



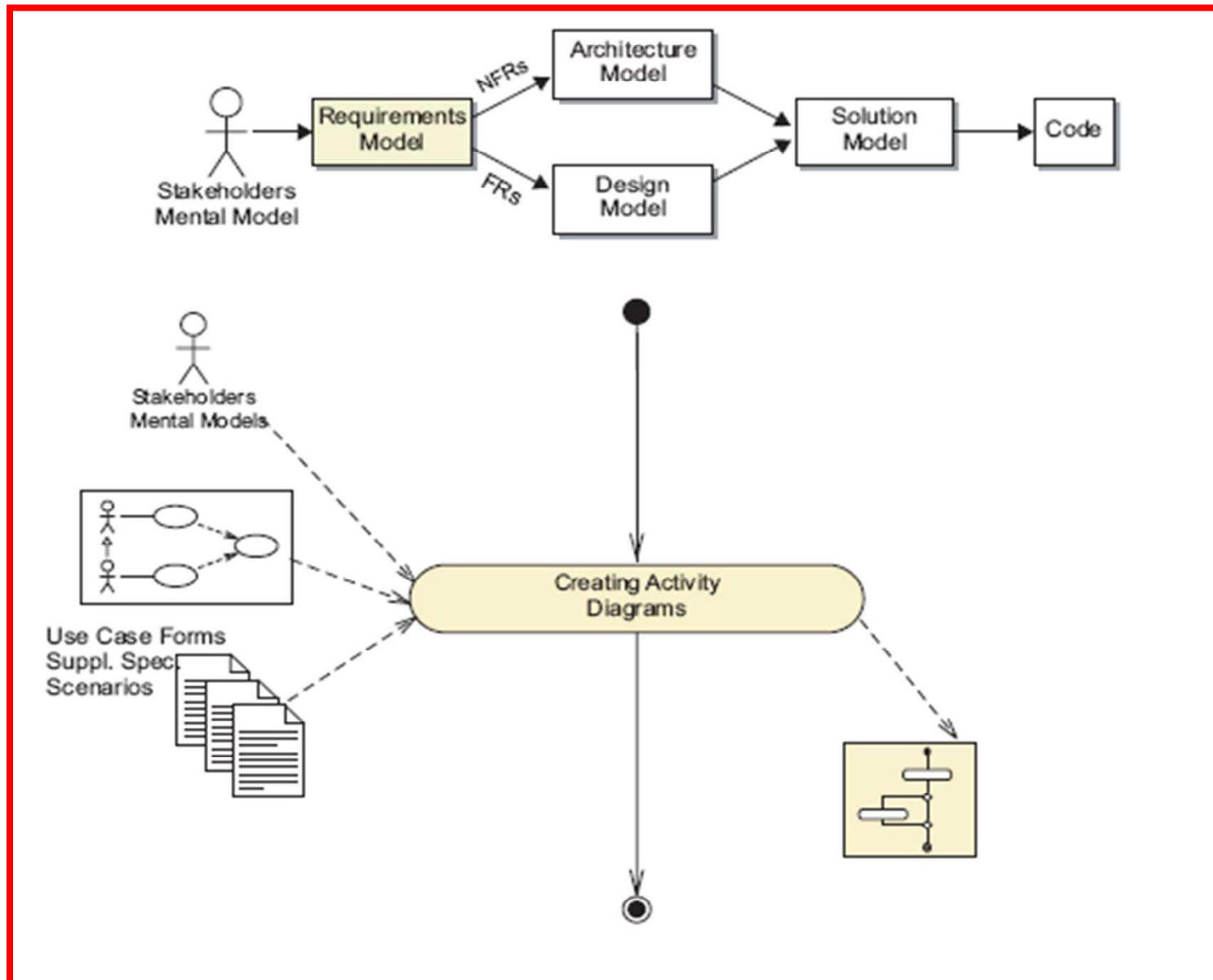
Creating Activity Diagram

Objectives

After completing this lesson, you should be able to do the following:

- Identify the essential elements of an Activity diagram
- Model a Use Case flow of events using an Activity diagram





Describing a Use Case With an Activity Diagram

To verify a mental model of a Use Case you can:

- Model the flow of events of an Use Case in an Activity diagram
- Validate the Use Case by reviewing the Activity diagram with the stakeholders

