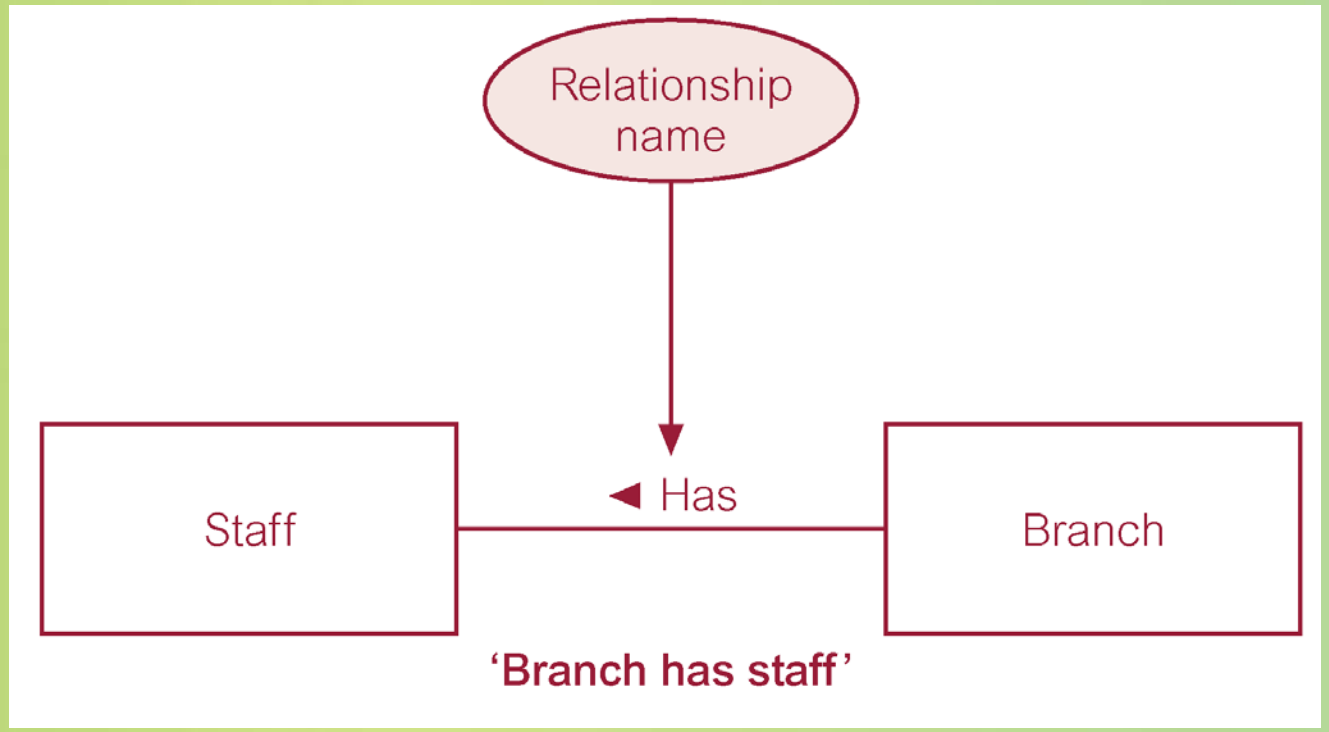
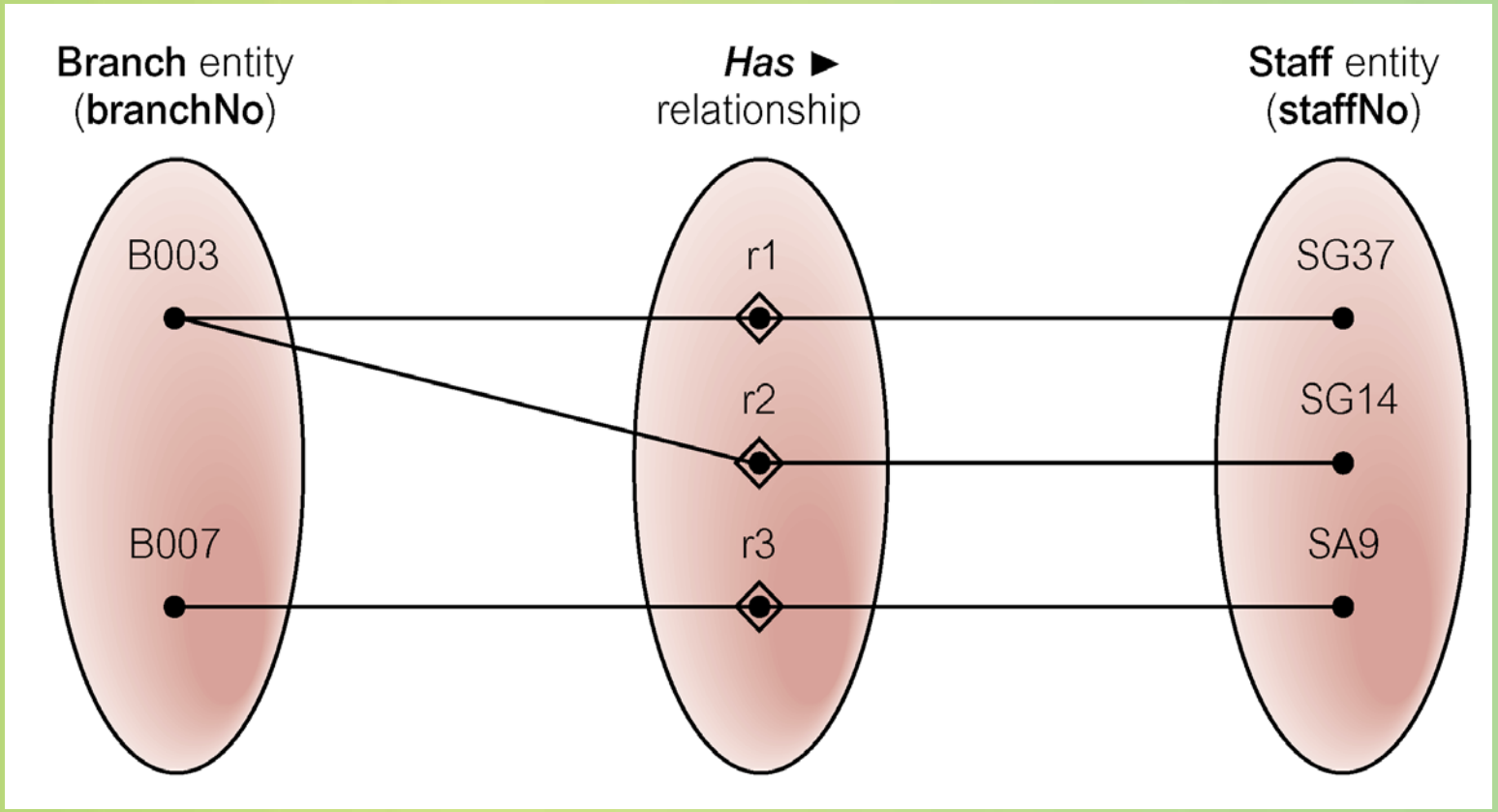
Class ERD examples from Connolly & Begg (Ch. 12 & 13)

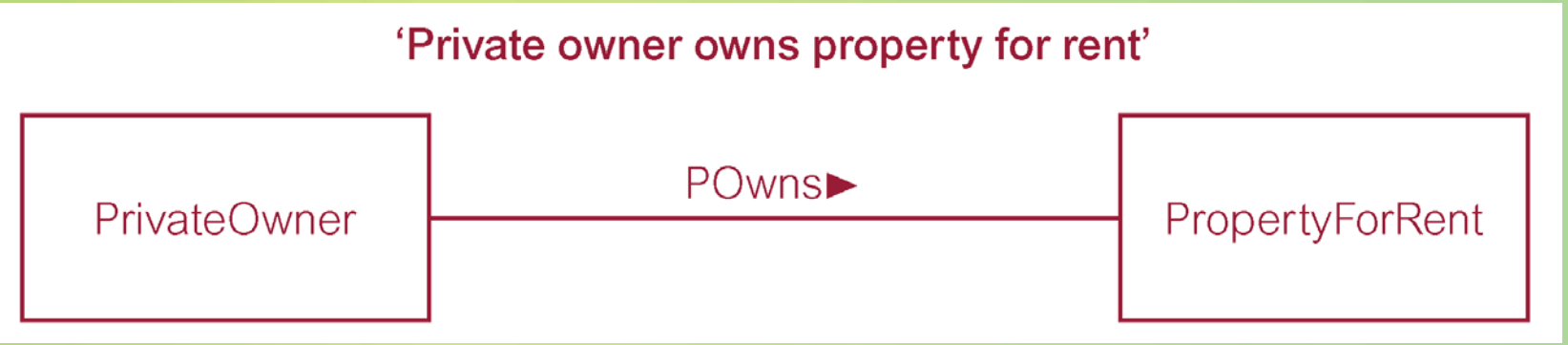
ER diagram of Branch *Has* Staff relationship



