Object Oriented Analysis And Design
Aleenah Khan

Chapter 3 (Continued)

Creating Use Cases

ACTIVITY DIAGRAMS

Activity Diagrams

- Activity Diagrams also may be created at this stage in the life cycle.
- These diagrams represent the dynamics of the system.
- They are flow charts that are used to show the workflow of a system.
- They show the flow of control from activity to activity in the system, what activities can be done in parallel, and any alternate paths through the flow.
- Activity diagrams may be created to represent the flow across use cases or they may be created to represent the flow within a particular use case.
- Later in the life cycle, activity diagrams may be created to show the workflow for an operation.

Activity Diagrams

- Activity diagrams contain **activities**, **transitions** between the activities, **decision points**, and **synchronization bars**.
- In the UML:
  - Activities are represented as rectangles with rounded edges.
  - Transitions are drawn as directed arrows.
  - Decision points are shown as diamonds.
  - Synchronization bars are drawn as thick horizontal or vertical bars as shown in Figure 3-11.

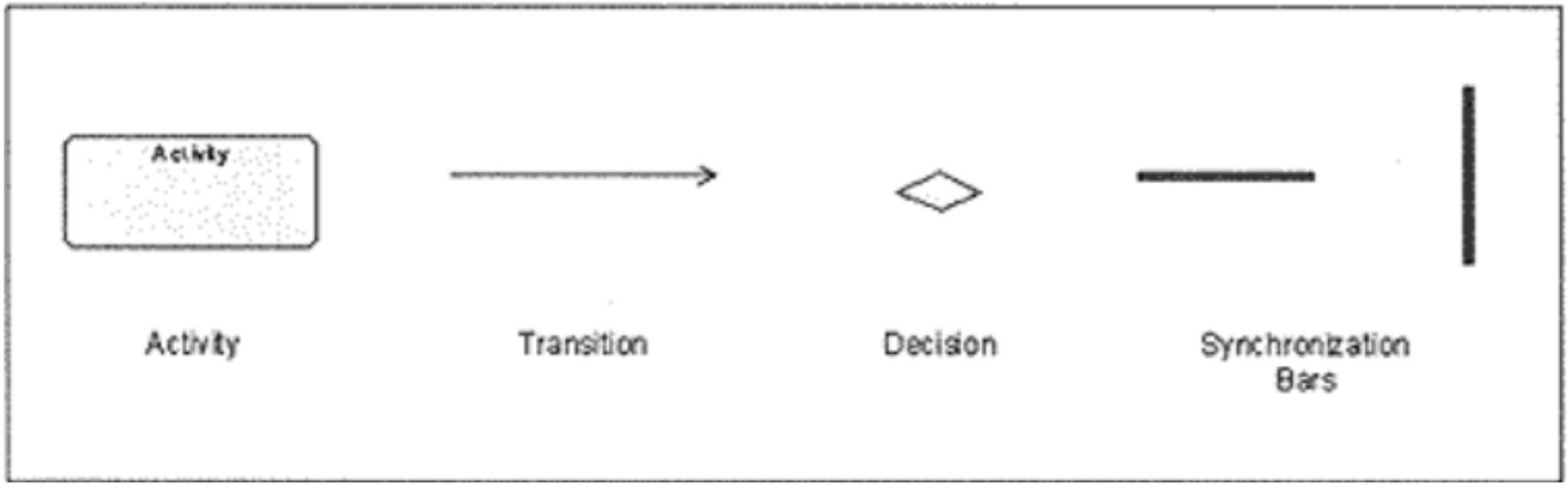
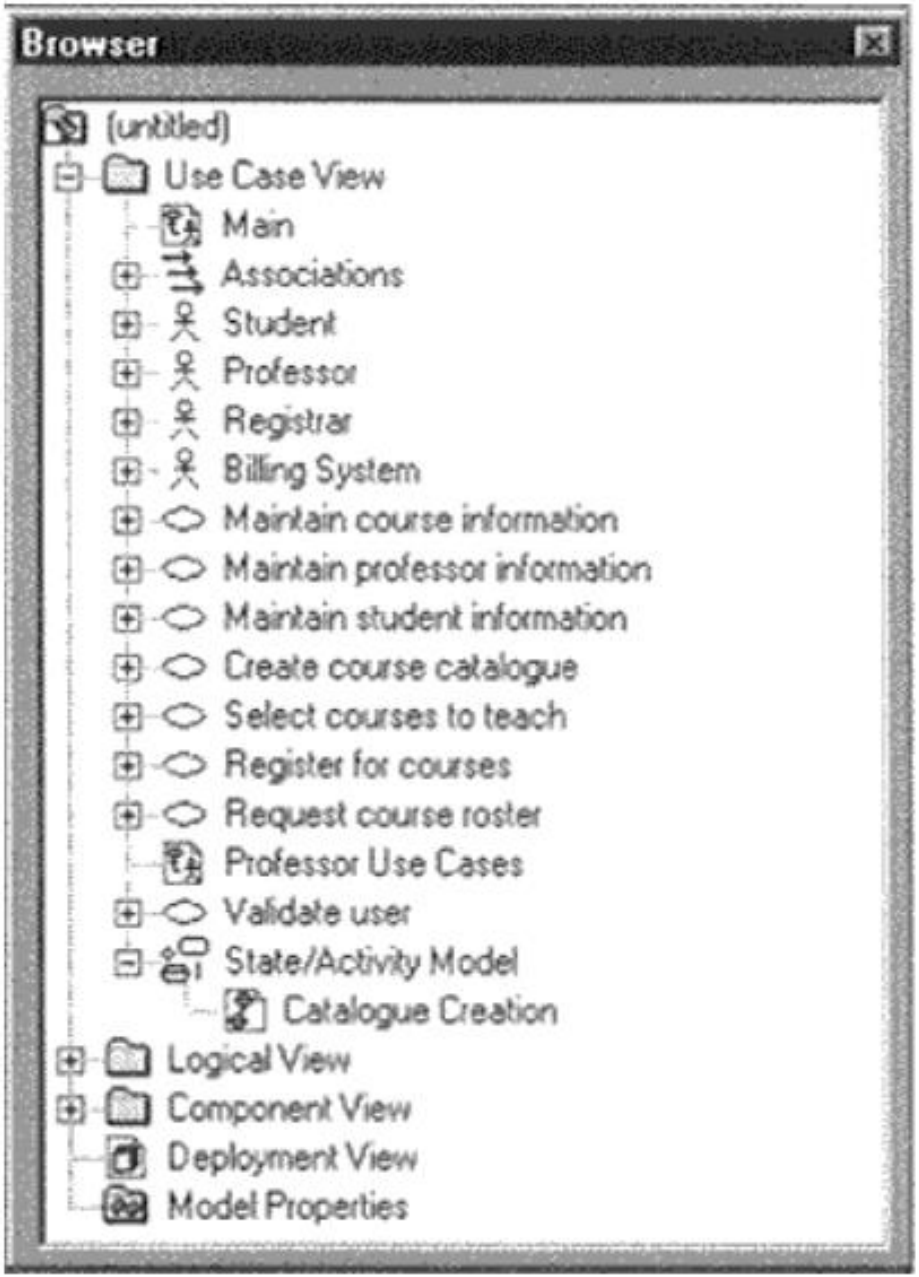