Activity Diagrams can also be used for the following

- Model Business Processes
- Model Detailed Design

Activity Diagrams

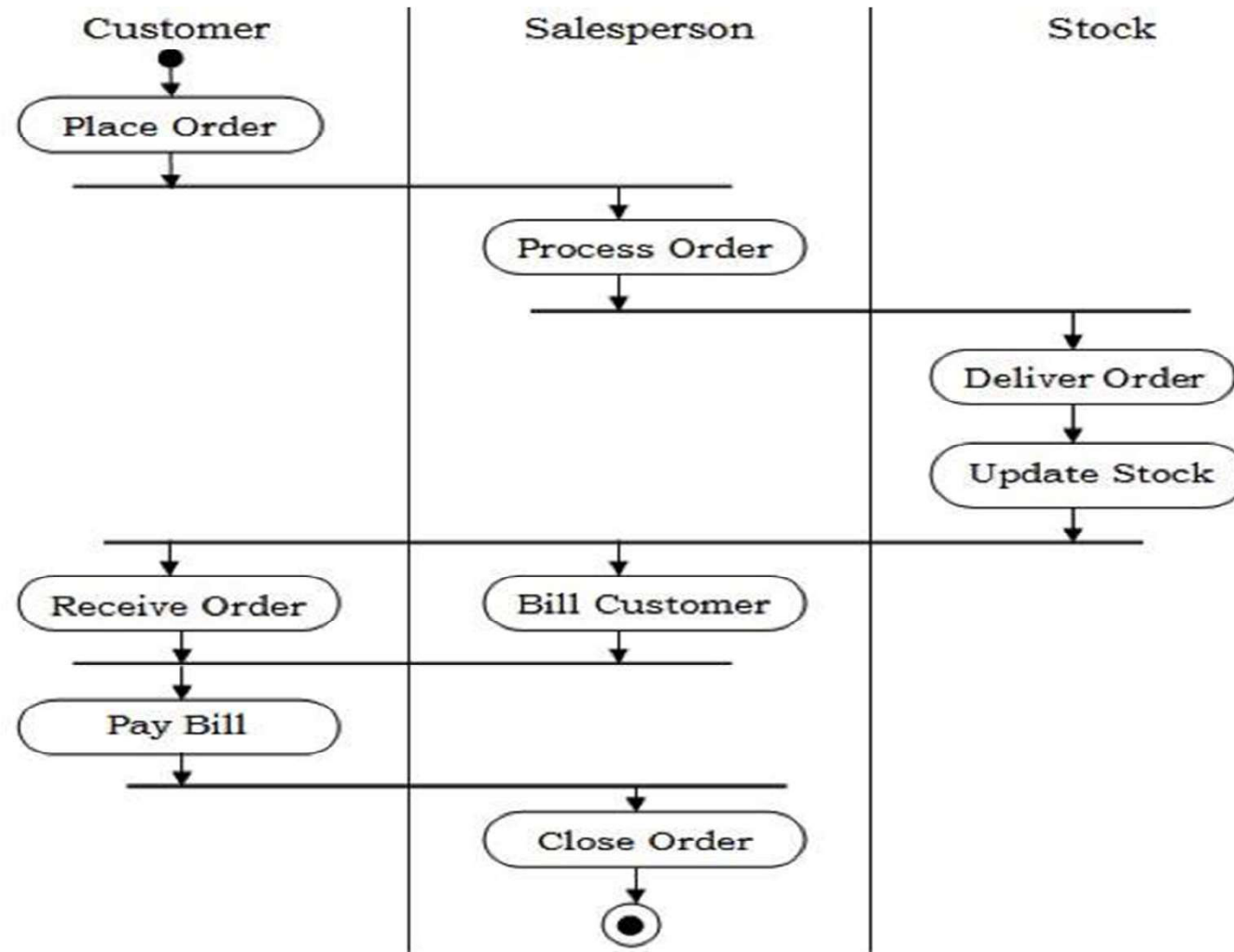
Activity diagrams comprise of:

1. Activity states and action states
2. Transitions
3. Objects

Activity diagrams are used for modeling:

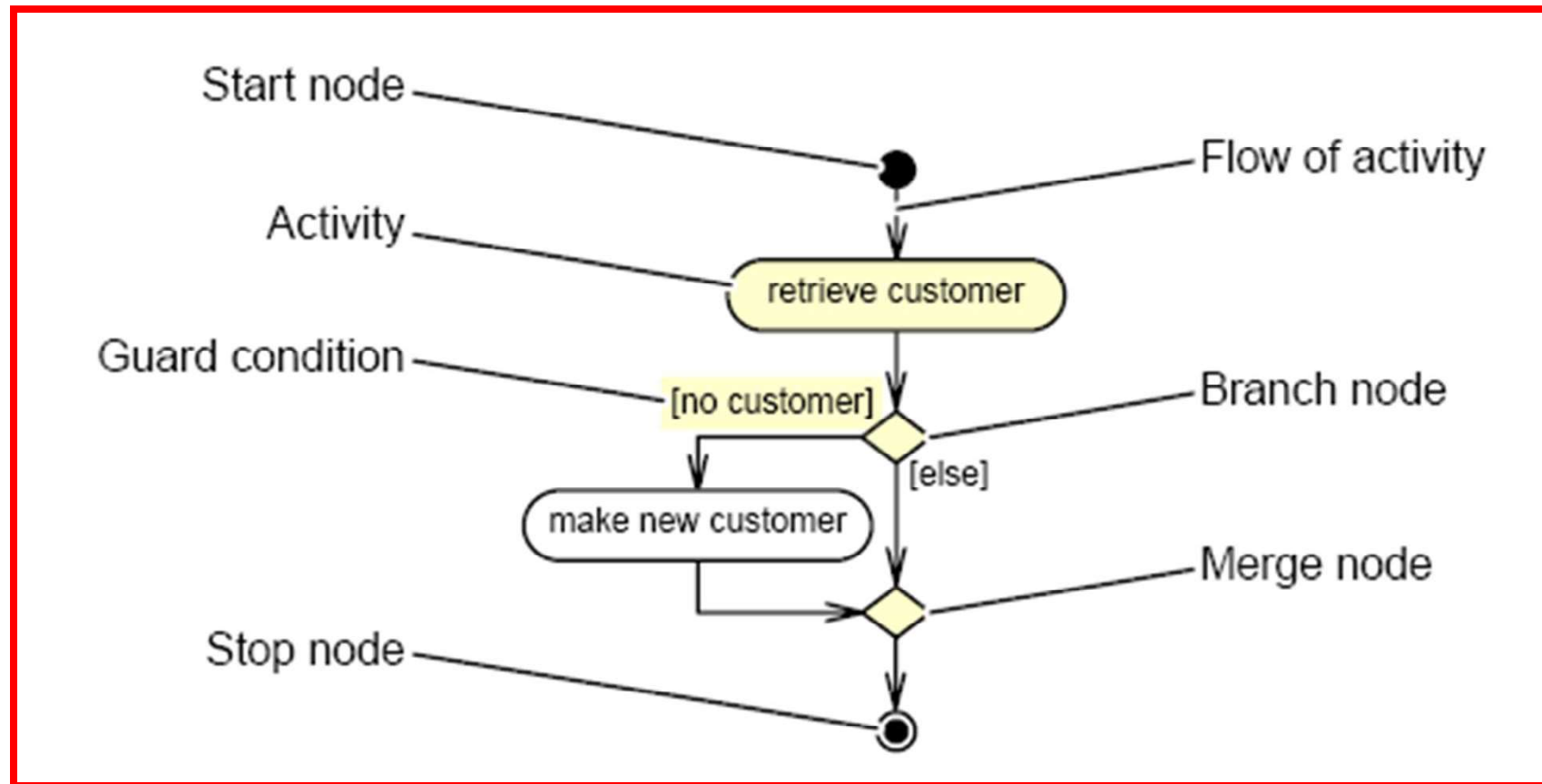
- Workflows as viewed by actors, interacting with the system.
- Details of operations or computations using flowcharts.

