

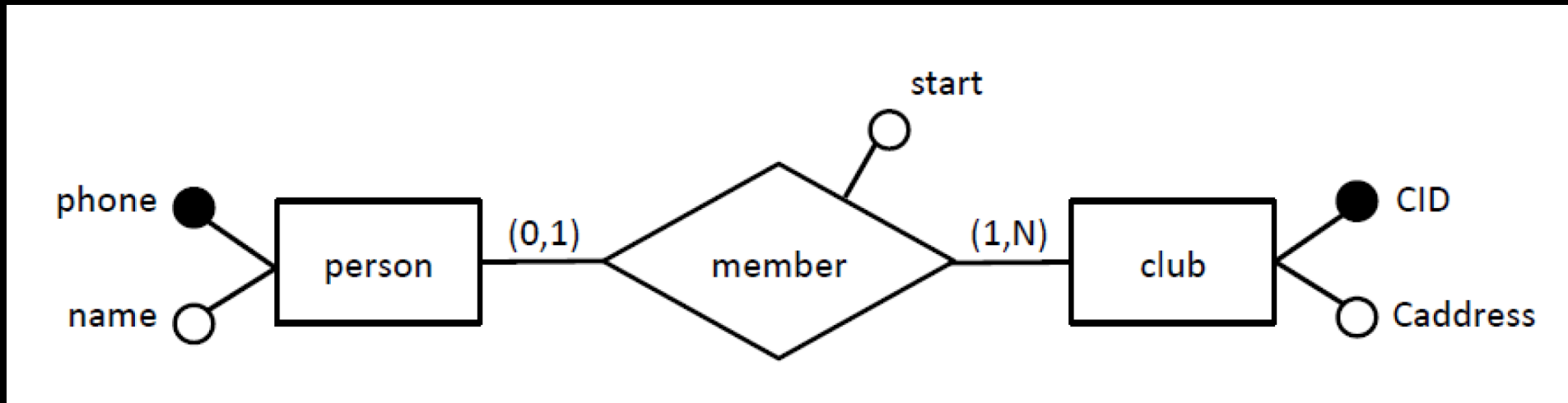
CSCC43 Tutorial #6

Entity-Relationship Diagrams

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Part 1: Understand an ER Diagram

1. Consider the following ER Diagram:



Note: We can have people that are not a member of any club. An entry in member represents a person's membership to one club. A person can only be a member of at most one club. Clubs must have at least one person.

Part 1: Understand an ER Diagram

Note: We can have people that are not a member of any club. An entry in member represents a person's membership to one club. A person can only be a member of at most one club. Clubs must have at least one person.

What does this tell you about |club| compared to |member|?

|member| \geq |club|

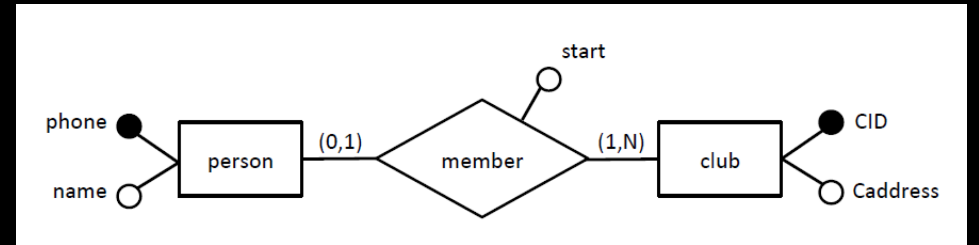
What does this tell you about |member| compared to |person|?

