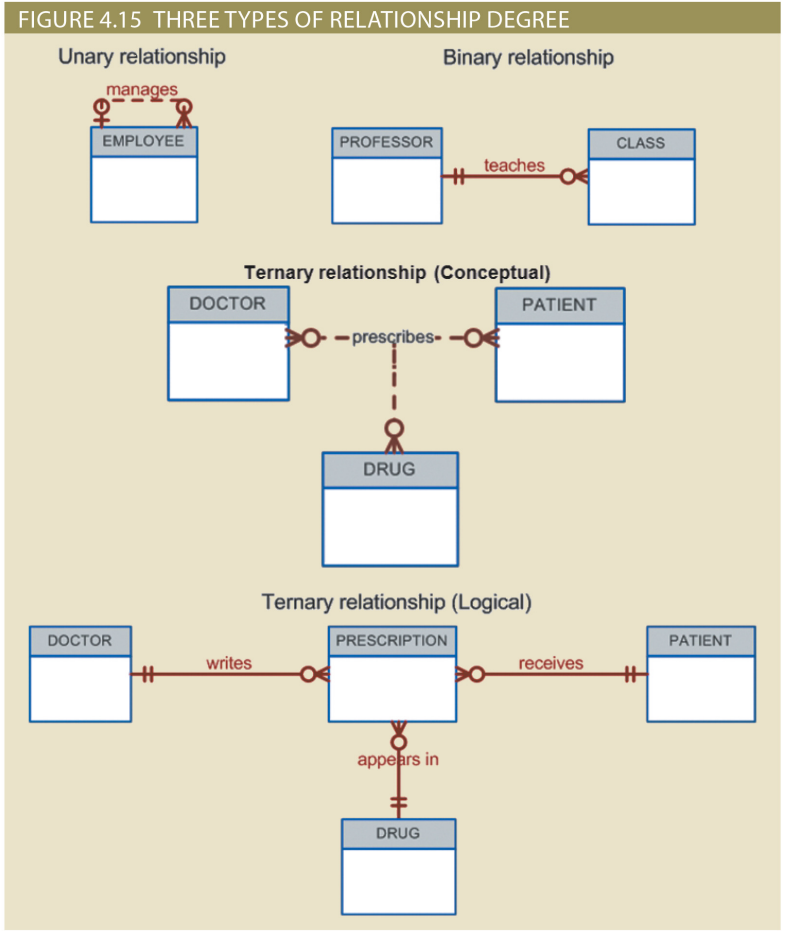
Relationship Degree

Relationship Degree

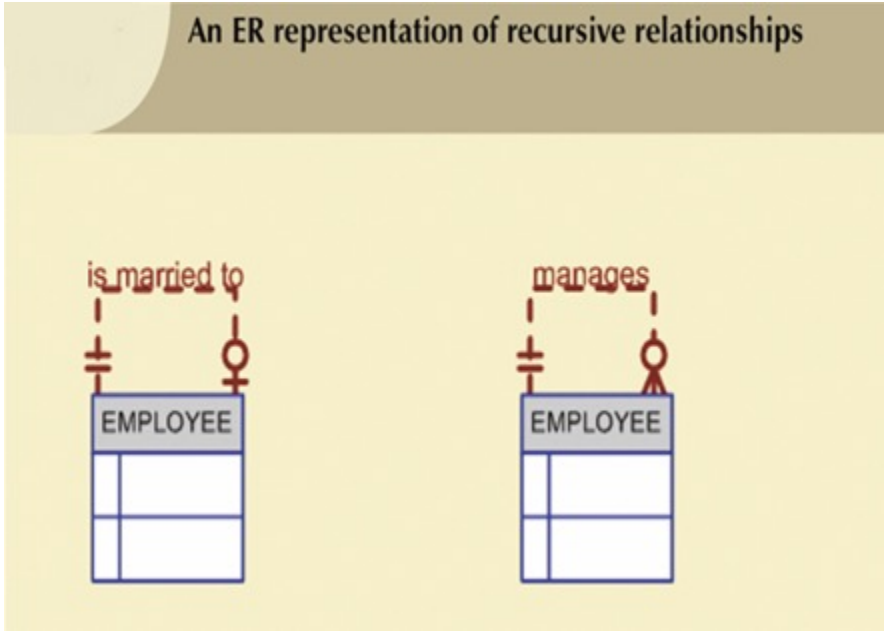
- Indicates number of associated entities or participants
- **Unary relationship**
  - Association is maintained within a single entity
- **Binary relationship**
  - Two entities are associated
- **Ternary relationship**
  - Three entities are associated