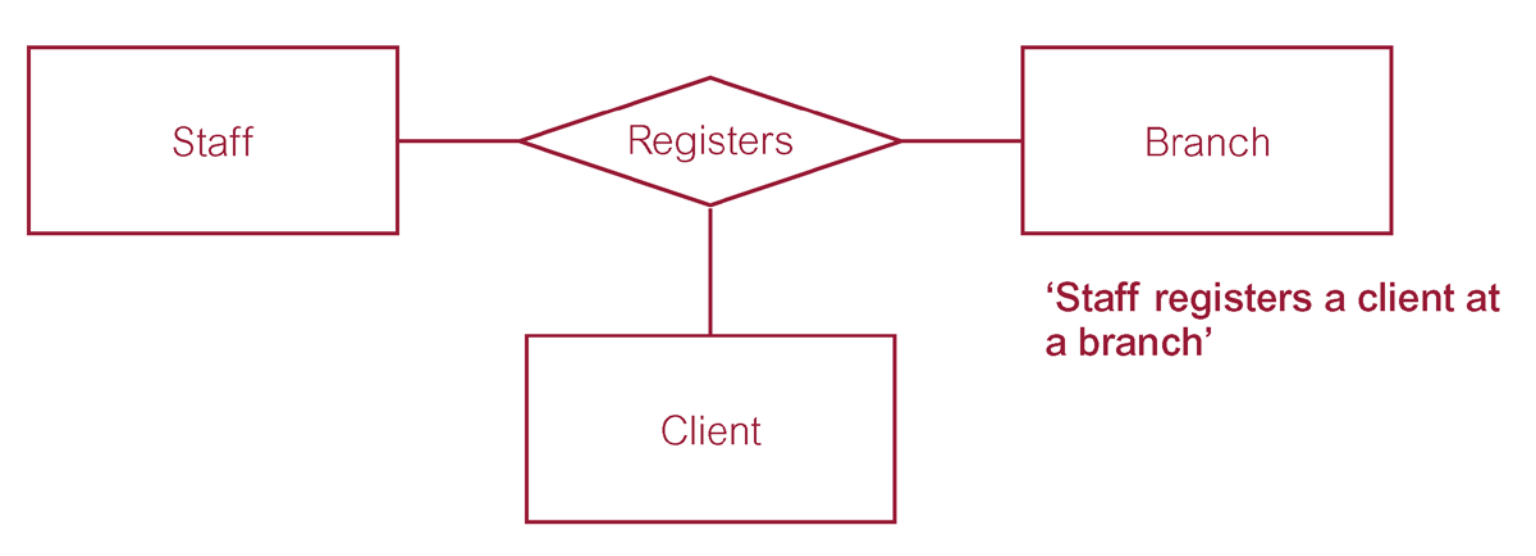
Semantic net of *Has* relationship type



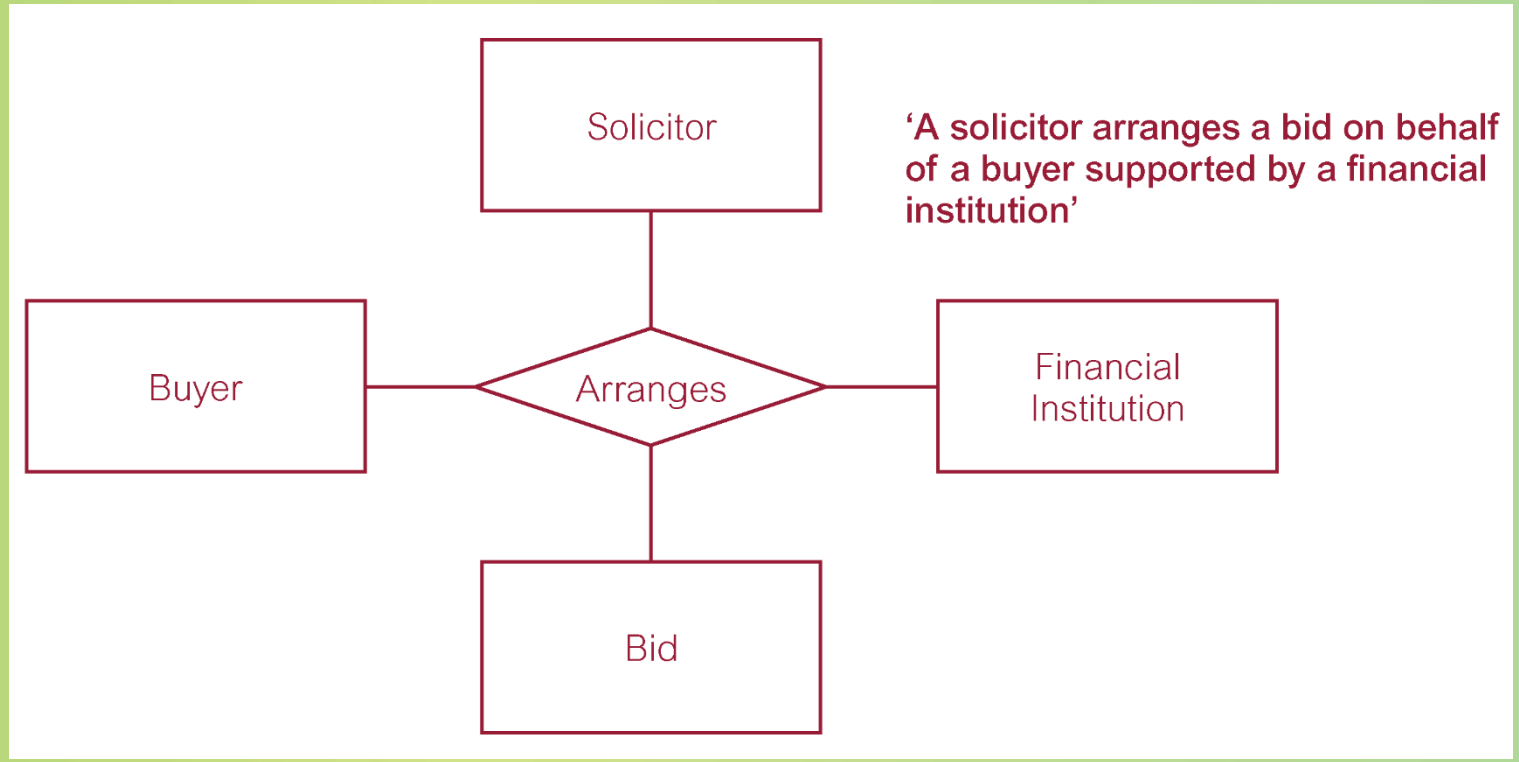
Binary relationship called *POwns*



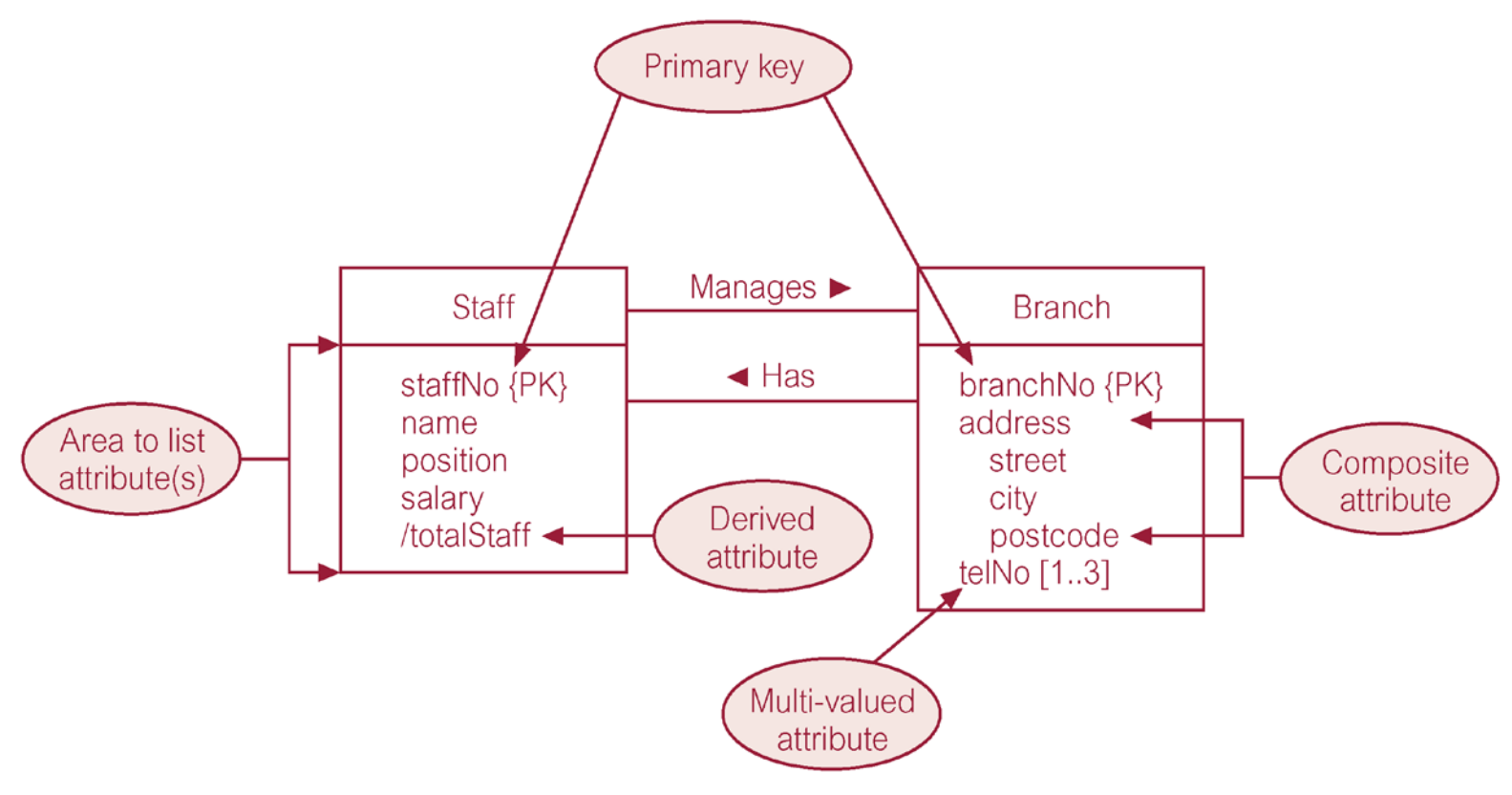
Ternary relationship called *Registers*



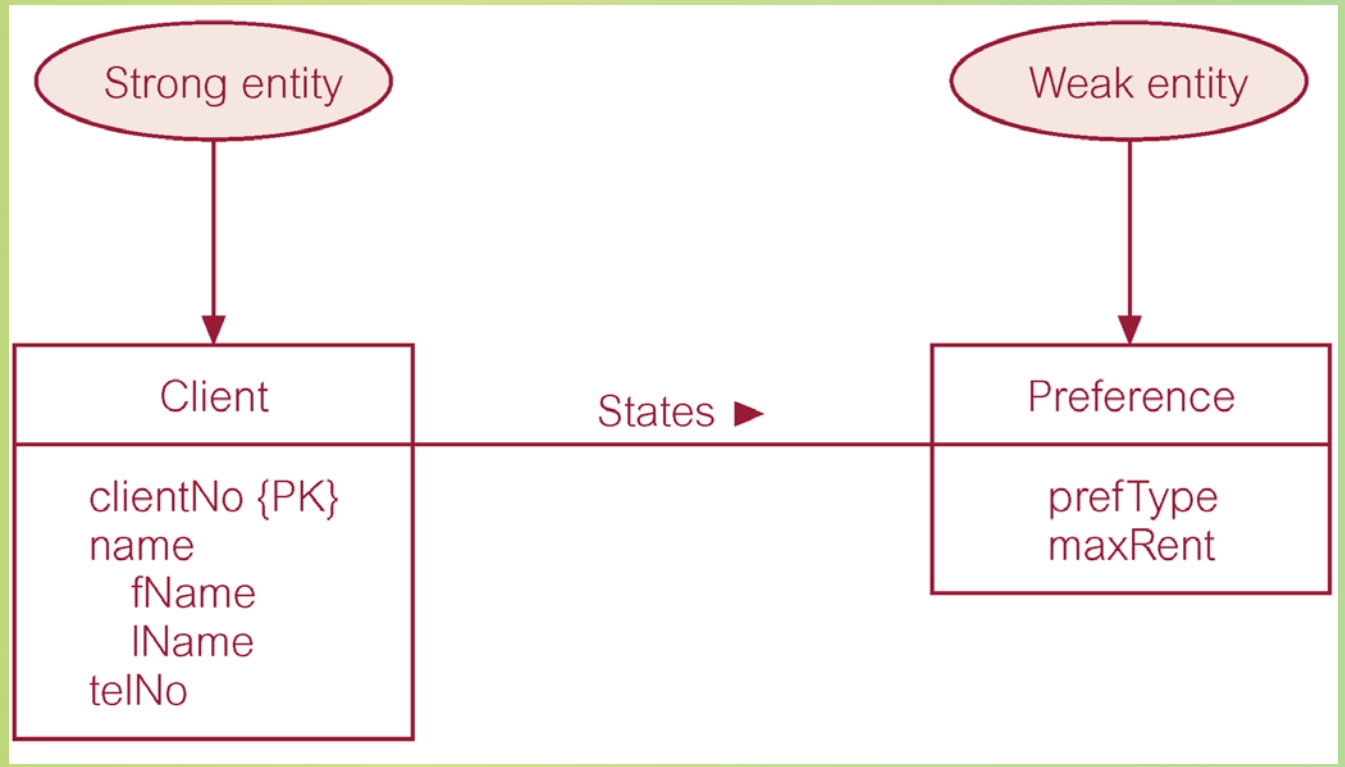
Quaternary relationship called *Arranges*



