



# **E-R Modeling: A Case Study**

**University of Alberta**  
**Department of Computing Science**  
**CMPUT 291 - File and**  
**Database Management Systems**

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University of Alberta  
Department of Computing Science  
Database Laboratory

**E-R Modeling: A Case Study**



# Goals

- Demonstrate how to build an E-R model from a simple database specification of a *video store*.
- Use Dia to draw E-R Diagram



# Video store scenario:

- A video store rents movies to members
- Each movie in the store has a title and is identified by a unique movie number.
- A movie can be in one or multiple VHS, VCD and DVD formats.
- Each movie belongs to only one of a given set of categories (action, adventure, comedy...)



# Scenario (cont'd)

- The store has a name and a (unique) phone number for each member.
- Each member may provide a favorite movie category (used for marketing purposes).



# Scenario (cont'd)

- There are two types of members:
  - **Golden Members**  
Require their credit cards and can rent more than one movies each time.
  - **Bronze Members**  
Don't require their credit cards and can rent only one movie each time.



# Scenario (cont'd):

- A member may have a number of dependents (with known names).
- Each dependent is allowed to rent one movie at a time.



# Draw E-R Diagram using Dia:

- What is Dia?
- Dia for Windows  
<http://dia-installer.sourceforge.net>
- To launch Dia on lab machines, try **dia &**



A video store rents movies to members



A video store rents movies to members.

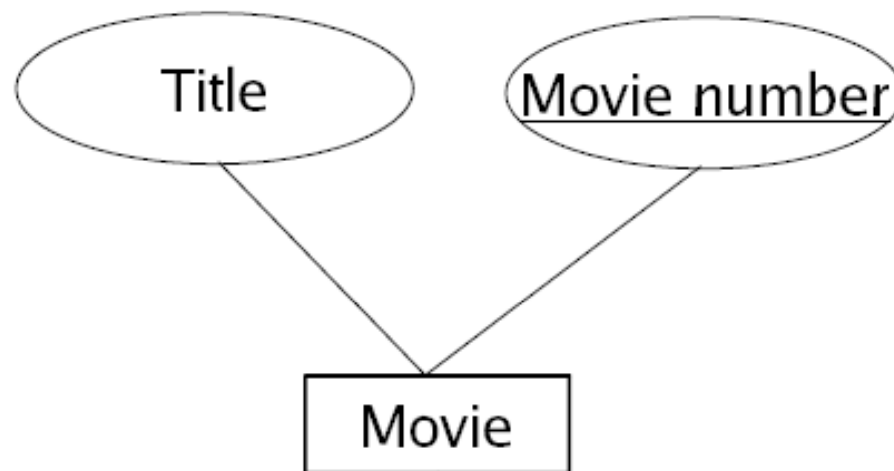
Member

Movie

Each movie in the store has a title and is identified by a unique movie number.



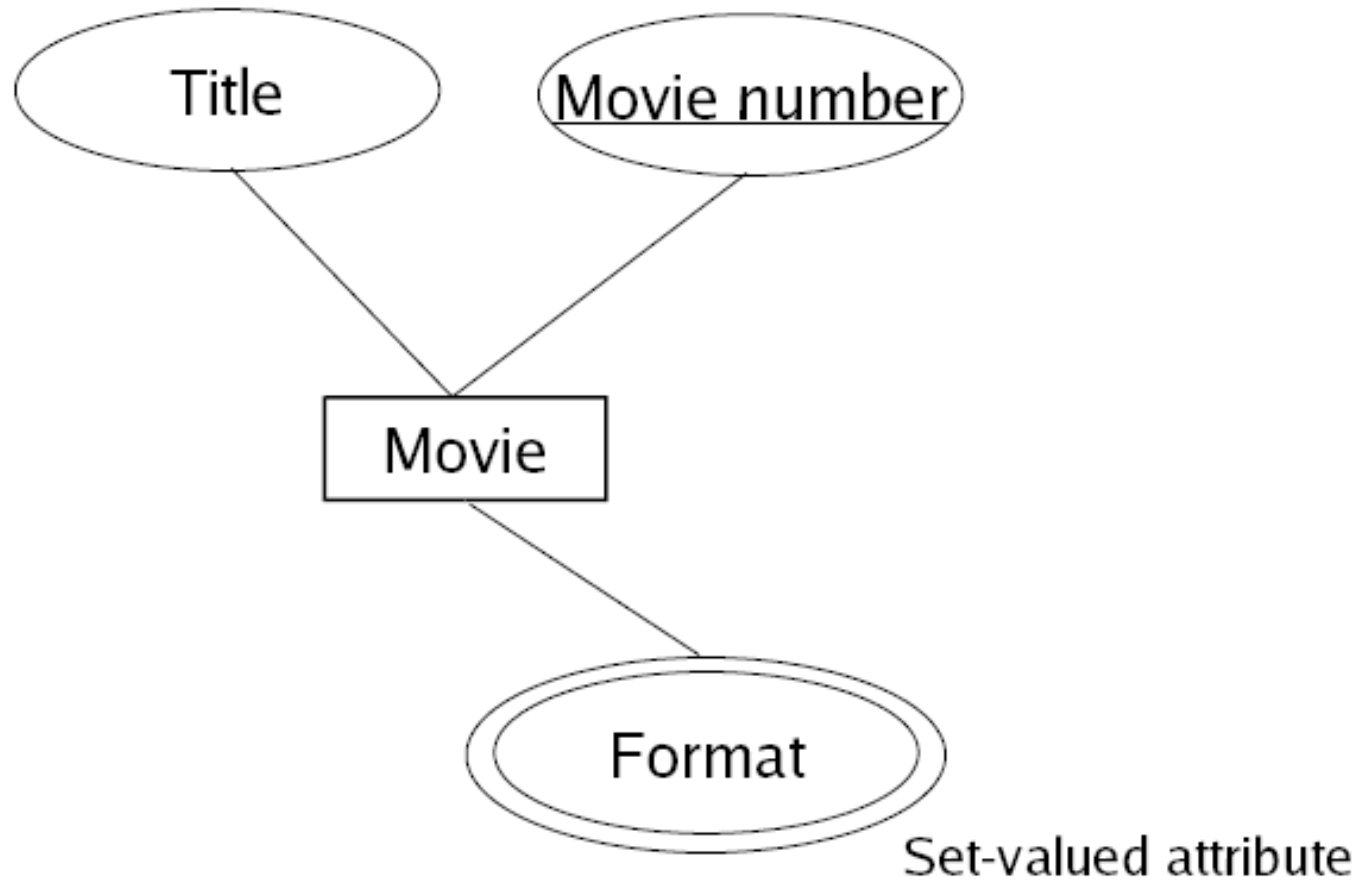
Each movie in the store has a title and is identified by a unique movie number.



