

Database Technology

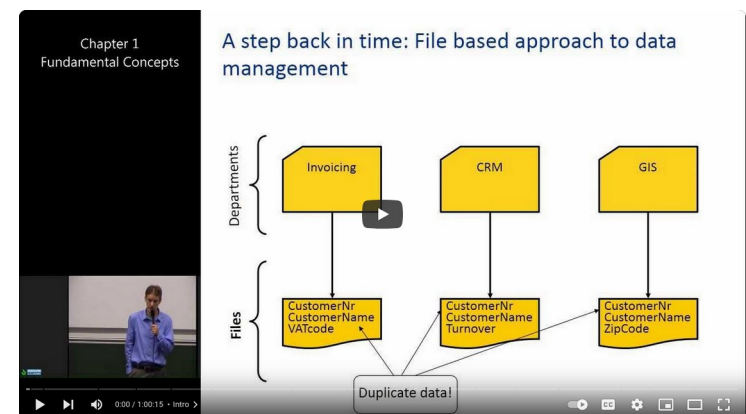
Topic 1: Fundamental Concepts

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Topics of the Video

- Applications of database technology
- Definitions
- File-based versus database-based approach to data management
- Elements of a database system
 - Data model
 - Schemas and instances
 - The three-layer architecture
 - Data dictionary (catalog)
 - DBMS languages
- Advantages and characteristics of using database systems



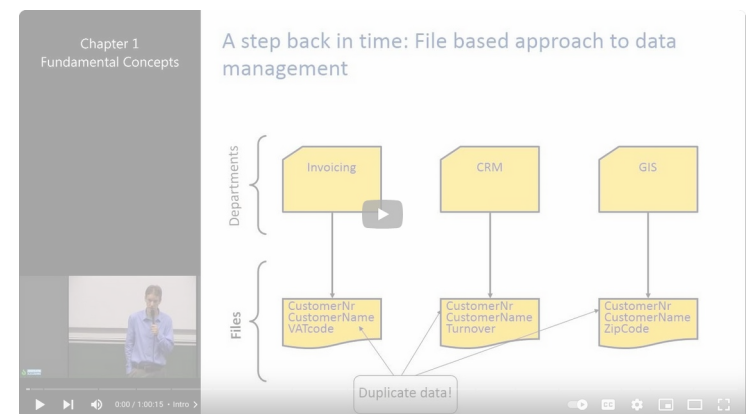
Quiz (File-based vs Database Approach)

Which of these statements is *not* correct?

- A) In the database approach to data management, maintenance of data and metadata is easier.
- B) In the database approach, the data definitions or metadata are stored in the applications accessing the data.
- C) In the database approach, applications don't have their own data files; instead, all applications access the same version of the data by interfacing with the DBMS.
- D) In a file approach to data management, different applications could be using older and newer versions of the same data.

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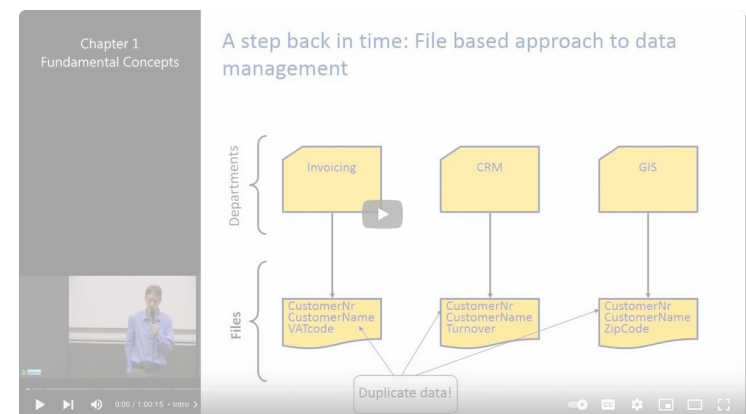
Quiz (Database Languages)

Which of these statements is *not* correct?

- A) In a file-based approach to data management, every application has its own query and access procedures, even if they want to access the same data.
- B) SQL is a database language to interact with DBMSs without having to write a substantial amount of programming code.
- C) SQL is a database language with which users tell the DBMS how it has to access the data and how to produce the result.
- D) The database language SQL allows different applications to access different subsets of the data necessary for each application.