Example



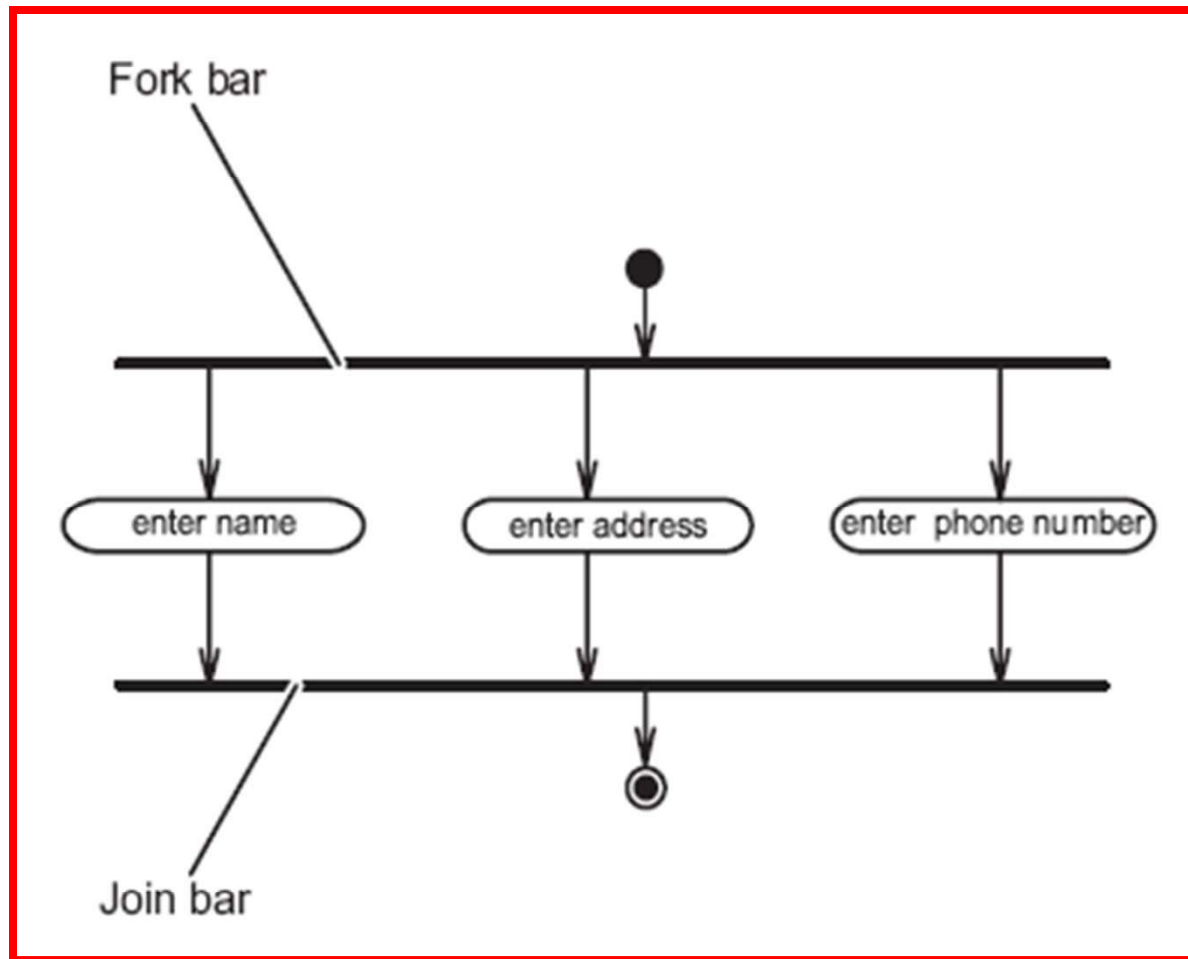
Identifying the Elements of an Activity Diagram

- An Activity diagram is composed of the following elements:



Identifying Elements of an Activity Diagram

- An example of concurrent activities:



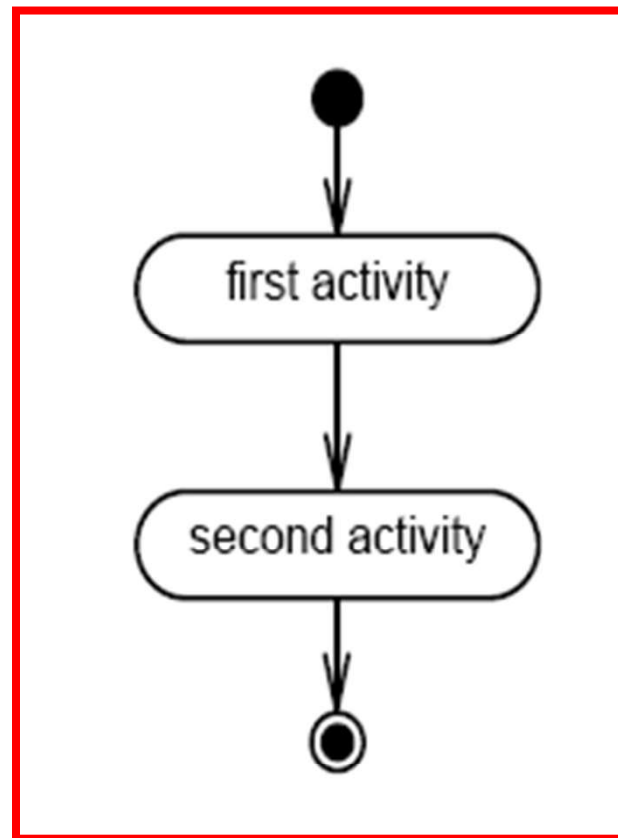
Activities And Actions

Activities and actions are processes taken by the system or an actor.

- Activity nodes and action nodes use the same notation in UML
- An activity can be divided into other activities or actions
- An action is an activity node which cannot be divided within the context of the current view.
- A primitive form of action results in a change in the state of the system or the return of a value.