A movie can be in one or multiple VHS, VCD,  
and DVD formats.



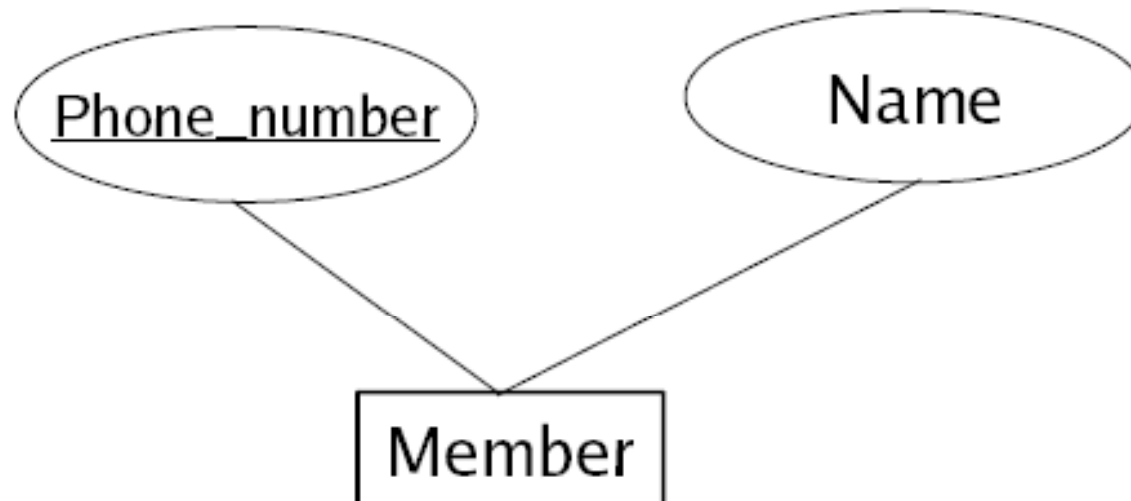
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The store has a name and (unique) phone number for each member.



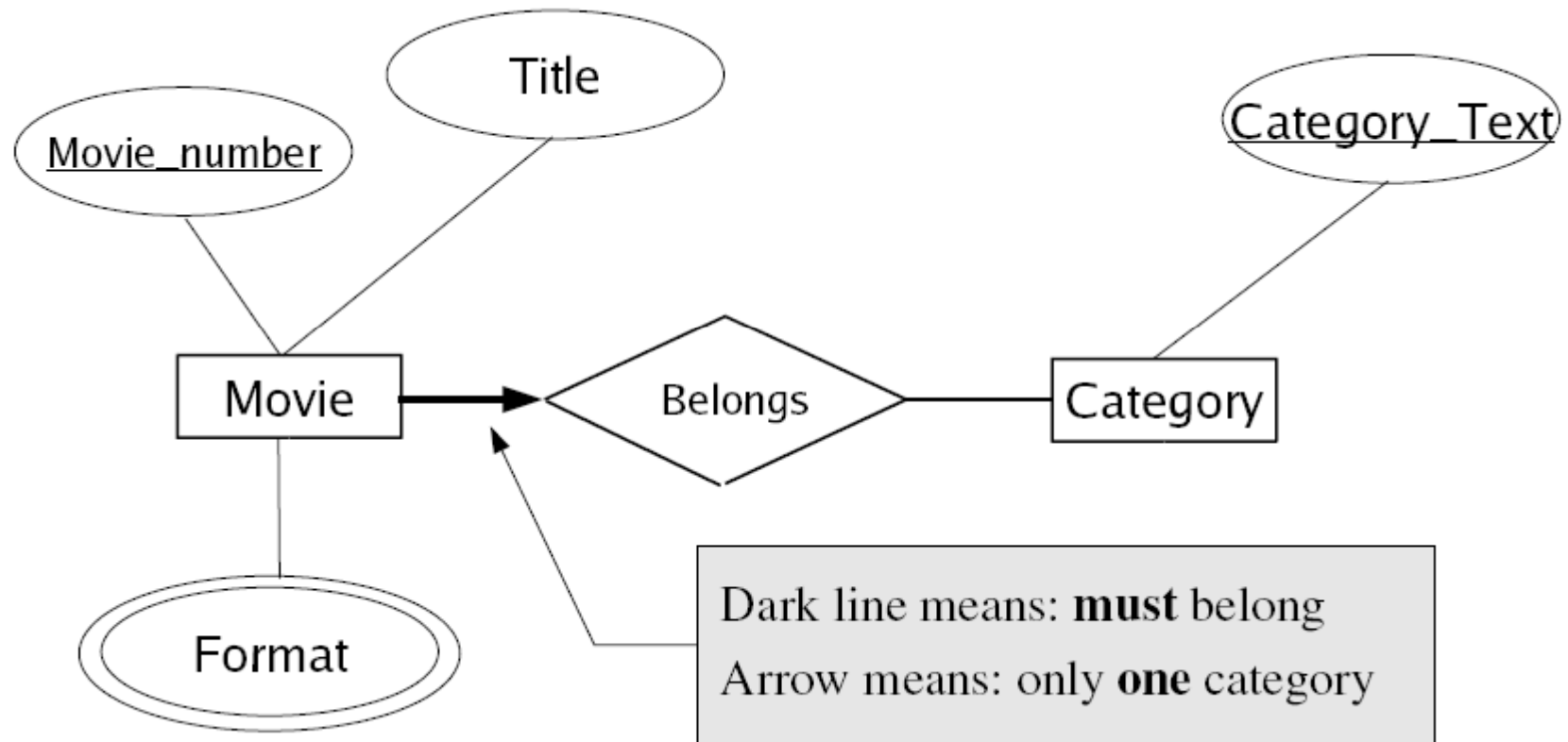
The store has a name and (unique) phonenumber for each member.