ER diagram of Staff and Branch entities and their attributes



Strong entity type called Client and weak entity type called Preference

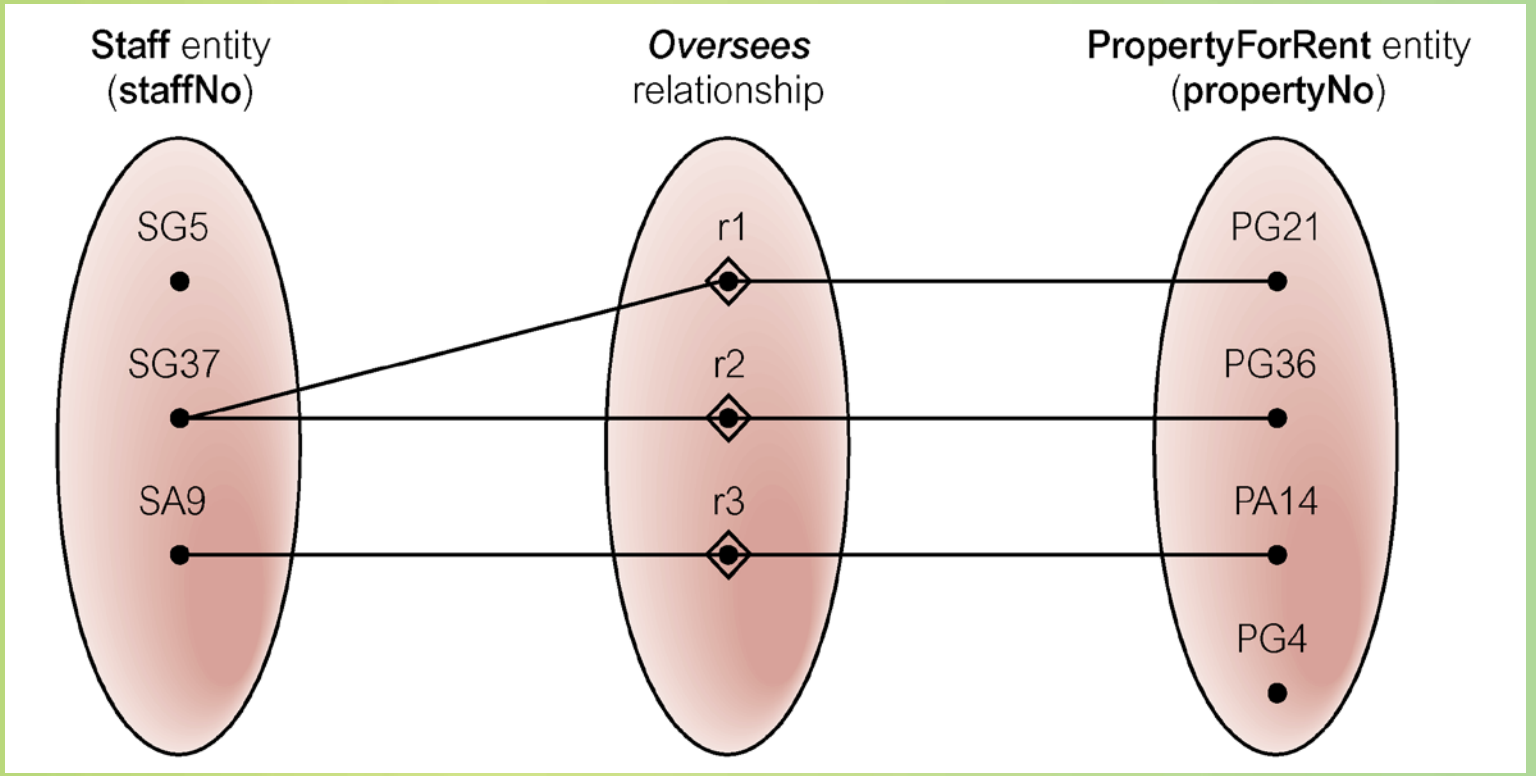


Modeling exercise

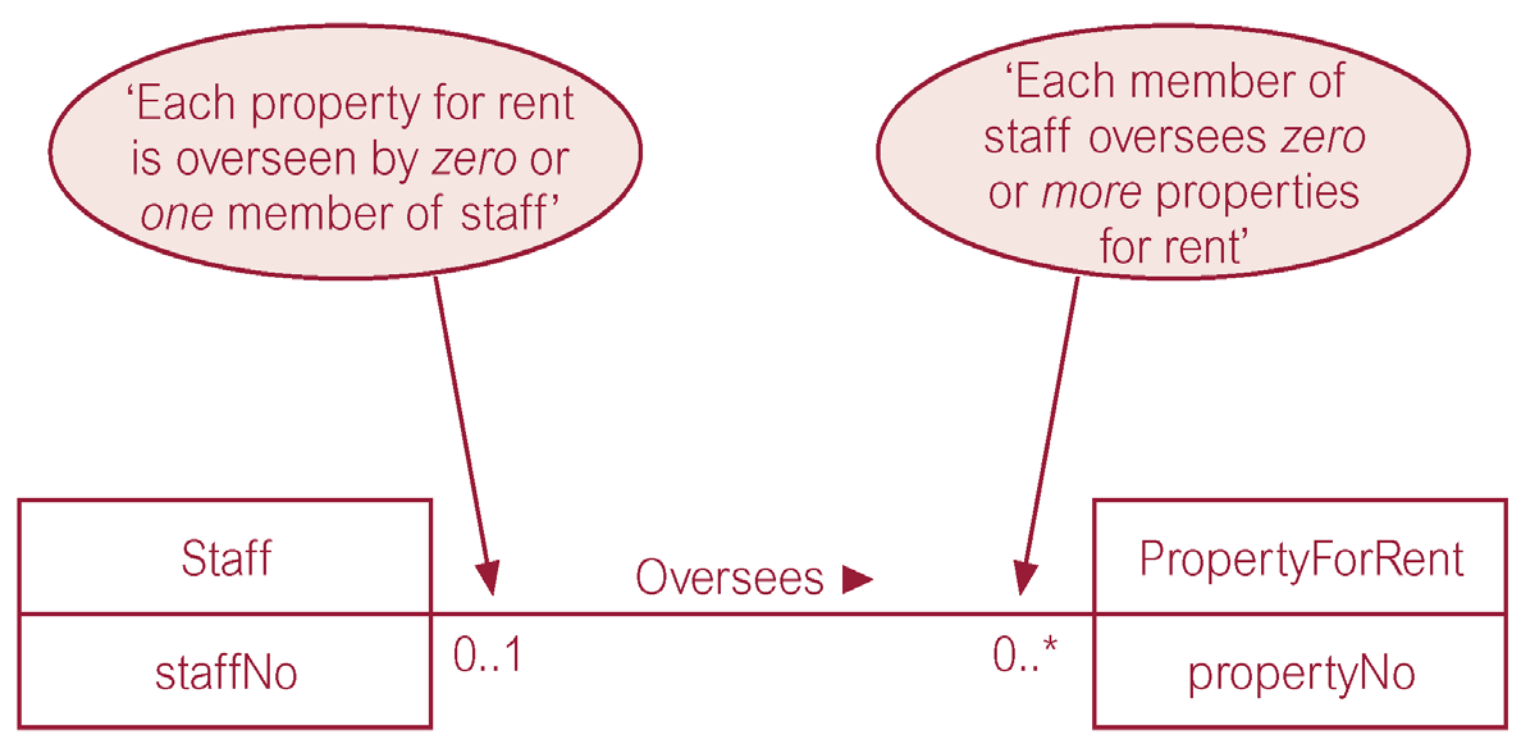
A university database contains information about professors and courses. Professors are identified by social security number, or SSN and courses are identified by courseid. Professors teach courses; each of the following scenarios concerns the Teaches relationship set between courses and professors. For each of the following scenarios, draw an UML diagram that describes it. Please assume that no other constraints hold.

- Professors can teach the same course in several semesters, and each offering must be recorded (saved in DB).
- Professors can teach the same course in several semesters, and only the most recent such course offering needs to be recorded (saved in DB).

