

**Department of Computer Science and Engineering
National Institute of Technology Calicut
E-R Design Model**

Notations:

Figure 3.14
Summary of the notation for ER diagrams.

Symbol	Meaning
	Entity
	Weak Entity
	Relationship
	Identifying Relationship
	Attribute
	Key Attribute
	Multivalued Attribute
	Composite Attribute
	Derived Attribute
	Total Participation of E_2 in R
	Cardinality Ratio 1:N for $E_1:E_2$ in R
	Structural Constraint (min, max) on Participation of E in R

Example :01

Suppose you are given the following requirements for a simple database for the Kerala Football League (KFL):

- The KFL 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, a skill level (Individual records), 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 and a score.

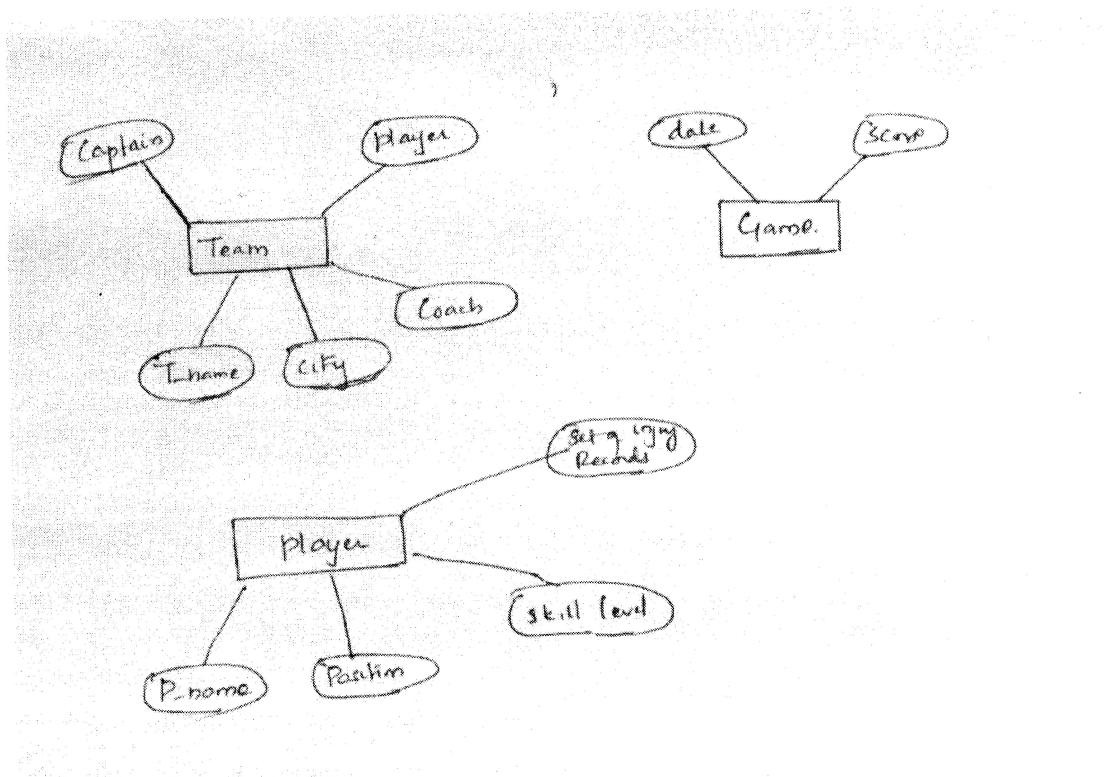
Construct a clean and concise ER diagram for the Kerala Football League database using the notations in your textbook. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.

