Superkeys, Candidate Keys, Primary key

CAR

License_number	Engine_serial_number	Make	Model	Year
Texas ABC-739	A69352	Ford	Mustang	02
Florida TVP-347	B43696	Oldsmobile	Cutlass	05
New York MPO-22	X83554	Oldsmobile	Delta	01
California 432-TFY	C43742	Mercedes	190-D	99
California RSK-629	Y82935	Toyota	Camry	04
Texas RSK-629	U028365	Jaguar	XJS	04

Let's identify superkeys and candidate keys

Let's assume (generally speaking, it is reasonable to say that …):
* license number is unique in cars
* engine serial number is unique in cars

Then, any combination of the attributes that includes any of the two attrs will be superkeys

The combinations such as "Make+Model+Year" … should not be considered a superkey, because it may be true in this particular example of 6 cars … but it won't be true if the table is extended with more entities

Candidate keys are license_number and engine_serial_number. You can make either of them to be the primary key

Exercise 2: Relationship Semantics

Describe precisely the scenarios implied by the following relationships:

Many to One ... optional/partial between "lecturer and teaches", mandatory/full between "course and teaches"

Some lecturers teach one course. Every course must be taught by one or more lecturers.

Many to Many ... mandatory/full between "lecturer and teaches", mandatory/full between "course and teaches"

All lecturers teach one of more courses; all courses are taught by one of more lecturers

One to One ... optional/partial between "lecturer and teaches", mandatory/full between "course and teaches"

Some lecturers teach one course; Not every lecturer teaches a course, when they teach a course, they teach one course; A course must be taught by one lecturer;

Some of the common words you could use to describe these different relationship semantics are:

* some – partial participation (e.g., some lecturers teach a course.)
* all/every/each – total participation ... but be careful when choosing a word ...
NOTE: hoep you can notice that written words could be more confusing than the ER notations ...!!!

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Exercise: Write down some facts expressed in this ER

Figure 3.15
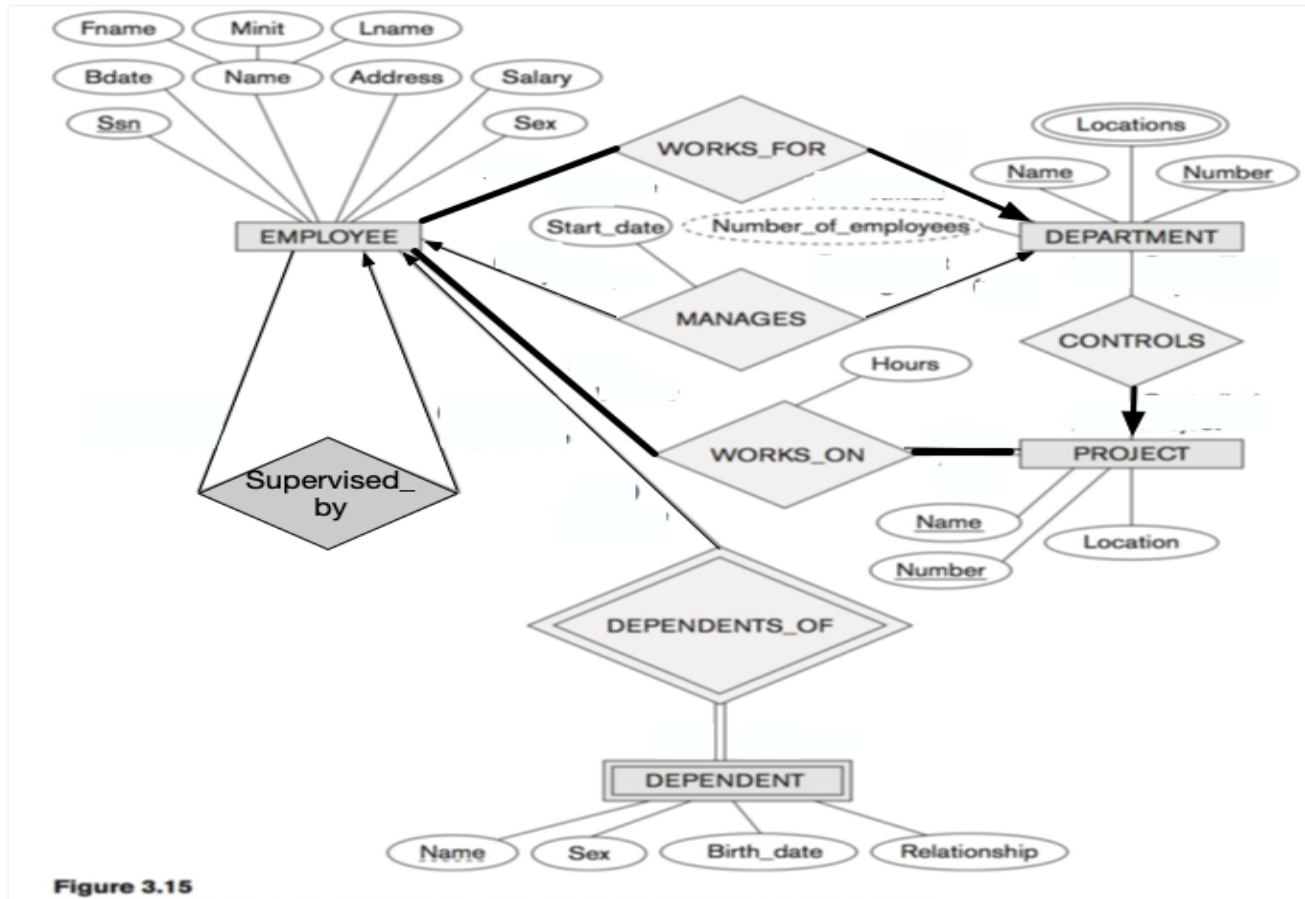
Similar exercise to the previous one … There are many facts that can be expressed in writing based on this. I will leave them up to you. ☺

Exercise: ER diagram

Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):

- the NHL has many teams,
- each team has a name, a city, a coach, a captain, and a set of players,
- each player belongs to only one team,
- each player has a name, a position (such as left wing or goalie), a skill level, and
- a set of injury records,
- a team captain is also a player,
- a game is played between two teams (referred to as host_team and guest_team)
- and has a date (such as May 11th, 1999) and a score (such as 4 to 2).

Construct a clean and concise ER diagram for the NHL database.

Exercise: ER diagram

(i.e., every player must belong to a team; a team must have one or more players)

Suggested answer

Answer :

Exercise: Subclasses in the University

- Every person has a name and an address. A person is uniquely identified by their name.

- At a university, there are two groups of persons, employees and students. Every employee receives a salary, while every student pays a fee.

- Among the employees, there is research and teaching staff. An employee can belong to both groups.

- Among the teaching staff, there are lecturers and tutors. A tutor works for several courses.

- Every student is either a postgraduate student or an undergraduate student.

- A postgraduate student has a thesis title, on which he/she is working.

- Every undergraduate student is working on a project.

- Every undergraduate student is supervised by a member of the teaching staff.

Exercise: Subclasses