|person| \geq |member|

Therefore, |person| \geq |member| \geq |club|

Part 1: Understand an ER Diagram

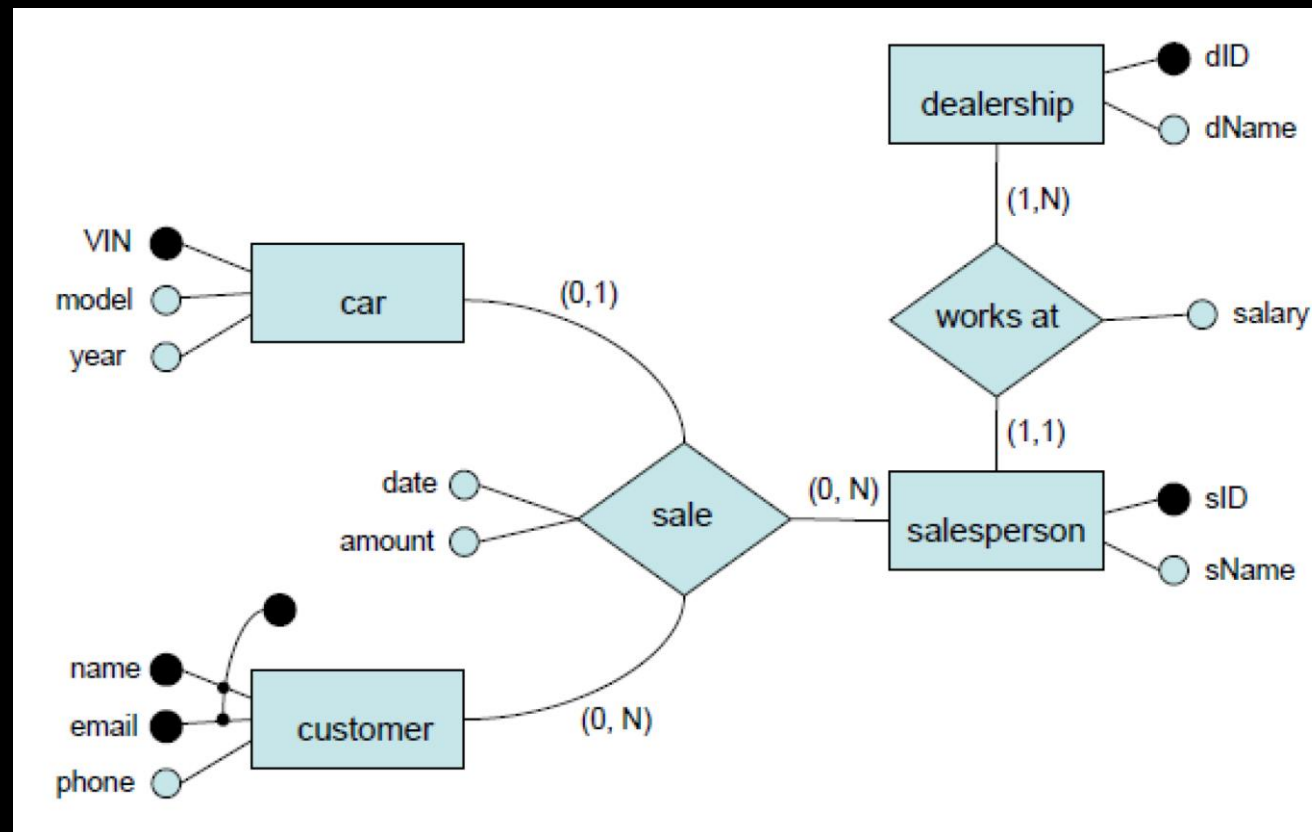
Which of these cardinalities is possible?



person	member	club	Is it possible?
5	0	8	Yes <u>No</u>
5	7	8	Yes <u>No</u>
5	0	5	Yes <u>No</u>
5	10	5	Yes <u>No</u>
11	3	4	Yes <u>No</u>
11	9	4	<u>Yes</u> No

