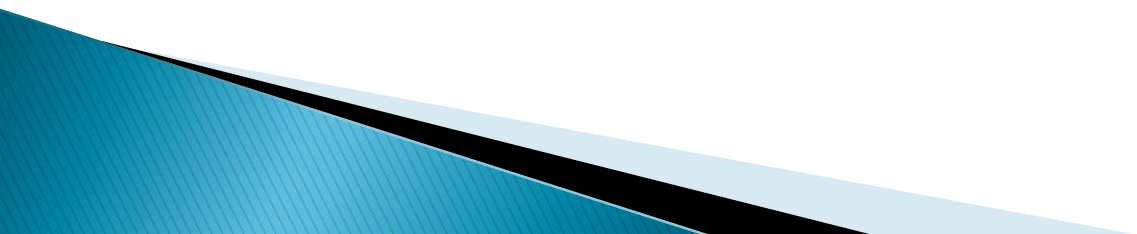
Entity-Relational Modeling, Chapter 12



Relational Model versus Entity-Relationship Modeling

relational model

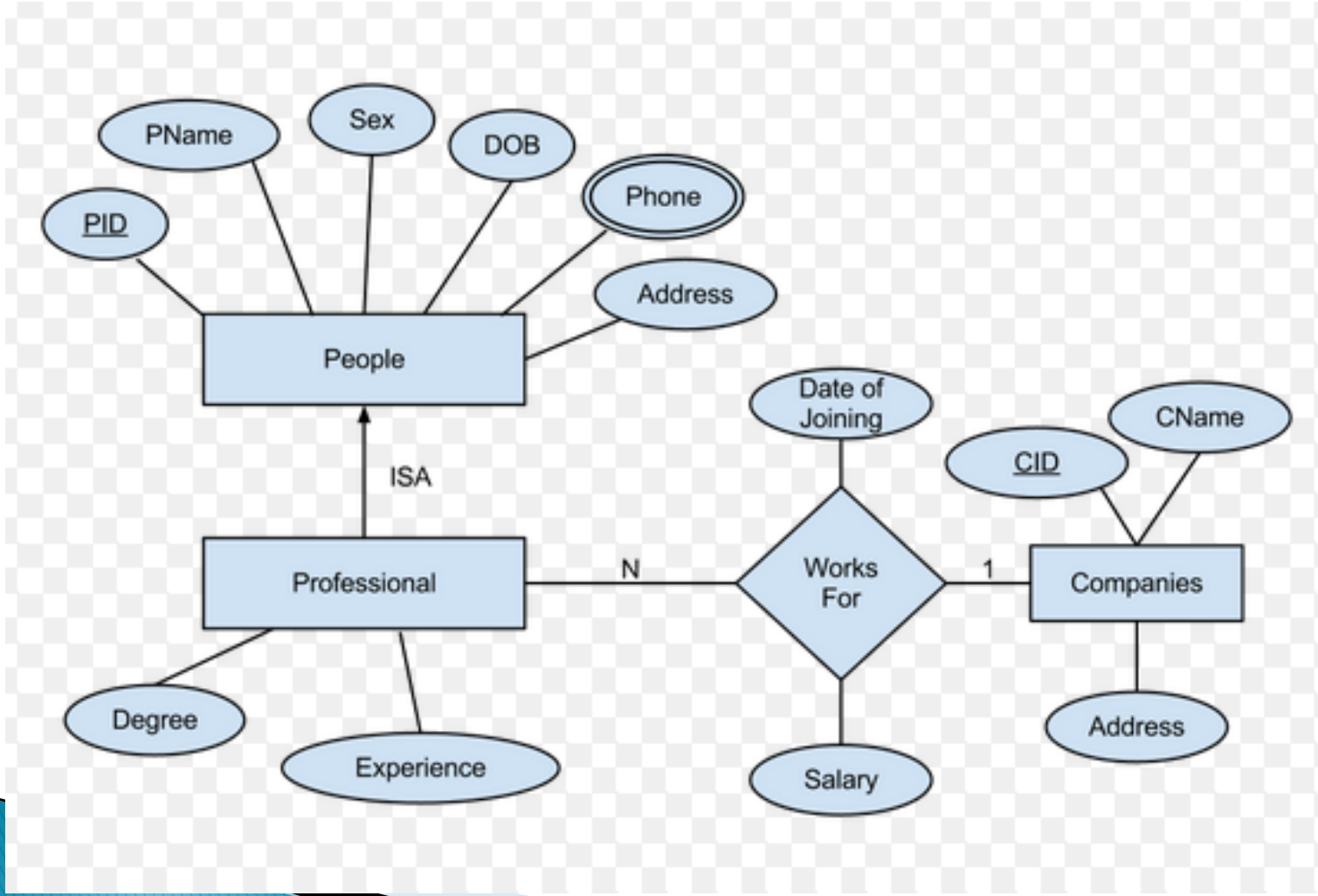
- based on first-order predicate logic,
- formulated by Edgar F. Codd (1969)
- data is represented in terms of tuples, grouped into relations
- Database organized in terms of the relational model is a relational database.