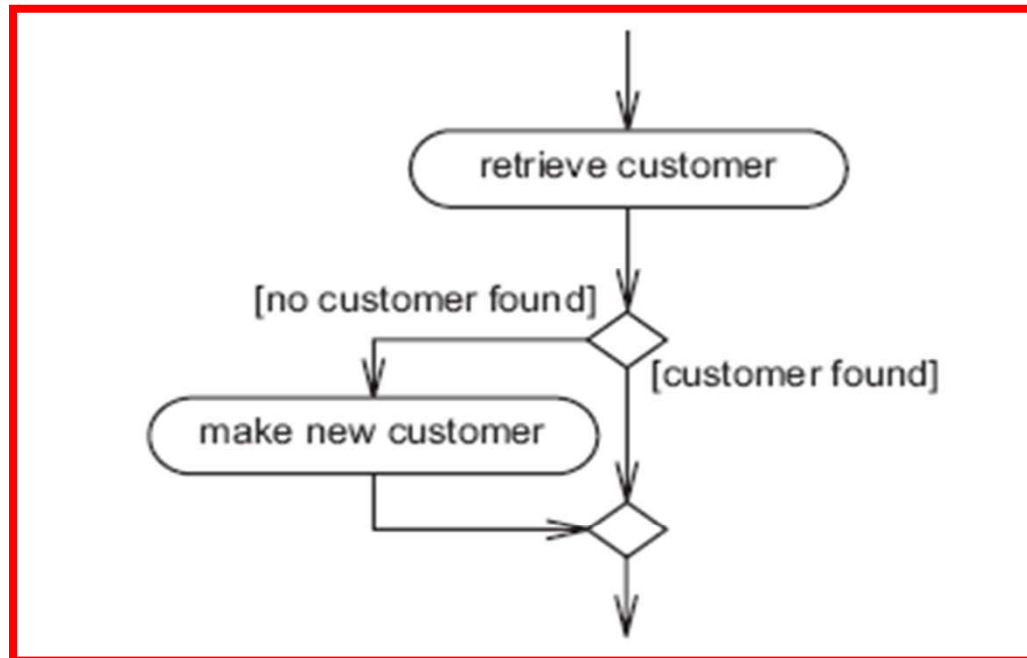
Flow of Control

- An Activity diagram must start with a Start node and end with a Stop node. Flow of control is indicated by the arrows that link the activities together.



Branching

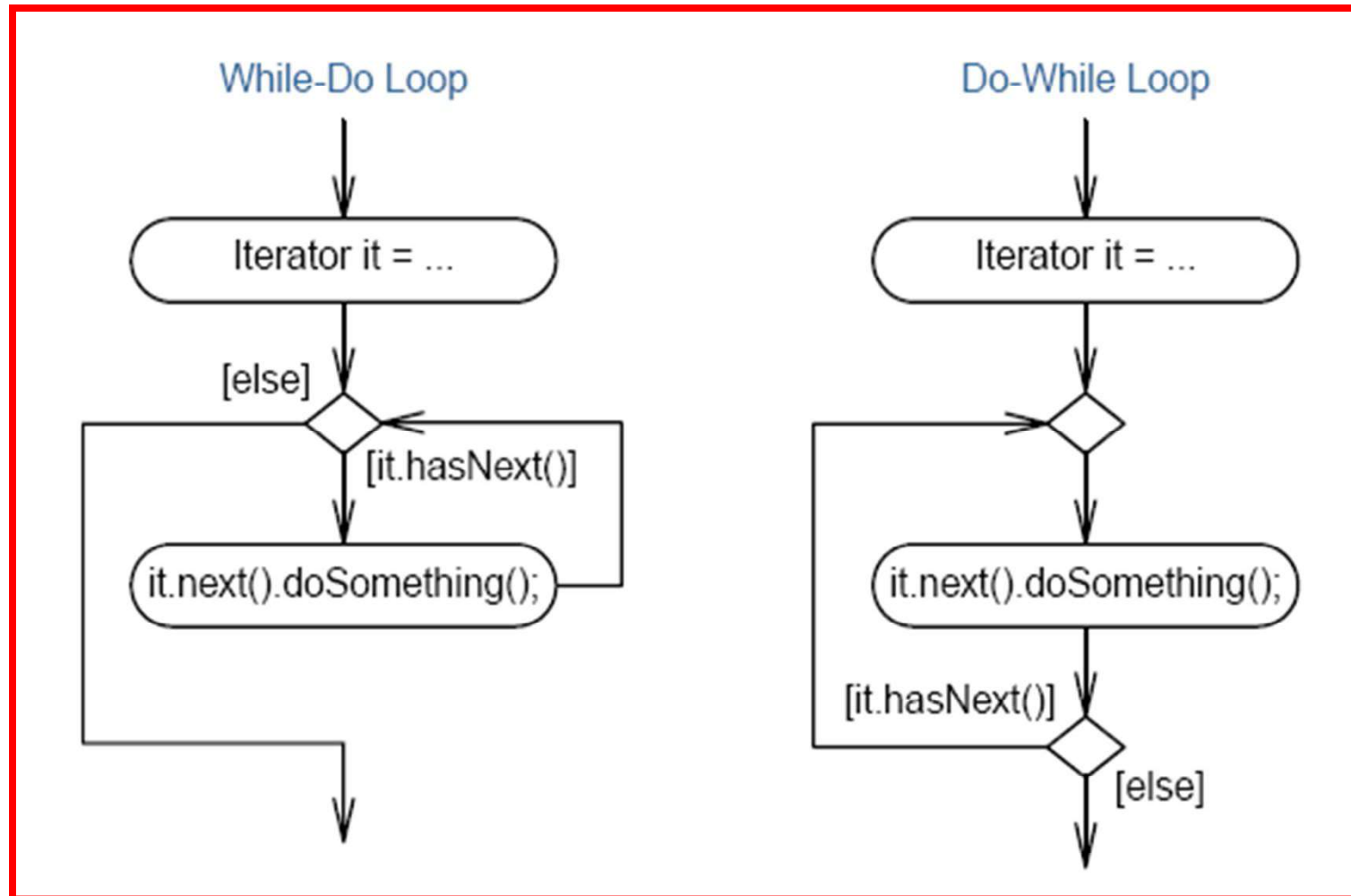
- The branch and merge nodes represent conditional flows of activity.