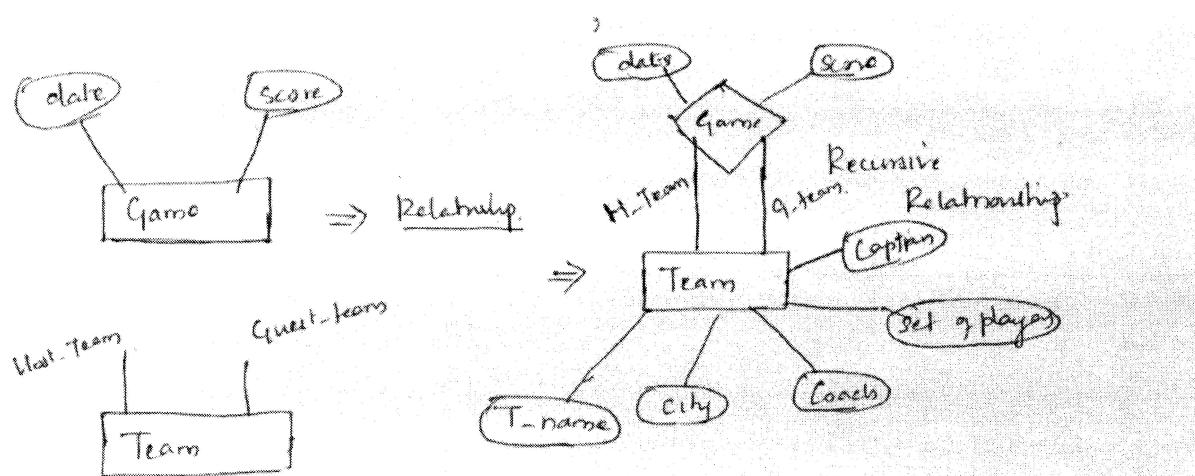
(i) Entities identified correctly

Team- {T_name, city, Coach, captain, set of players}

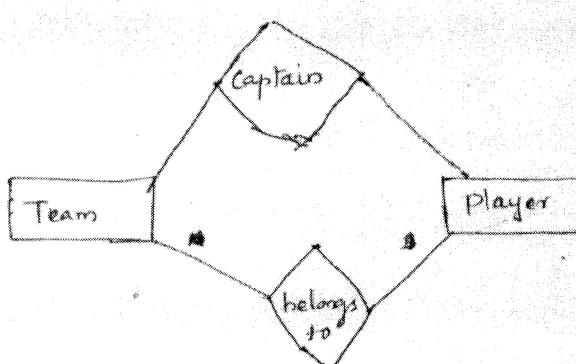
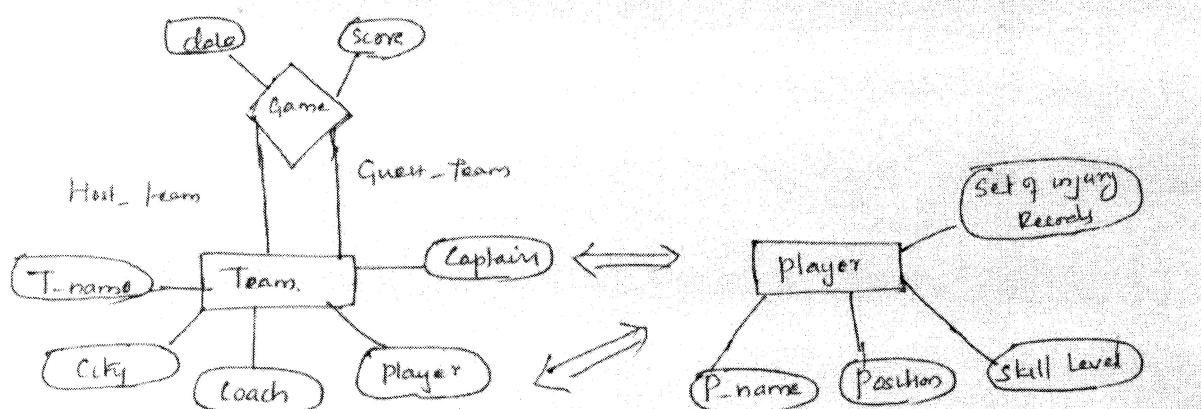
Player-{ P_name, Position, Skill Level, Set of injury records}

