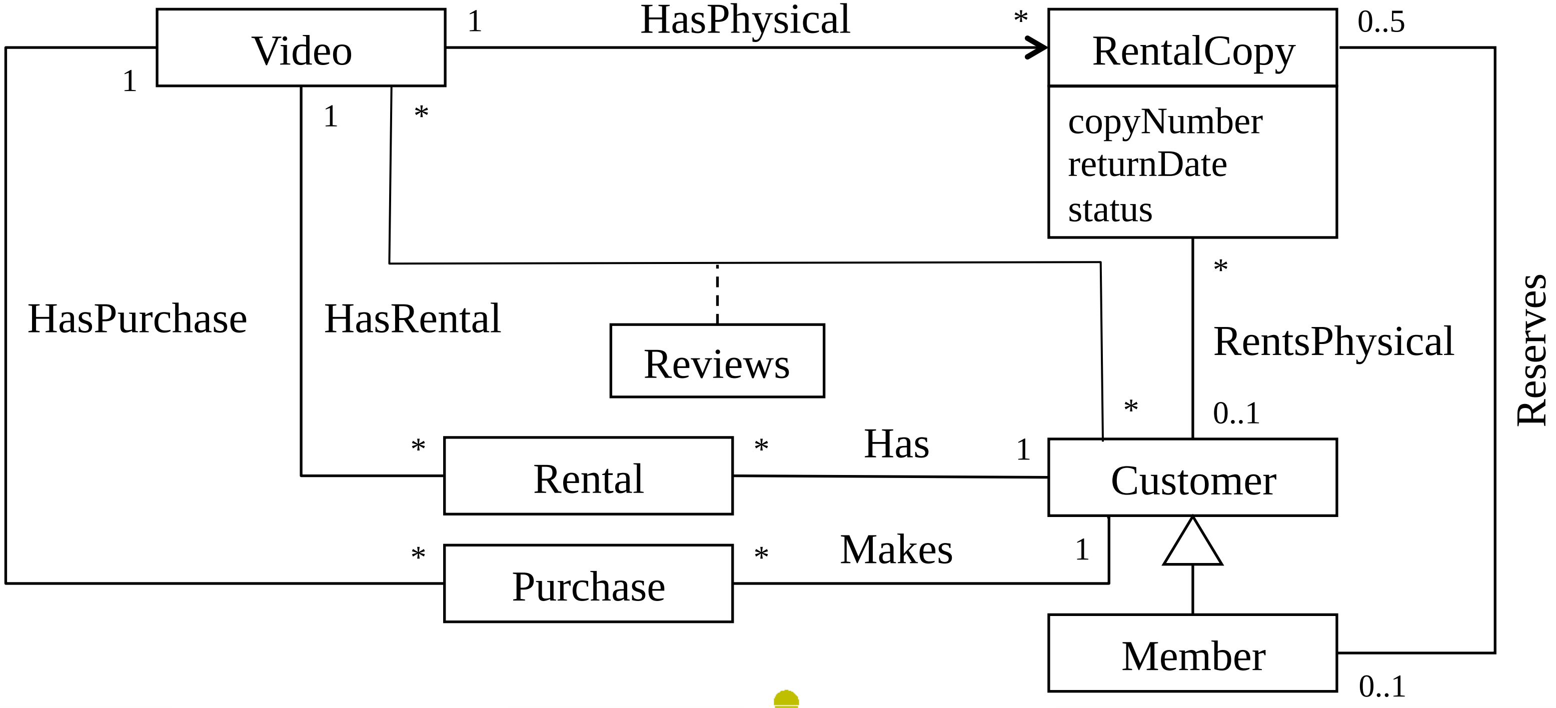
STATE MACHINE DIAGRAM EXAMPLE

Part of the information kept in the **RentalCopy** class in the domain model shown below is the rental status of a video. Construct a state machine diagram showing the states that an instance of the **RentalCopy** class can be in *with respect to its rental status*. Show only the states, transitions and the events and/or conditions, if any, that cause a transition to be taken. *Do not show the activities that can occur within a state.*



STATE MACHINE DIAGRAM EXAMPLE

The problem statement requirements that could be relevant to determining the states of a RentalCopy object:

- It must be able to record which videos are sold and rented and by whom.
- For sold videos, the quantity sold should be recorded; for physical video rental, which copy is rented and when it is due back should be recorded.
- The system should keep track of overdue rentals of physical videos and send email notices to customers who have videos overdue.
- Members should be able to make reservations for physical video rentals either in person at the shop, by telephone or via the Web.
- A member can reserve at most five physical videos at any one time, but there is no limit on how many physical videos a member or nonmember can rent at any one time.
- A sales clerk should be able to sell and rent physical videos and process the return of rented physical videos.

STATE MACHINE DIAGRAM EXAMPLE: ANALYSIS

- It must be able to record which videos are sold and rented and by whom.

states:	Available; Rented
events:	rent
transitions:	Available → rent → Rented

- For sold videos, the quantity sold should be recorded; for physical video rental, which copy is rented and when it is due back should be recorded.

No new state, event or transition information in this statement.

- The system should keep track of overdue rentals of physical videos and send email notices to customers who have videos overdue.

states:	Overdue
events:	when(date>returnDate)
transitions:	Rented → when(date>returnDate) → Overdue

STATE MACHINE DIAGRAM EXAMPLE: ANALYSIS

- Members should be able to make reservations for physical video rentals either in person at the shop, by telephone or via the Web.

states:	Reserved
events:	reserve
transitions:	Available → reserve → Reserved Reserved → rent → Rented

- A member can reserve at most five physical videos at any one time, but there is no limit on how many physical videos a member or nonmember can rent at any one time.

