E-R Modeling: A Case Study

University of Alberta

Department of Computing Science

CMPUT 291 - File and

Database Management Systems

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:

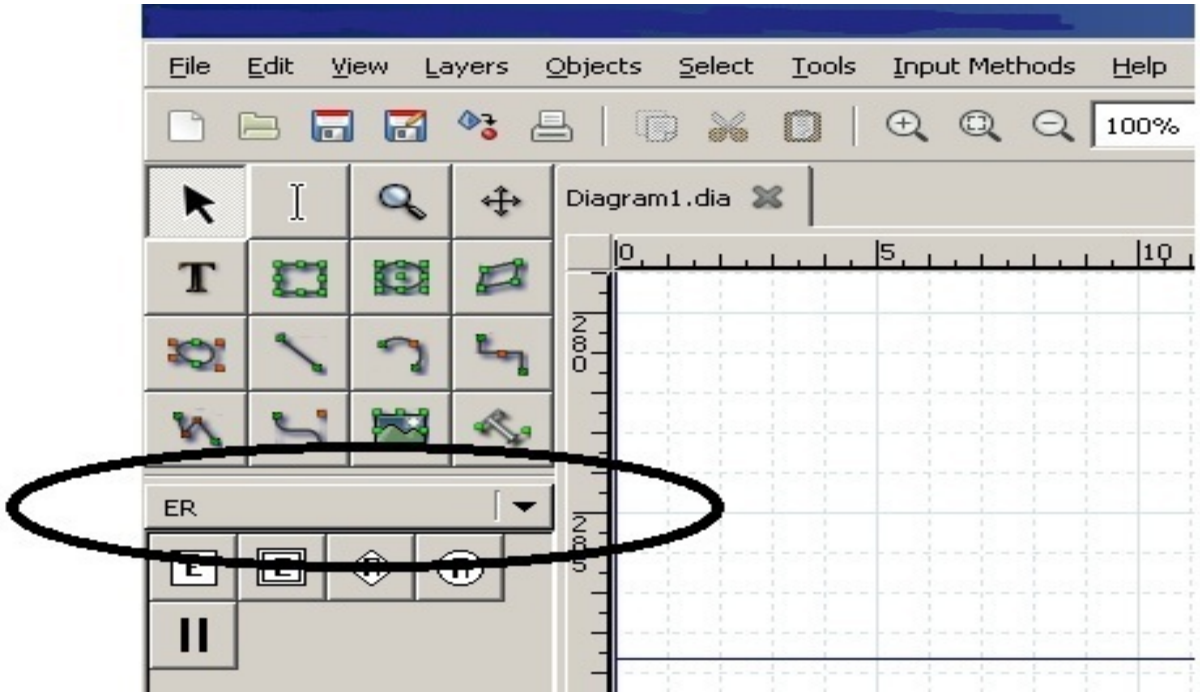
- What is Dia?
- Dia for Windows

  http://dia-installer.sourceforge.net
- To launch Dia on lab machines, try

  dia &

Dia

- Make sure that you select the right chart



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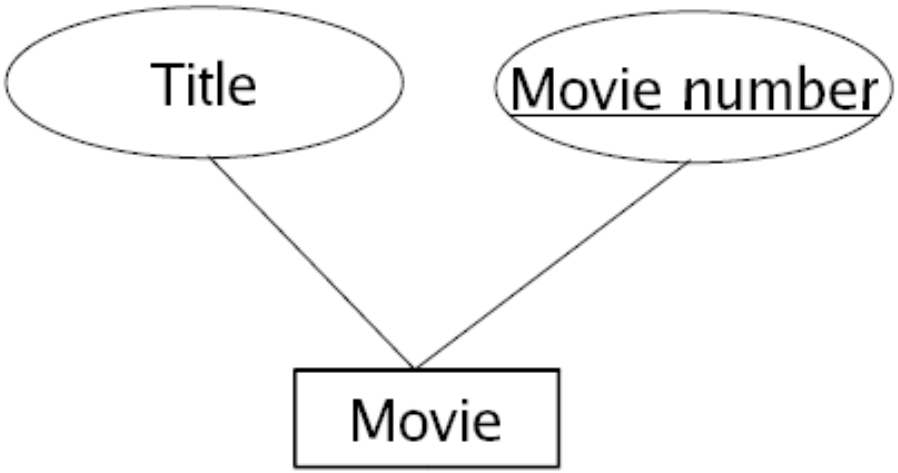