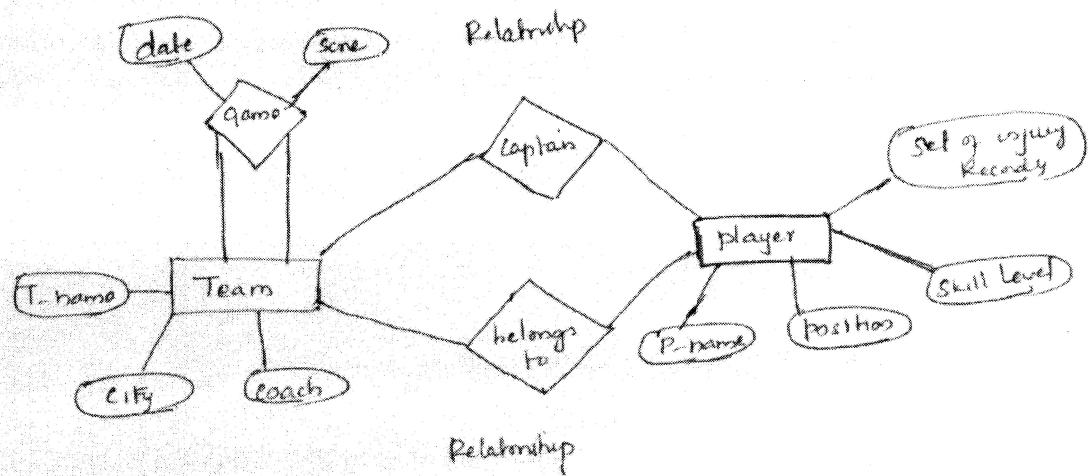
Game- { date, Score}





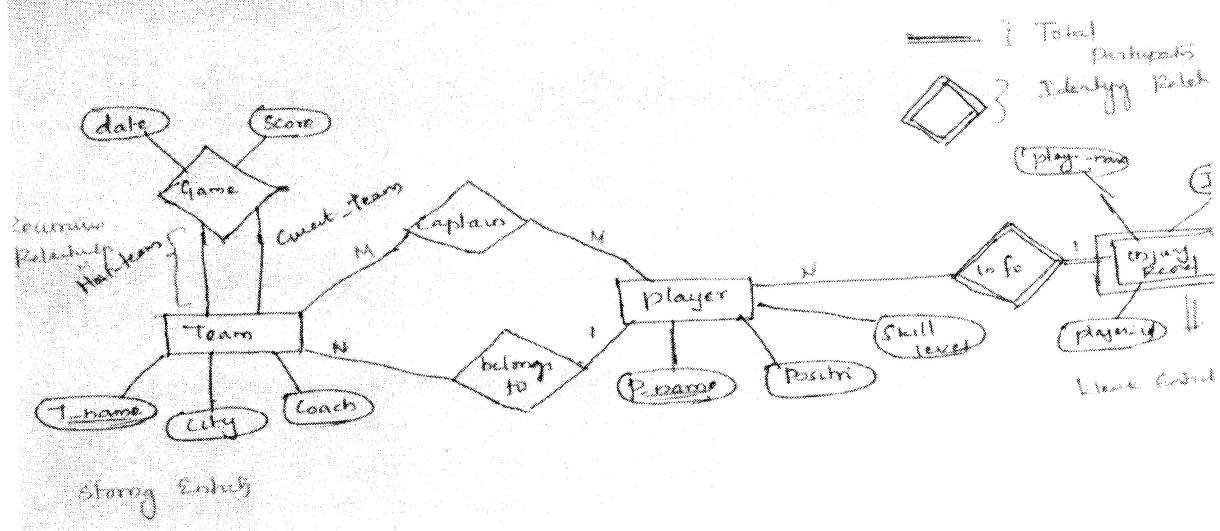
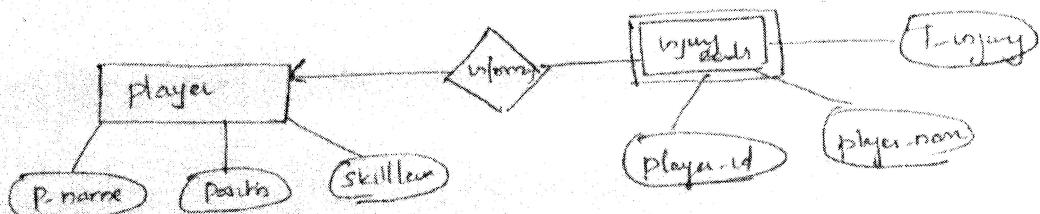
Team - Relationship player :- ?





