

CS 457 / CS 557 – Database Software Design

Assignment 1

Bishops University

Natural Science

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Assignment 1

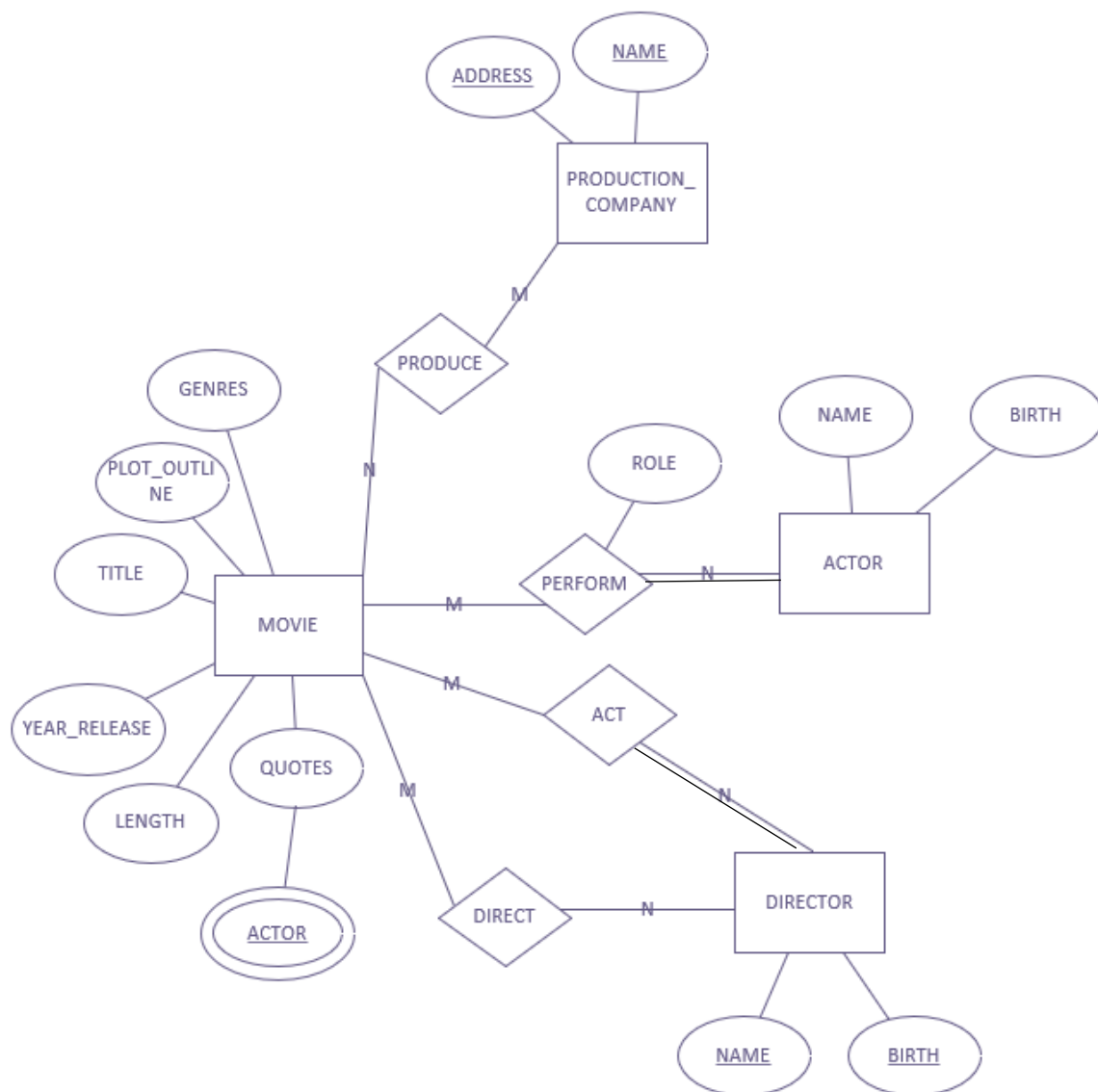
Problem 1

Consider a MOVIE database in which data is recorded about the movie industry. The data requirements are summarized as follows:

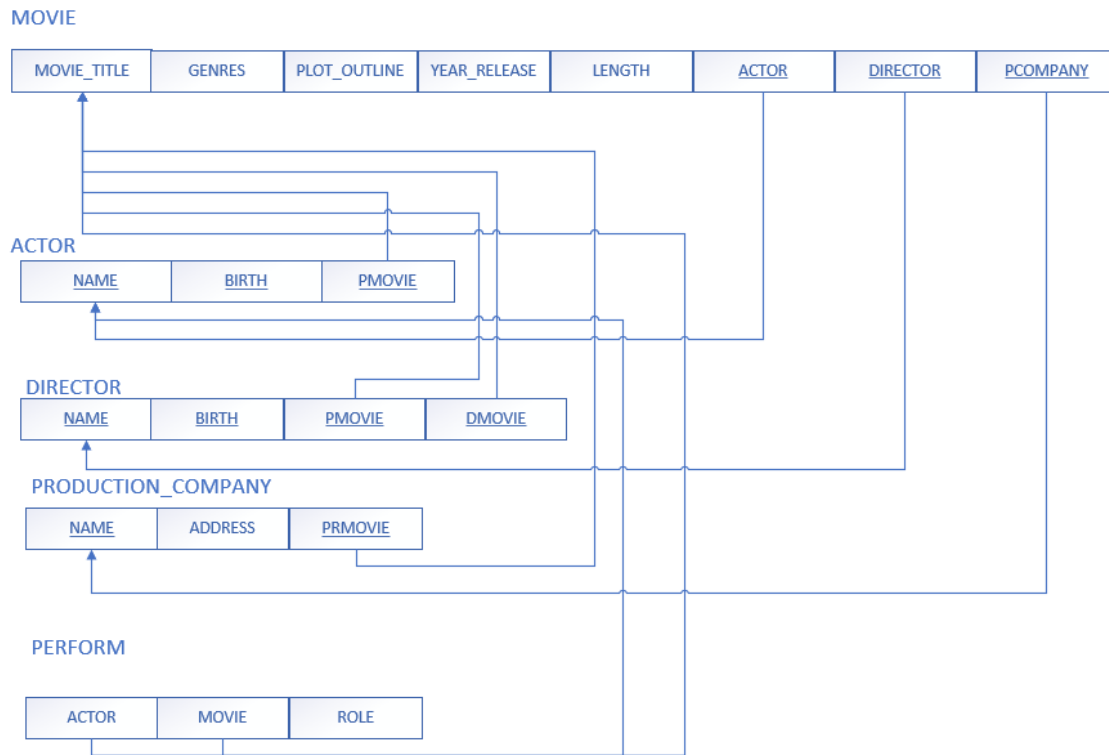
- ✦ Each movie is identified by title and year of release. Each movie has a length in minutes. Each has a production company, and each is classified under one or more genres (such as horror, action, drama, and so forth). Each movie has one or more directors and one or more actors appear in it. Each movie also has a plot outline. Finally, each movie has zero or more quotable quotes, each of which is spoken by a particular actor appearing in the movie.
- ✦ Actors are identified by name and date of birth and appear in one or more movies. Each actor has a role in the movie.
- ✦ Directors are also identified by name and date of birth and direct one or more movies. It is possible for a director to act in a movie (including one that he or she may also direct).
- ✦ Production companies are identified by name and each has an address. A production company produces one or more movies.

Design an Entity-Relationship diagram for the movie database and convert it to relational model. You can use the data modeling tool ERwin to enter the design (*Not mandatory*).

Entity-Relationship diagram for the movie database



Relational Model



The key relation in this relational model is movie and the name of actor.