Three Types of Relationships



Recursive / Self-referencing Relationships

- Relationship can exist between occurrences of the same entity
- Naturally found within a unary relationship



The 1:1 recursive relationship "EMPLOYEE is married to EMPLOYEE"

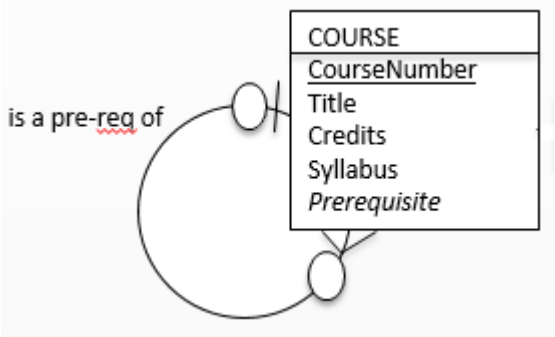
Database name: CH04_PartCo
Table name: EMPLOYEE_V1

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_SPOUSE
345	Ramirez	James	347
346	Jones	Anne	349
347	Ramirez	Louise	345
348	Delaney	Robert	
349	Shapiro	Anton	346

Recursive / Self-referencing Relationships

- **More examples:**
  - An employee may supervise many other employees. An employee may be supervised by only one employee.

- A course may be a pre-requisite of many other courses. A course may have only one pre-requisite.

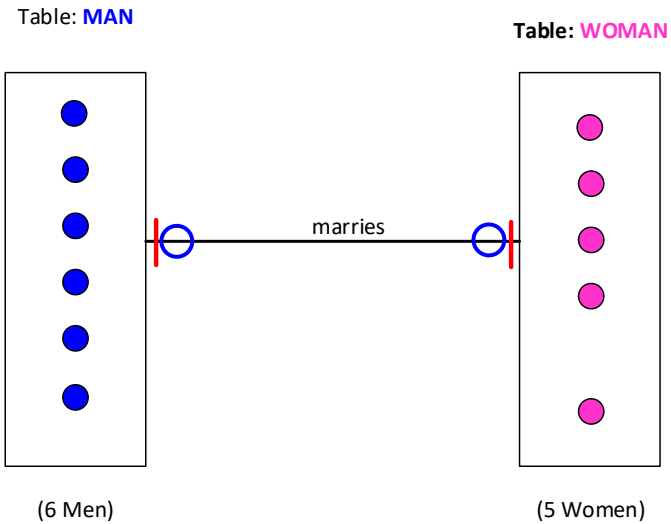


Unary Relationship - More example

ERD example from Week 2

Business rule:

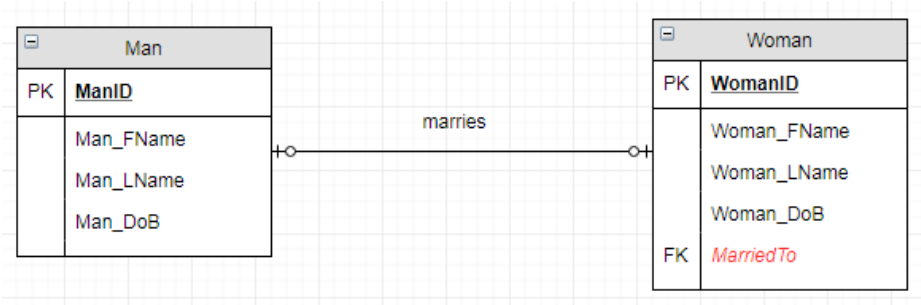
- A man may marry only one woman and
- A woman may marry only one man



Let's see how data could be in database tables

Logical ERD:

- *MarriedTo* foreign key in Woman table holds marriage data



- Let's consider 3 marriages so far happened
- So, two database tables may look like

Man

ManID	Man_FName	Man_LName	Man_DoB
1	John	Patrick	31/12/1970
2	Sachin	Deb	3/05/1972
3	Ramesh	Ram	10/10/1980
4	Mohammad	Emri	12/04/1985
5	Michael	Jackson	11/11/1991
6	Noam	Chomsky	5/05/1995

Woman

WomanID	Woman_FName	Woman_LName	Woman_DoB	*MarriedTo*
11	Angela	Julie	31/12/1975	2
12	Fatima	Nasrin	3/05/1974	NULL
13	Anushka	Debi	10/10/1983	5
14	Mariam	Ahmed	12/04/1995	3
15	Ying	Liu	11/11/1981	NULL

Do we need TWO separate tables?

