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CIS 310-02 - Database Design

FALL 2019

ASSIGNMENT #2

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Chapter 2 (pp. 63 to 65), complete the following problems: Problem 1, 2,, 3, 4, 6, 7, and 8.

1. Discuss the importance of data models.

According to the book definition of data model is a relatively simple representation, usually graphical, of more complex real-world data structures. In general terms, a model is an abstraction of a more complex real-world object or event.

2. What is a business rule, and what is its purpose in data modeling?

According to the book: A business rule is a brief, precise, and unambiguous description of a policy, procedure, or principle within a specific organization. In a sense, business rules are misnamed: they apply to any organization, large or small—a business, a government unit, a religious group, or a research laboratory—that stores and uses data to generate information.

Its purpose:

Business rules derived from a detailed description of an organization's operations help to create and enforce actions within that organization's environment. Business rules must be rendered in writing and updated to reflect any change in the organization's operational environment. If the description of operations is incorrect or inomplete, the business rules derived from it will not reflect the real world data environment accurately, thus leading to poorly defined data models, which lead to poor database designs.

3. How do you translate business rules into data model components?

According to the book: As a general rule, a noun in a business rule will translate into an entity in the model, and a verb (active or passive) that associates the nouns will translate into a relationship among the entities. For example, the business rule "a customer may generate many invoices" contains two nouns (customer and invoices) and a verb (generate) that associates the nouns.

4. Describe the basic features of the relational data model and discuss their importance to the end user and the designer.

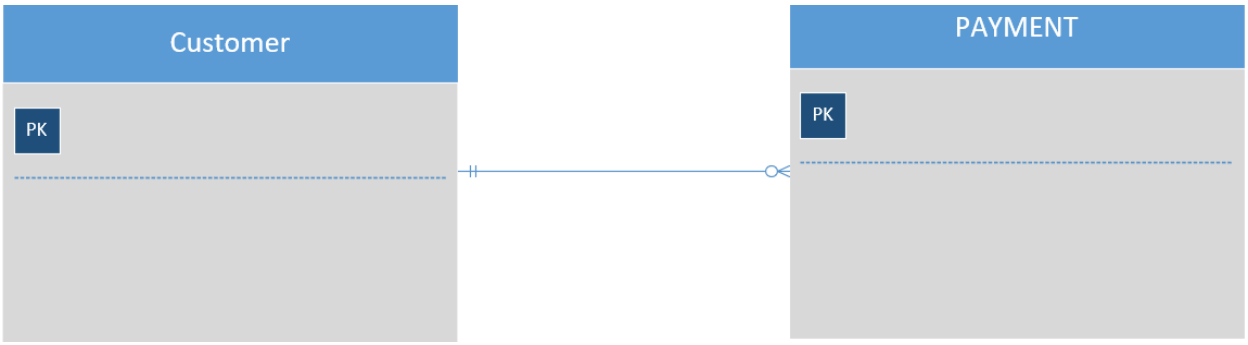
A relational database is a single data repository that provides both structural and data independence while maintaining conceptual simplicity.

The relational database model is perceived by the user to be a collection of tables in which data are stored. Each table resembles a matrix composed of row and columns. Tables are related to each other by sharing a common value in one of their columns.

5. Explain how the entity relationship (ER) model helped produce a more structured relational database design environment.

The ER model helped produce a more structured relational database design environment because it allowed designers to visually see entities and their relationships.

6. Consider the scenario described by the statement "A customer can make many payments, but each payment is made by only one customer" as the basis for an entity relationship diagram (ERD) representation.



This shows one and only customer can generate zero to many payments.

7. Why is an object said to have greater semantic content than an entity?

According to the book: An object has greater semantic content because it embodies both data and behavior. An object is also described by its factual content.

8. What is the difference between an object and a class in the object-oriented data model (OODM)?

As the book states**:** An object is an abstraction of a real-world entity. In general terms, an object may be considered equivalent to an ER model's entity. More precisely, an object represents only one occurrence of an entity Objects that share similar characteristics are grouped in classes.

A class is a collection of similar objects with shared structure (attributes) and behavior (methods). In a general sense, a class resembles the ER model's entity set. However, a class is different from an entity set in that it contains a set of procedures known as methods.