Each movie belongs to only one of a given set of categories (action, adventure, comedy, ...).



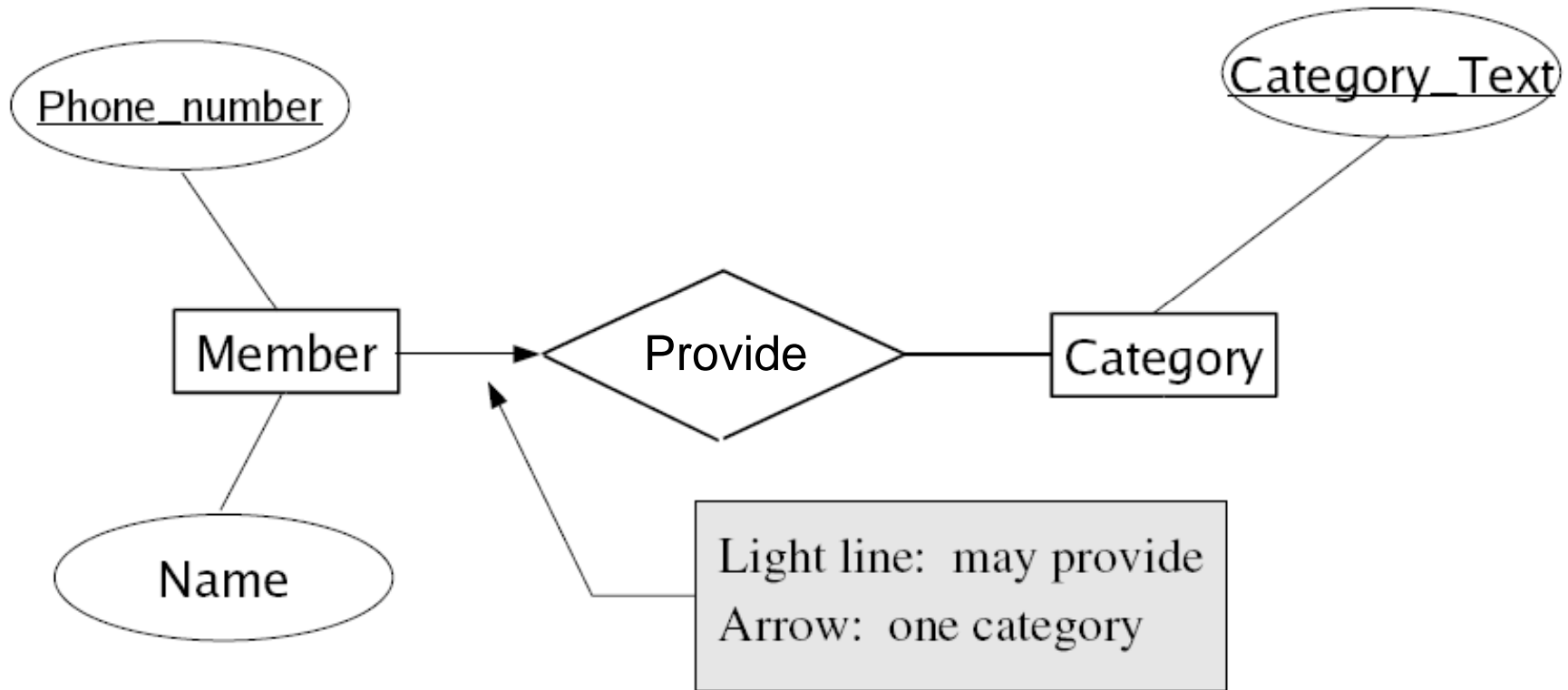
Each movie belongs to only one of a given set of categories (action, adventure, comedy, ...)



Each member may provide one favorite movie category (used for marketing purposes).



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- There are two types of members:

- **Golden Members**

- Require their credit card and can rent more than one movie each time.