- First 4 columns are same in both tables, so Man & Woman can be one table!

Man

ManID	Man_FName	Man_LName	Man_DoB
1	John	Patrick	31/12/1970
2	Sachin	Deb	3/05/1972
3	Ramesh	Ram	10/10/1980
4	Mohammad	Emri	12/04/1985
5	Michael	Jackson	11/11/1991
6	Noam	Chomsky	5/05/1995

Woman

WomanID	Woman_FName	Woman_LName	Woman_DoB	*MarriedTo*
11	Angela	Julie	31/12/1975	2
12	Fatima	Nasrin	3/05/1974	NULL
13	Anushka	Debi	10/10/1983	5
14	Mariam	Ahmed	12/04/1995	3
15	Ying	Liu	11/11/1981	NULL

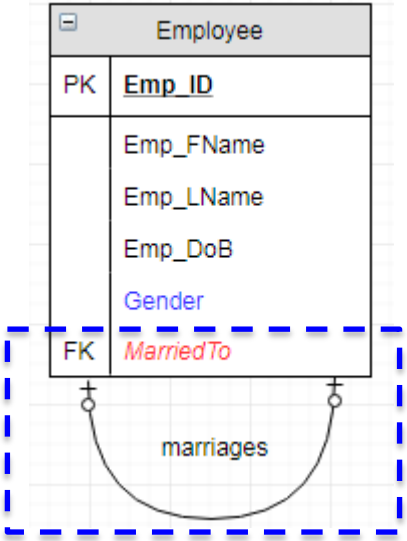
- In practice, in any business we have tables like Staff & Employee
- But not separate tables for Male & Female employees
- If necessary, an attribute Gender can specify male/female/other.

Employee	
PK	Emp_ID
	Emp_FName
	Emp_LName
	Emp_DoB
	Gender

What about if only ONE table is used?

- So, the use of ONE table is practical!
- Marriage can still be shown using the foreign key *MarriedTo*
- Everything else is the same, except use ONE table!
- This is called a UNARY or self-referencing relationship!
- So, the table would look like now:

Employee					
Emp_ID	**Emp_FName**	**Emp_LName**	**Emp_DoB**	**Gender**	***MarriedTo***
1	John	Patrick	31/12/1970	M	NULL
2	Sachin	Deb	3/05/1972	M	11
3	Ramesh	Ram	10/10/1980	M	14
4	Mohammad	Emri	12/04/1985	M	NULL
5	Michael	Jackson	11/11/1991	M	13
6	Noam	Chomsky	5/05/1995	M	NULL
11	Angela	Julie	31/12/1975	F	2
12	Fatima	Nasrin	3/05/1974	F	NULL
13	Anushka	Debi	10/10/1983	F	5
14	Mariam	Ahmed	12/04/1995	F	3
15	Ying	Liu	11/11/1981	F	NULL



Recursive / Self-referencing Relationships

- Relationship can exist between occurrences of the same entity
- Naturally found when an entity has relationship with itself!

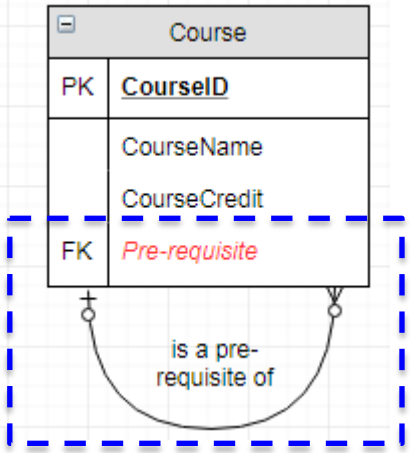
Unary can be recursive!

Business rules:

- A course may be a pre-requisite of many other courses.
- A course may have only one pre-requisite.

Course			
CourseID	**CourseName**	**CourseCredit**	***Pre-requisite***
1008ICT	Business Informatics	10	NULL
1803ICT	Foundation of Information Systems	10	NULL
2806ICT	IT Services Management	10	1803ICT
1804ICT	Data Management	10	1803ICT
3809ICT	Advanced Database	10	1804ICT
3222ICT	Business Analytics	20	2806ICT

- Students can take courses in orders like:
  - 1008ICT
  - 1803ICT
  - 1803ICT > 2806ICT > 3222ICT
  - 1803ICT > 1804ICT > 3809ICT



Thank you