Wikipedia on “Relational Model”

entity-relationship modeling

- top-down approach to database design
- Begin by identifying entities and relationships between the entitiies

Example: Entity-Relationship (ER) Diagram



Dream Home ER Diagram (pg. 323)

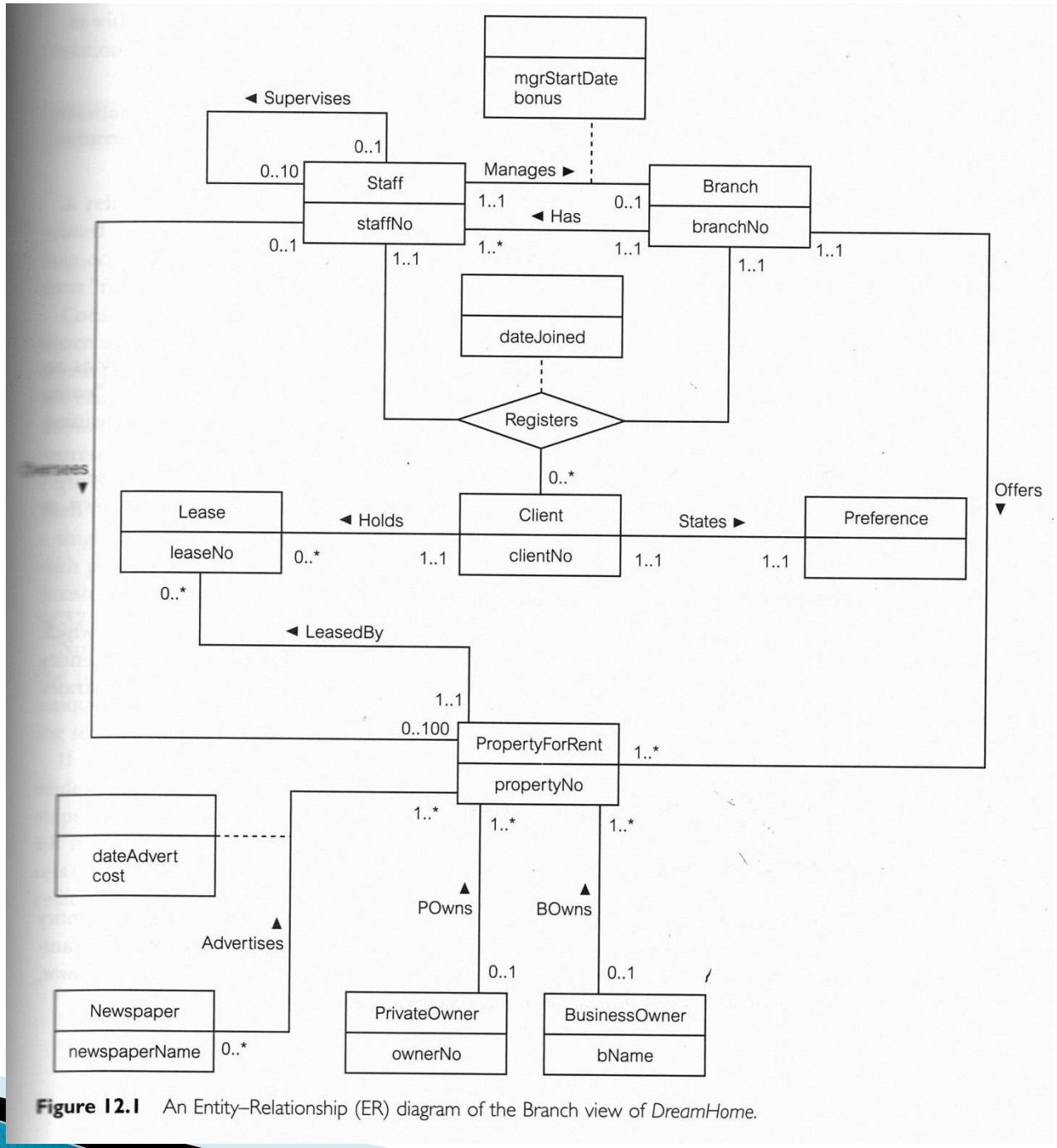
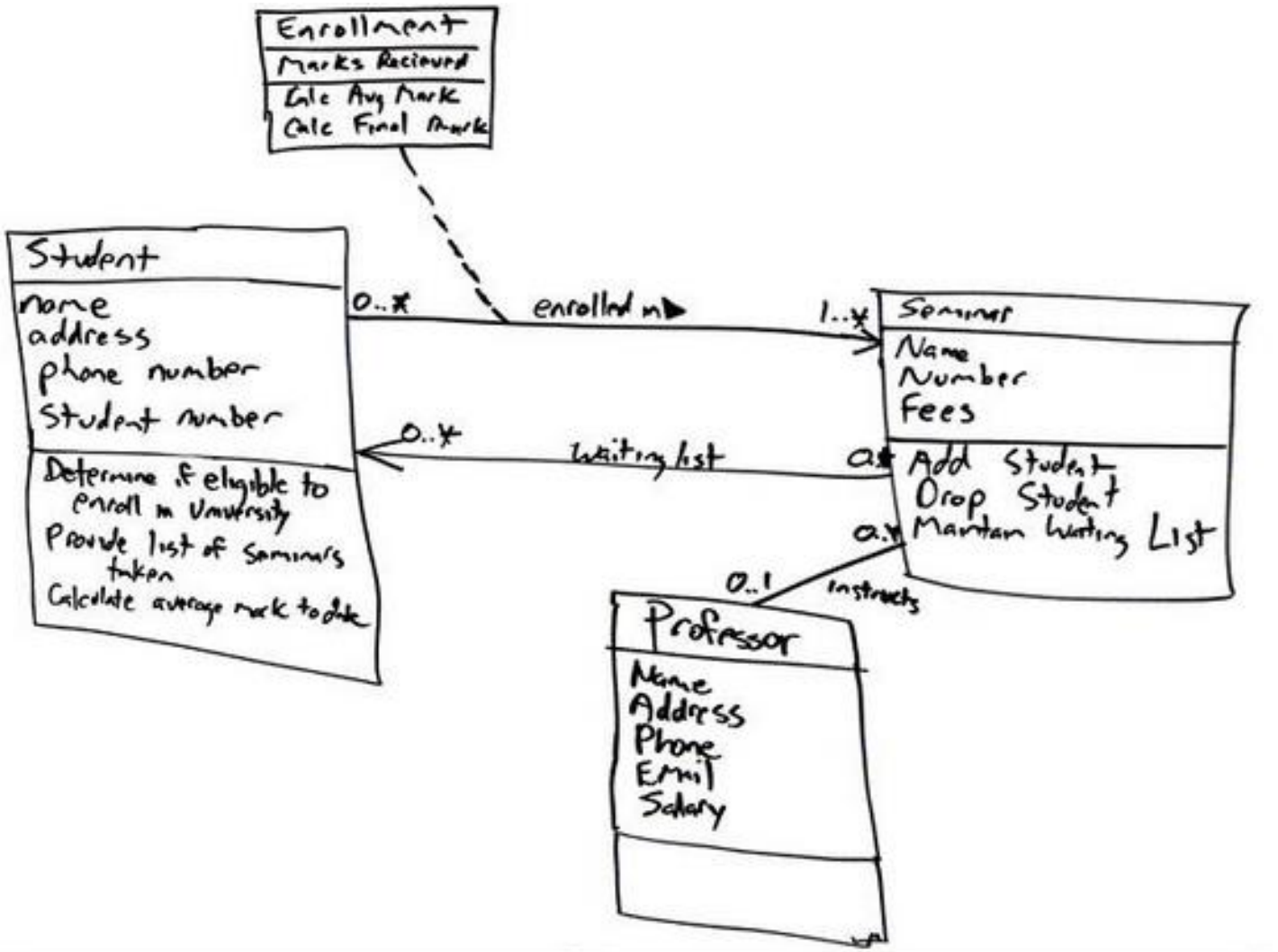