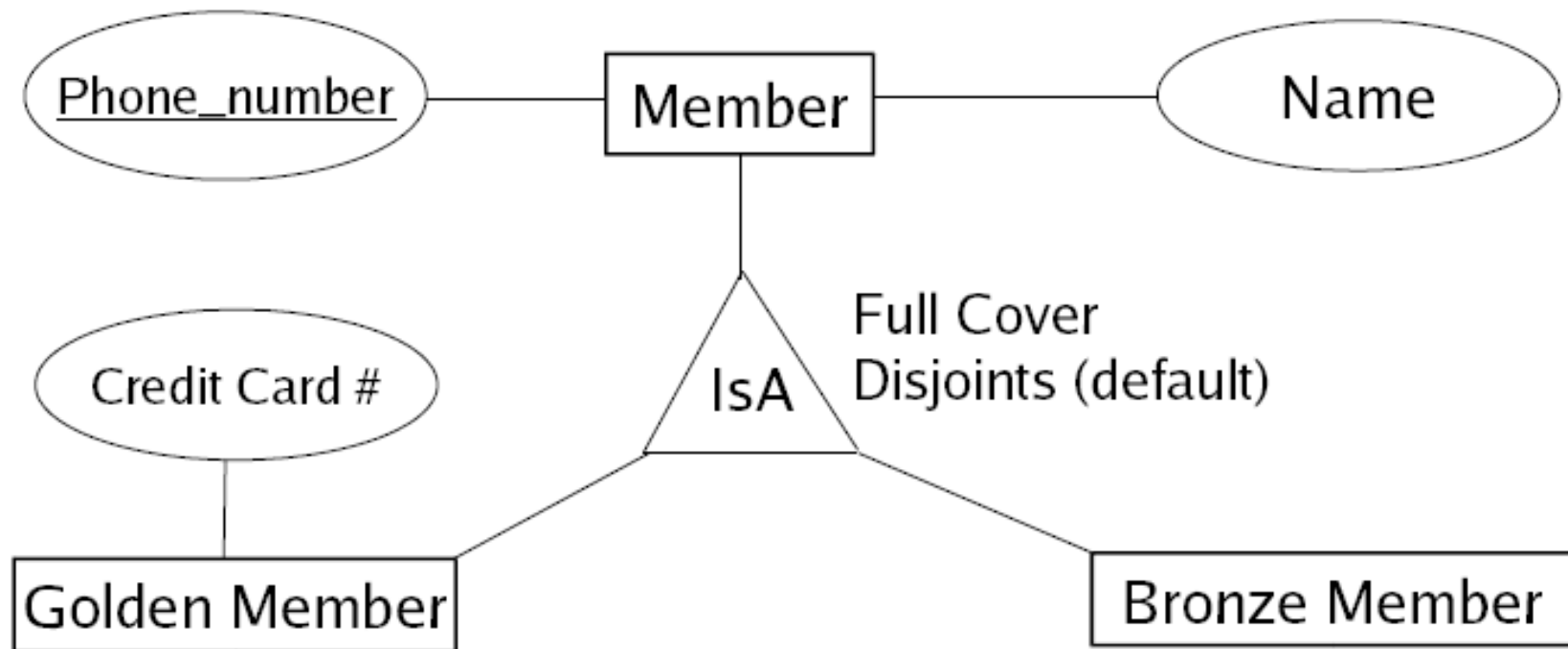
- **Bronze Members**

- Don't require their credit card and can rent only one movie each time.



There are two types of members:

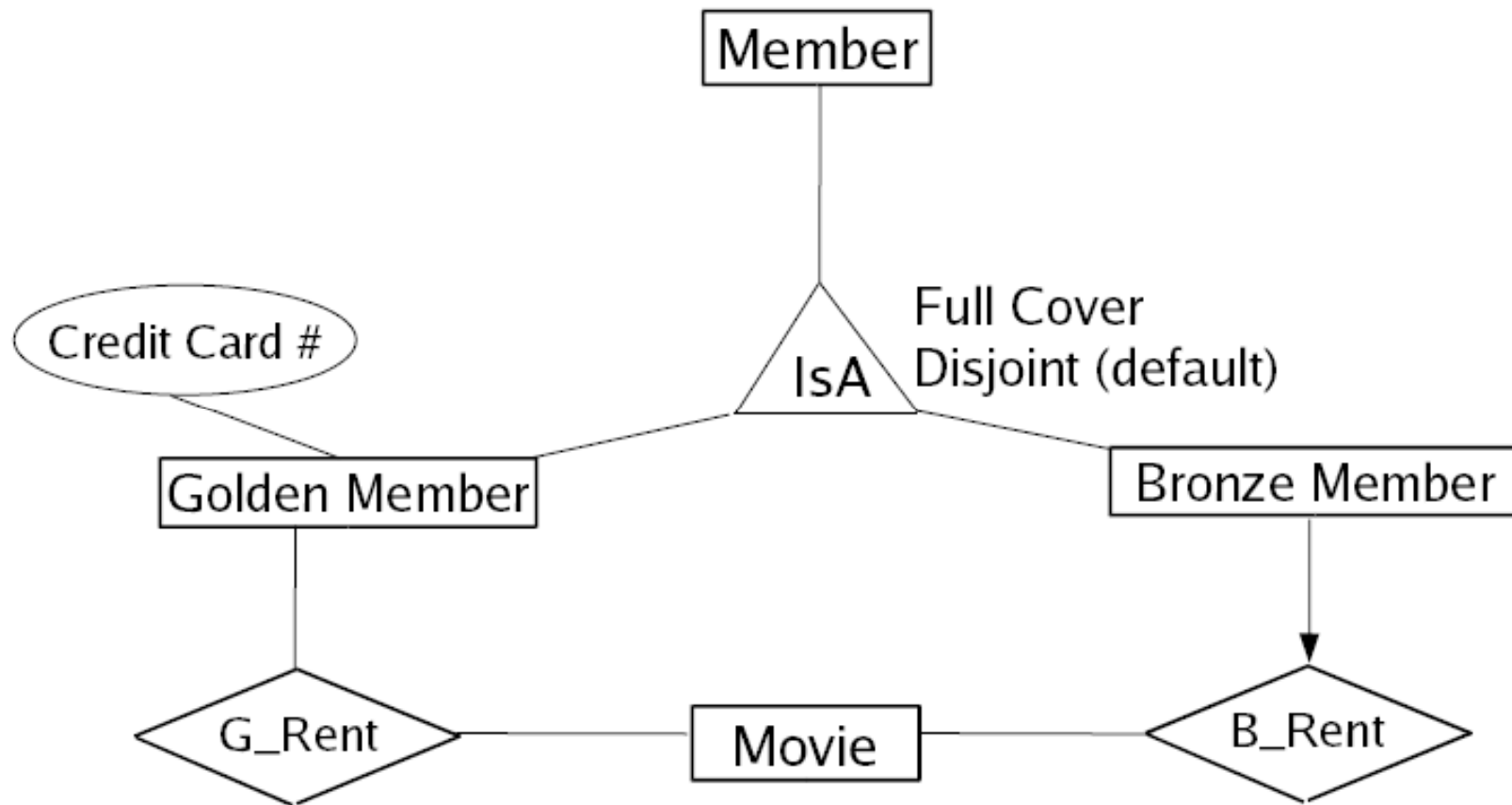
- **Golden Members: provide credit card#**
- **Bronze Members: not provide credit card#**