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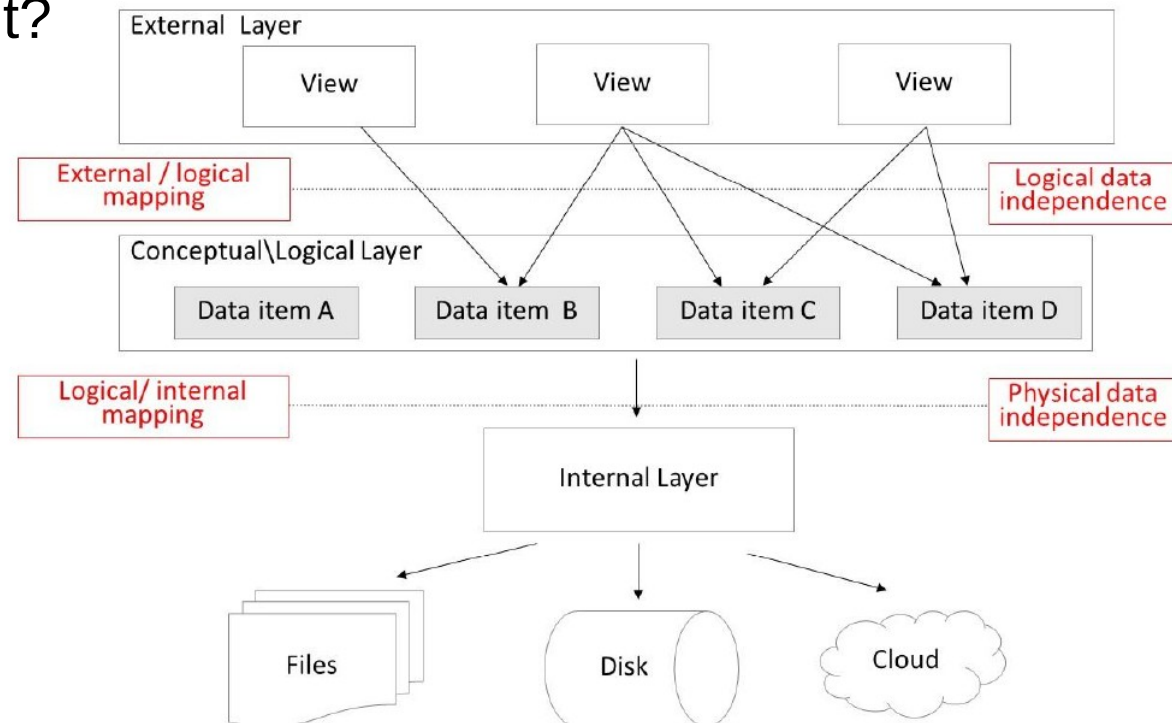
Quiz

Statement 1: Logical data independence implies that the applications are minimally affected by changes in the conceptual layer.

Statement 2: Physical data independence does *not* prevent the need for changes to the external-logical mapping when changes are made to the data storage specifications in the internal data model.

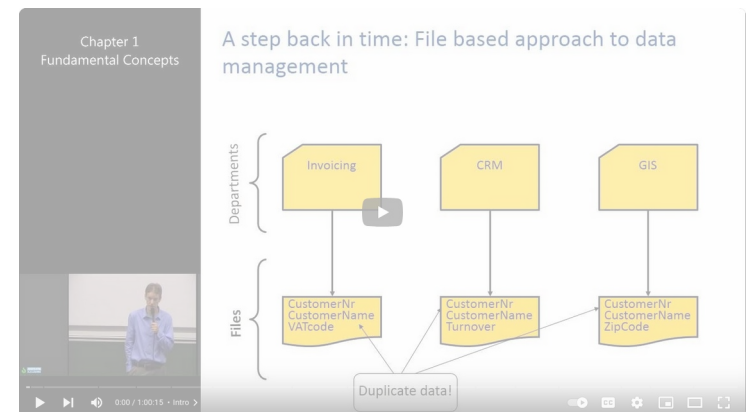
Which statement(s) is/are right?