Figure 12.1 An Entity–Relationship (ER) diagram of the Branch view of *DreamHome*.

Class Diagram with Minimum and Maximum Cardinalities



Universal Modeling Language

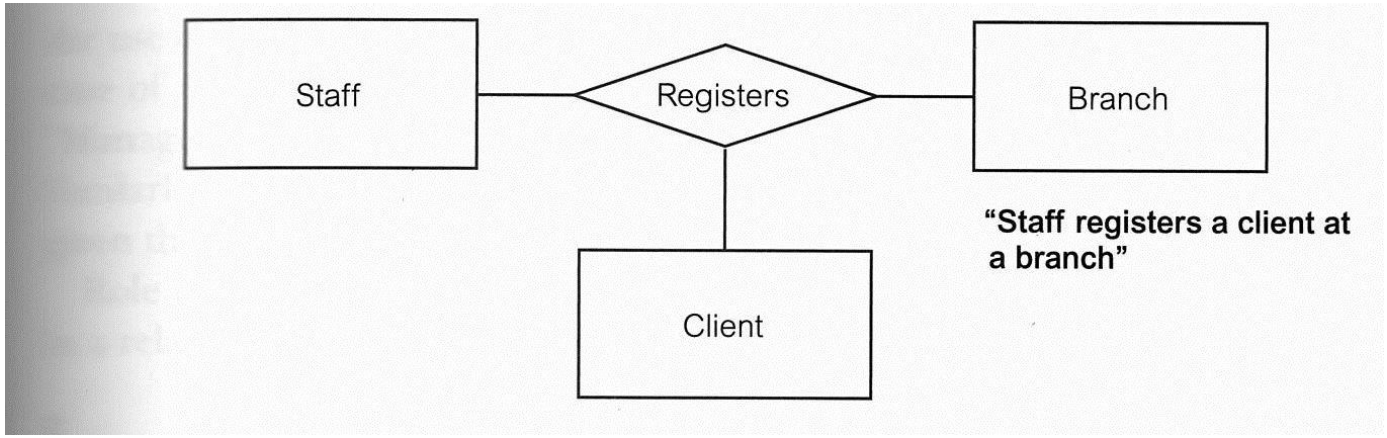
- Wikipedia: http://en.wikipedia.org/wiki/Universal_Modeling_Language

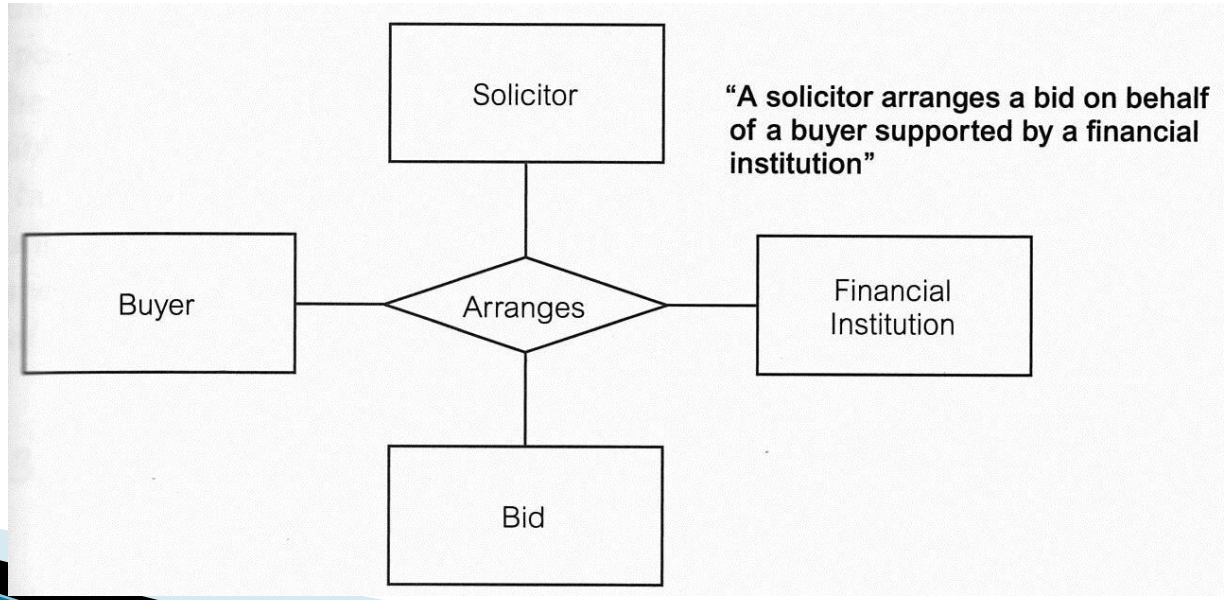
  See Section 3 "Diagrams Overview"