player - Relationship - Records (injury Records)

Weak Entity

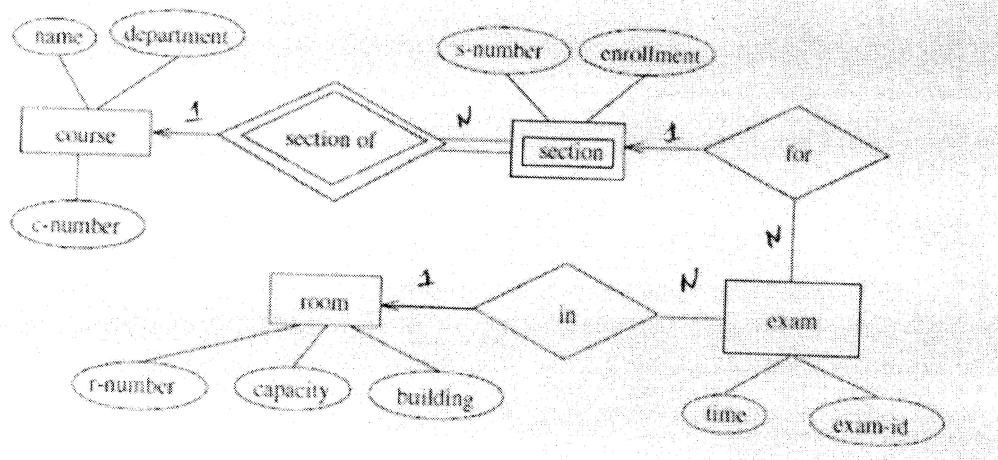
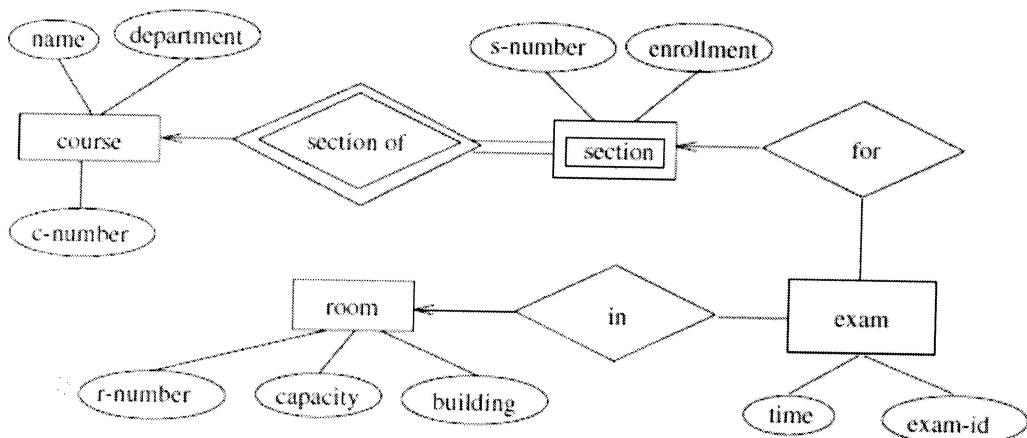


Example 2:

Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set exam, with attributes course_name, section_number, room_number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity, as

- ✓ Course with attributes course_name(c-number), department, and name
- ✓ Section with attribute section_number(s-number) and enrollment, and dependent as a weak entity set on course
- ✓ Room with attribute room_number(r-number), capacity, and building