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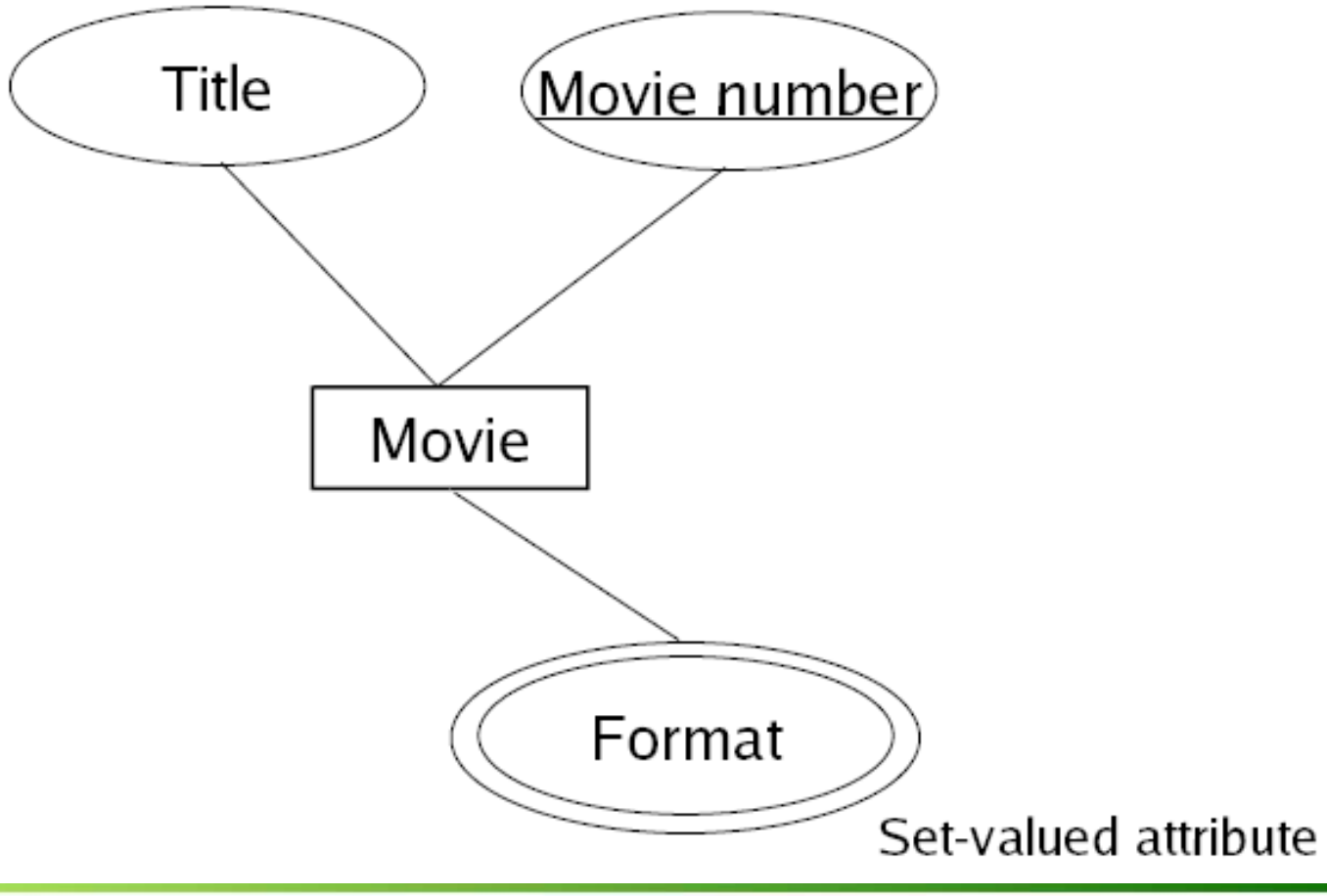

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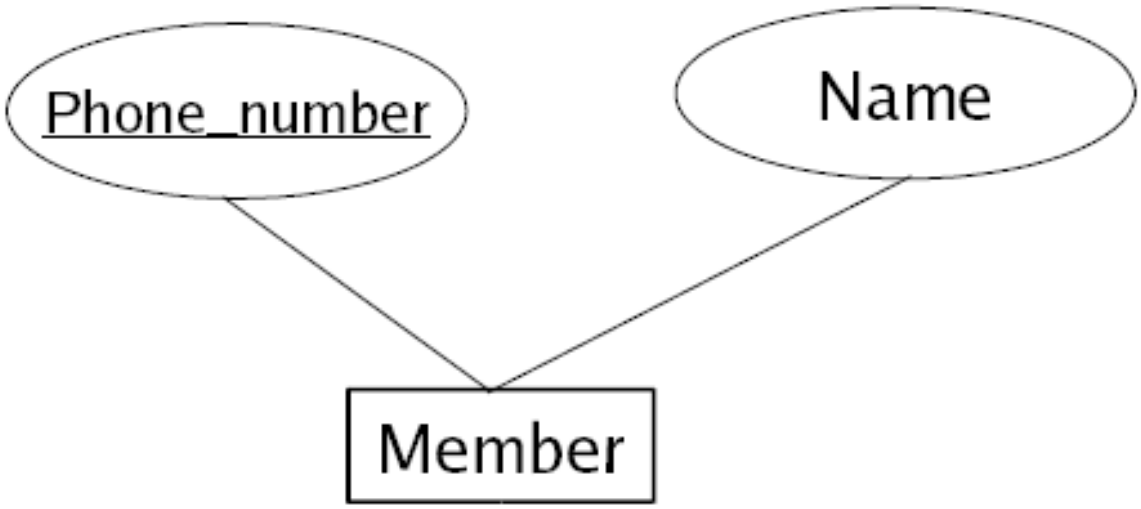