14 types of diagrams:

- 7 for structural information and
- 7 for behavior/interactions.

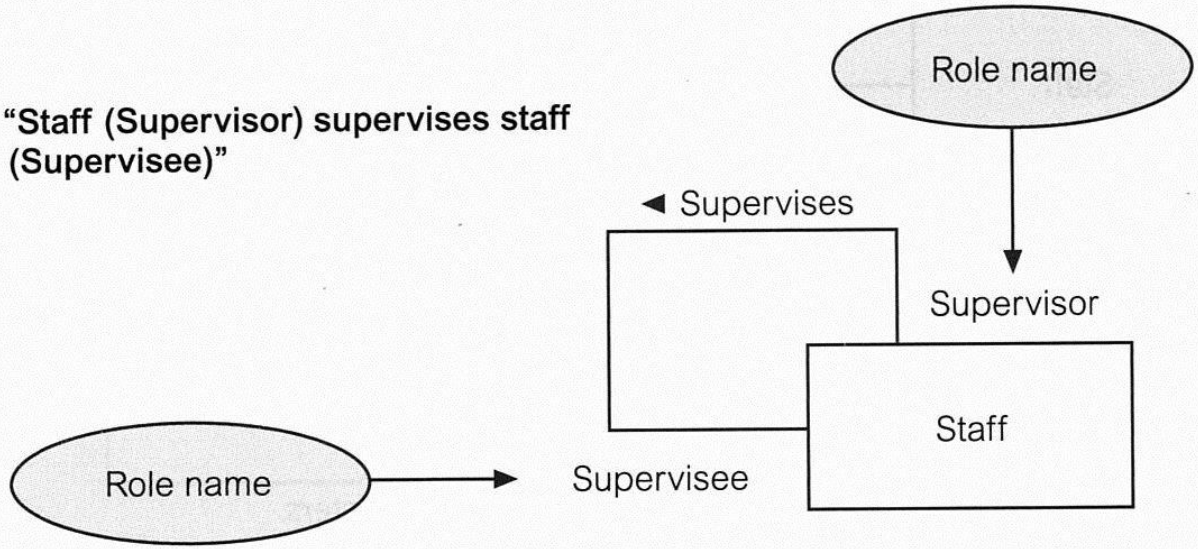
Example Ternary and Quaternary Relationship (pg. 327)





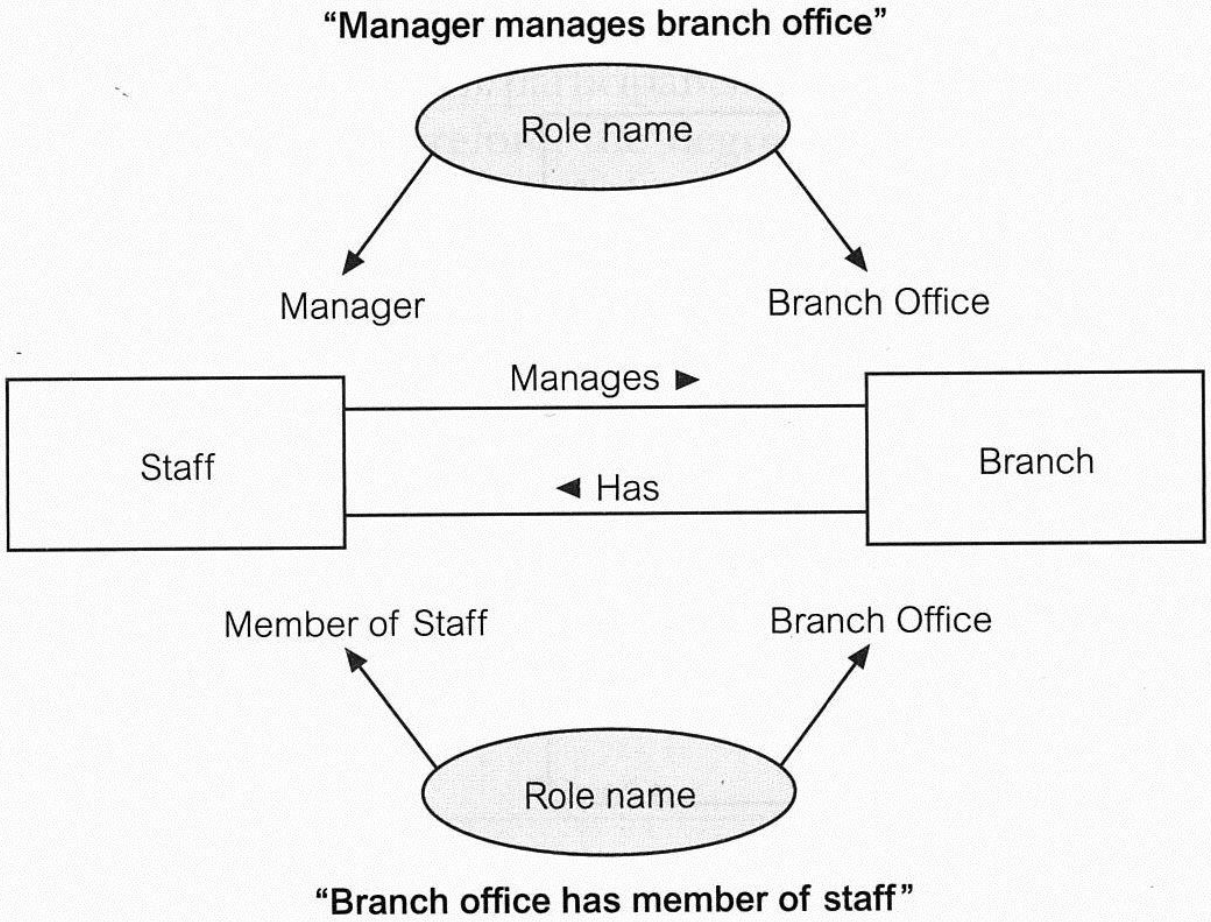
Recursive Relationship (pg. 328)