- A branch node has two or more outflows, with Boolean predicates to indicate the selection condition.
- A merge node collapses conditional branches.

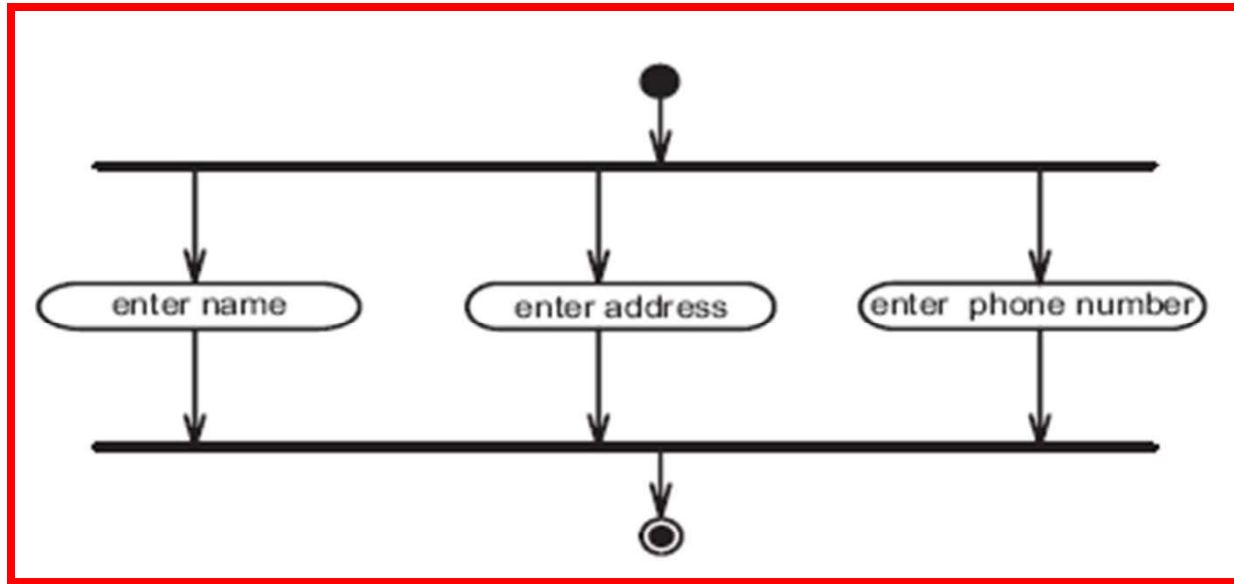
Iteration

- Iteration can be achieved using branch nodes.



Concurrent Flow of Control

The fork and join bars indicate concurrent flow of control.

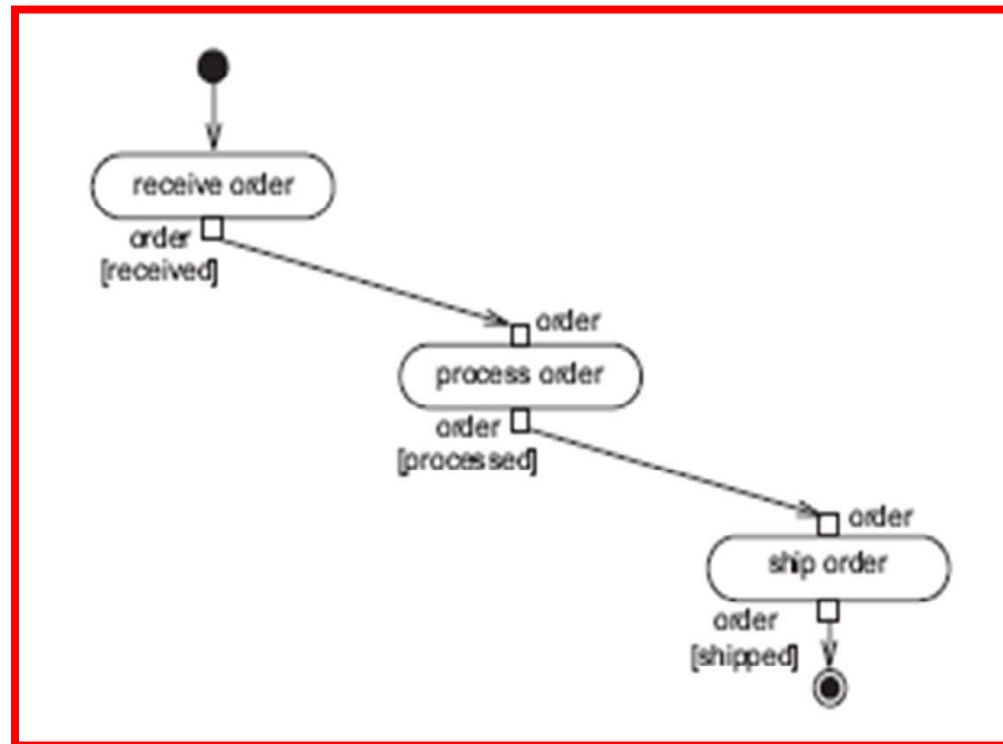


- Fork and join bars can represent either threaded activities or parallel user activities.
- The multiplicity indicator specifies how many of the parallel activities must have been processed.

