

Tutorial Sheet 3: Entity Relationship Modelling

1. Describe:
 - a. Simple attribute
 - b. Composite attribute
 - c. Derived attribute
 - d. Key attribute
2. Define:
 - a. Relationship
 - b. Relationship degree
 - c. Cardinality of a relationship
3. Describe the two types of participation constraints.
4. Draw an ER diagram for the following application from the manufacturing industry:
 - a. Each supplier has a unique name.
 - b. More than one supplier can be located in the same city.
 - c. Each part has a unique part number.
 - d. Each part has a colour.
 - e. A supplier can supply more than one part.
 - f. A part can be supplied by more than one supplier.
 - g. A supplier can supply a fixed quantity of each part.
5. Draw an ER diagram for the following. Be sure to indicate the existence and cardinality for each relationship.

A college runs many classes. Each class may be taught by several teachers, and a teacher may teach several classes. A particular class always uses the same room. Because classes may meet at different times or on different evenings, it is possible for different classes to use the same room.
6. [2008R Q3a] A theatre shall be modelled using the graphical Entity-Relationship notation. A theatre has employees. All of them are described by an ID and a name. The employees are distinguished into actors and directors. In addition to the employee attributes an actor is described by a character type and a director by the number of plays (s)he has directed in the past. Plays are described by their title (identifying) and writer. For each play there can be a number of performances. Play performances are described by the date of the performance. Actors and directors shall be associated with the play performances. Add suitable cardinalities to the relationships.
7. [2007 Q3a] A banking organisation shall be modelled using the Entity-Relationship notation. A bank has many branches around the country. Each branch manages a set of accounts which are opened by a customer. A bank is described by its name and head office address. A branch has a sort code, an address, and a manager. Accounts are described by their account number, the balance of the account and the type of account. Customers are described by their name, customer number, address, and PPS number. Although only one customer can open an account there can be more than one signatories on an account. All addresses are made up of a street name, a town, a county and a country. Draw out the Entity-Relationship model for the scenario described above, add suitable cardinalities for the relationships.
8. [2000 Q3c] A hotel shall be modelled. A hotel is described by its name address and the number of rooms. Hotels have rooms. Each room of a hotel is

characterised by a room number (identifying) and the number of beds. Hotels accommodate guests. Their arrival and departure in each hotel they stay shall be modelled. Guests are located in rooms. Guests have a name and address. There are also employees, described by a name and position. Each hotel has a manager (who is an employee), who is supposed to work for only one hotel.

9. [Tricky Example] A supermarket chain shall be modelled using the Entity Relationship Notation. A chain is identified by its name and can have a number of outlets. Each outlet of a chain is identified by a unique outlet number and is additionally described by an address. Each outlet has a number of employees, each identified by an employee number and described by name and his/her position. Each outlet also maintains a list of customers, described by name, address and phone. The date of a customer's first visit at an outlet shall also be modelled. Employees and customers shall be considered as persons. Persons are identified by a combination of name and date of birth. Add suitable cardinalities for the relationships.