Figure 3-11. UML Notation for Activity Diagram Elements

Note

1. Right-click on the Use Case View in the browser to make the shortcut menu visible.
2. Select the New:Activity Diagram menu choice. This will add an activity diagram called NewDiagram to the browser.
3. While the new diagram is still selected, enter the name of the diagram.
4. Double-click on the activity diagram in the browser to open the diagram.

Figure 3-12. Activity Diagram in the Browser



Activities

An activity represents the performance of some behavior in the workflow.

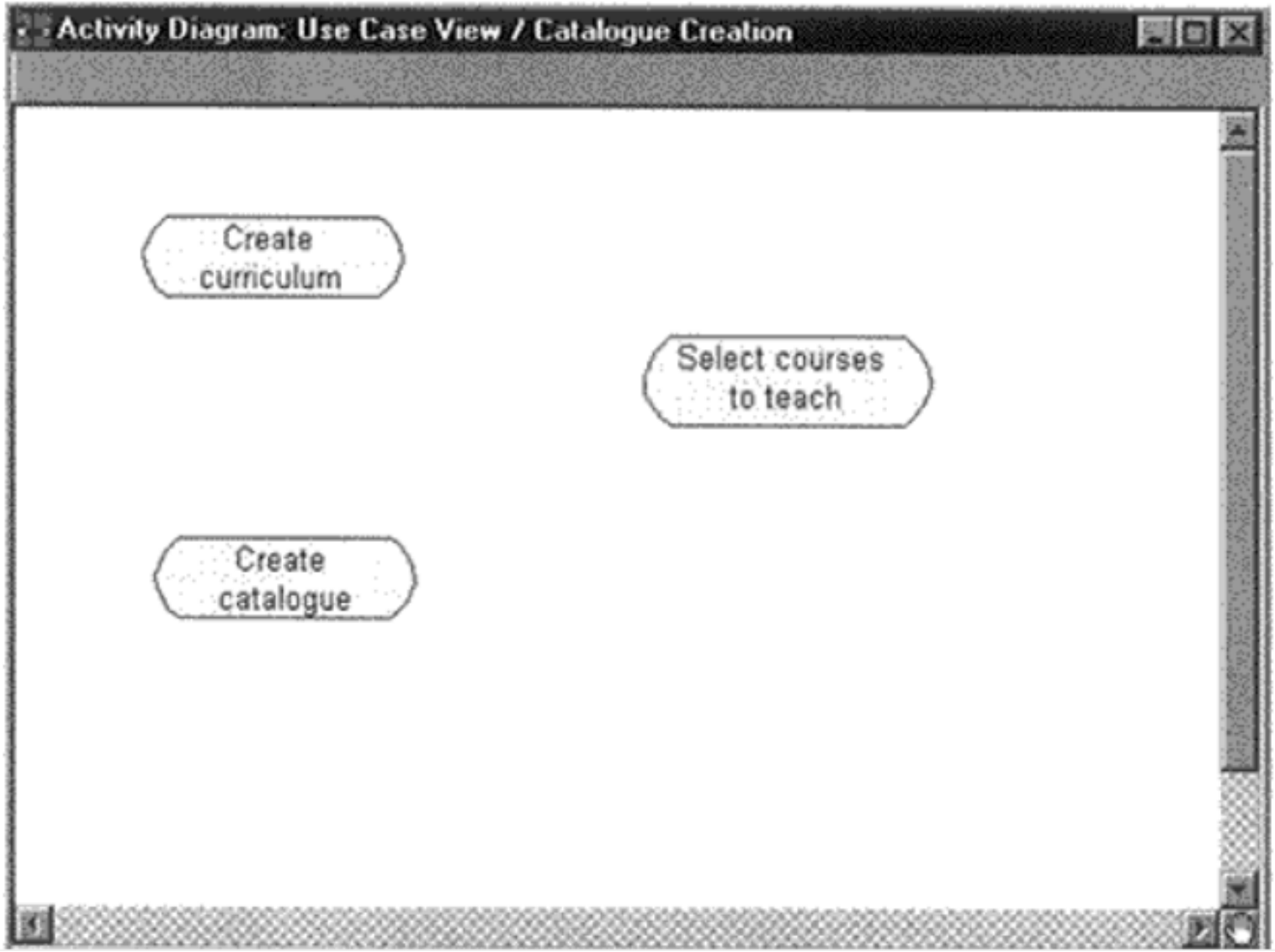
Note

