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Data Modeling

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Homework # 10 – Ch09

1. What is an information system? What is its purpose?

A system composed of people, hardware, software, databases, application programs, and procedures used to collect, store, retrieve and manage data and information.

1. What does the acronym SDLC stand for, and what does it portray?

Systems Development Life Cycle – Traces the history of an information system.

1. What does the acronym DBLC mean and what does it portray?

Database Life Cycle – Portrays the life cycles that Databases experience – Contains 6 phases. Database initial study, Database Design, Implementation and loading, testing and evaluation, operation, maintenance and evolution

1. Discuss the distinction between centralized and decentralized conceptual database design.

Centralized is generally used by smaller companies, and performed by a single database designer. Decentralization is generally performed by larger companies, where multiple design teams are assigned to a larger system, where each group creates a subsystem.

1. What is the minimal data rule?

All that is needed is there, and all that is there is needed.

1. What are business rules? Why are they important to a database designer?

A formal description of operations, the businesses’ operations determines the design the business would require. Poorly defined or inaccurate business rules lead to database designs and implementations that fail to meet the needs of the organization’s end users.

1. What steps are required in the development of an ER diagram. (hint see table 9.3)
   1. Identify, analyze and refine the business rules.
   2. Identify the main entities, using the results of steps 1.
   3. Define the relationships among the entities, using the results of steps 1 and 2.
   4. Defines the attributes, primary keys, and foreign keys for each of the entities.
   5. Normalize the entities. (Remember that entities are implemented as tables in an RDBMS.)
   6. Complete the initial ER diagram.
   7. Validate the ER model against the end user’s information and processing requirements.
   8. Modify the ER model, using the results of step 7.
2. What factors are important in a DBMS software selection?

Cost, DBMS features and tools, Underlying model, Portability, and DBMS hardware requirements.

1. List and briefly explain the four steps performed during the logical design stage.
   1. Map the conceptual model to logical model components.
   2. Validate the logical model using normalization.
   3. Validate the logical model integrity constraints.
   4. Validate the logical model against user requirements.
2. List and briefly explain the three steps performed during the physical design stage.
   1. Define data storage organization.
   2. Define integrity and security measures.
   3. Determine performance measurements.
3. What stage in the database design process could be referred to as the overall data as seen by the user?

Logical Design

1. What stage in the database design process could be referred to as the data as seen by the DBMS?

Conceptual Design

1. What stage in the database design process could be referred to as the data as seen by the operating system’s storage management devices?

Physical Design

1. Answer True or False for the following statement: The database design process is a fully sequential process. True or False.

False

1. Explain your answer for #14.

The database design process often requires that the designer revists past steps in hopes of improving later steps of the design.