Figure 12.9
An example of a recursive relationship called *Supervises* with role names Supervisor and Supervisee.



Two Relationships Between Same Entities (pg. 328)

Figure 12.10
An example of entities associated through two distinct relationships called *Manages* and *Has* with role names.



Composite, Derived and Multi-Valued Attributes (pg. 332)

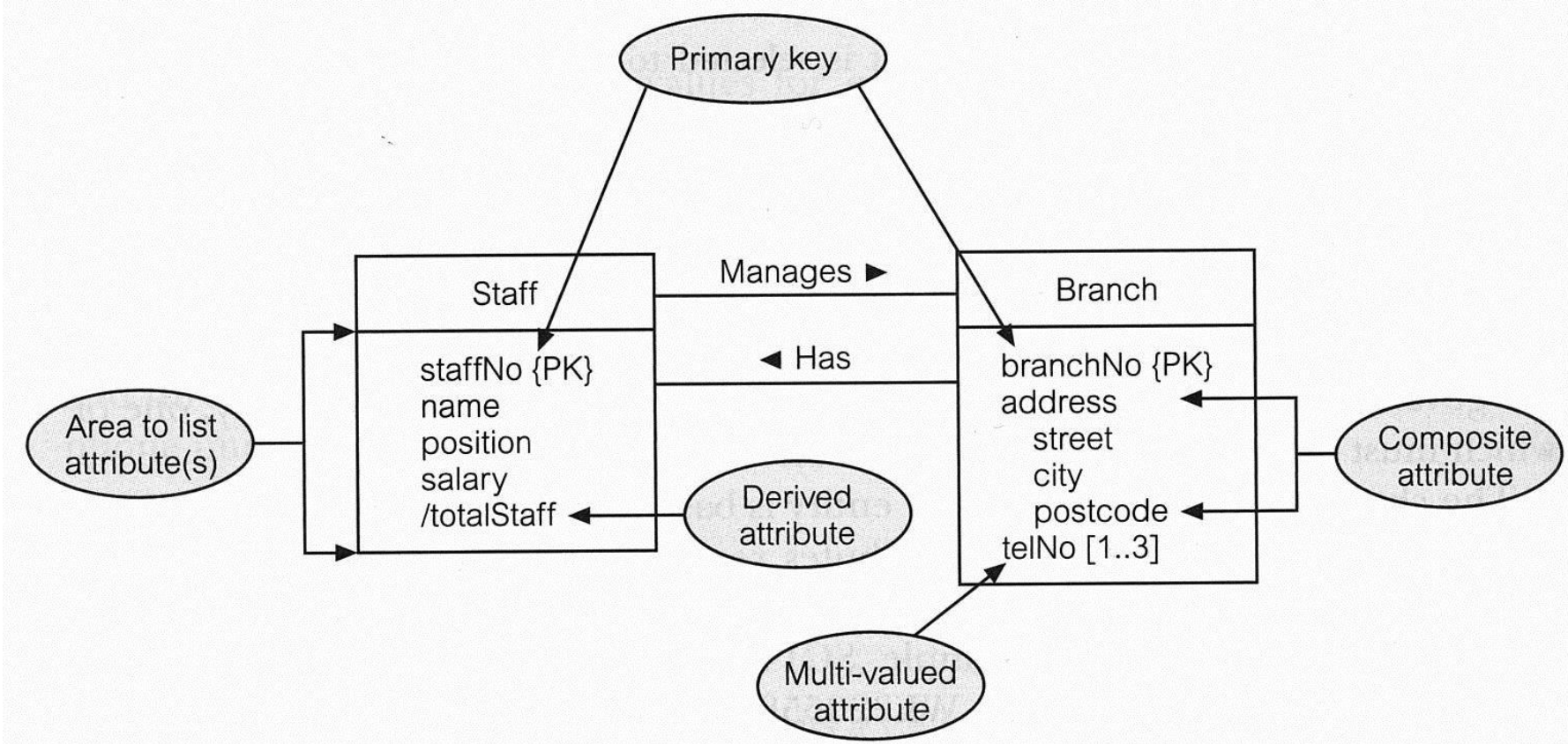


Figure 12.11 Diagrammatic representation of Staff and Branch entities and their attributes.