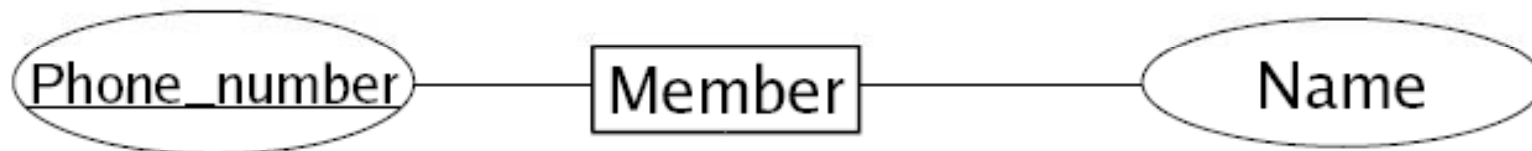
Golden Members can rent more than one movies.  
Bronze Members can rent only one movie.



Golden Members can rent more than one movie.  
Bronze Members can rent only one movie.

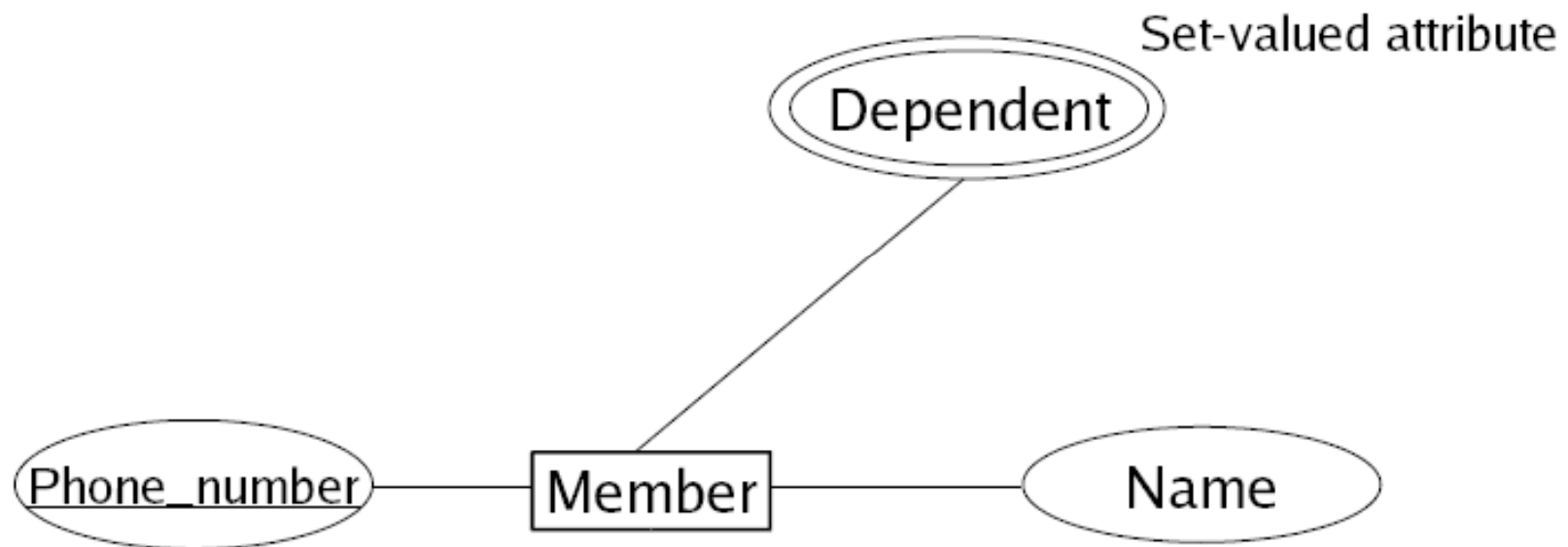


A member may have a set of dependents  
(with known names)

