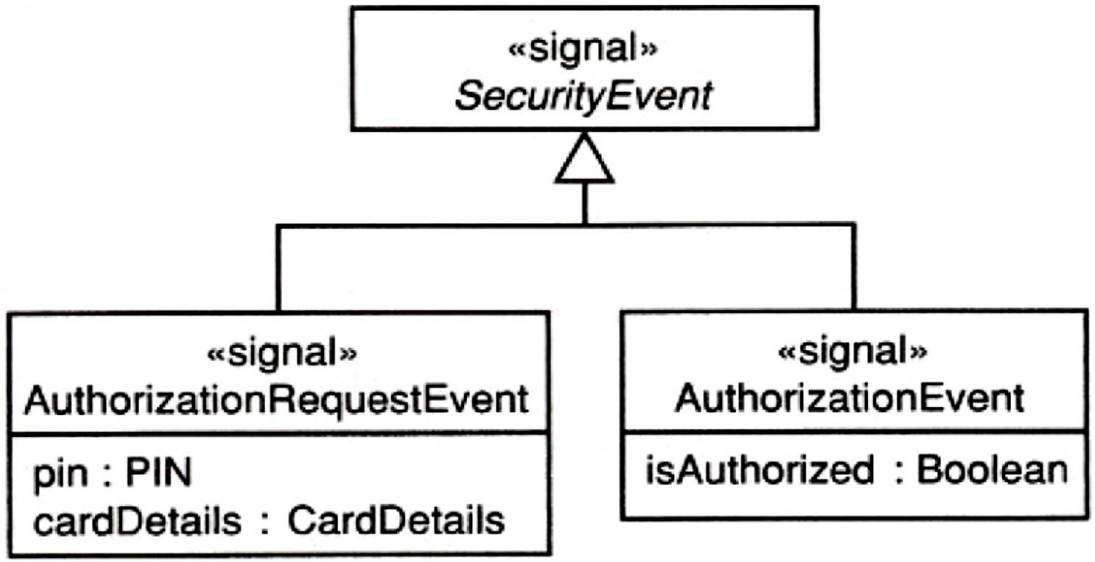
- A Pin is an object node that represents one input to or output from an action or activity.





Sending Signals and Accepting Events

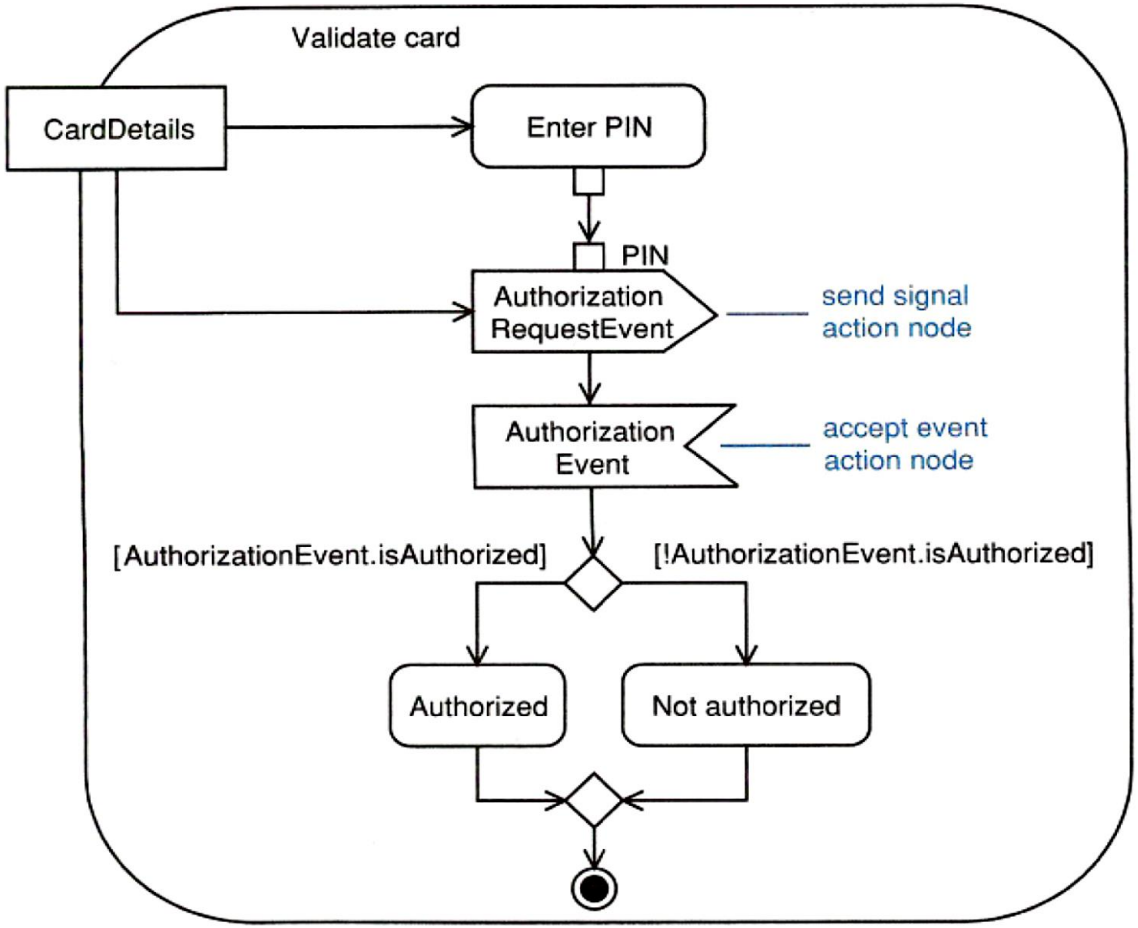
- Signals:
  - information that is passed asynchronously between objects;
  - class stereotyped «signal»;
  - the information is held in the attributes.