Part 1: Understand an ER Diagram

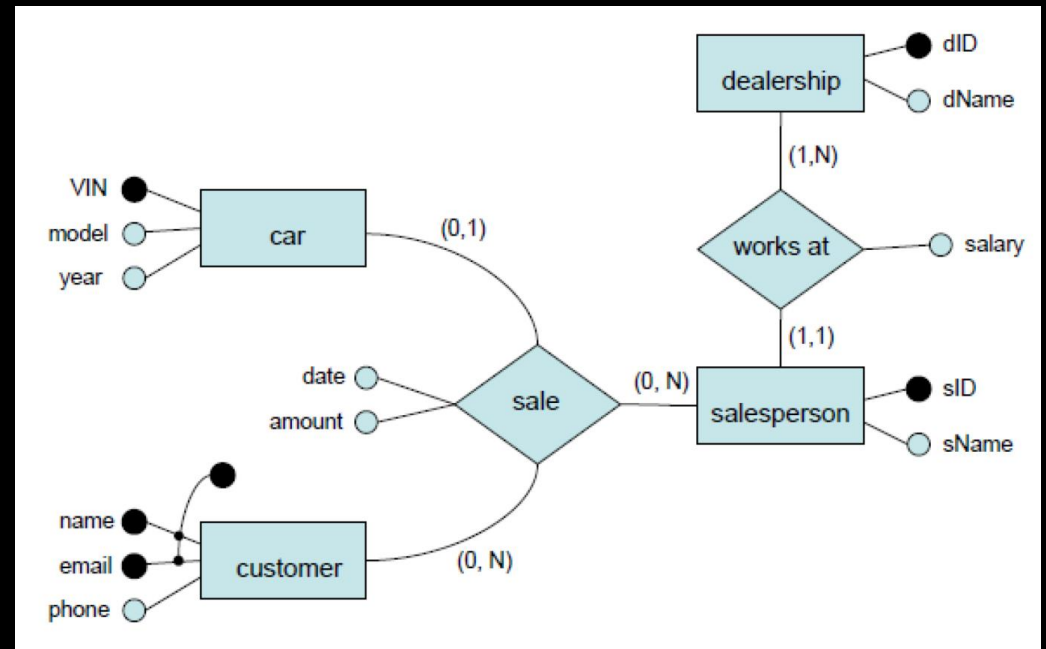
2. Below is an Entity-Relationship diagram about car dealerships. It may or may not represent the domain well. Answer the following questions.



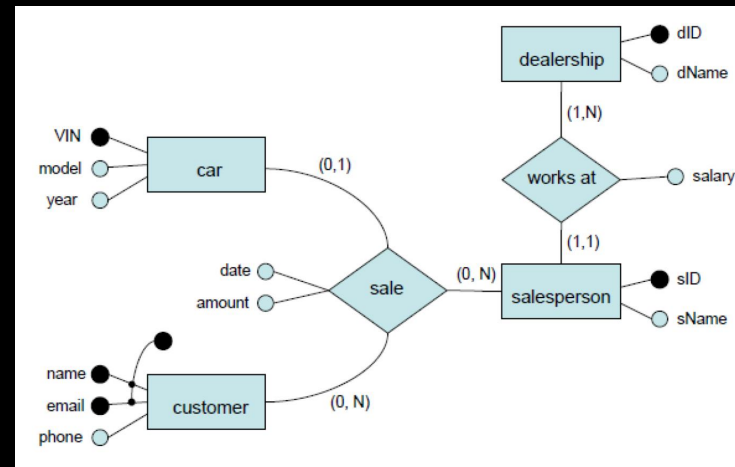
Part 1: Understand an ER Diagram

Note:

- The Sale relation relates cars, customers, and salespersons.
- We can have cars that are not sold (cars can only be in at most one sale).
- We can also have customers that have not bought a car (customers could have bought many cars).
- We can also have salespersons who have not sold any cars (but could have also sold many cars).
- A salesperson must work at exactly one dealership.
- Dealerships must have at least one salesperson.



Part 1: Understand an ER Diagram



Question	Answer
A car sale cannot involve more than one salesperson	<u>True</u> False
There can be two cars with the same VIN as long as the model and year are different	True <u>False</u>
A salesperson can work at any number of dealerships	True <u>False</u>
There cannot be more salespeople than dealerships	True <u>False</u>
There can be multiple sales on the same date	<u>True</u> False
Two salespeople can have the same sID as long as they work at different dealerships	True <u>False</u>
This model contains a weak entity set	True <u>False</u>
The works at relationship is a one-to-many relationship	<u>True</u> False