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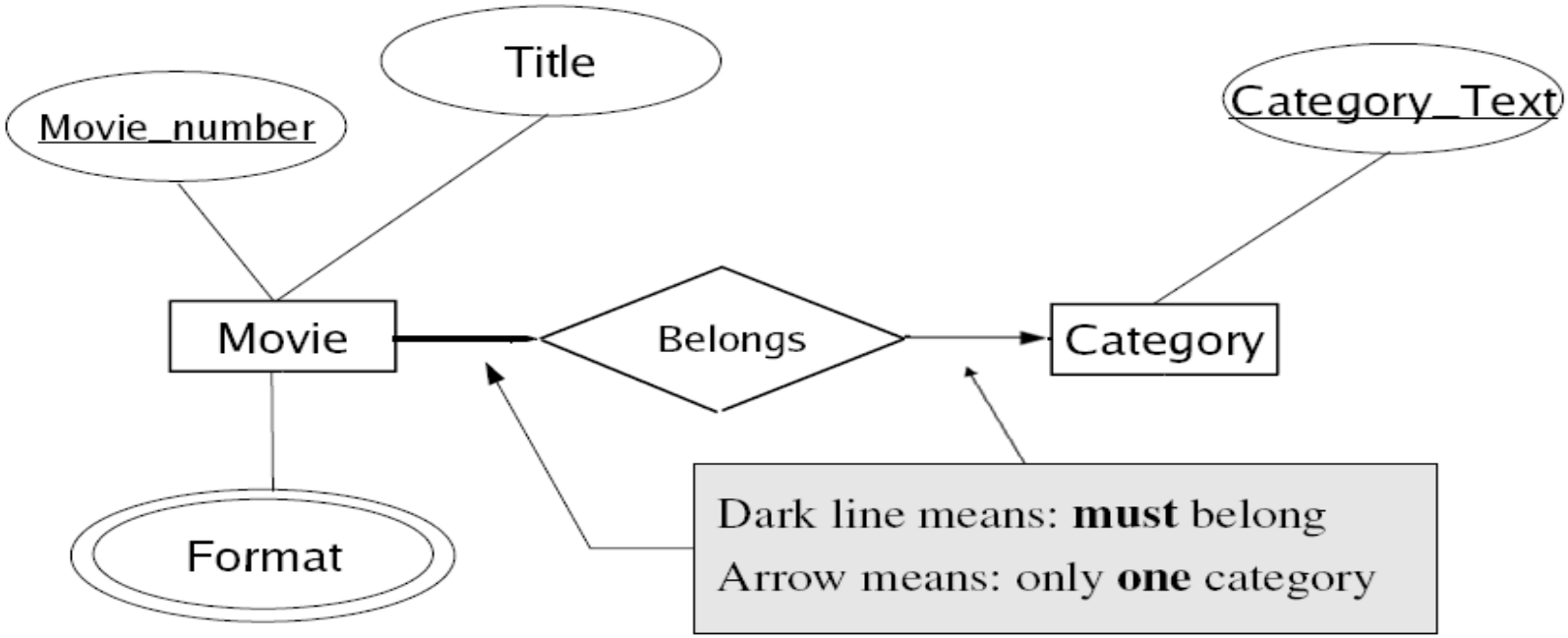

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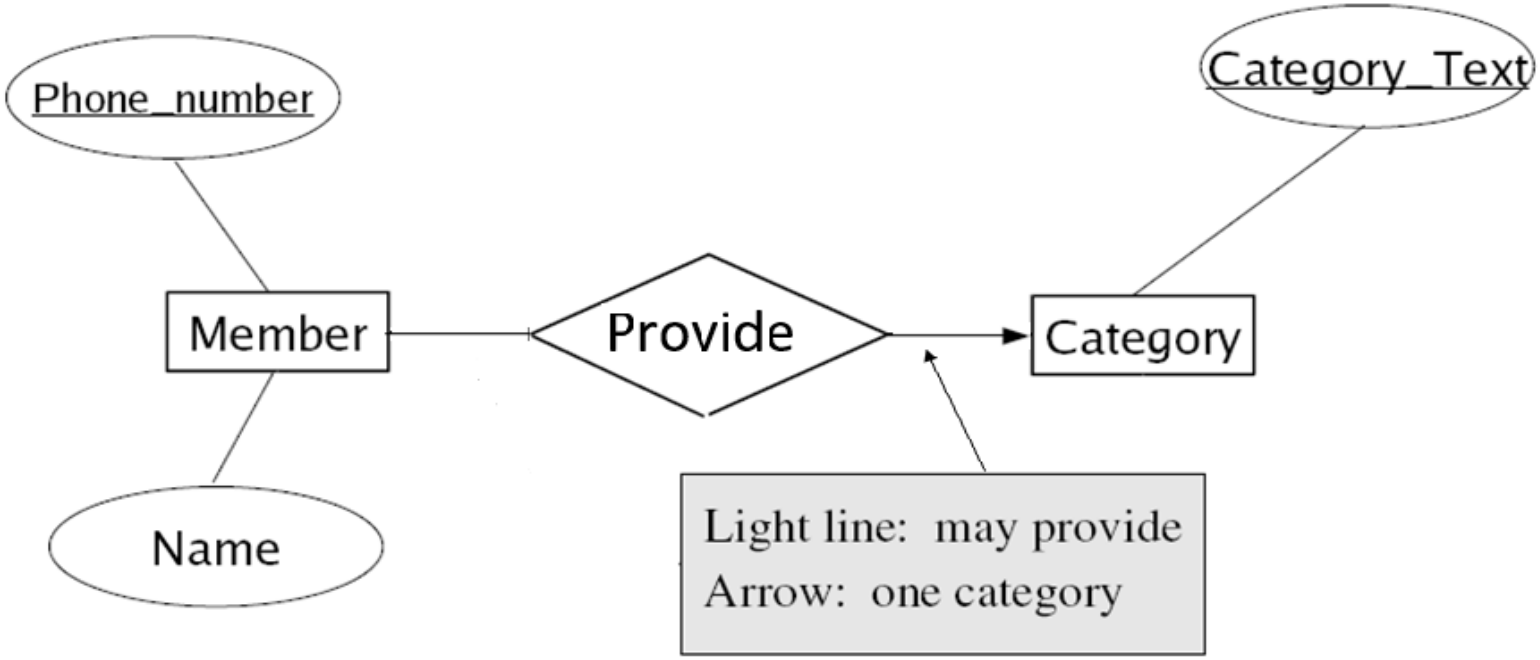