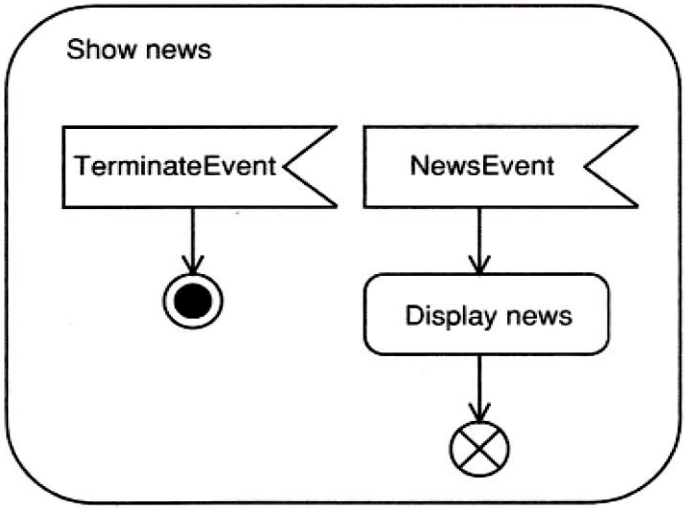


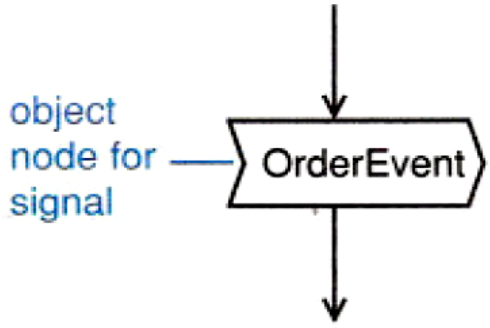
Sending Signals and Accepting Events: Action Nodes

- **Send Signal** action node:
  - starts when there is a token on all input pins;
  - executes - a signal object is constructed and sent;
  - then ends and offers control tokens on its output edges.
- **Accept Event** action node:
  - started by an incoming control edge *or* if no incoming edge, when its owning activity starts;
  - waits for an event of the specified type:
  - outputs a token that describes the event;
  - continues to accept events while the owning activity executes;
  - for a signal event, the output token is a signal.