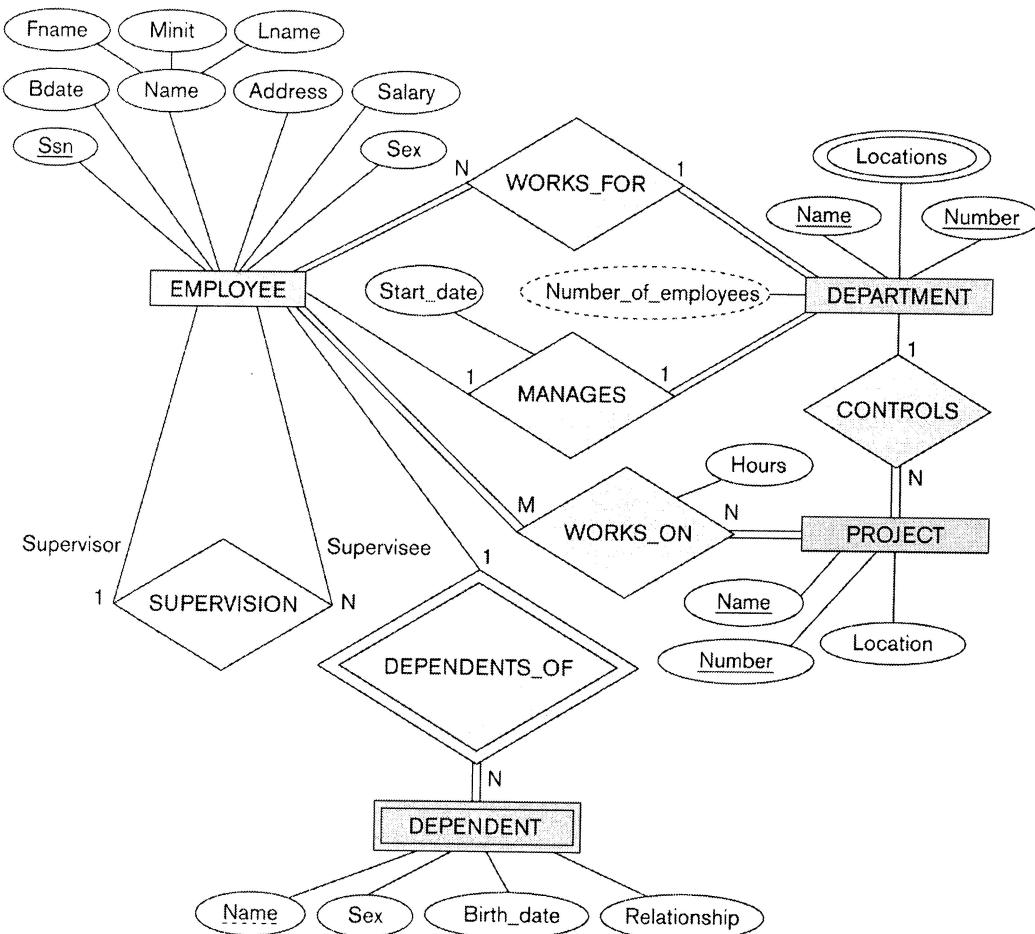
Show an E-R diagram illustrating the use of all three additional entity sets listed



Example 3:

The company is organized into departments.

- (i) Each department has a unique name, a unique number, and a particular employee who manages the department.
- (ii) We keep track of the start date when that employee began managing the department.
- (iii) A department may have several locations.
- (iv) A department controls a number of projects, each of which has a unique name, a unique number, and a single location.
- (v) We store each employee's name, Social Security number, address, salary, sex (gender), and birth date.
- (vi) An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department.
- (vii) We keep track of the current number of hours per week that an employee works on each project.
- (viii) We also keep track of the direct supervisor of each employee (who is another employee).
- (ix) We want to keep track of the dependents of each employee for insurance purposes.
- (x) We keep each dependent's first name, sex, birth date, and relationship to the employee.

**Figure 3.2**

An ER schema diagram for the COMPANY database. The diagrammatic notation is introduced gradually throughout this chapter.

