**Unit 1 Introduction to DataBase System Management - Exercises**

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**Exercise 1**

Choose all correct answers

1. In relation to database management systems:

   ☐ They are the same as databases.

   ☐ They are the hardware components of databases.

   ☒ They are an interface between applications and data.

   ☐ They are an interface between applications and the operating system.

2. What is the data dictionary composed of?

   ☐ The administrator's tables

   ☐ Of user data and table data

   ☐ Information from remote servers

   ☐ Metadata

3. In the 3-level architecture:

   ☐ The physical level is the most internal level and describes the file records, the files and their format.

   ☐ The logical level is the most internal level and describes the records of the files and their format.

   ☐ The internal level is the level that is in contact with the applications.

   ☐ The conceptual level describes how each of the users.
   sees the database.

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**Exercise 2**

Answer the following questions:

1. What is metadata and what is it used for?

   Es un almacenamiento de gran cantidad de datos. En cada celda se guardan 3 parámetros. Se usa para mover gran cantidad de datos en poco tiempo.

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2. Briefly explain what the DB manager is responsible for and what functions it performs.

   Es el responsable de la base de datos. Sus funciones son: almacenar, controlar concurrencia, evitar que haya redundancia, controla que los datos sean válidos, optimiza la consulta de datos, centraliza la búsqueda de datos y que tenga independencia.

3. Explain why files solution for databases could imply redundancy of data.

   es cuando se hace una copia de seguridad para evitar daños físicos, para salvar los datos de ataques cibernéticos y para agilizar el acceso a los datos teniendo 2 bases de datos.

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4. Indicate which type of DB is most suitable for the following scenarios and why:

   a. Manage documentary information that stores documents in various formats which may require specific operations for each document.

      Relacional: puedes poner varios datos en la misma tabla

   b. Manage the information of a company with branches that handle their own information which may be shared sporadically with other branches.

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Usaría base de datos no relacional para poder mover la documentación más rápido._____

c. Manage the information of a hospital.

Relacional, porque los usuarios no acceden a toda la información

d. Manage the information of a company with a rigid tree structure.

No relacional, para acceder a muchos datos en poco tiempo

5. Indicates which DB level corresponds to the following users:

e. The DB administrator configures the users accessing the DB and the type of storage for the information.

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f. An analyst makes a data model to describe a real-world problem.

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g. A property manager uses an application to access a DB that provides him with the status of the payment of bills of the residents' associations.

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h. A DB designer describes the representation of a problem focused on a relational database.

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6. Explain the difference between DBs and DBMSs.

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7. Research about what it means the Velocity for Big Data and its types.

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8. Research about how it could be a possible solution on the Cloud with the Iaas approach and how with the Dbaas approach. Find out some commercial examples.

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9. Indicate which functions the database manager has to perform when working with the following types of databases.
   ● A database **distributed** among several servers **in different physical locations and connected through the Internet.**

      _____

   ● A **centralized database on a corporate server** accessed through the Internet by several **web applications located on web servers**.

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- A **centralized database on a server accessed by desktop applications installed on PCs**. Both the DB server and the PCs are located on an **Intranet**.

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## Exercise 3 - Monitoring

Research on the **parameters** that are usually monitored in a database.Then enumerate some **commercial tools** to perform this monitoring.

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## Exercises 4 - Relational and  non-relational databases.

Strengthen your knowledge of **the difference between Relational and Non-Relational Databases. Examples**

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