1. Click to select the Activity icon from the toolbar.

2. Click on the activity diagram window to place the activity.

3. While the activity is still selected, enter the name of the activity.

Figure 3-13. Activities



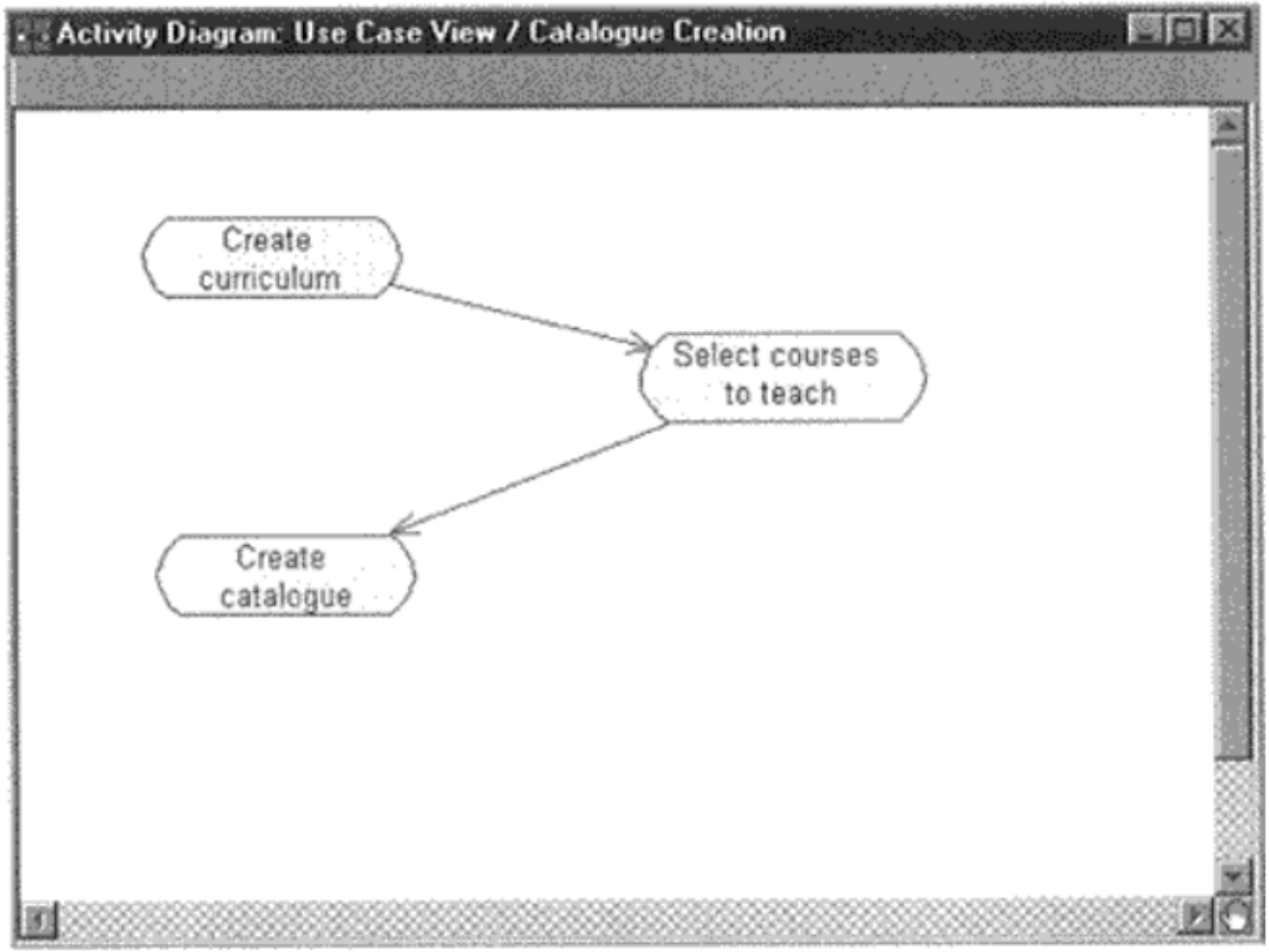
Transitions

- Transitions are used to show the passing of the flow of control from activity to activity.
- They are typically triggered by the completion of the behavior in the originating activity.

Note

1. Click to select the state transition icon from the toolbar.
2. Click on the originating activity and drag the transition arrow to the successor activity.

