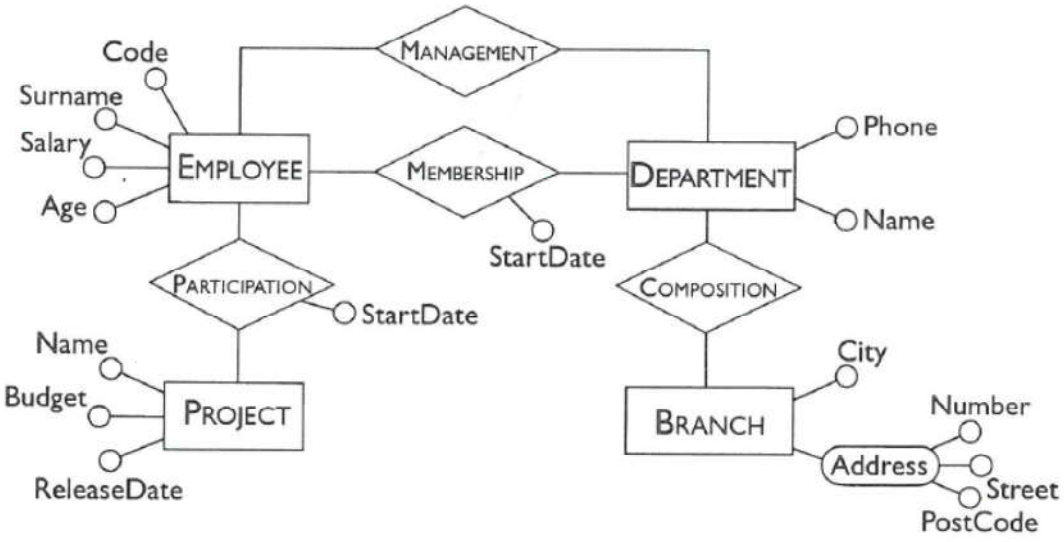
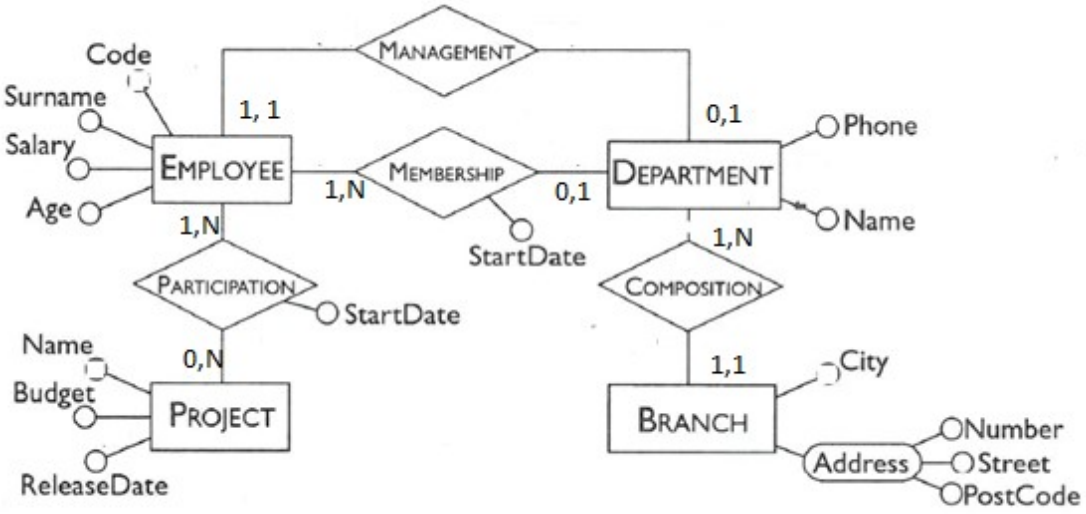
Entity-Relationship Activity 2 - Solutions

1. Consider the following ER diagram which represents a firm and the relationships between entities such as a branch, department, employee and project.
    a. Describe in plain English the situation (scenario) it is designed to represent.
    b. Add cardinality and participation (obligatory/optional) constraints to the ER diagram, given the following rules:
        i. An employee may be a member of one department only, and a department has at least one member.
        ii. An employee may manage at most one department. A department is must be managed by one employee only.
        iii. A branch has at least one department. A department belongs to one branch only.
        iv. An employee may participate in many projects. A project must have at least one employee.