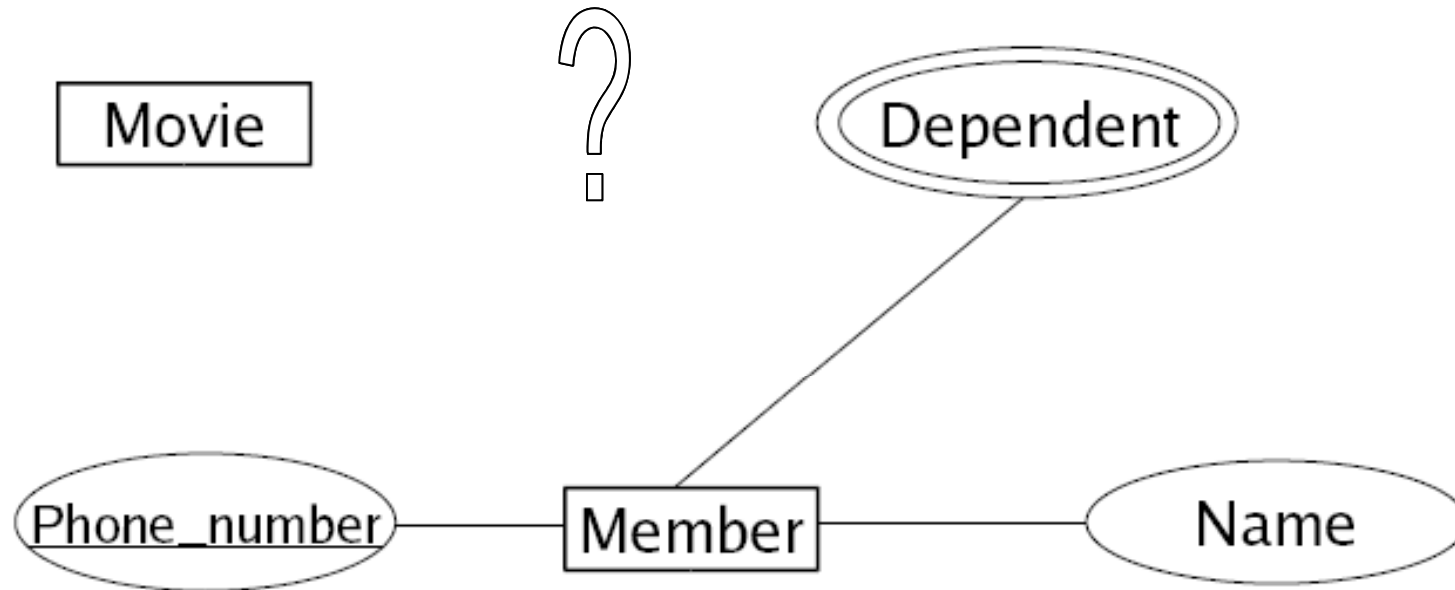


A member may have a set of dependents  
(with known names).

One idea:

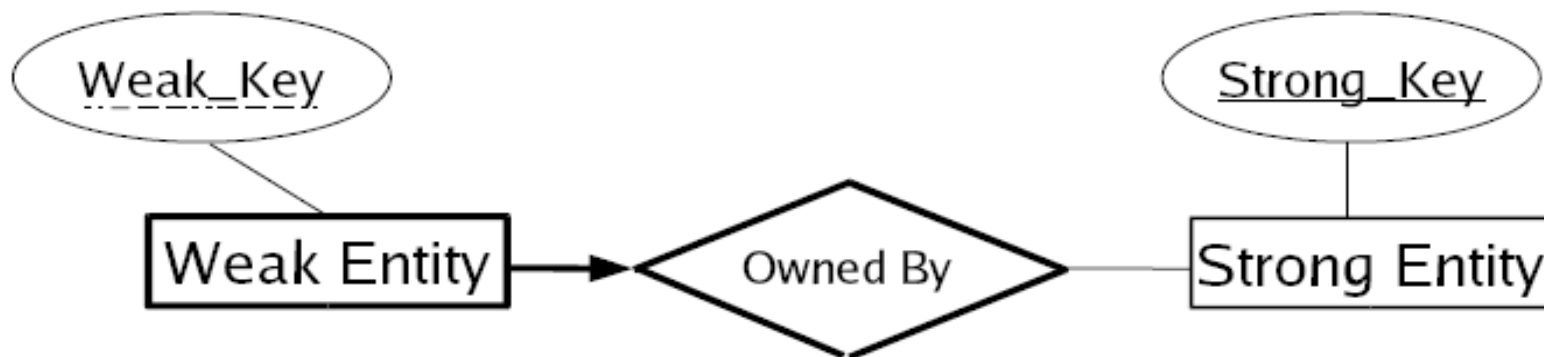


Each dependent is allowed to rent one movie.  
Problem:

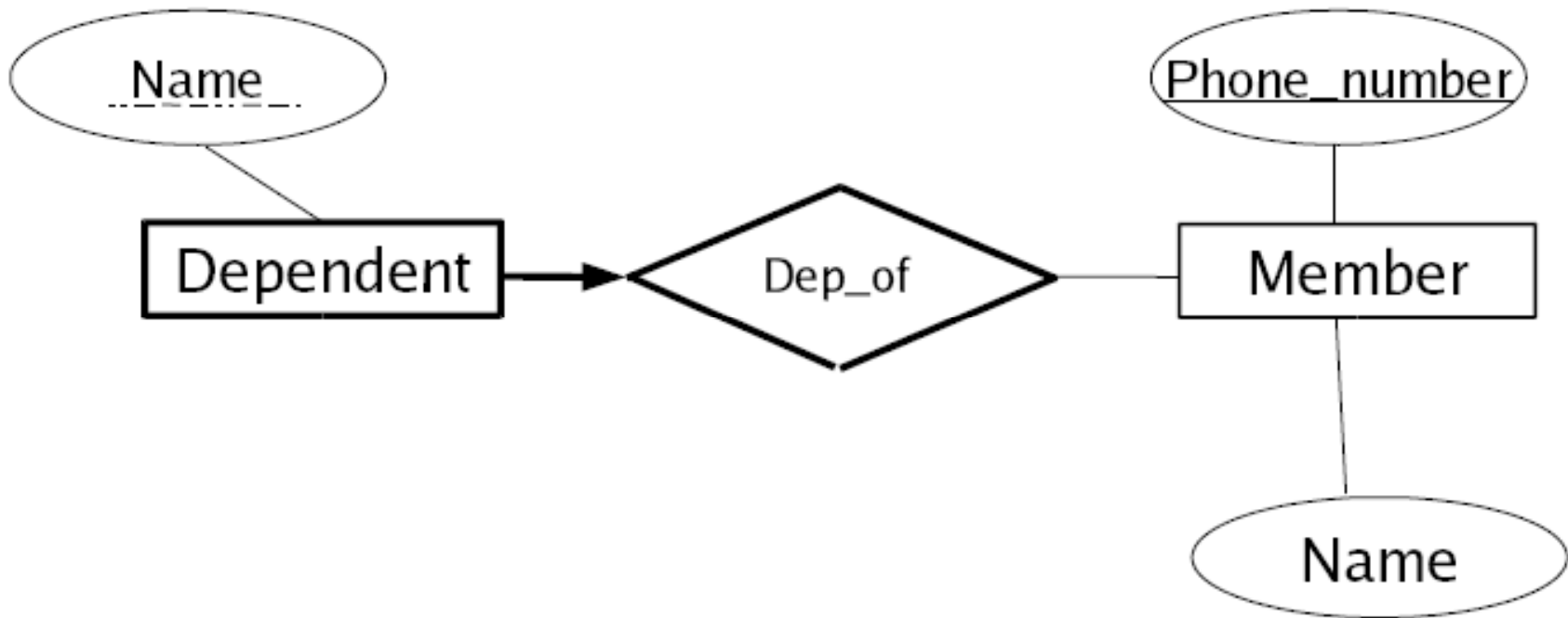


**An attribute can not participate in a relationship!**

- **Dependent** is an example of **Weak Entity**
  - Their existence depends on a strong entity.
  - They usually lack sufficient attributes to form a key.
- **Primary key** for a weak entity is formed by:
  - primary key of associated strong entity **PLUS**
  - the local attributes that provide individual identity.



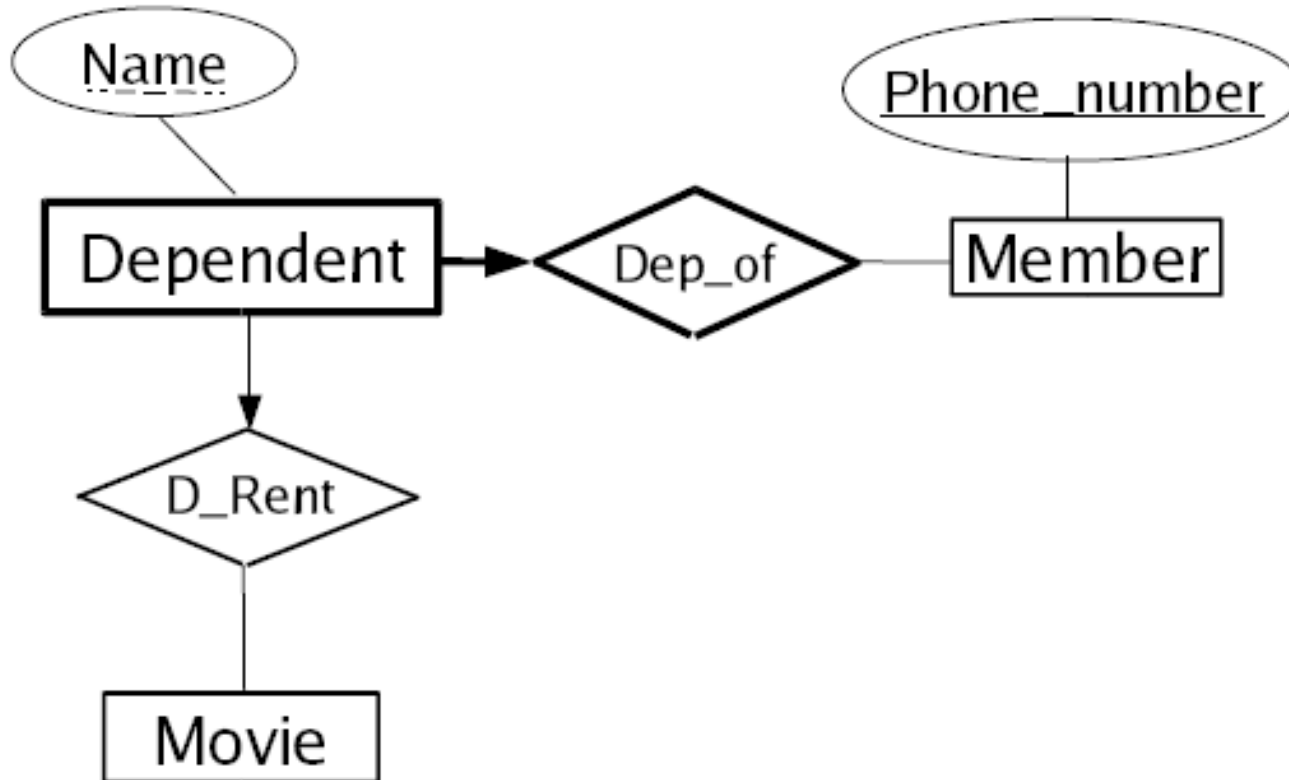
A member may have a set of dependents  
(with known names).