Figure 3-14. Transitions



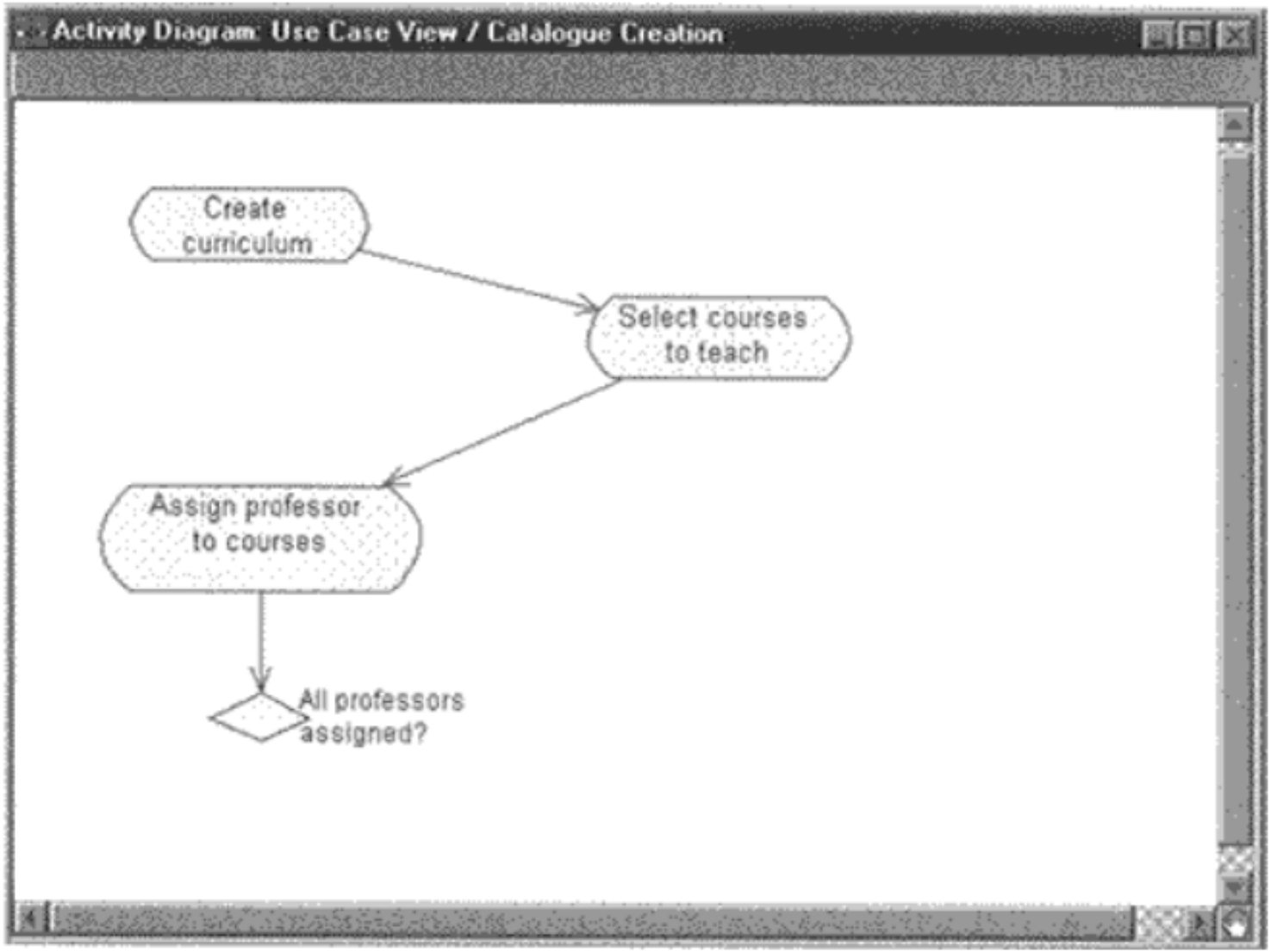
Decision Points

- When modeling the workflow of a system it is often necessary to show where the flow of control branches based on a decision point.
- The transitions from a decision point contain a guard condition, which is used to determine which path from the decision point is taken.
- Decisions along with their guard conditions allow you to show alternate paths through a work flow.