Passing an Object between Actions

An Activity diagram can show objects being passed between actions

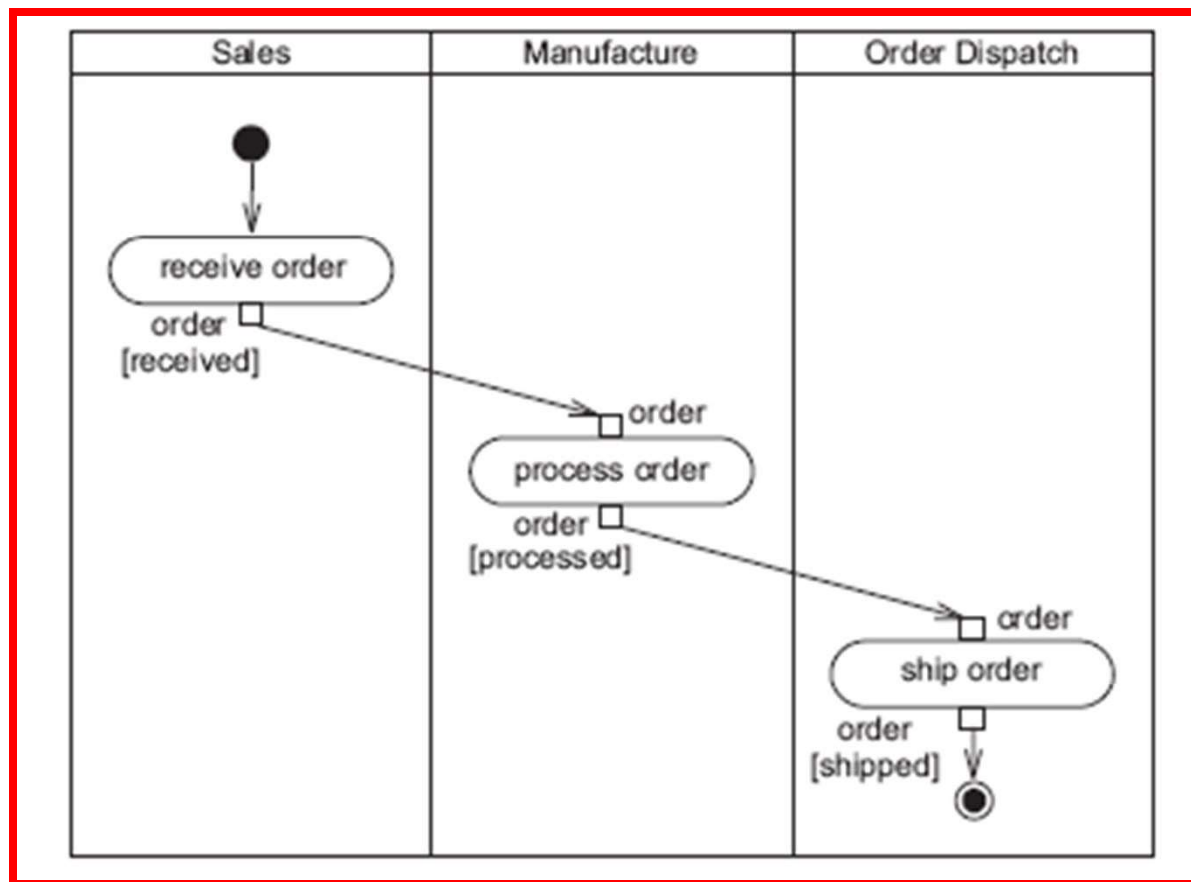
- A pin is a connection point of an action for object input or output



- The name of the pin denotes the object being passed

Partitions in Activity Diagrams

- An Activity diagram can show objects grouped into partitions (formerly called swimlanes)
- Partitions can be vertical, horizontal or both

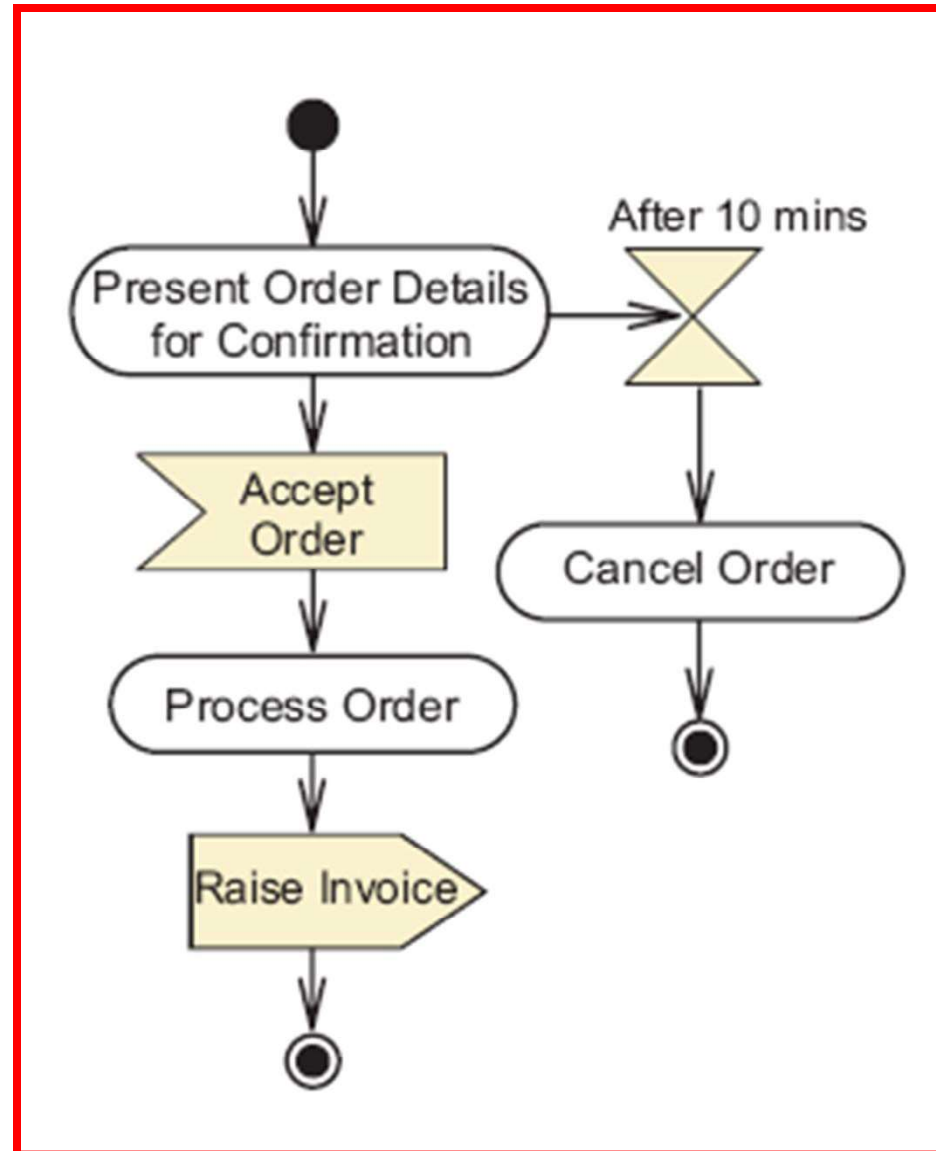


Signals in Activity Diagrams

An Activity diagram can show the receiving and sending of signals.