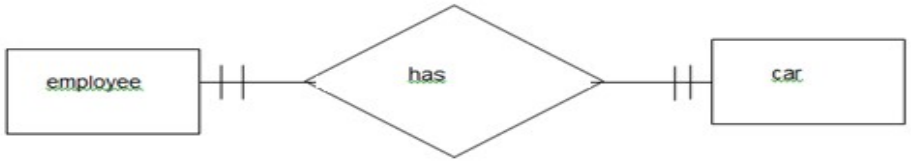


(See Notation in lecture)

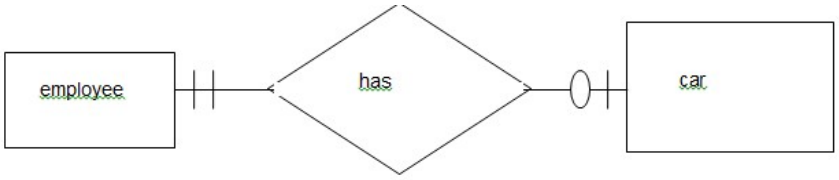


2. For each of the following scenarios create a corresponding ER diagram:

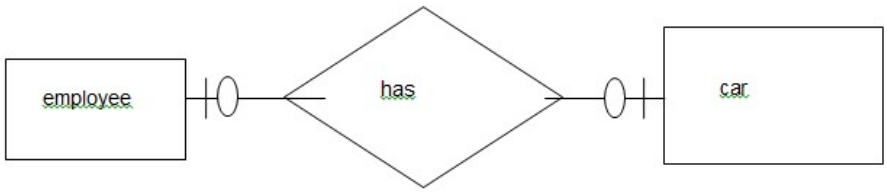
   a. Company cars are assigned to employees and no car is shared between employees, and no employee has the use of more than one car. Employees and cars are identified by employee# and car#, respectively. Every employee has a company car, and every company car is used by an employee.



   b. Same scenario as in a. above, except that not every employee has a car.

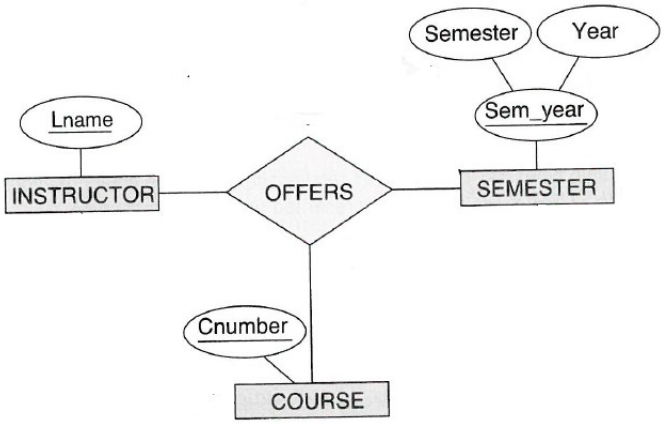


   c. Same scenario as in a. above, except that employees do not necessarily have company cars, and cars are not necessarily used by employees.

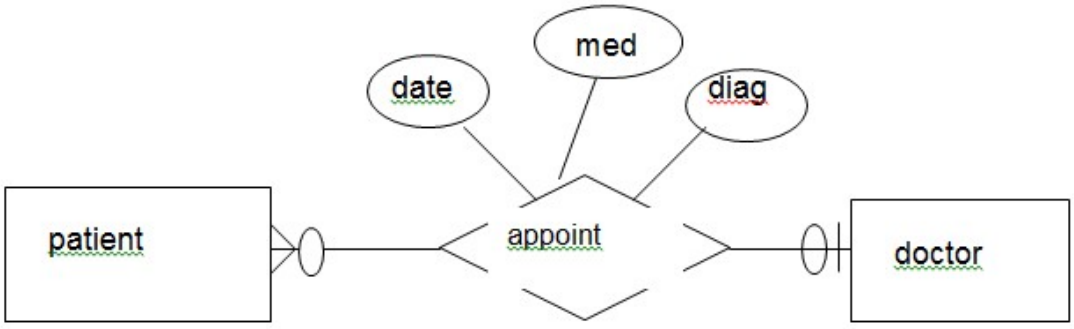


3. Make reasonable assumptions and draw an ER diagram for the following scenario.

   In a university, an INSTRUCTOR offers a COURSE for a particular SEMESTER. An INSTRUCTOR is identified by Lname; COURSE is identified Cnumber and SEMESTER is identified by Sem_year (a composite attribute).

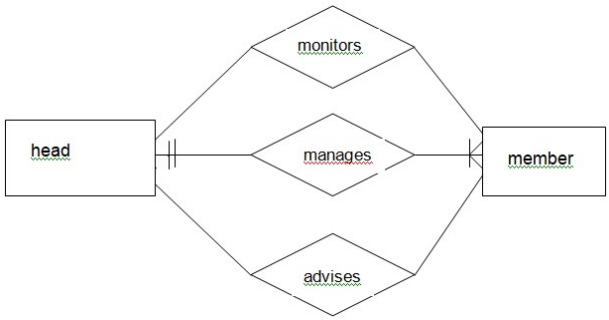


4. Consider the following scenario.
   In a surgery, a patient can make an appointment with one doctor only. A doctor may see many patients. A patient is identified by patientNo and has attributes name, DOB and address. A doctor is identified by doctorId and has attributes name and specialty. There is a need to hold the date of the appointment, the diagnosis and the medication that result from that appointment.
   Create the corresponding ER diagram and assign the attributes appropriately.



5. The head of a unit in an organisation performs three roles. First, he/she manages the members of the unit. Second, he/she advises the members of the unit. Third, he/she monitors the members of the unit.

Draw the corresponding ER diagram.



Three relationships between head and member.