Note

1. Click to select the Decision icon from the toolbar.
2. Click on the activity diagram window to place the decision.
3. While the decision is still selected, enter the name of the decision.
4. Click to select the Transition icon on the toolbar.
5. Click on the originating activity and drag the transition to the decision icon.

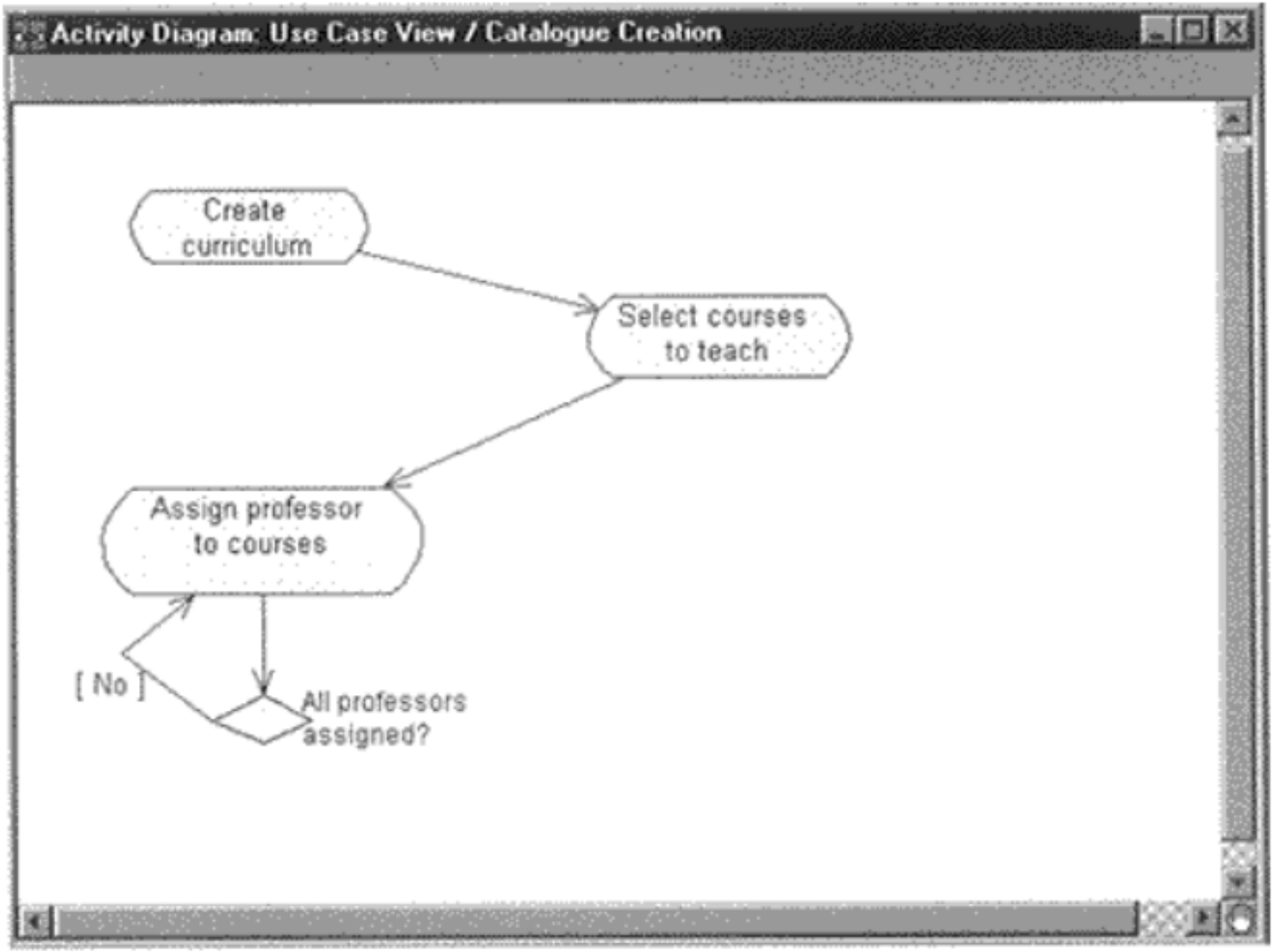
Figure 3-15. Decision in an Activity Diagram