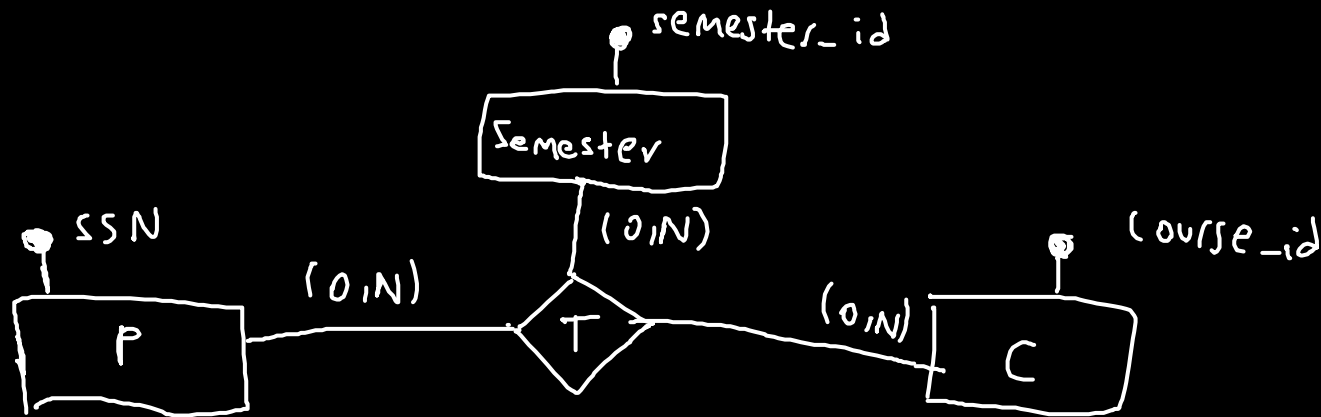
Part 2: Draw an ER Diagram

A university database contains information about professors (identified by social security number, or SSN) and courses (identified by `course_id`). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation, draw an ER diagram that describes it (assuming no further constraints hold).

P = Professor
C = Course
T = Teaches

Part 2: Draw an ER Diagram

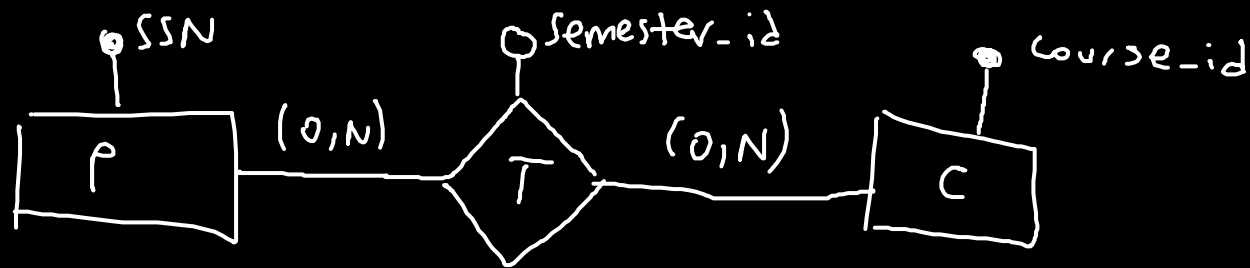
1. Professors can teach the same course in several semesters, and each offering must be recorded.



P = Professor
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Part 2: Draw an ER Diagram

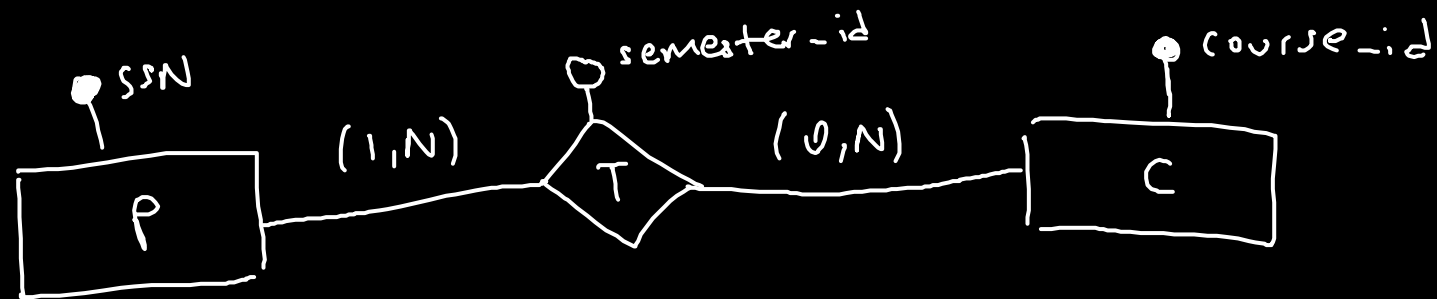
2. Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded (assume this condition applies in all subsequent questions).