No state, event or transition information in this statement.

- A sales clerk should be able to sell and rent physical videos and process the return of rented physical videos.

event:	return
transitions:	Rented → return → Available Overdue → return → Available

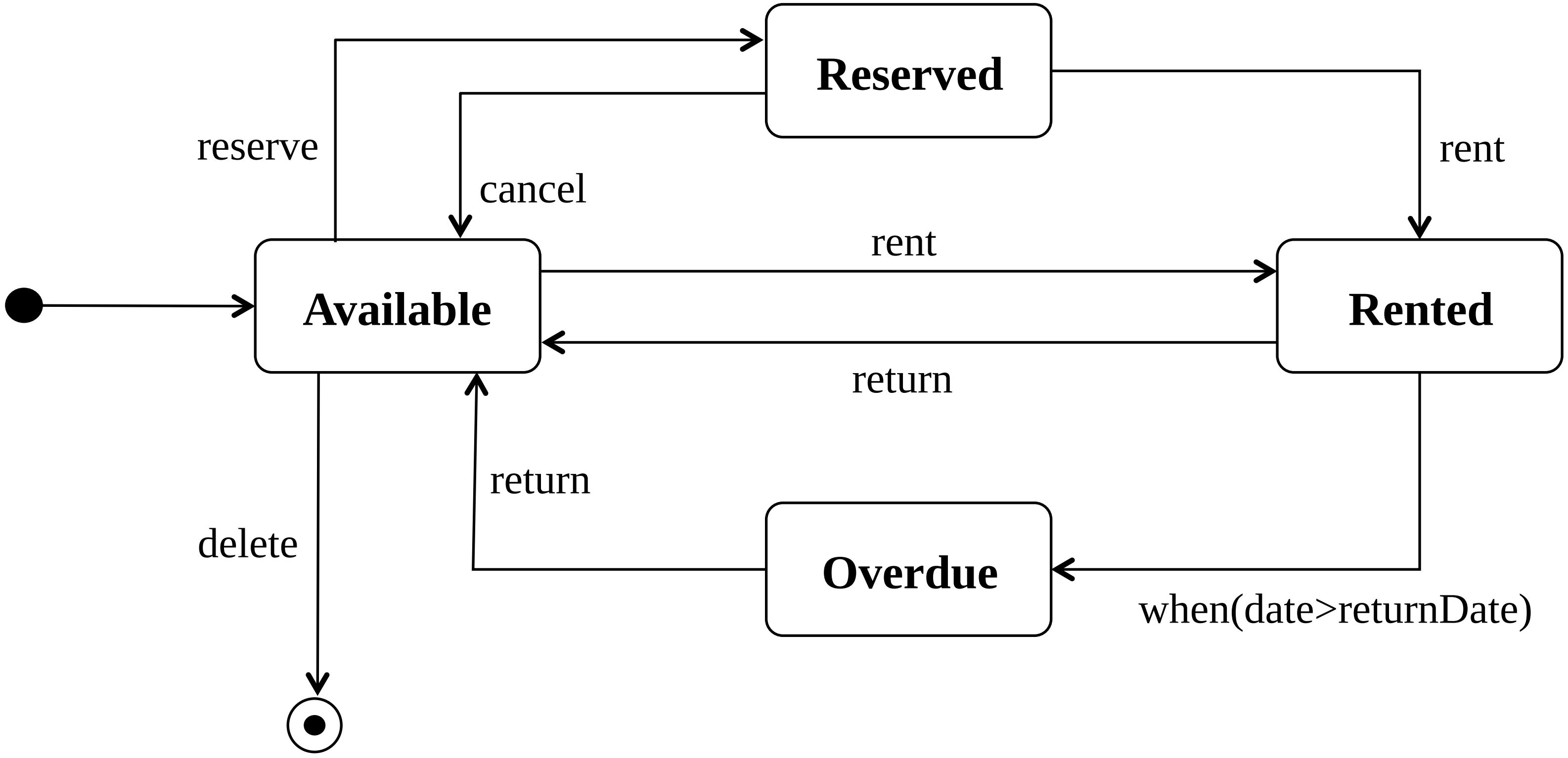
STATE MACHINE DIAGRAM EXAMPLE: ANALYSIS

Other reasonable events and transitions (but not explicitly stated)

events: cancel, delete

transitions: Reserved → cancel → Available
Available → delete → Final state

STATE MACHINE DIAGRAM EXAMPLE: SOLUTION



STATE MACHINE DIAGRAM: COMMON ERRORS

- Showing states/transitions/events not applicable to the object under consideration.

  e.g., reservedCopy < 5 applies to Member objects, not to RentalCopy objects

  e.g., the Buy state applies to Video objects that are for sale, not to RentalCopy objects.

- Having transitions with no events or with several events.

- Missing/incorrect transitions.

  e.g., an overdue video is not destroyed! It can be returned.

- Having states with no outgoing transition.

  e.g., Overdue, Reserved

STATE MACHINE DIAGRAM: COMMON ERRORS

- Using attributes not in the object.
  e.g., #copies
- Using states not in the problem statement.
  e.g., stolen, sold, lost
- Using incorrect states.
  e.g., Customer, Sales clerk, VideoCopy