Note

1. Click to select the State Transition icon from the toolbar.
2. Click on the decision and drag the transition to the successor activity.
3. Double-click on the transition arrow to make the Specification visible.
4. Select the Detail tab.
5. Enter the guard condition in the Guard Condition field.
6. Click the OK button to close the Specification.

Figure 3-16. Guarded Transition



Note

1. Click to select the line that should be rectilinear (multi-select may be accomplished by first selecting the Shift button).
2. Select the Format: Line Style: Rectilinear menu choice.
3. Relocate the lines as needed by selecting the line and dragging it to the desired location on the activity diagram window.

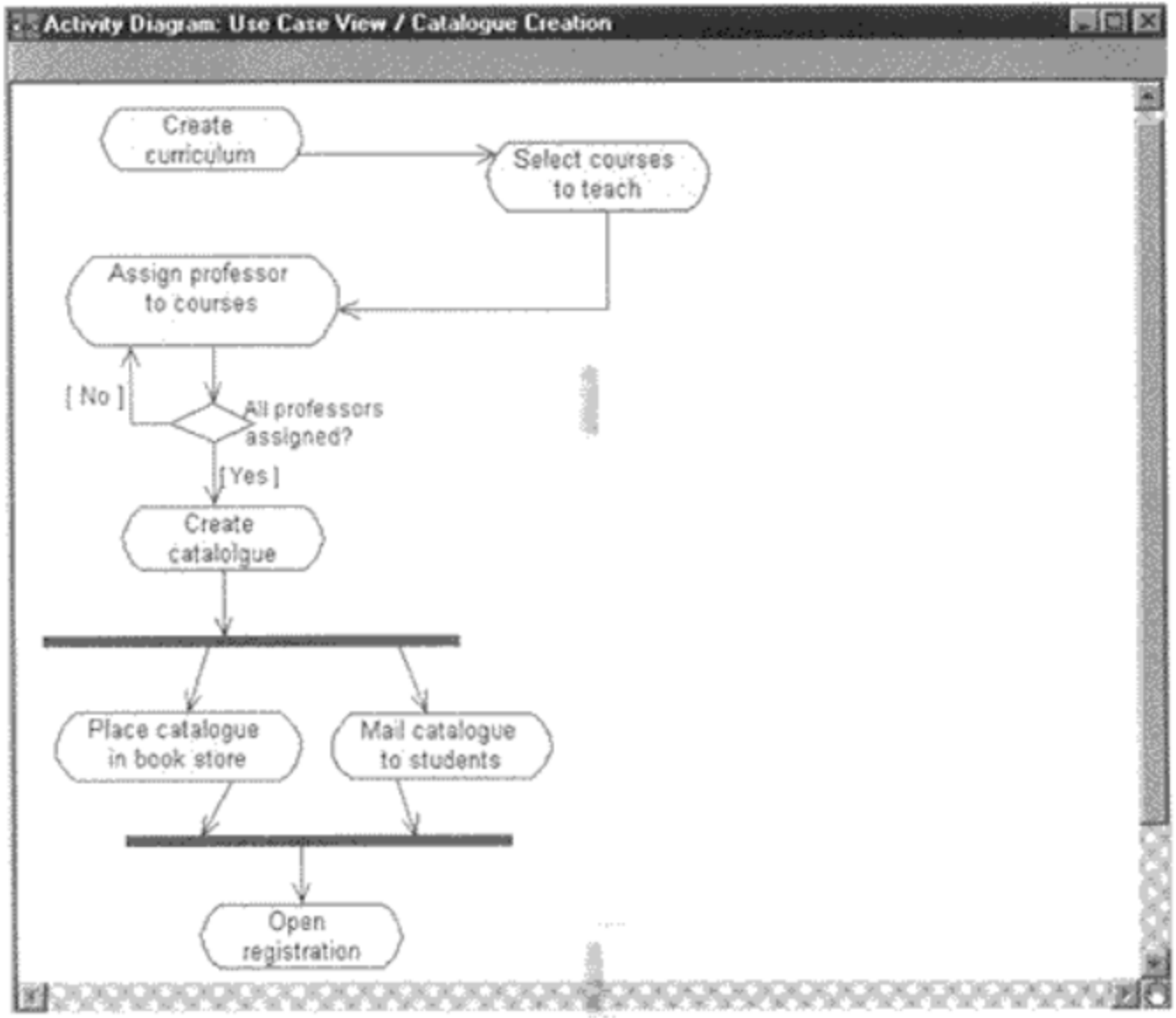
Synchronization Bars

- In a workflow there are typically some activities that may be done in parallel.
- A synchronization bar allows you to specify what activities may be done concurrently.
- Synchronization bars are also used to show joins in the workflow; that is, what activities must complete before processing may continue.
- A synchronization bar may have many incoming transitions and one outgoing transition, or one incoming transition and many outgoing transitions.