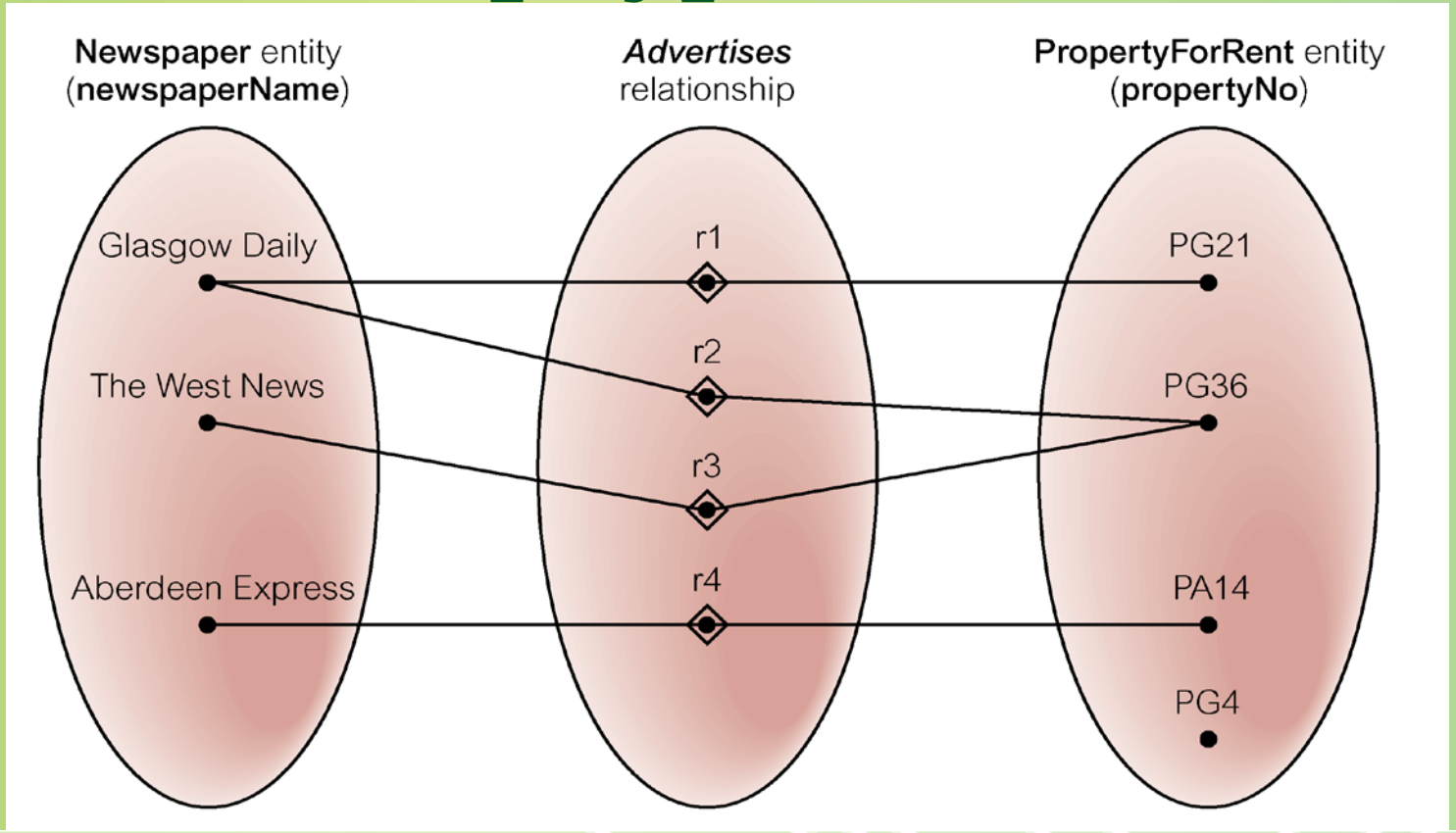
Semantic net of Staff *Oversees* PropertyForRent relationship type



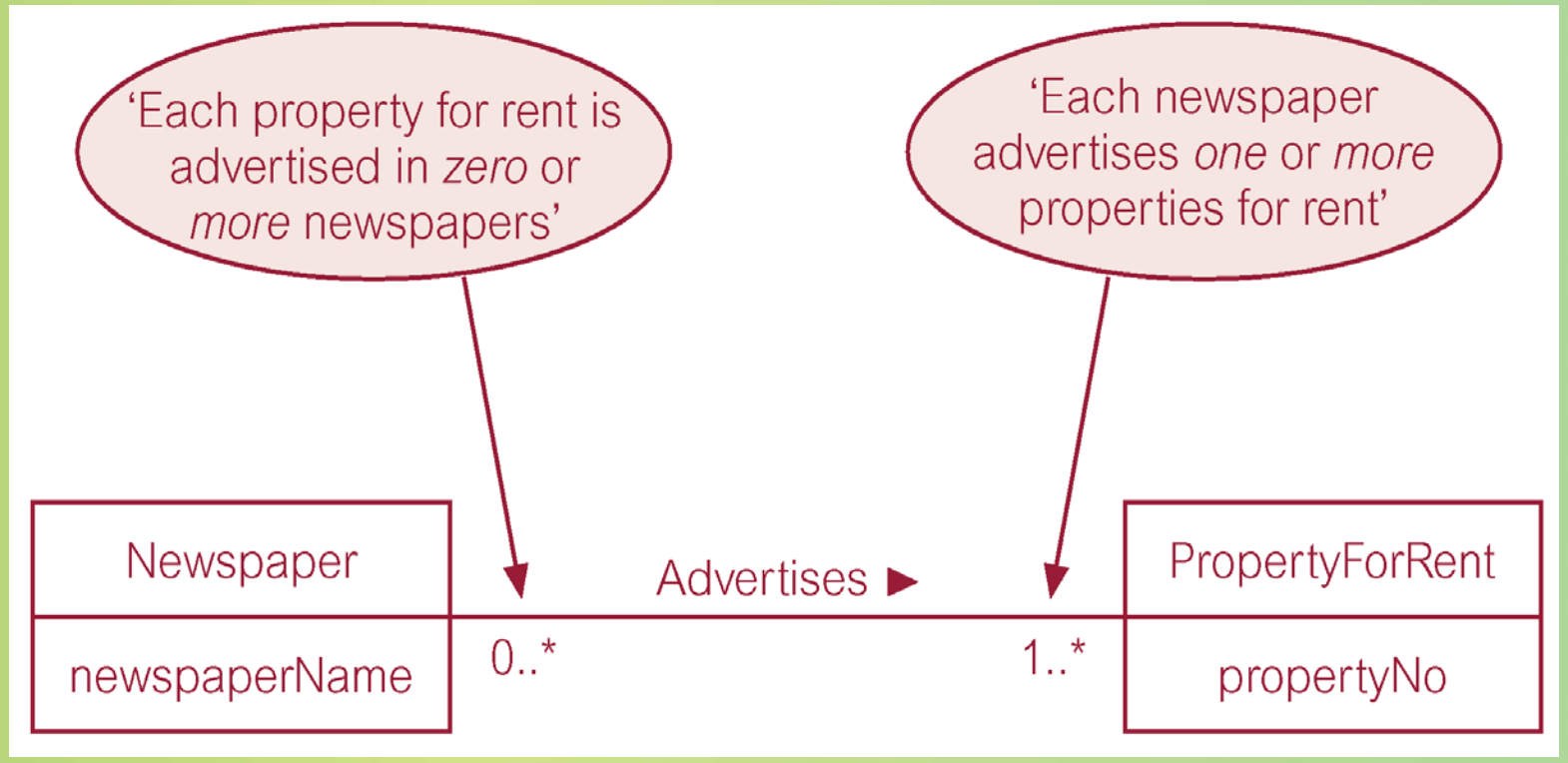
Multiplicity of Staff *Oversees* PropertyForRent (1:*) relationship type



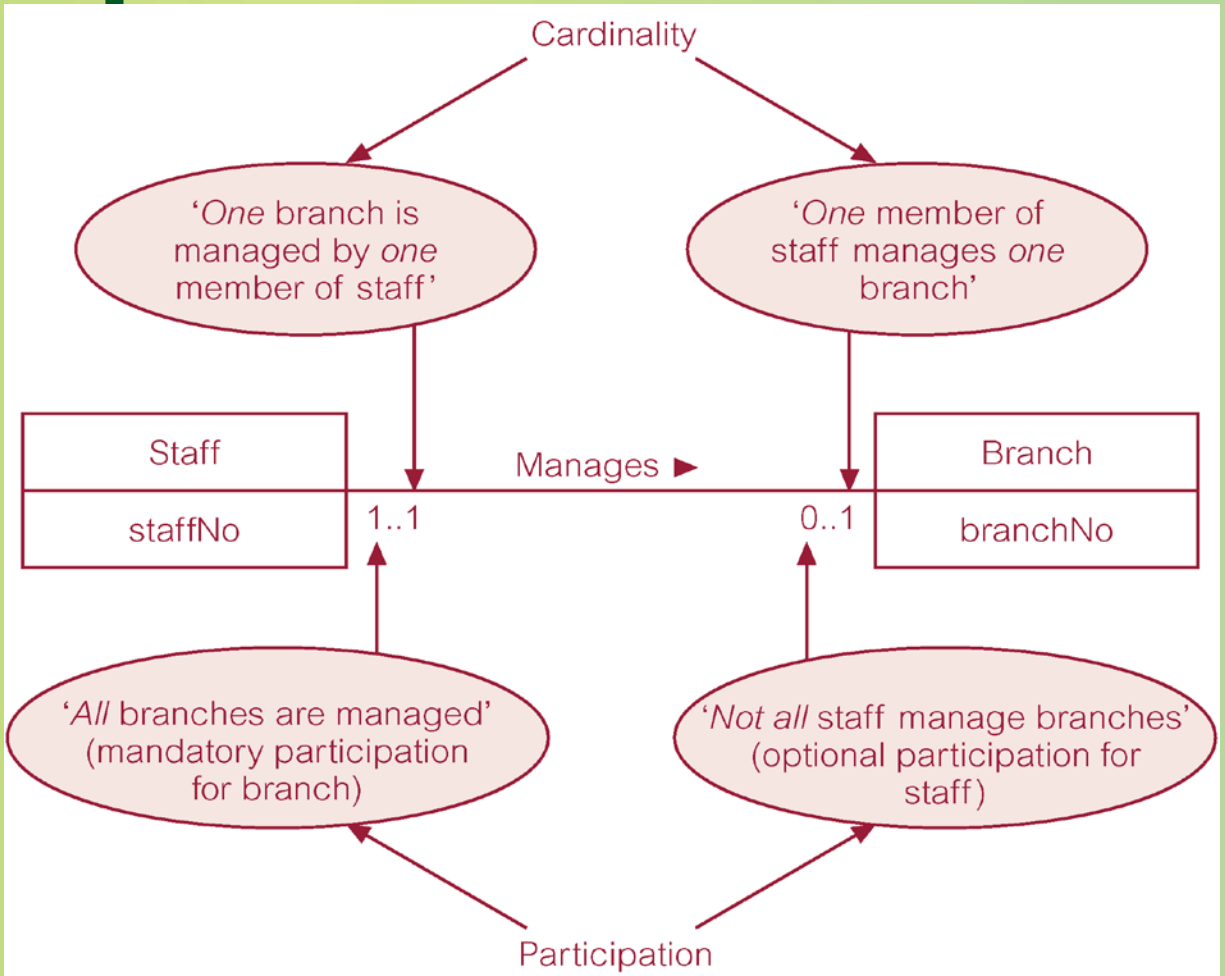
Semantic net of Newspaper *Advertises* PropertyForRent relationship type



