Chapter 1: The Database Environment

1. For each of the following pairs of related entities, indicate whether (under typical circumstances) there is a one-to-many or a many-to-many relationship. Then, using the shorthand notation introduced in the text, draw a diagram for each of the relationships.(Q.1-pg.45)

a. STUDENT and COURSE (students register for courses)
b. BOOK and BOOK COPY (books have copies)
c. COURSE and SECTION (courses have sections)
d. SECTION and ROOM (sections are scheduled in rooms)
e. INSTRUCTOR and COURSE

Answer:

Relationship of Entities

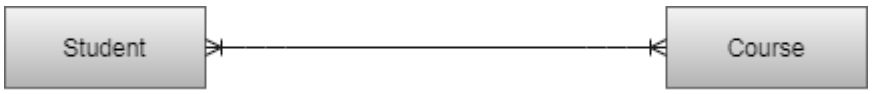
Entity is the basic block for building the data collected about person, place, event, or thing.

• Entities represent attributes that can have multiple instances.
• Relationship denotes the link between the entities.
• Relationship between entities is represented through three relationships such as,

- 1:1(one to one)
- 1:N (one to many)
- M:N (many to many)

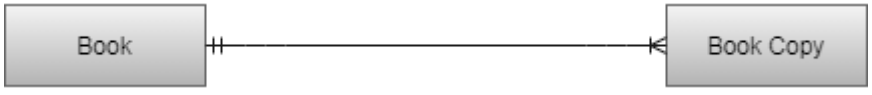
a. STUDENT and COURSE (students register for courses)

• Many-to-many because a course can have many different students and a student can be enrolled in many different classes.



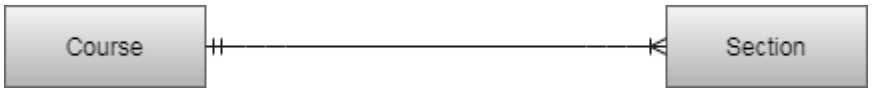
b. BOOK and BOOK COPY (books have copies)

• One-to-many because a book can have many copies made of itself but each individual copy of a book can only be that one book.



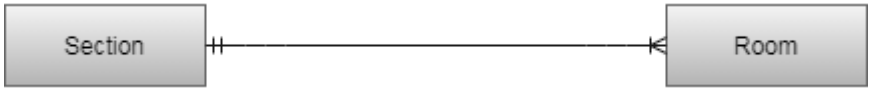
c. COURSE and SECTION (courses have sections)

• One-to-many because a course can have many sections but each section can only be for one course.



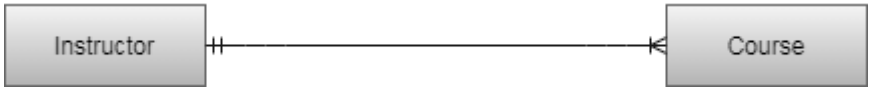
d. SECTION and ROOM (sections are in scheduled rooms)

• One-to-many because each section can only be in the room that it is scheduled in but each room can have many different sections at different times.



e. INSTRUCTOR and COURSE

• One-to-many because an instructor can teach many different courses but each course traditionally only has one instructor teaching it.



2. A driver's license bureau maintains a database of licensed drivers. State whether each of the following represents data or metadata. If it represents data, state whether it is structured or unstructured data. If it represents metadata, state whether it is a fact describing a property of data or a fact describing the context of data. (Q.6-pg.45)

a. Driver's name, address, and birth date
b. The fact that the driver's name is a 30-character field
c. A photo image of the driver
d. An image of the driver's fingerprint
e. The make and serial number of the scanning device that was used to scan the fingerprint
f. The resolution (in megapixels) of the camera that was used to photograph the driver
g. The fact that the driver's birth date must precede today's date by at least 16 years

Answer:

a. Driver's name, address, and birth date
   • Data that is structured
b. The fact that the driver's name is a 30-character field
   • Metadata describing a property of the data
c. A photo image of the driver
   • Data that is unstructured
d. An image of the drivers fingerprint
   • Data that is unstructured
e. The make and serial number of the scanning device that was used to scan the fingerprint
   • Metadata describing the context of the data
f. The resolution (in megapixels) of the camera that was used to photograph the driver
   • Metadata describing the context of the data
g. The fact that the driver's birth date must precede today's date by at least 16 years
   • Metadata describing a property of the data