Note

1. Click to select the Horizontal Synchronization or the Vertical Synchronization icon from the toolbar.
2. Click on the activity diagram window to place the synchronization bar.
3. Click to select the State Transition icon on the toolbar and add any needed incoming and outgoing transitions to the synchronization bar.

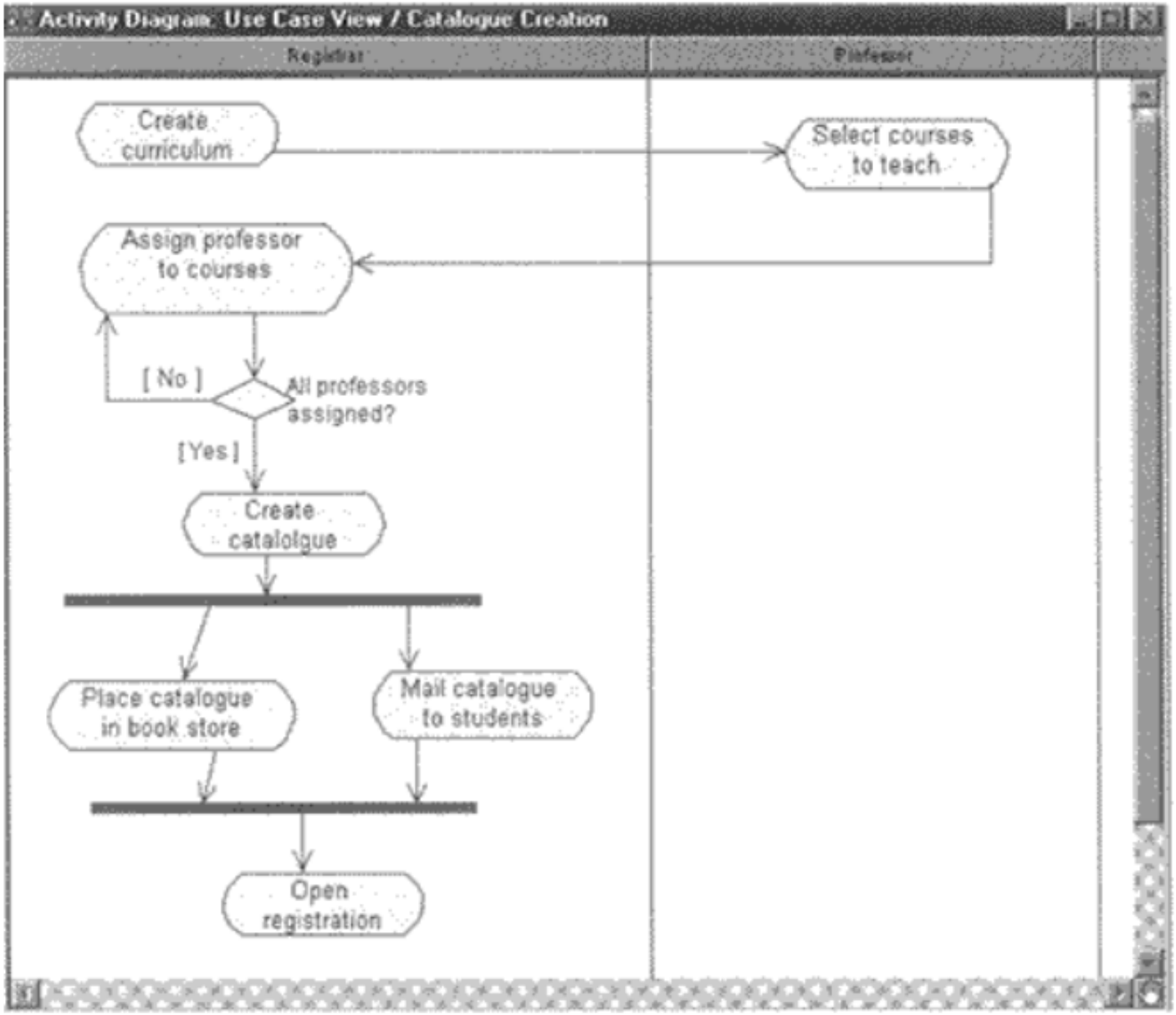
Figure 3-18. Synchronization Bars



Swimlanes

- **Swimlanes** may be used to partition an activity diagram.
- This typically is done to show what person or organization is responsible for the activities contained in the swimlane.