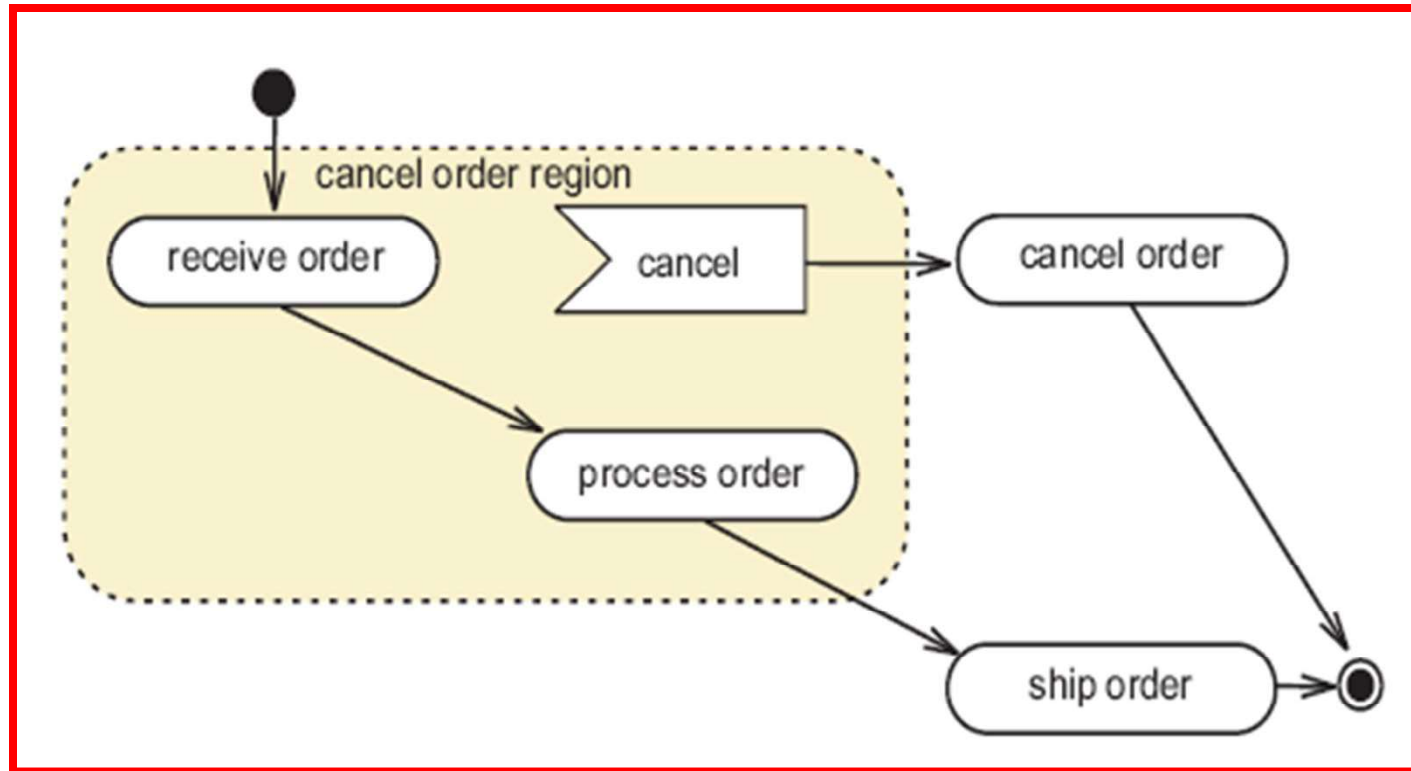
- An Accept Event Action element
- an Accept Time Event element is used to show the receiving of a signal
- A Send Event Action element is used to show the sending of a signal

Displaying Signals in Activity Diagrams



Interruptible Activity Regions

- An Activity diagram can show a sub set of activities that can be interrupted by an event.