- A) Neither 1 nor 2
- B) Only 2
- C) Only 1
- D) 1 and 2



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Quiz (Data Models)

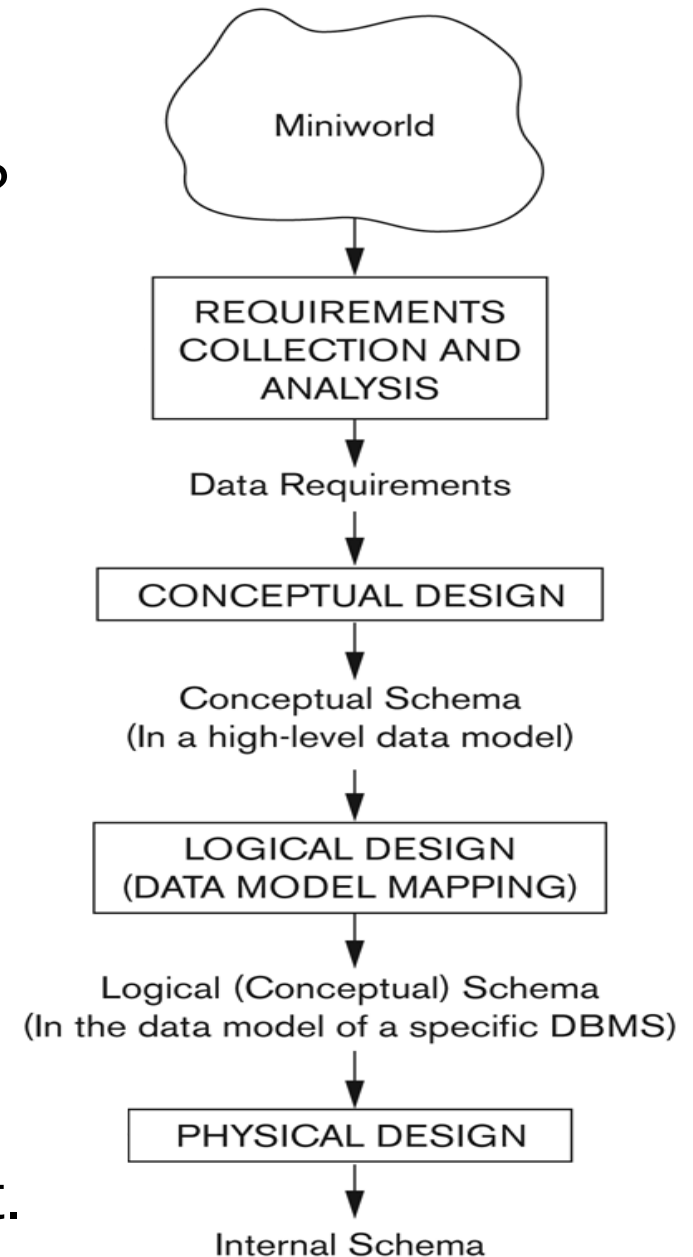
Which of these statements is *not* correct?

- A) A logical schema is represented in a high-level data model such as the Entity-Relationship (ER) model
- B) A logical schema represents the conceptual schema translated to a specific implementation environment.
- C) A conceptual schema captures the data requirements from the perspective of the users.
- D) The data model for the physical schema is implementation dependent.

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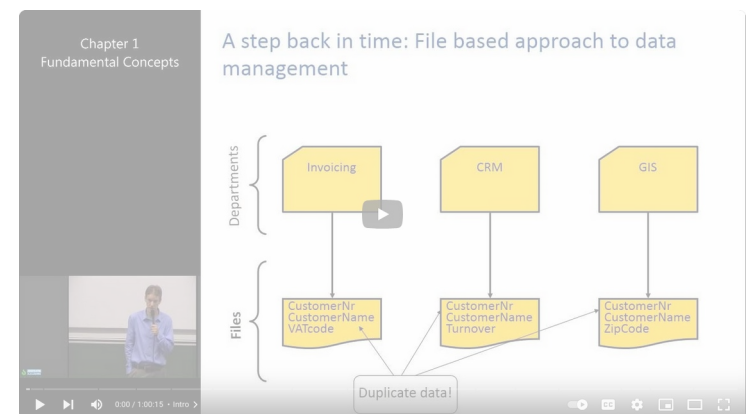
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Quiz (Database Catalog)

Which of the following things does the catalog of a database system contain?

- A) Statistics about data in the database.
- B) The database management system.
- C) The database state.
- D) Definitions of views.

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RELATIONS

Relation_name	No_of_columns
STUDENT	4
COURSE	4
SECTION	5
GRADE_REPORT	3
PREREQUISITE	2

COLUMNS

Column_name	Data_type	Belongs_to_relation
Name	Character (30)	STUDENT
Student_number	Character (4)	STUDENT
Class	Integer (1)	STUDENT
Major	Major_type	STUDENT
Course_name	Character (10)	COURSE
Course_number	XXXXNNNN	COURSE
....
....
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Prerequisite_number	XXXXNNNN	PREREQUISITE

Example from "Fundamentals of Database Systems" by Elmasri and Navathe, Addison Wesley.

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