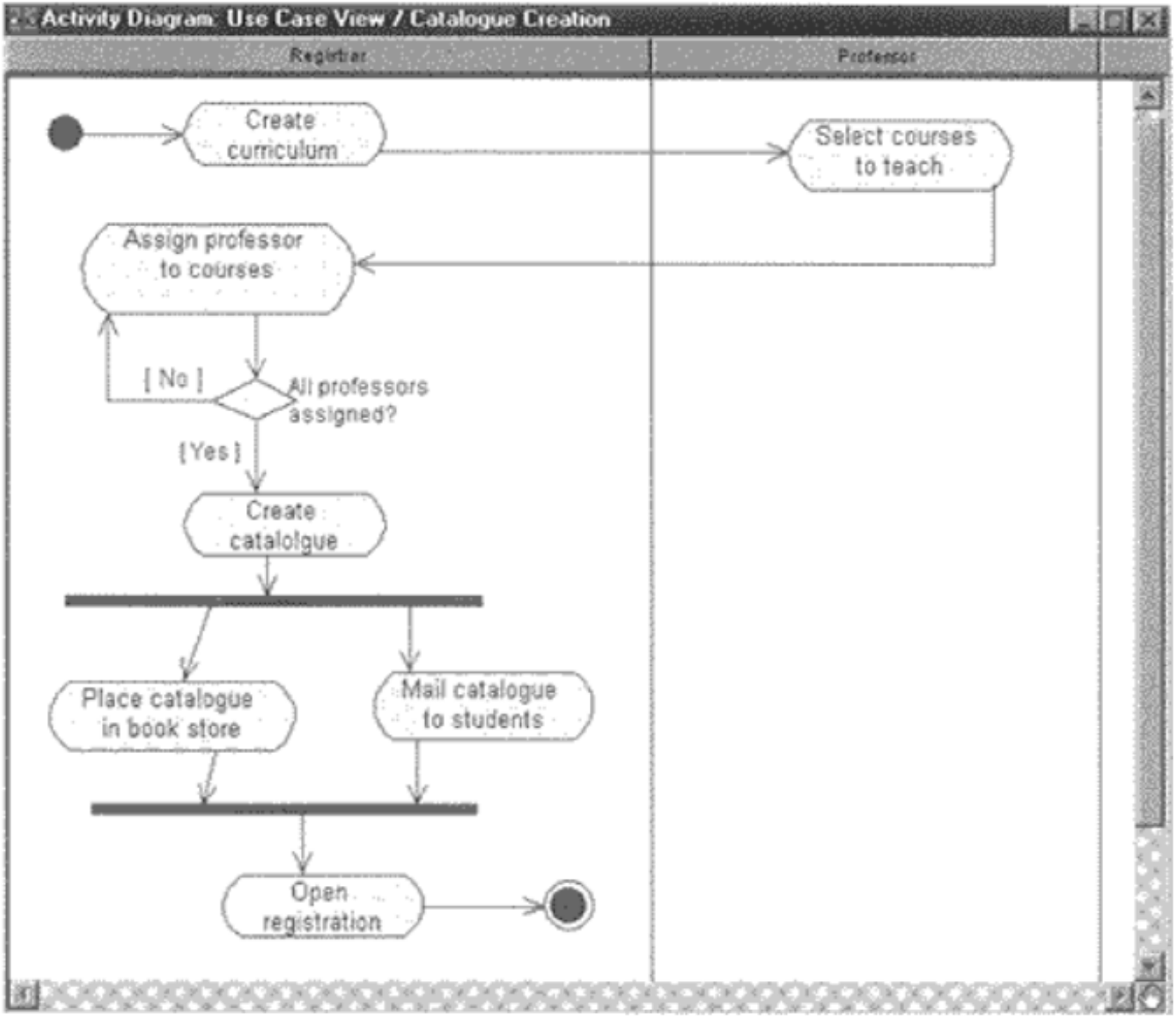
Figure 3-19. Swimlanes



Initial and Final Activities

- There are special symbols that are used to show the starting and final activities in a workflow.
- The starting activity is shown using a **solid filled circle** and the final activities are shown using a **bull's eye**.
- Typically, there is one starting activity for the workflow and there may be more than one ending activity (one for each alternate flow in the workflow).

Figure 3-20. Start and End States



Useful Links

- StarUML Download Link:
  http://staruml.io/download
- StarUML Tutorial
  https://www.youtube.com/watch?v=7lztE-O8NoU
- UML Use Case Diagram Tutorial
  https://www.youtube.com/watch?v=zid-MVo7M-E