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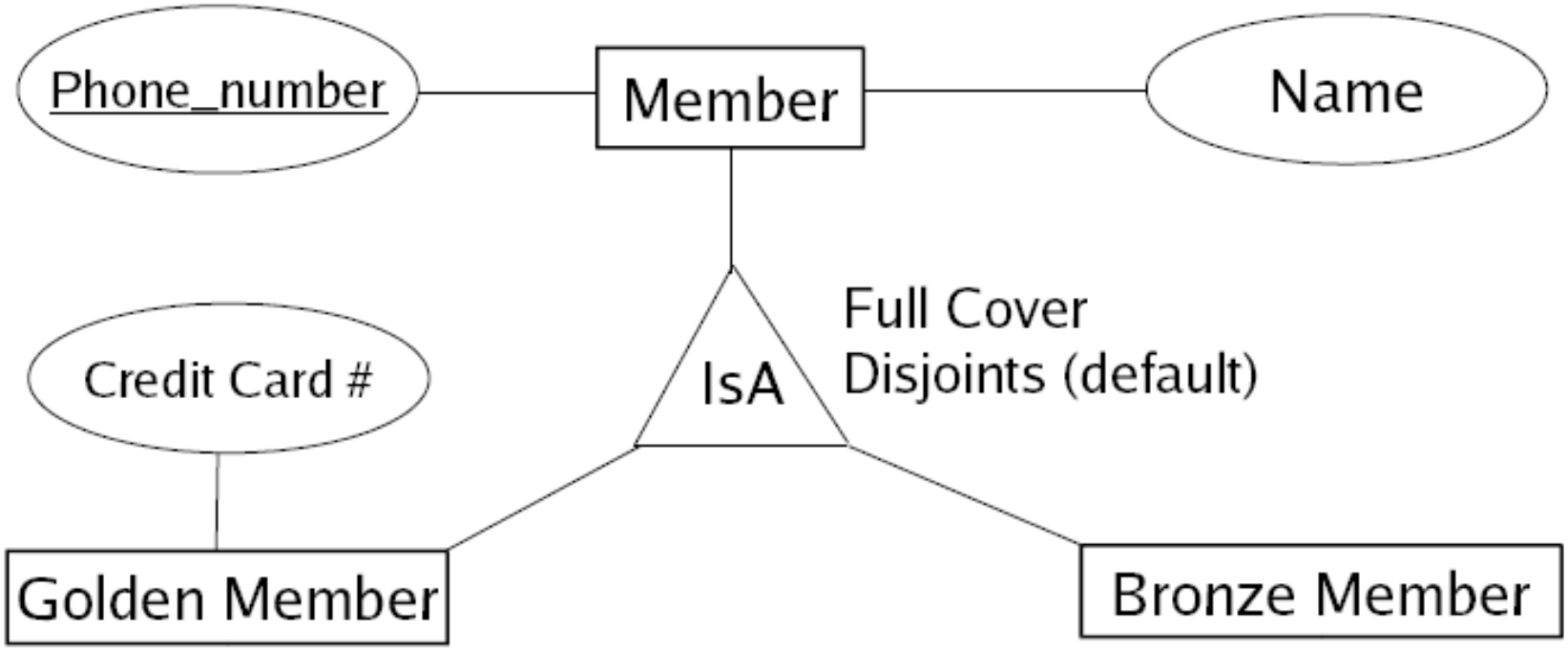
- **Golden Members: provide credit card#**
- **Bronze Members: not provide credit card#**



Golden Members can rent more than one movies.