P = Professor
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Part 2: Draw an ER Diagram

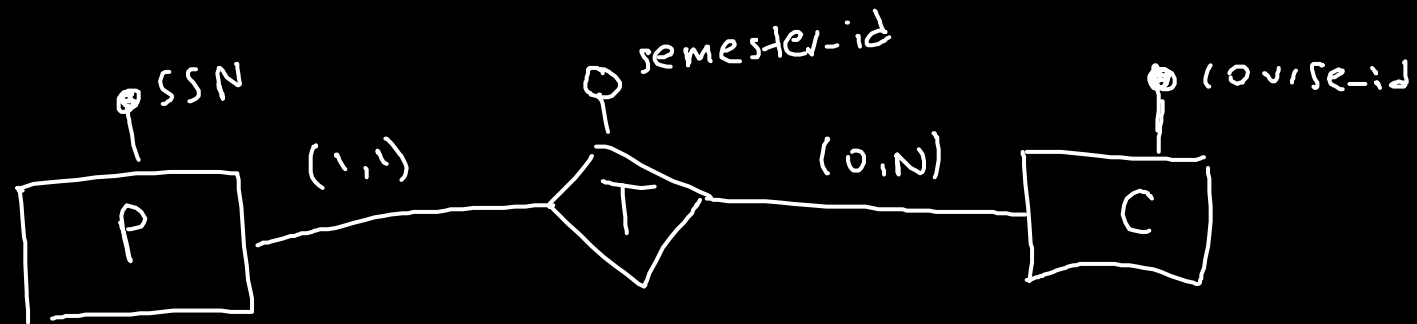
3. Every professor must teach some course.



P = Professor
C = Course
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Part 2: Draw an ER Diagram

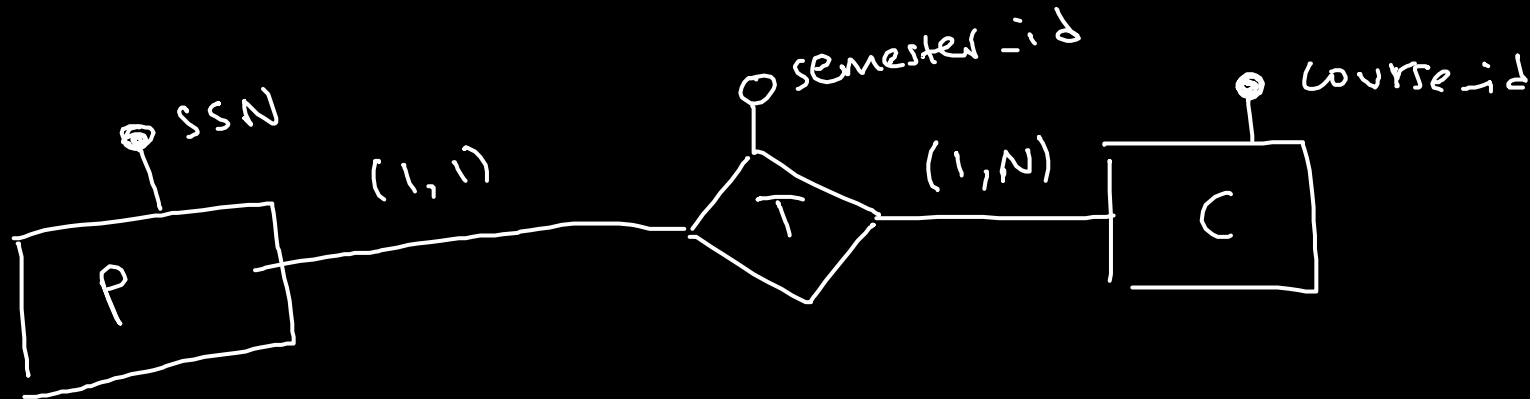
4. Every professor teaches exactly one course (no more, no less).



P = Professor
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Part 2: Draw an ER Diagram

5. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.



P = Professor
C = Course
T = Teaches

Part 2: Draw an ER Diagram

6. Now suppose that certain courses can be taught by a team of professors jointly, but it is possible that a specific team of professors do not teach a course. Model this situation, introducing additional entity sets and relationship sets if necessary.