Sending Signals and Accepting Events: Examples

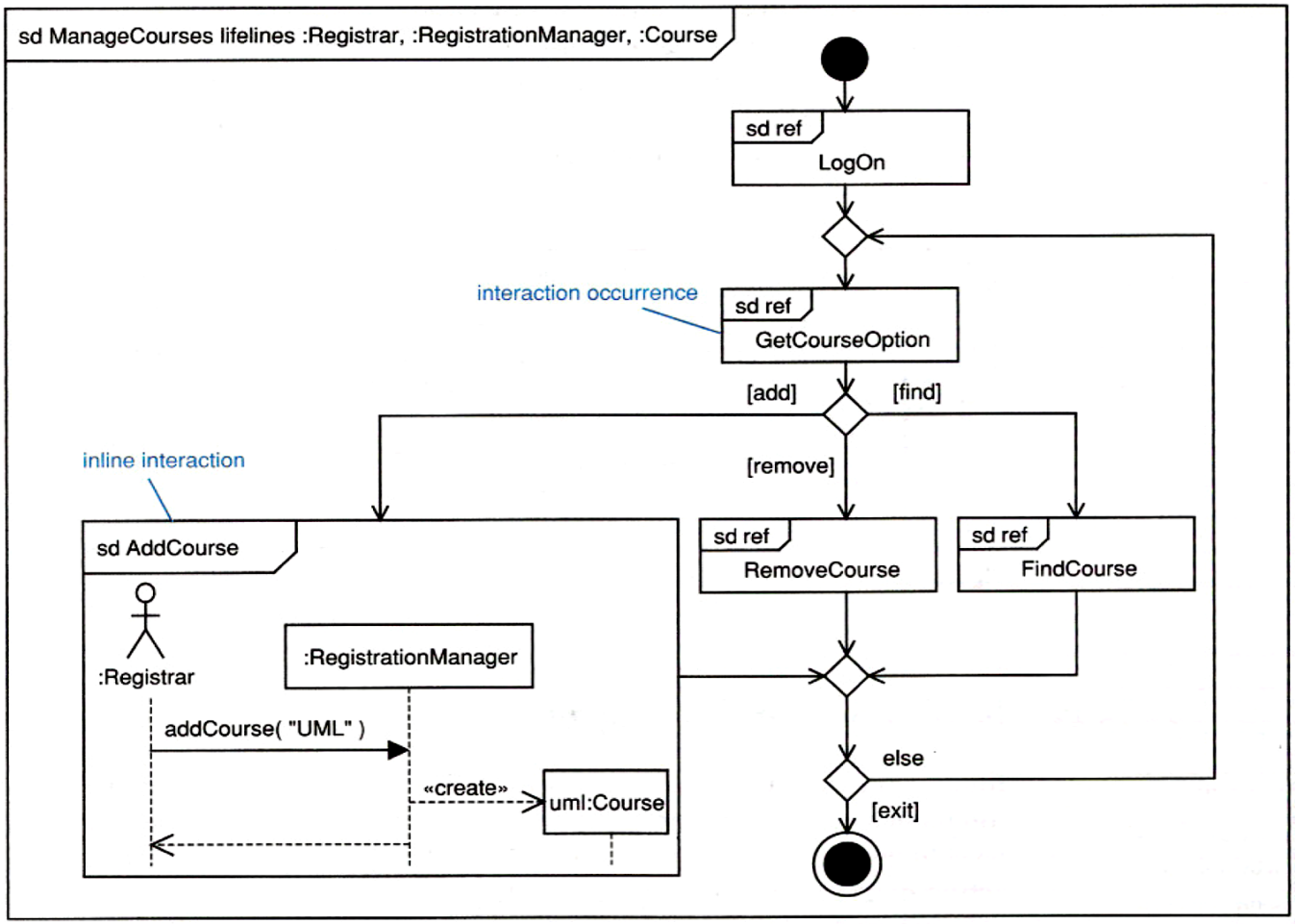






Interaction Overview Diagrams

- Interaction overview diagrams show flow between interactions and interaction occurrences



Reference

- Arlow, J., Neustadt, I., *UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design*, 2nd Ed. Addison-Wesley, 2005.