Strong and Weak Entity (pg. 334)

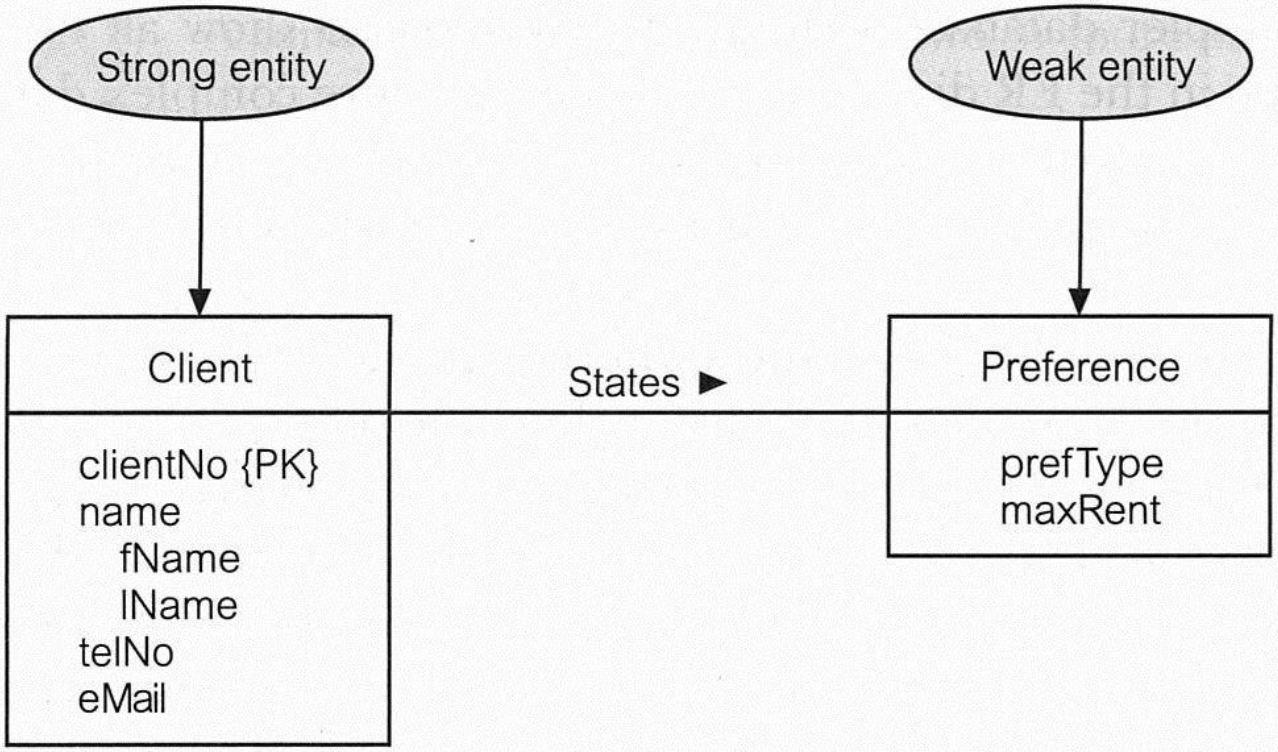


Figure 12.12 A strong entity type called Client and a weak entity type called Preference.

Attributes on Relationship (pg. 335)

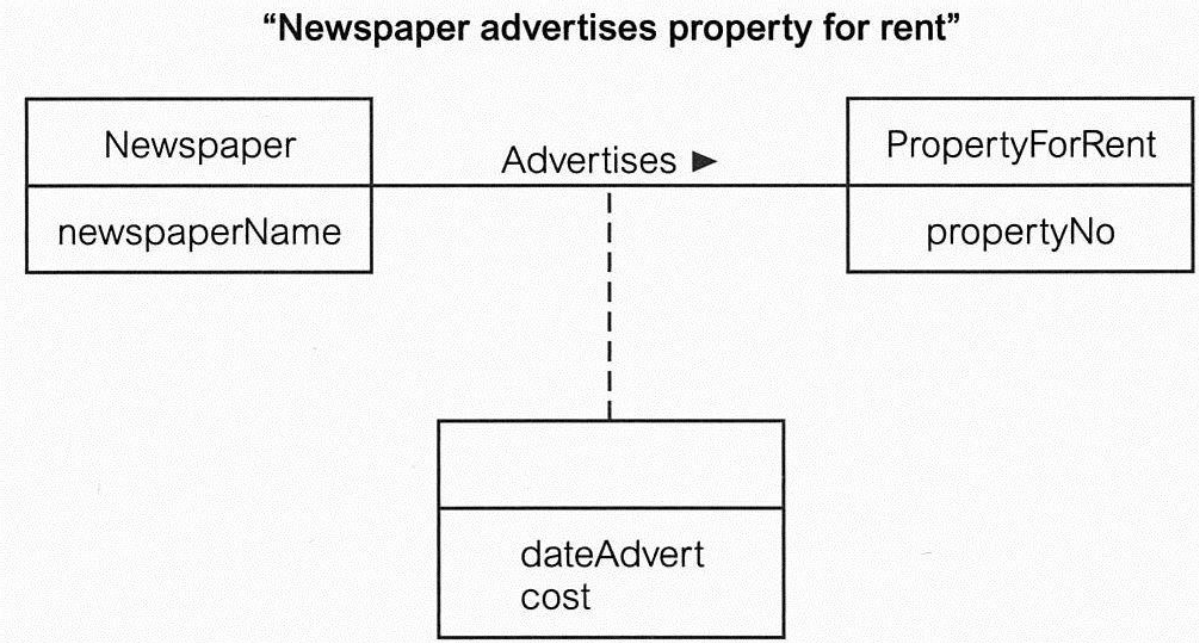


Figure 12.13 An example of a relationship called *Advertises* with attributes dateAdvert and cost.