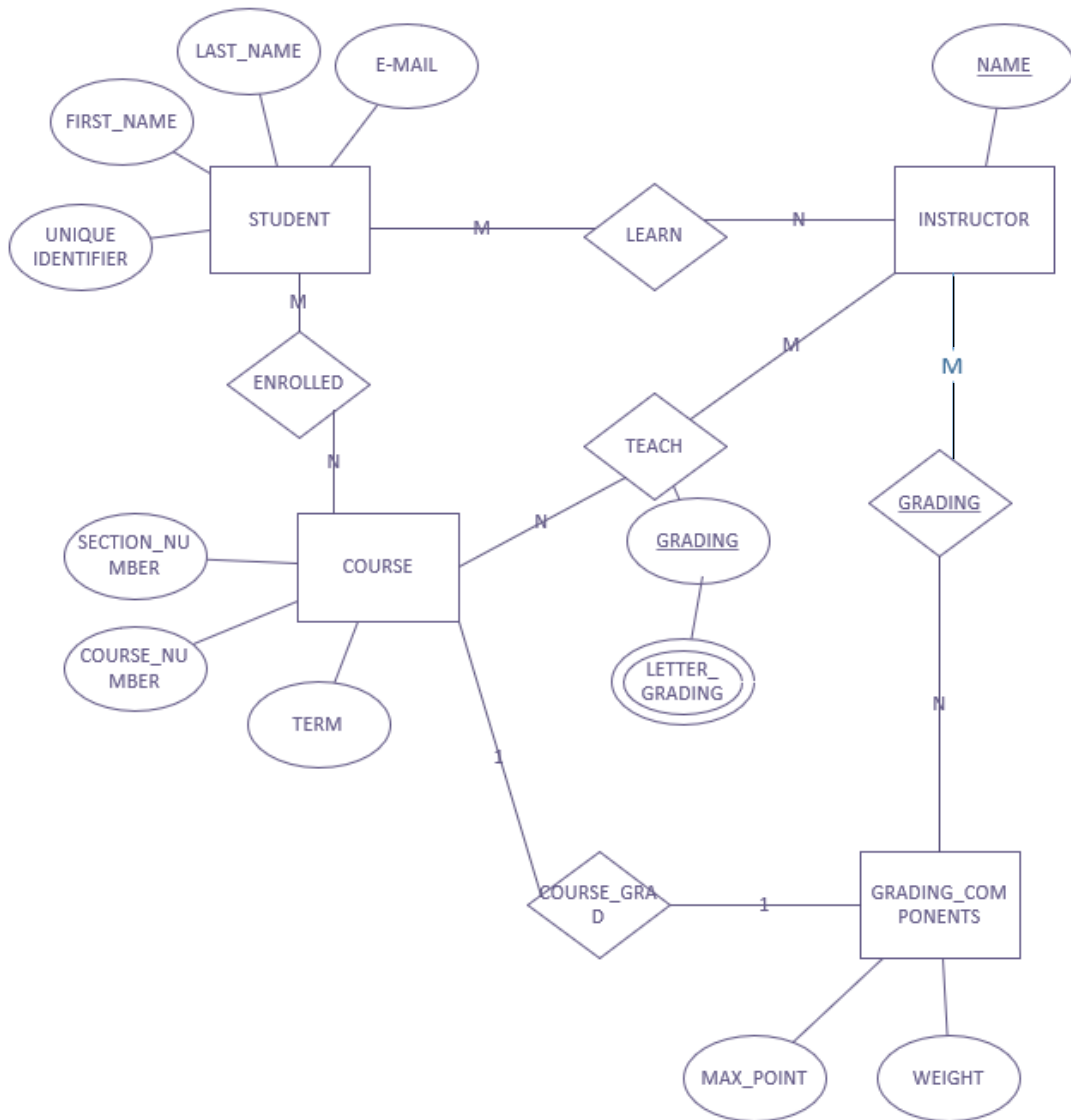
Problem 2

Consider a GRADE_BOOK database in which instructors within academic department record points earned by individual students in their classes. The data requirements are summarized as follows:

- ✦ Each student is identified by a unique identifier, first and last name, and an e-mail address.
- ✦ Each instructor teaches certain courses each term. Each course is identified by a course number, a section number, and the term in which it is taught. For each course he or she teaches, the instructor specifies the minimum number of points required in order to earn letter grades A, B, C, D, and F. For example, 90 points for an A, 80 points for a B, 70 points for a C, and so forth.
- ✦ Students are enrolled in each course taught by the instructor.
- ✦ Each course has a number of grading components (such as midterm exam, final exam, project, and so forth). Each grading component has a maximum number of points (such as 100 or 50) and a weight (such as 20% or 10%). The weights of all the grading components of a course usually total 100.
- ✦ Finally, the instructor records the points earned by each student in each of the grading components in each of the courses. For example, student 1234 earns 84 points for the midterm exam grading component of the section 2 course CSc2310 in the fall term of 2009. The midterm exam grading component may have been defined to have a maximum of 100 points and a weight of 20% of the course grade.

Design an Enhanced Entity-Relationship diagram for the grade book database and convert it to a relational model. You can use the data modeling tool ERwin to enter the design.

Entity-Relationship diagram for the movie database



Relational Model

STUDENT

UNQ_IDENTIFIER	FIRST_NAME	LAST_NAME	E-MAIL	<u>COURSE</u>	<u>GRADE</u>
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COURSES

COURSE_NUMBER	SECTION_NUMBER	TERM	<u>GRADING</u>
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INSTRUCTOR

<u>NAME</u>	TEACH_COURSE	<u>GRADING</u>
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GRADING_COMPONENTS

MAX_POINT	WEIGHT	<u>GRAD_STUDENT</u>
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GRADE

COURSE	INSTRUCTOR	LETTER_GRAD
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The key connection of this relation model is grading and courses.