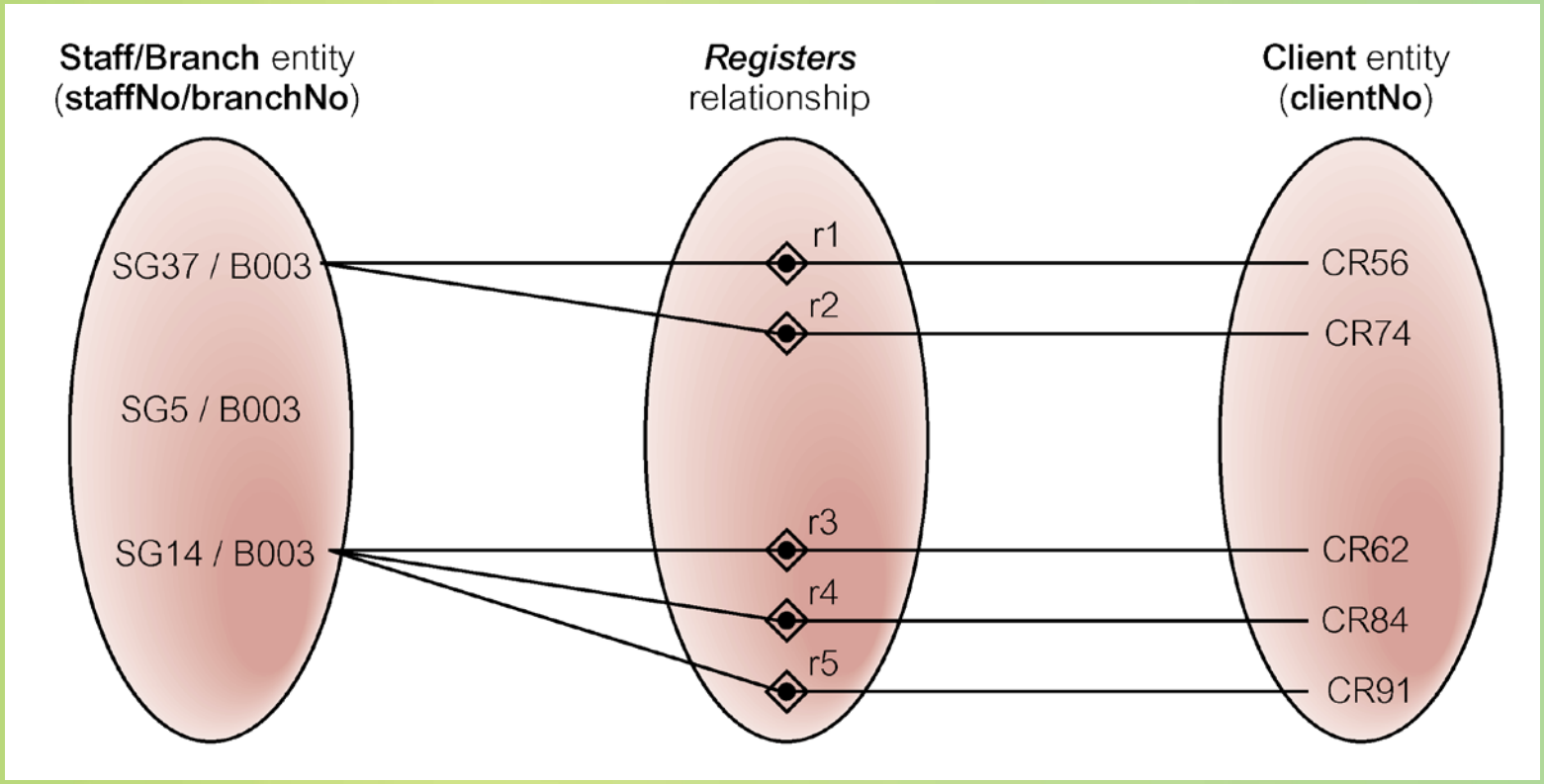
Multiplicity of Newspaper *Advertises* PropertyForRent (*:*) relationship



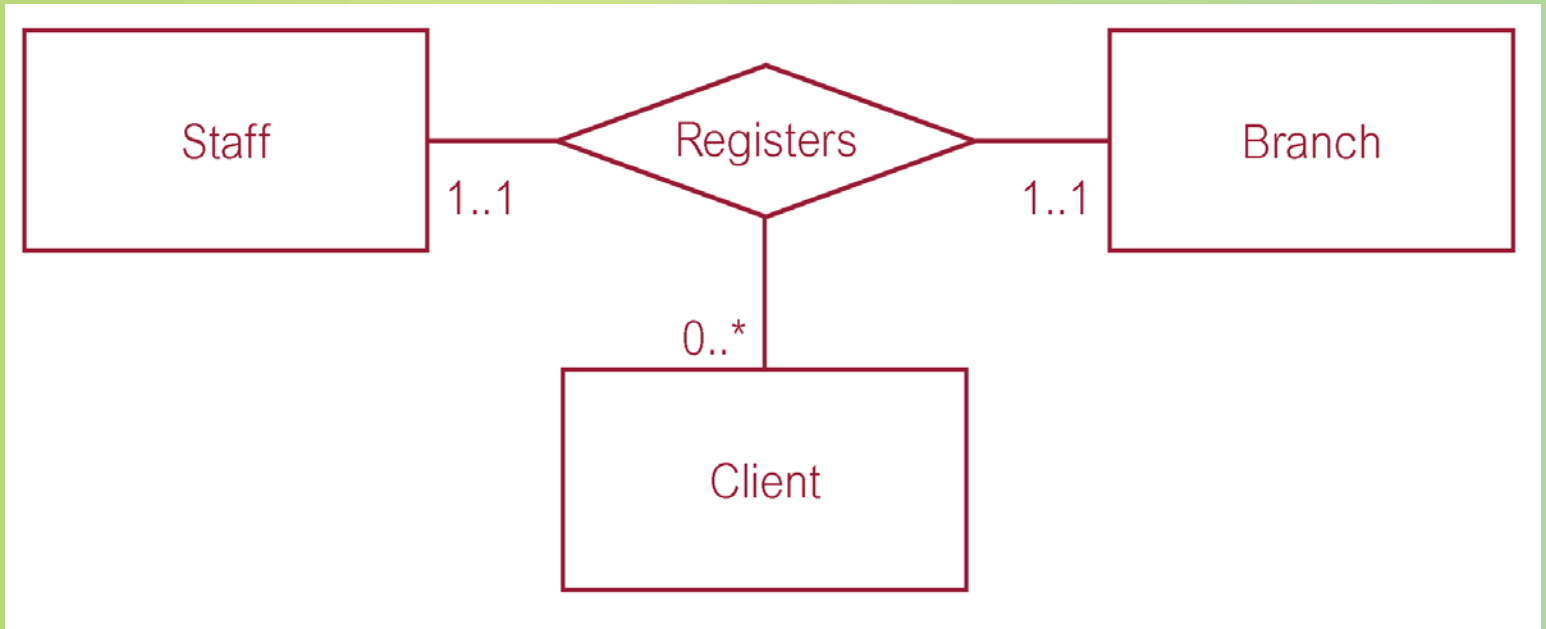
Multiplicity as cardinality and participation constraints



Semantic net of ternary *Registers* relationship with values for Staff and Branch entities fixed