Cardinalities:

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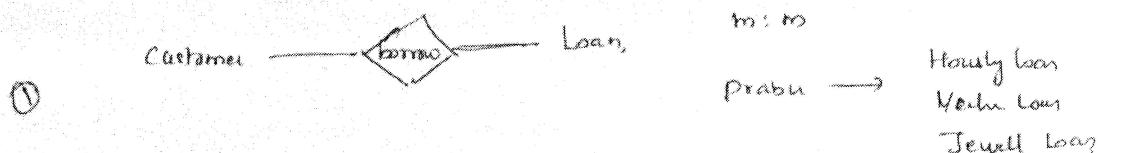
Many to many :- 

Many to one :- 

one to many :- 

one - to - one :- 

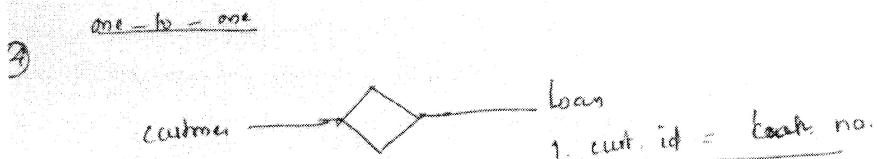
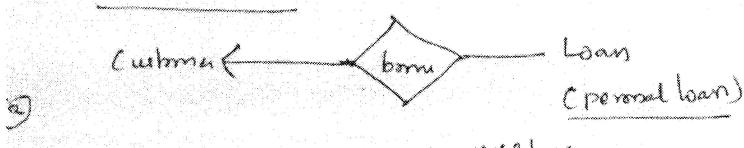
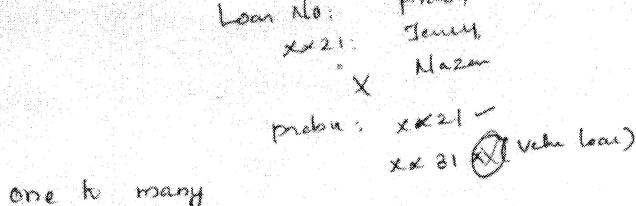
many to many

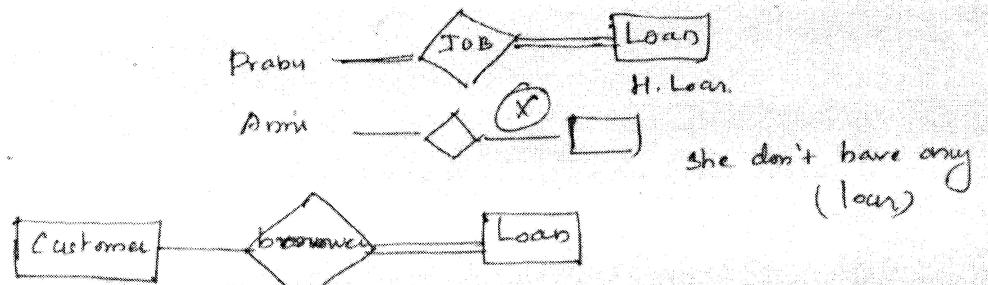


Hourly loan → Prabu
xx21
Jerli
Raghur.
Nazzeer.

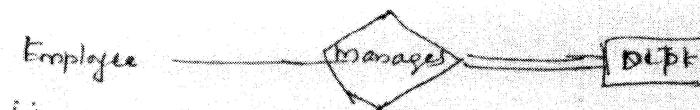
Yacht loan → Nazzeer, prabu
xx31

Prabu → Hourly loan.
Hourly loan → prabu, Nazzeer
xx21
Jewell loan → Jerli, Raghur

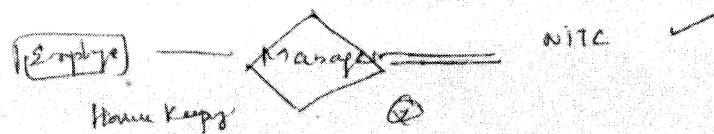


ParticipationExample 1 :-

- (i) Every loan linked with atleast one customer (Total)
- (ii) Every customer is not linked with loan (Partial)

Example 2 :-

- (i) Dept manages employee (Total)
- (ii) Every Employee will not be a part of that Dept



Entities/Attributes correctly identified.

- 1) Primary key/ Weak entities/ Identifying Relationship
- 2) Cardinalities/ participations.

