

Exercises 20.02.2019

Example 1

In a school, students are allocated to different classes. Each student must be allocated to exactly one class, and a class is formed by at least 30 students. Each class must be managed by several different students, namely prefect, 1th monitor, 2th monitor and 3th monitor. Draw an E-R diagram for the school, indicating cardinality.

Example 2

Wing Lee Inc. is a construction company with over 1,000 employees. A customer can hire the company for more than one project, and employees sometimes work on more than one project at a time. Equipment is assigned to only one project. Draw an E-R diagram for Wing Lee Inc. , indicating cardinality.

Example 3

A library is going to use a computer system to handle their circulation. Each user may borrow several books at each time. Each book is recorded separately by a librarian into a check out record, which contains data about the book, borrower, librarian and dates (borrow and return). There are three librarians working on three shifts.

- a) Draw an E-R diagram to show the relationships between BOOK and USER, indicating cardinality.
- b) Identify two other entities for the library information system and draw another E-R diagram to represent the relationships between these entities, showing the cardinality of each relationship.

Example 4

In a school, a student may be assigned with one or more functional posts, like prefect, monitor or chairman. A post must be assigned to exactly one student. Draw a complete E-R diagram to represent the relationship between STUDENT and POST, indicating cardinality.

Example 5

In a school, a teacher teaches in one or more classes, each of which is taught by one or more teachers. A teacher may have more than one qualification. On the other hand, each class must be responsible (lead) by one class teacher. Sketch an E-R diagram to show the relationship between TEACHER and CLASS, indicating cardinality.

Example 6

A joint project is held by a school and a voluntary service organization. The organization offers three types of voluntary services to students in the school. Students may participate in more than one such service. But, the teachers will adjust the services chosen by students so that the number of participants in each service is more or less the same. Score will be calculated for each student based on the number of hours worked and the type of services at the end of the school year.

- a) Draw an E-R diagram to show the relationship between STUDENT and SERVICE and include the necessary attribute(s) that enable(s) the score to be calculated, indicating cardinality.
- b) Re-draw the E-R diagram with a new entity converted from the relationship in a).

Example 7

In a hospital, a group of physicians are responsible for admitting new patients, while all the physicians will treat patients. Each new patient is admitted by exactly one admitting physician. Once admitted, a patient must be treated by at least one physician, who may or may not be the admitting physician. Whenever a patient is treated by a physician the hospital wishes to record the details of the treatment including Date, Time and Results. Draw an E-R diagram without M:N relationships for the hospital, indicating cardinality.

Example 8

University has a large number of courses in its catalogue. Each course may have one or more different courses as prerequisites, or may have no prerequisites. Similarly, a particular course may be a prerequisite of any number of courses, or may not be prerequisite of any other course.

- a) Sketch an E-R diagram that includes COURSE as the single entity, indicating cardinality.
- b) Sketch another E-R diagram that includes COURSE and PREREQUISITE as entities. State the necessary attribute in PREREQUISITE.