Each dependent is allowed to rent only one movie.

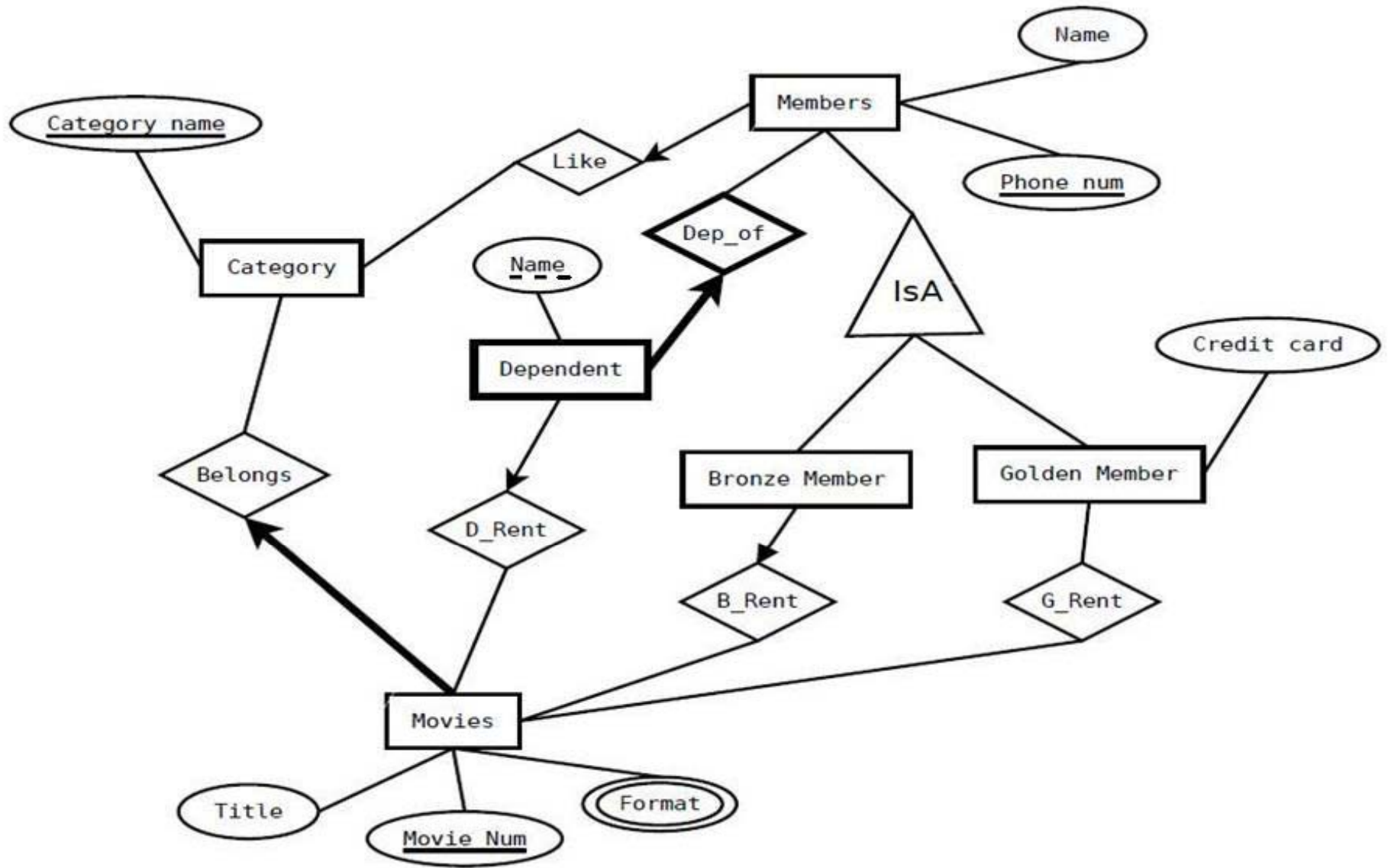


Each dependent is allowed to rent only one movie.



Now dependents CAN participate in a relationship.





To print your E-R diagram:

- Print to a postscript file (e.g., diagram.ps) in Dia.  
Ensure that the diagram fits on one page, first.
- At the Unix command prompt, execute the command:  
**lpr -Pprn219 diagram.ps**

For printing or any other lab hardware & software problems contact the Help Desk:

Room: 1-32 CSC

Email: [helpdesk@cs.ualberta.ca](mailto:helpdesk@cs.ualberta.ca)

Phone: 492-5067

