Review Questions

2.1 Discuss the concept of data independence and explain its importance in a database environment.

2.2 To address the issue of data independence, the ANSI-SPARC three-level architecture was proposed. Compare and contrast the three levels of this model.

2.3 What is a data model? Discuss the main types of data model.

2.4 Discuss the function and importance of conceptual modeling.

2.5 Describe the types of facility you would expect to be provided in a multi-user DBMS.

2.6 Of the facilities described in your answer to Question 2.5, which ones do you think would *not* be needed in a standalone PC DBMS? Provide justification for your answer.

2.7 Discuss the function and importance of the system catalog.

2.8 Describe the main components in a DBMS and suggest which components are responsible for each facility identified in Question 2.5.

2.9 What is meant by the term 'client–server architecture' and what are the advantages of this approach? Compare the client–server architecture with two other architectures.

2.10 Compare and contrast the two-tier client–server architecture for traditional DBMSs with the three-tier client–server architecture. Why is the latter architecture more appropriate for the Web?

2.11 What is a TP Monitor? What advantages does a TP Monitor bring to an OLTP environment?

Exercises

2.12 Analyze the DBMSs that you are currently using. Determine each system's compliance with the functions that we would expect to be provided by a DBMS. What type of language does each system provide? What type of architecture does each DBMS use? Check the accessibility and extensibility of the system catalog. Is it possible to export the system catalog to another system?

2.13 Write a program that stores names and telephone numbers in a database. Write another program that stores names and addresses in a database. Modify the programs to use external, conceptual, and internal schemas. What are the advantages and disadvantages of this modification?

2.14 Write a program that stores names and dates of birth in a database. Extend the program so that it stores the format of the data in the database: in other words, create a system catalog. Provide an interface that makes this system catalog accessible to external users.

2.15 How would you modify your program in Exercise 2.13 to conform to a client–server architecture? What would be the advantages and disadvantages of this modification?

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DATABASE SYSTEMS

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