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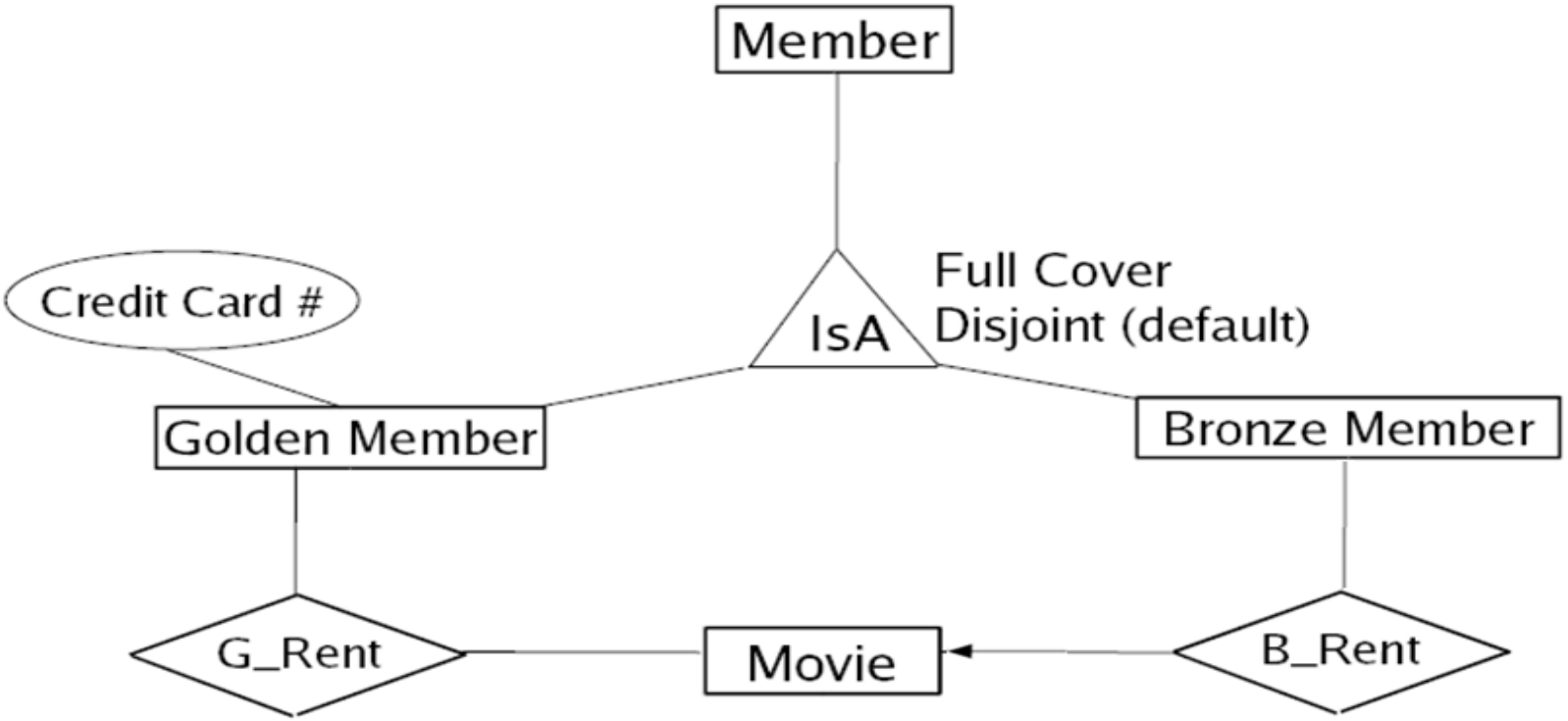
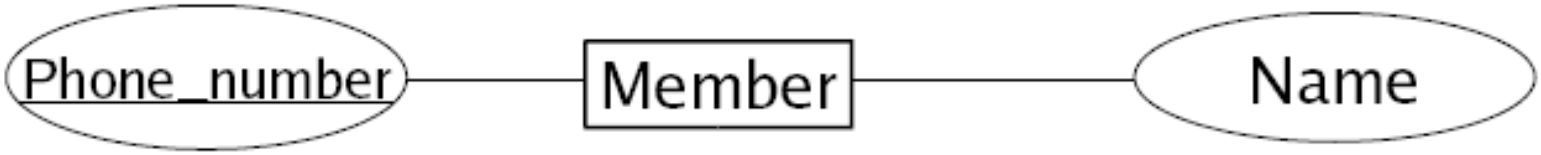


A member may have a set of dependents (with known names)