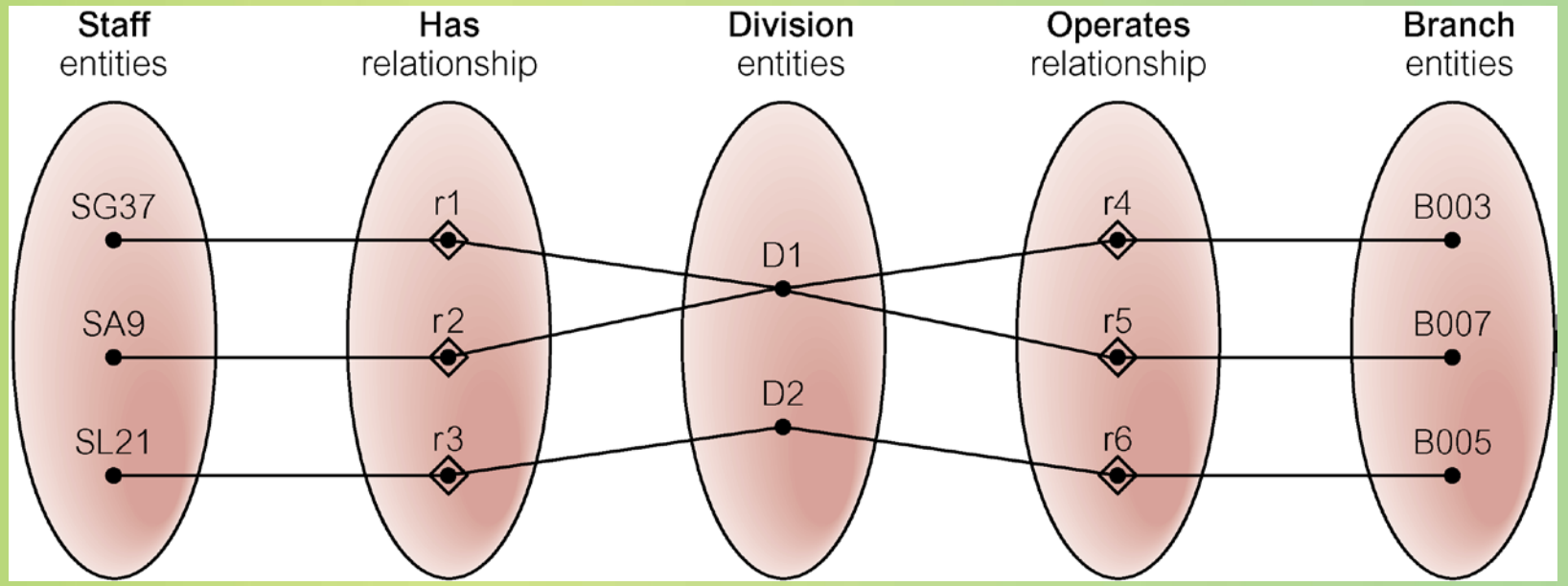


Multiplicity of ternary *Registers* relationship



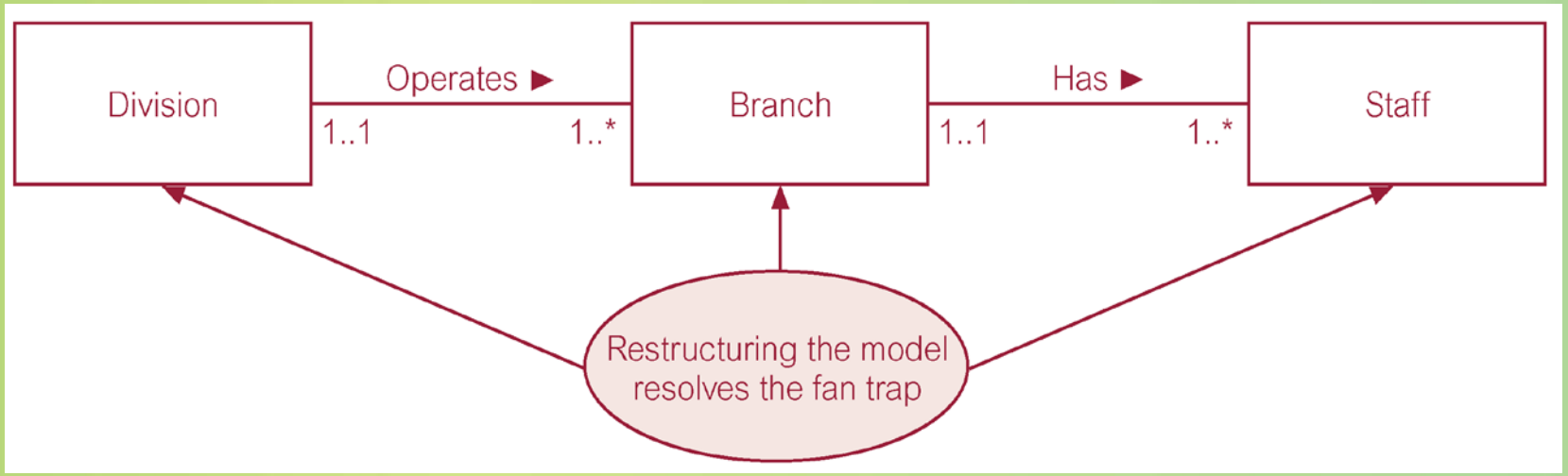
An Example of a Fan Trap

Semantic Net of ER Model with Fan Trap

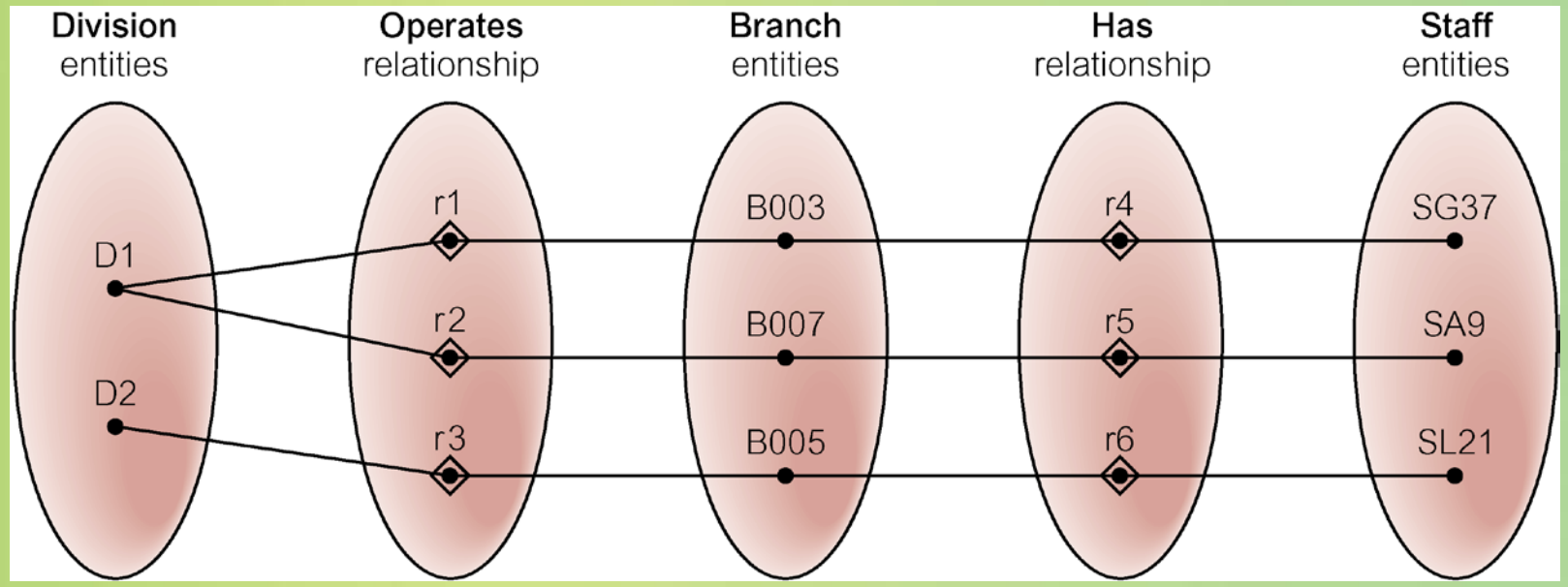


- **At which branch office does staff number SG37 work?**

Restructuring ER model to remove Fan Trap



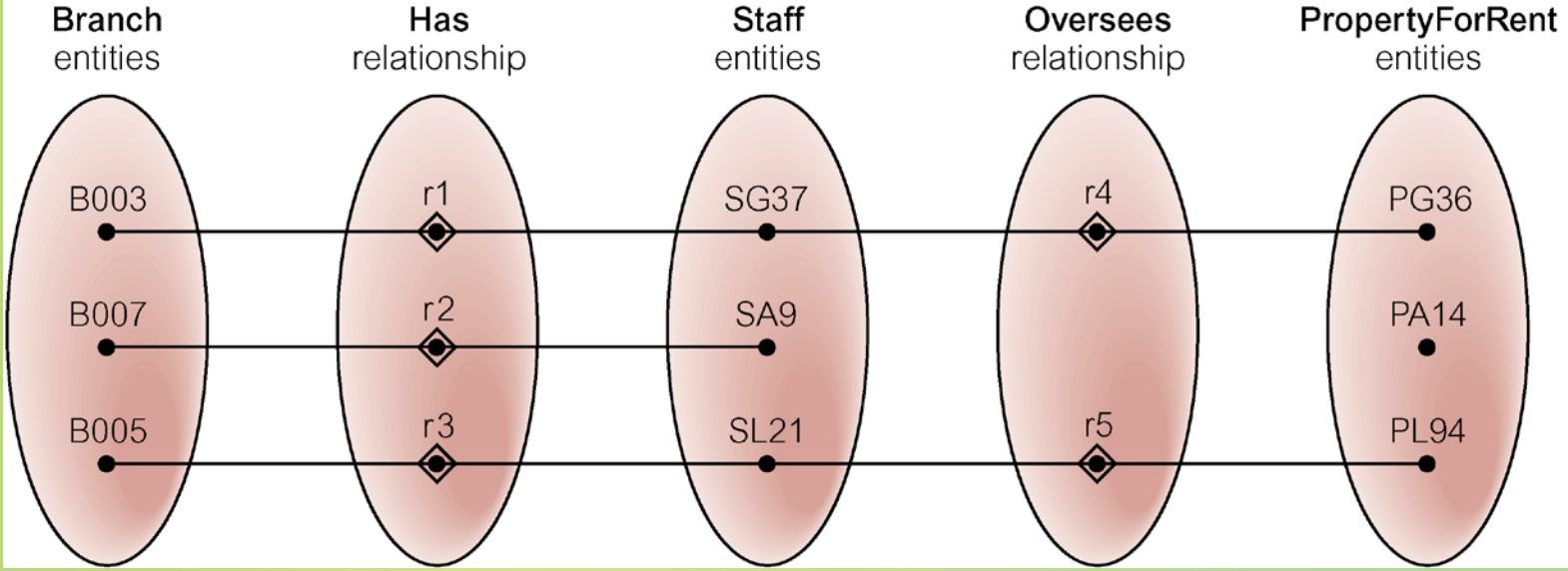
Semantic Net of Restructured ER Model with Fan Trap Removed