Cardinalities (pg. 336-339)

Figure 12.14(b) The multiplicity of the Staff *Manages* Branch one-to-one (1:1) relationship.

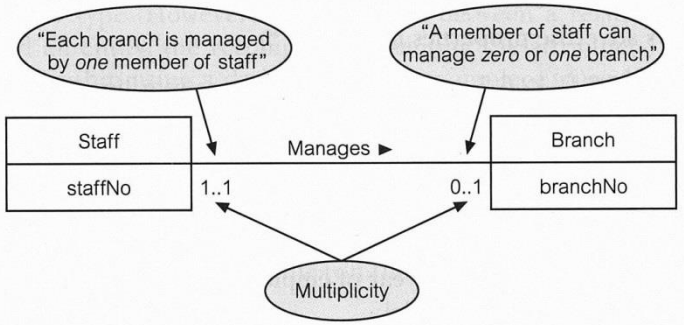
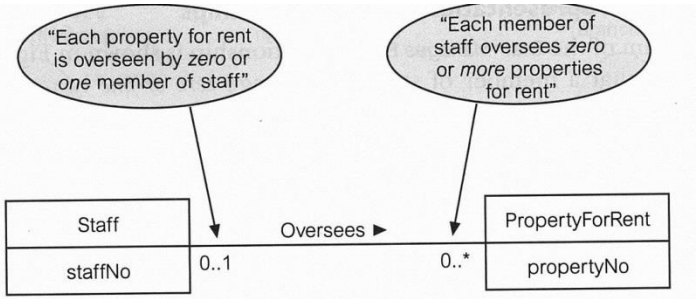


Figure 12.15(b) The multiplicity of the Staff *Oversees* PropertyForRent one-to-many (1:*) relationship type.



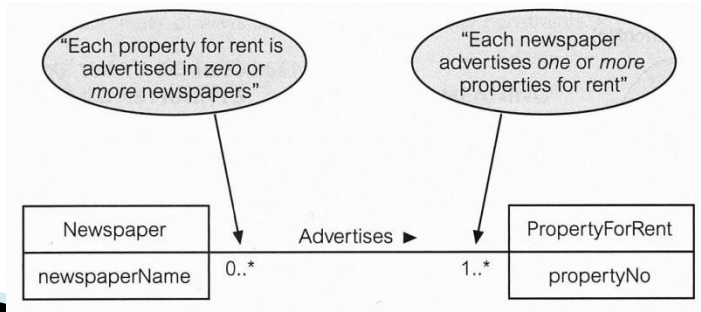


Figure 12.16(b) The multiplicity of the Newspaper *Advertises* PropertyForRent many-to-many (*:*) relationship.

Cardinality / Participation (pg. 341)