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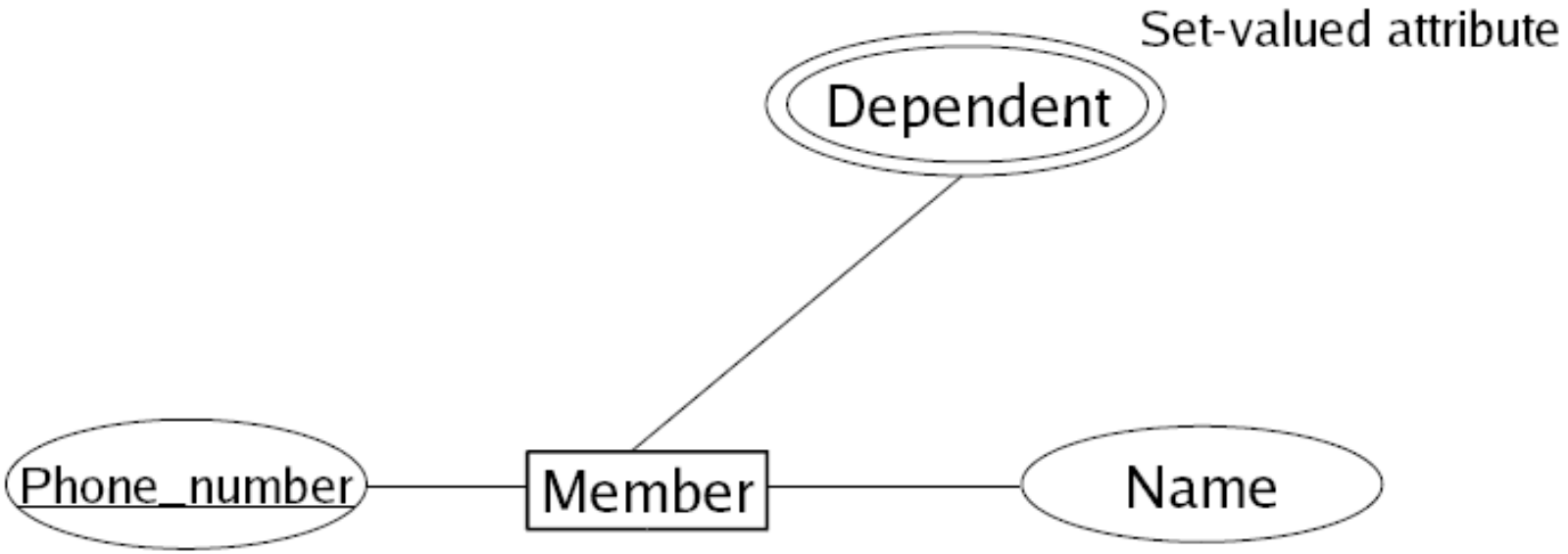
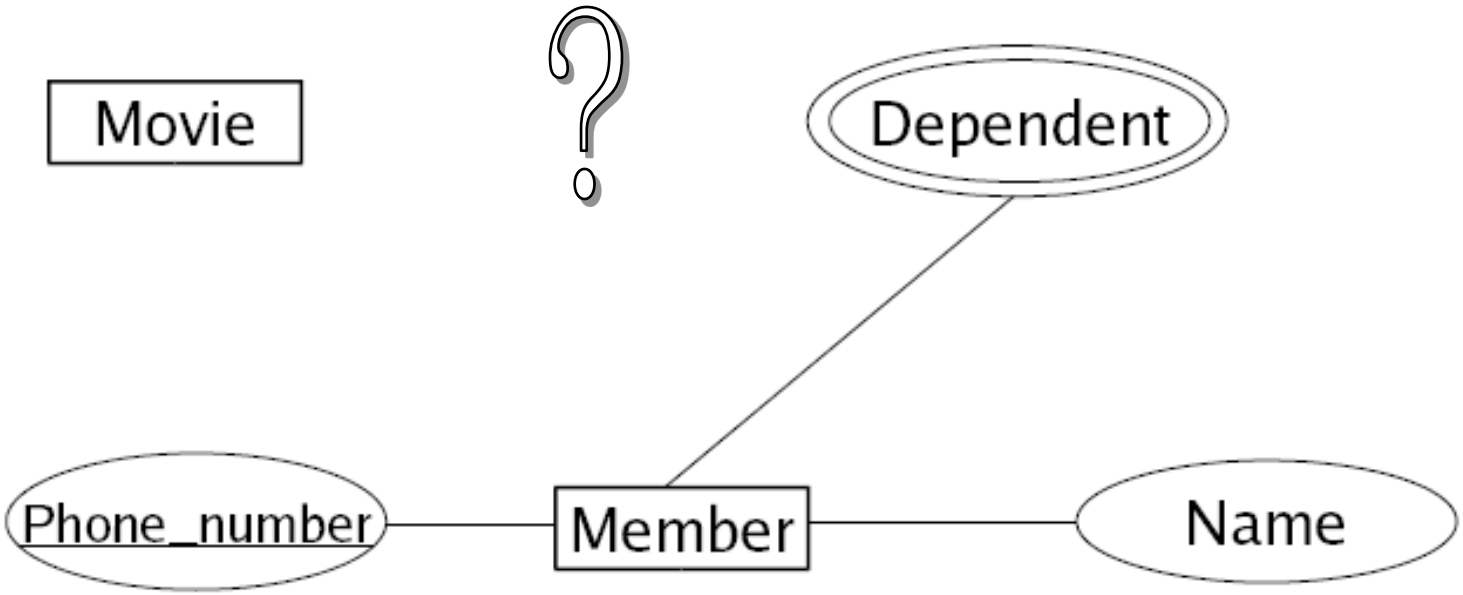
One idea:



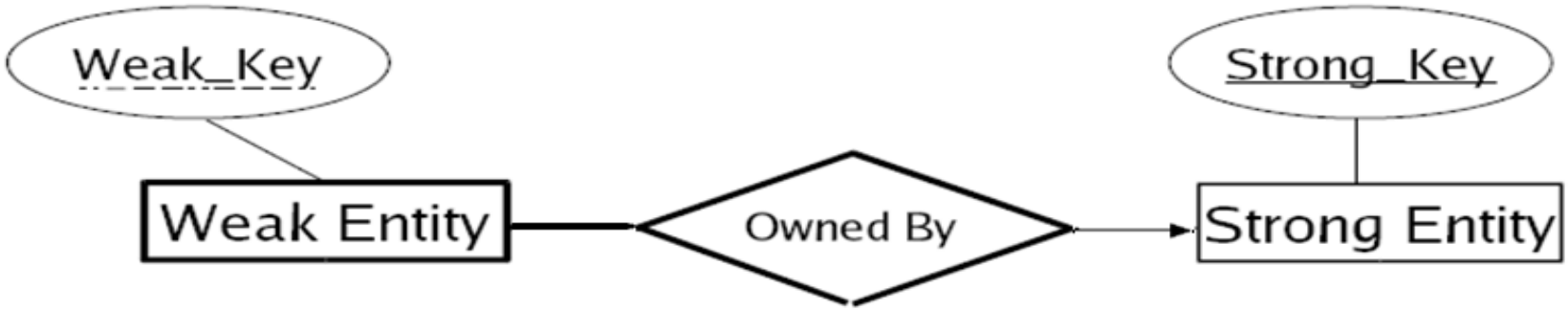
Each dependent is allowed to rent one movie.

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.