- **SG37 works at branch B003.**

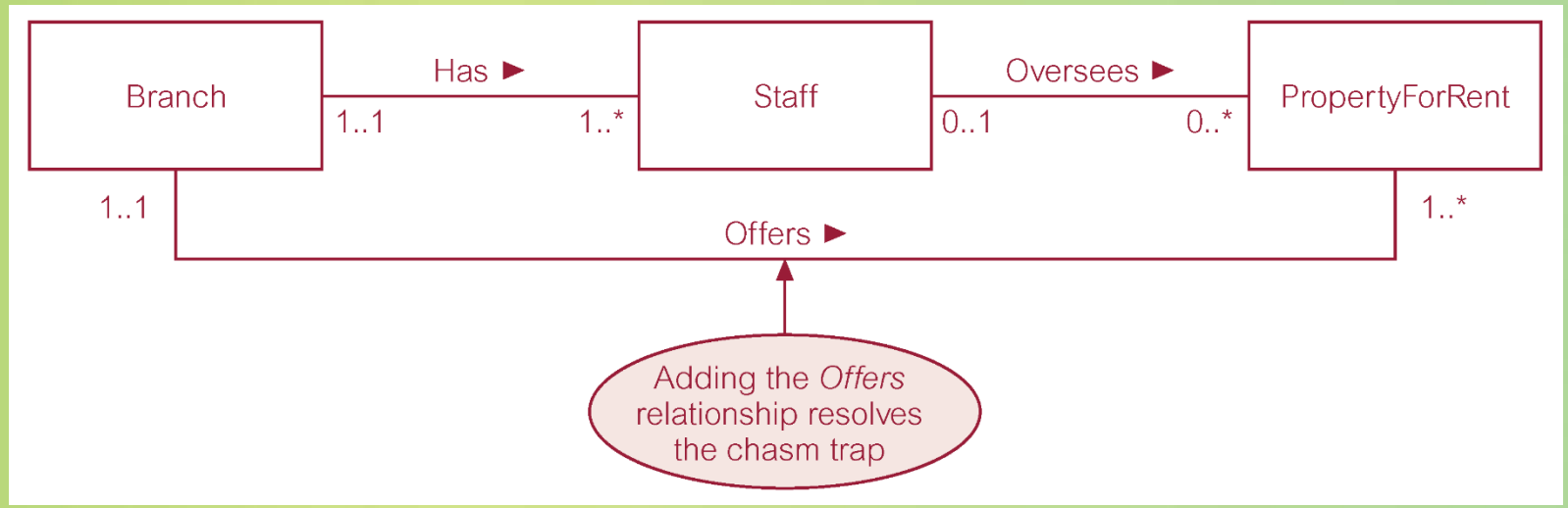
An Example of a Chasm Trap

Semantic Net of ER Model with Chasm Trap

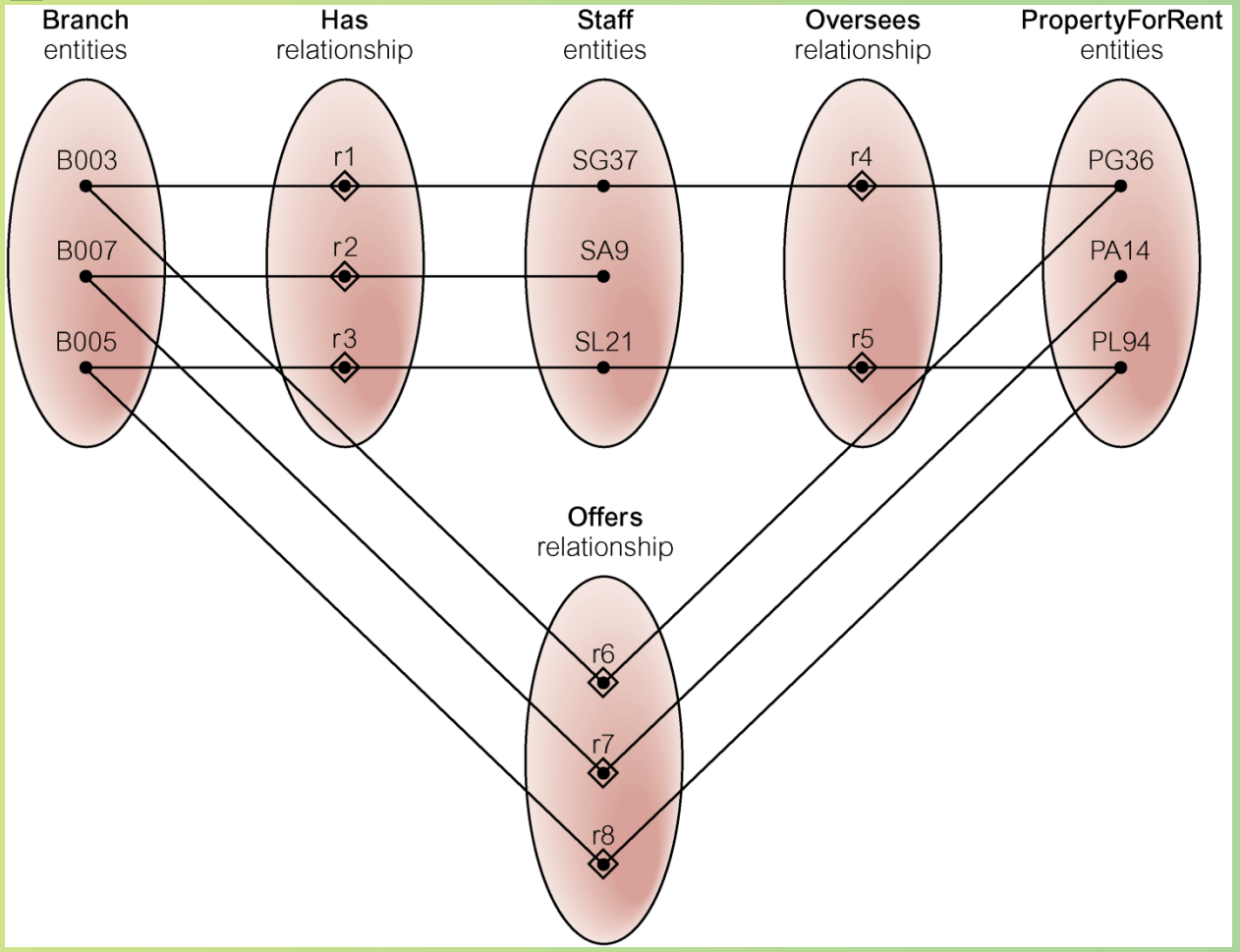


- **At which branch office is property PA14 available?**

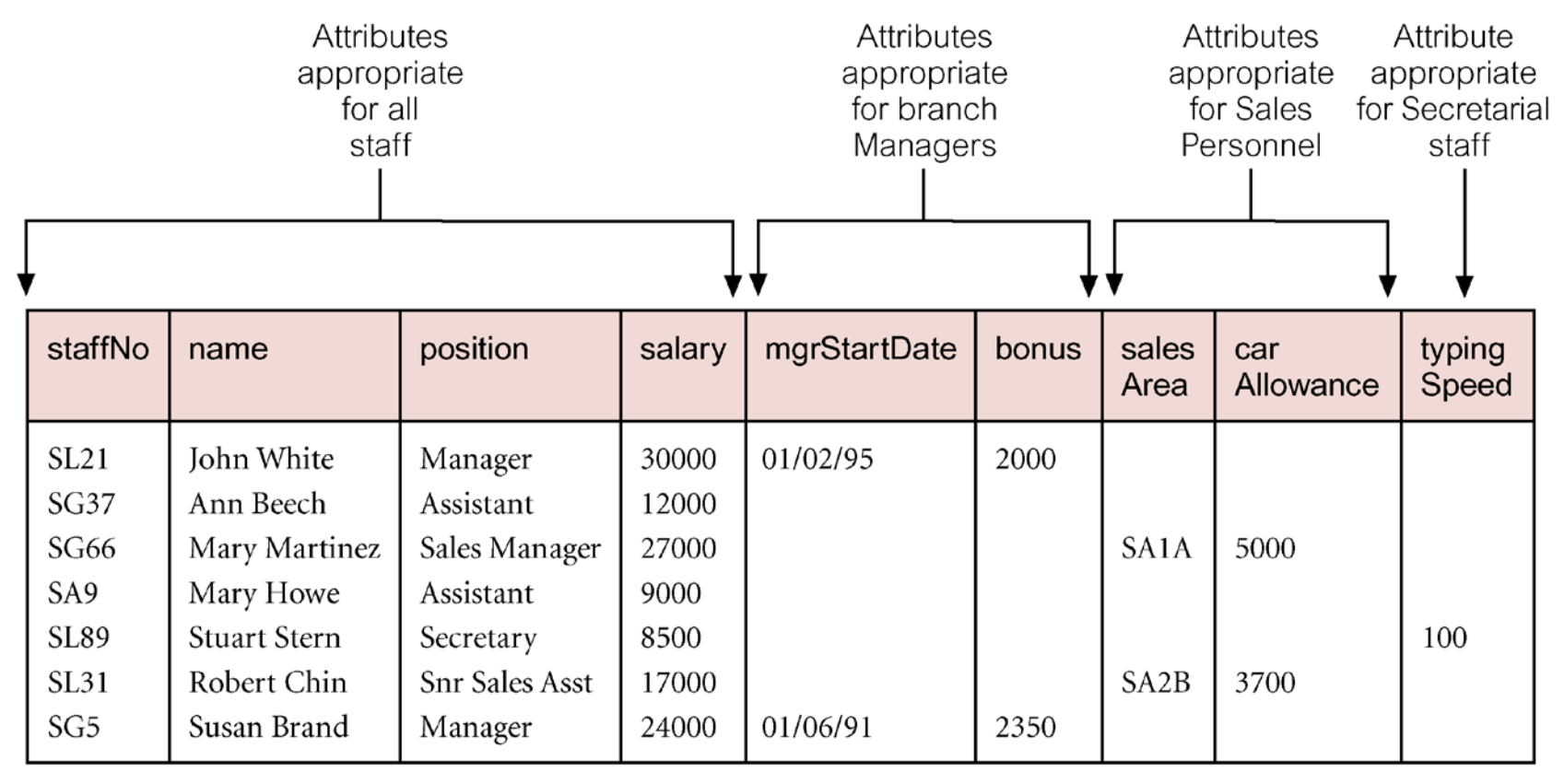
ER Model restructured to remove Chasm Trap