Creating an Activity Diagram for a Use Case : With Example

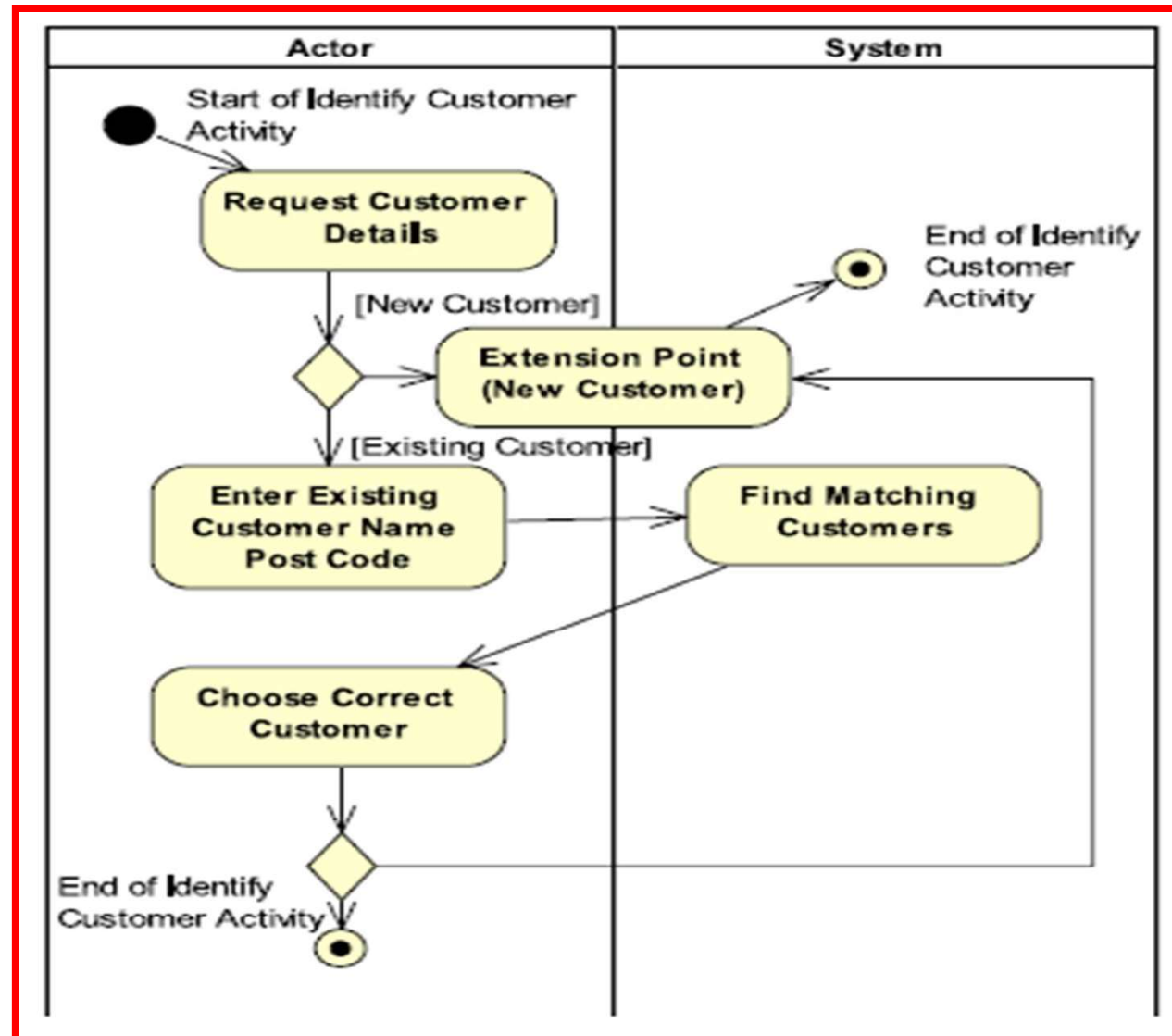
Analyze the flow of events field in the Use Case form:

- Identify activities
- Identify branching and looping
- Identify concurrent activities

Creating Activity Diagrams — Example 1

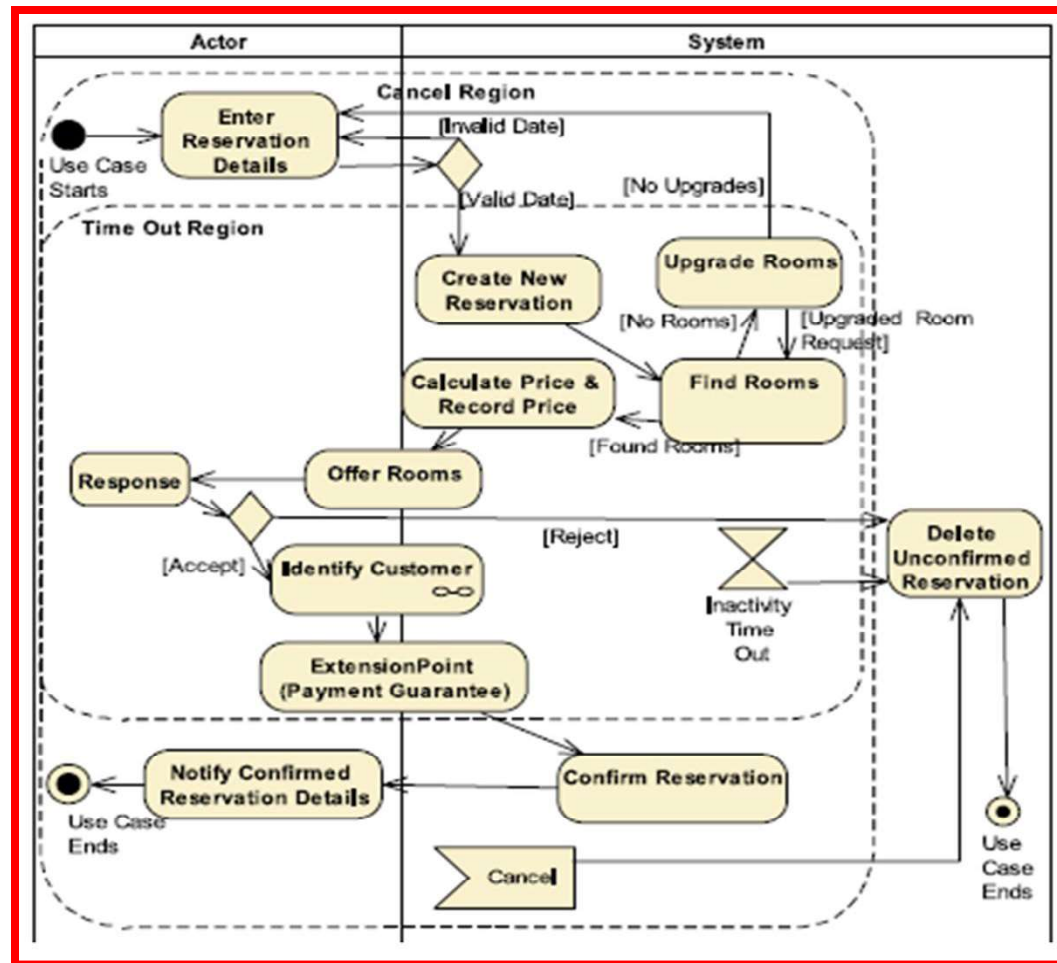
- The following slide illustrates a simple sequence of activities for a part of the Create Reservation Use Case.
- The diagram shows the activities involved in identifying the customer:
 - by either delegating the entry of the new customer details to the extension point (New Customer)
 - or by the actor entering a subset of customer information in order to find the existing customer
- If no existing customer is found then the extension point (New Customer) is used.

Creating Activity Diagrams – Example 1



Creating Activity Diagrams – Example 2

- The following slide shows an Activity diagram that represents the main flow path and the alternate flow path of the Create Reservation Use Case Form.



Summary

- The essential elements of an Activity diagram
- How to visually represent the flow of events of a Use Case with an Activity diagram