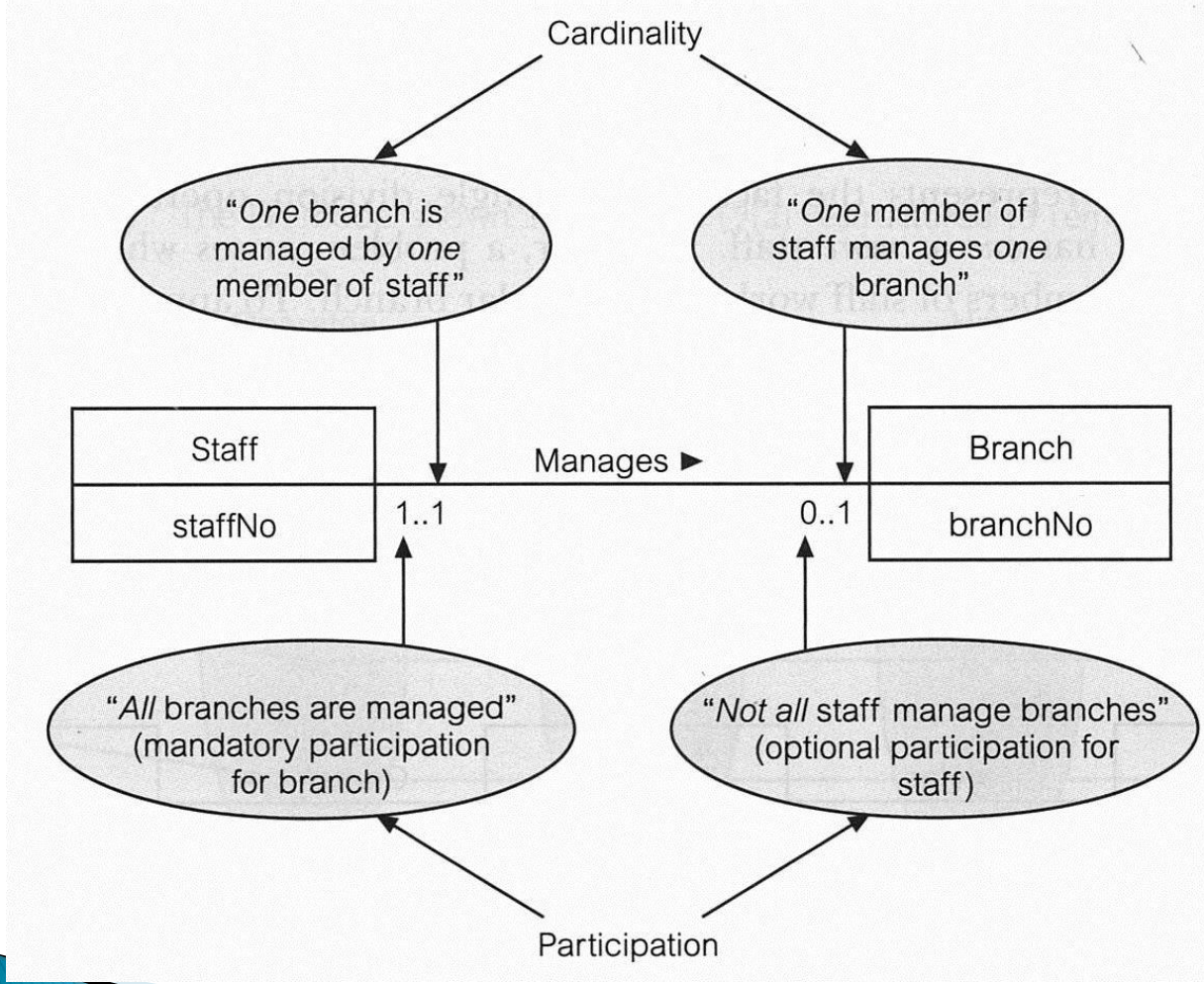
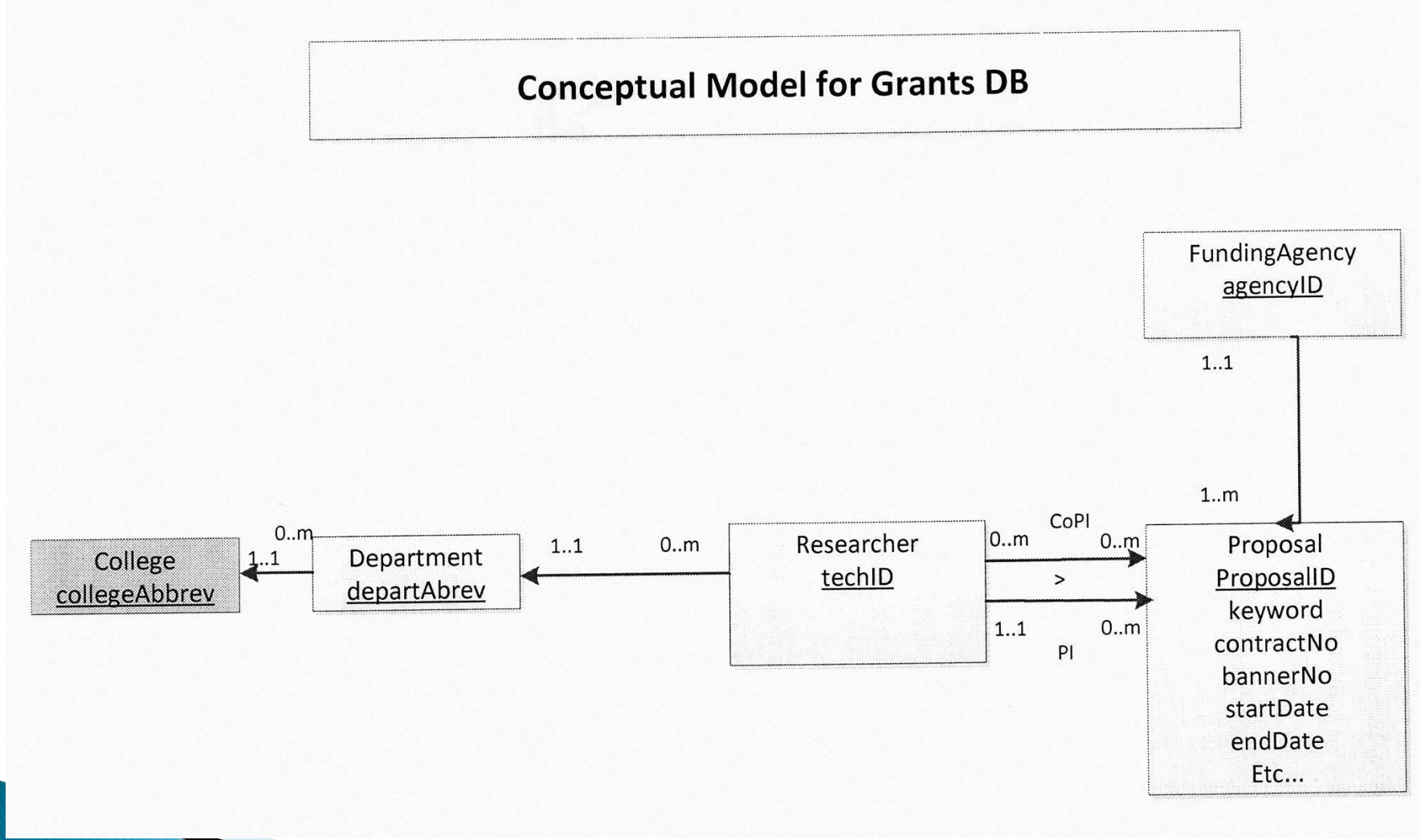


Figure 12.18 Multiplicity described as cardinality and participation constraints for the Staff *Manages* Branch (1:1) relationship.

Sample Conceptual Model



Related (Enhanced) Logical Model