Semantic Net of Restructured ER Model with Chasm Trap Removed

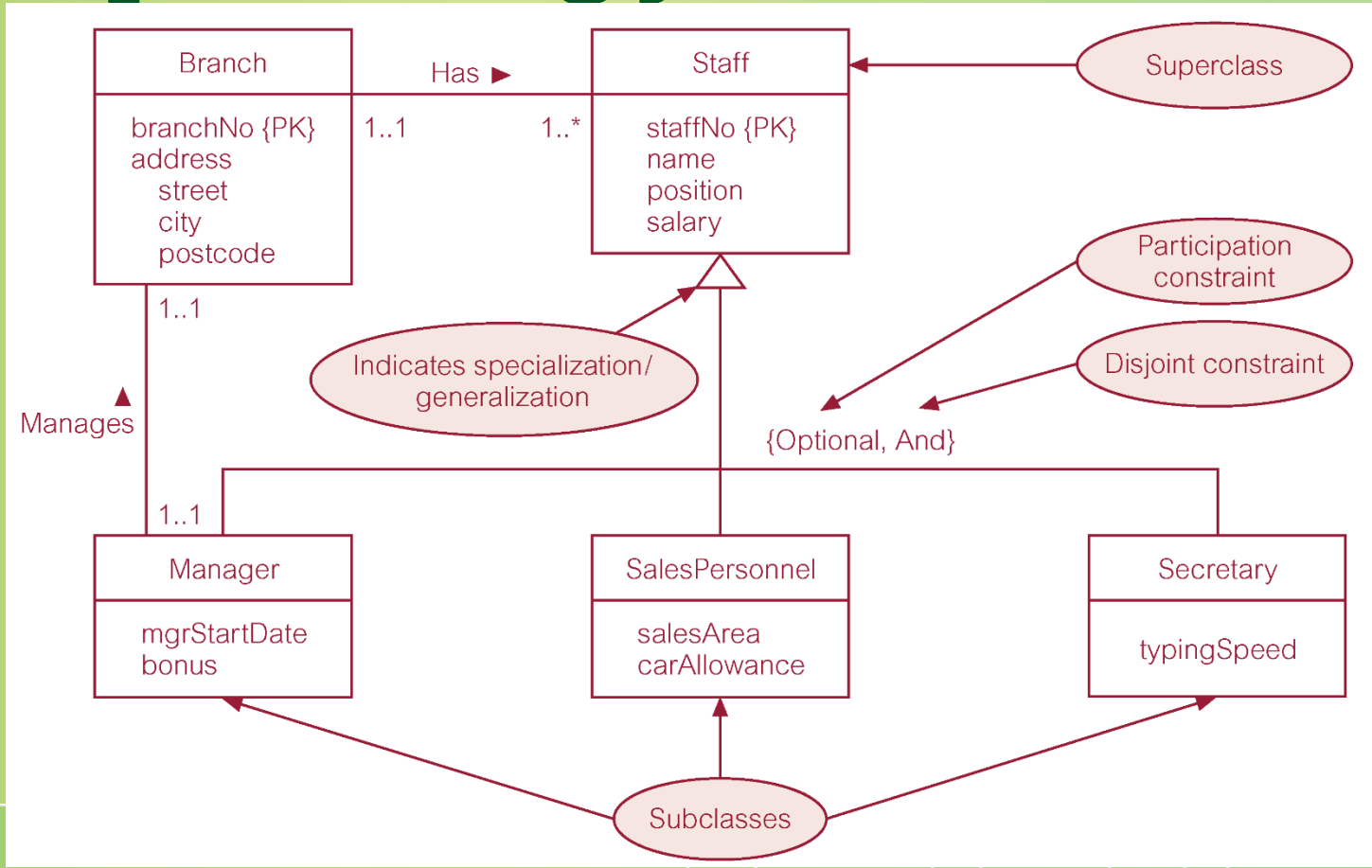


AllStaff relation holding details of all staff

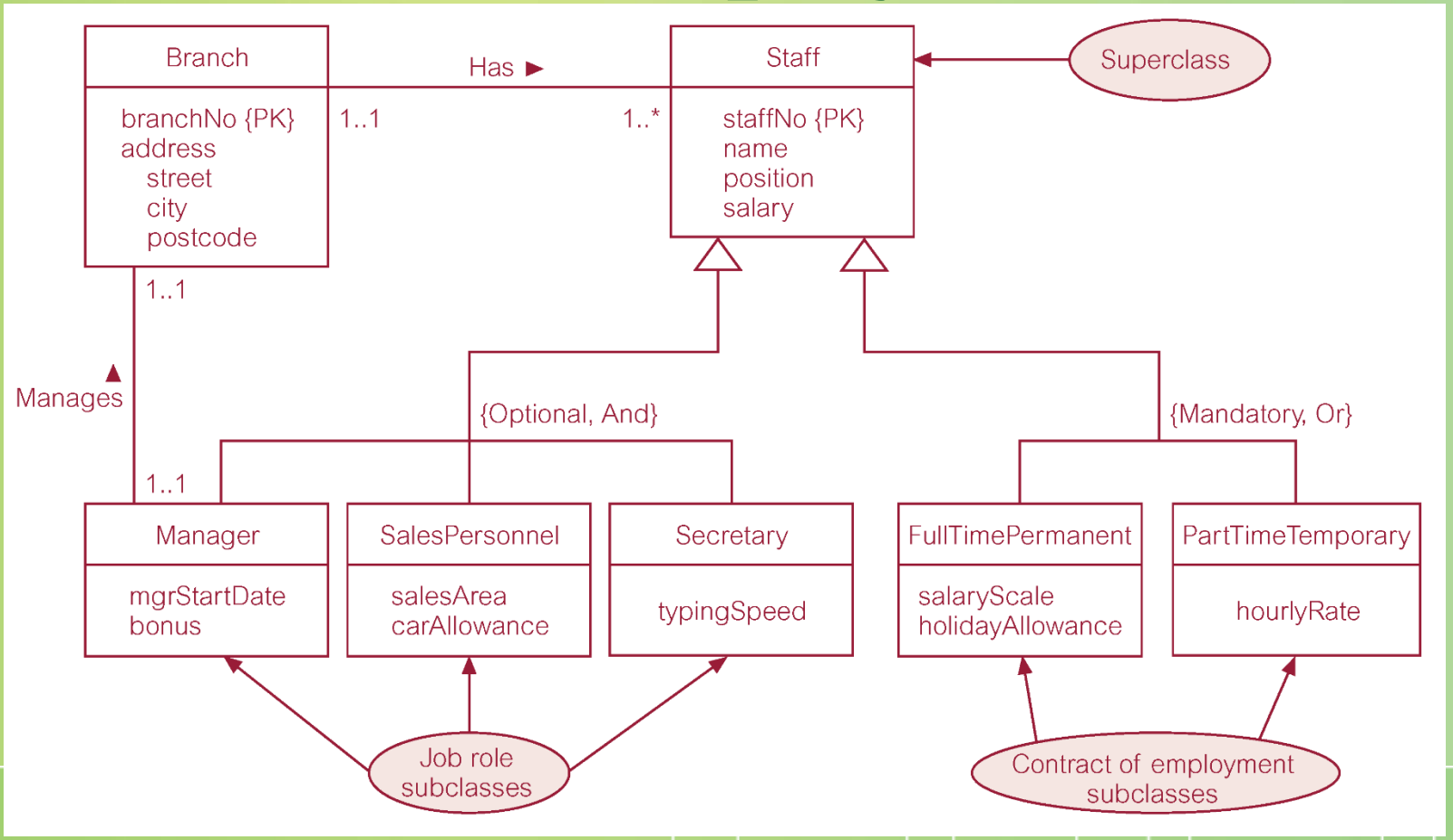


staffNo	name	position	salary	mgrStartDate	bonus	sales Area	car Allowance	typing Speed
SL21	John White	Manager	30000	01/02/95	2000			
SG37	Ann Beech	Assistant	12000					
SG66	Mary Martinez	Sales Manager	27000			SA1A	5000	
SA9	Mary Howe	Assistant	9000					
SL89	Stuart Stern	Secretary	8500					100
SL31	Robert Chin	Snr Sales Asst	17000			SA2B	3700	
SG5	Susan Brand	Manager	24000	01/06/91	2350			

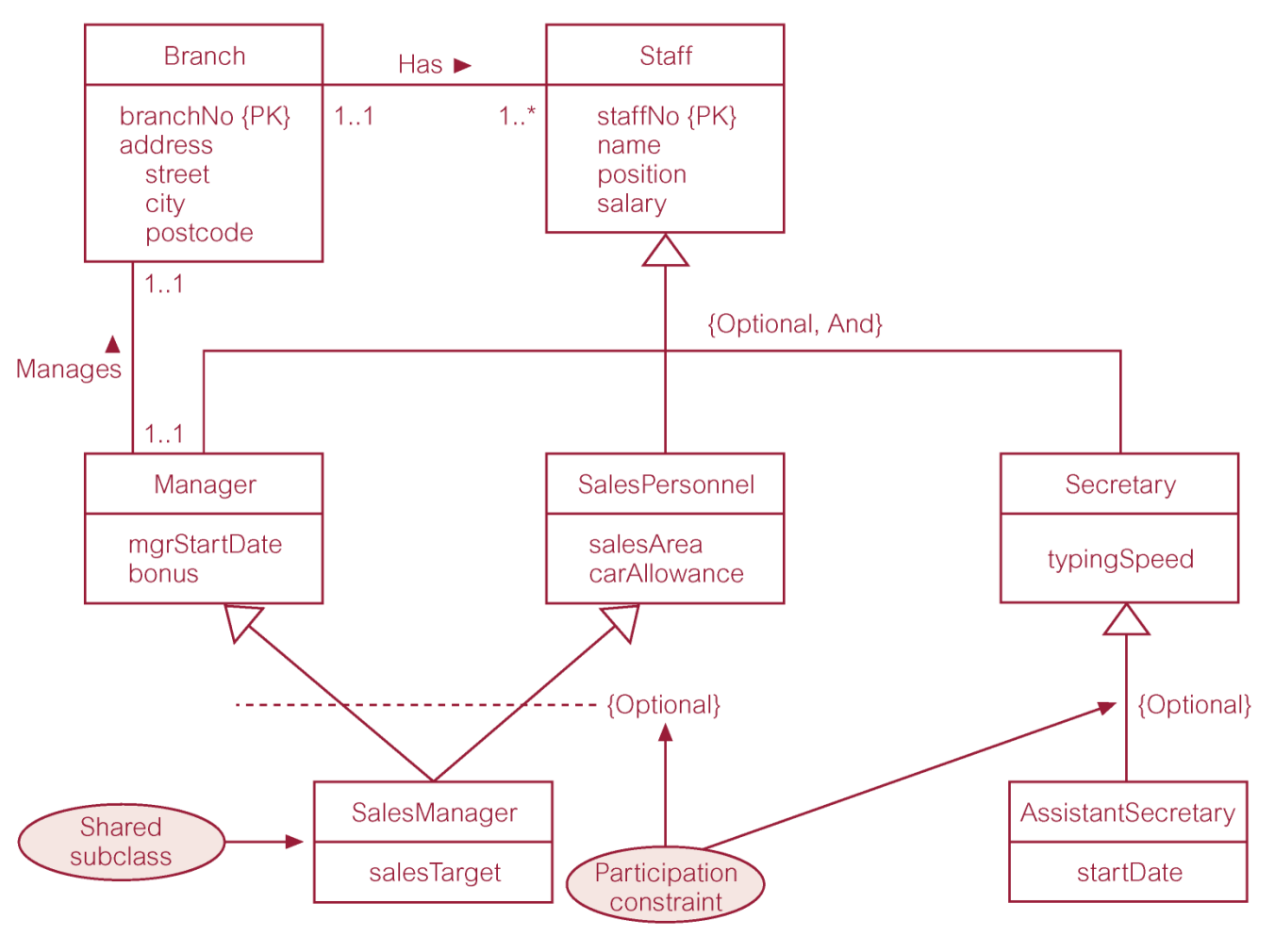
Specialization/generalization of Staff entity into subclasses representing job roles



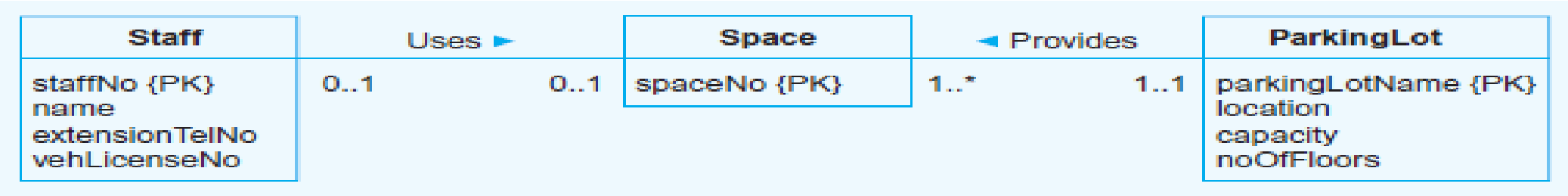
Specialization/generalization of Staff entity into job roles and contracts of employment



EER diagram with shared subclass and subclass with its own subclass



Modeling Exercise 2



- Extend the model above to include the following concepts:
  - *The majority of parking spaces are under cover and each can be allocated for use by a member of staff for a monthly rate.*
  - *Parking spaces that are not under cover are free to use and each can be allocated for use by a member of staff.*
  - *Up to twenty covered parking spaces are available for use by visitors to the company. However, only members of staff are able to book out a space for the day of the visit. There is no charge for this type of booking, but the member of staff must provide the visitor's vehicle license number.*

One solution