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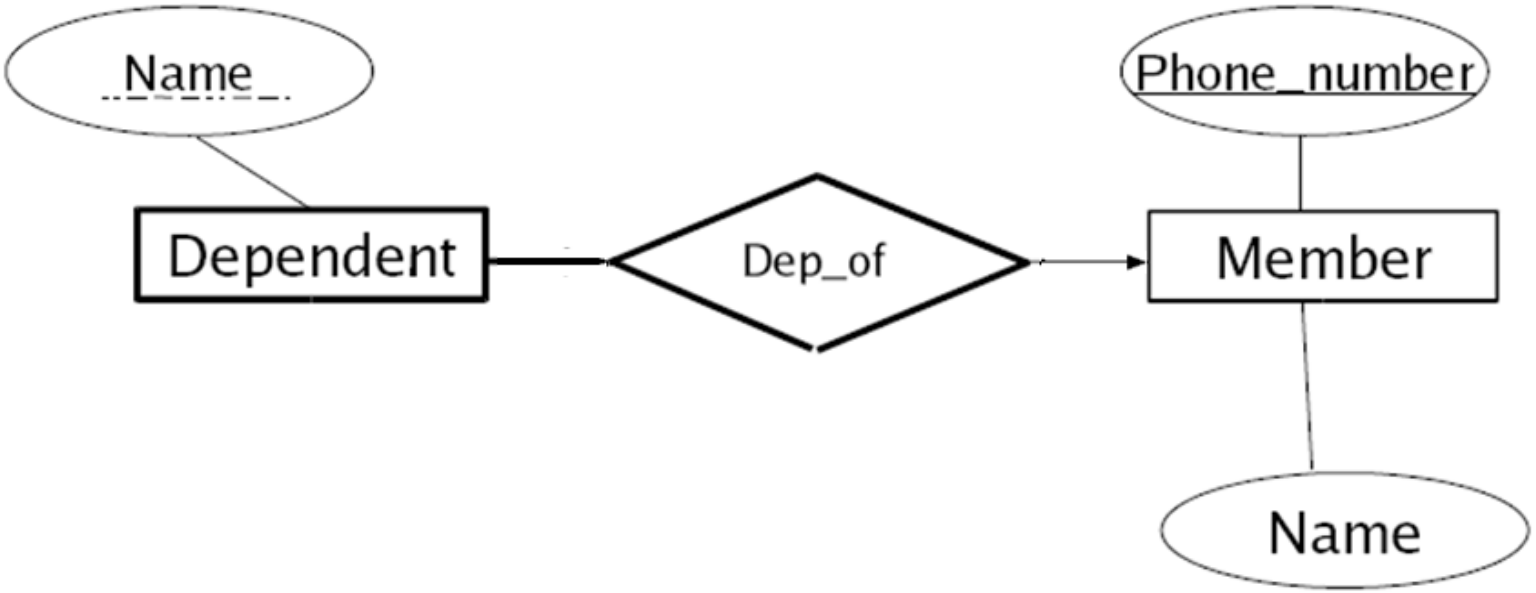

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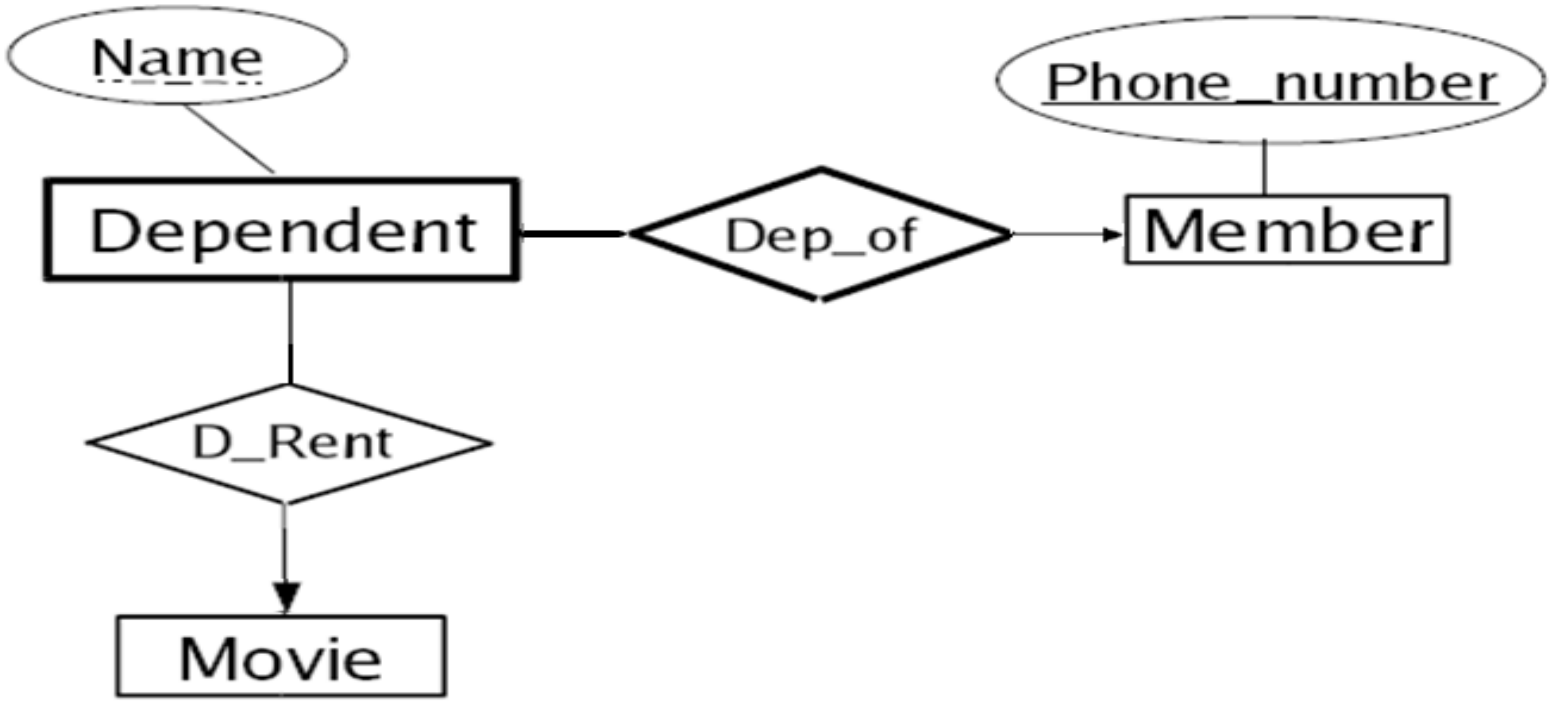
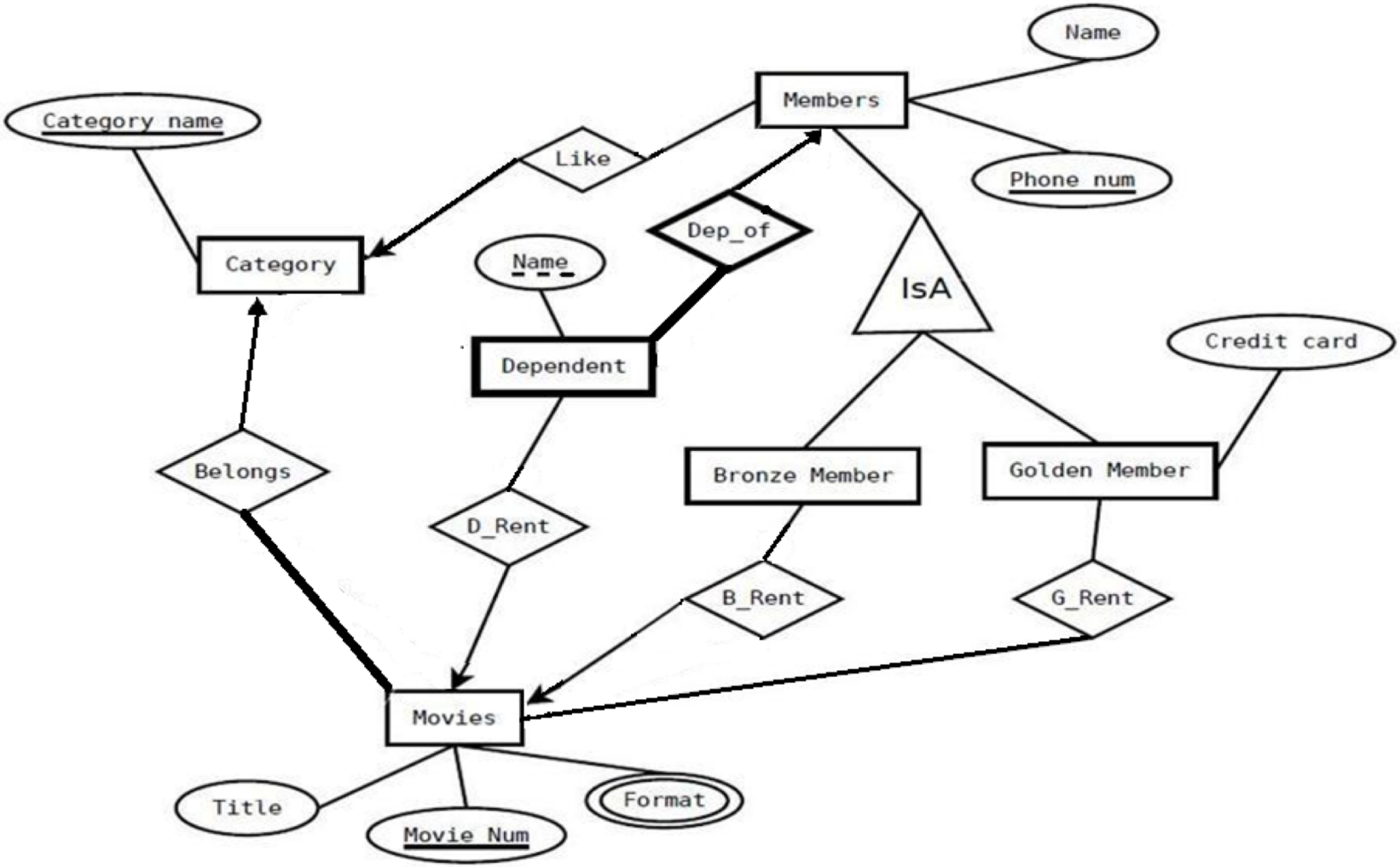


Now dependents CAN participate in a relationship.


Name
Members
Category name
Like
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Category
Name
IsA
Credit card
Dependent
Belongs
Bronze Member
Golden Member
D_Rent
B_Rent
G_Rent
Movies
Title
Format
Movie Num

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 –P prn219 diagram.ps

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

  Room: 1-32 CSC

  Email: helpdesk@cs.ualberta.ca

  Phone: 492-5067