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CS 2243 Chapter 01 Homework

I. Explain the difference between facts, data, information and knowledge. How are these terms “a progression?” How does a database work/help in this context?

Facts, or data, are just individual tidbits. Things like phone numbers, ages, or addresses, but without the knowledge that it is a phone number, an age, or an address. Metadata would give that knowledge. Information is analysis on the data. Examples would be things like the average age is such and such, or we've got a 20% budget surplus. “Knowledge,” as it's used here, could also be restated as subject understanding plus situational awareness.

The terms are a progression because each one leverages the one before. Data is data. “Information” is the result of leveraging data. “Knowledge” is the collection and accumulation of that information over time.

Databases and database management systems are a solution that provides quick access to “information,” maintains data integrity, and better security against intrusions and data loss.

II Please provide answers to these Exercises:

The designated Review Questions and Problems are located at the end of the chapter.

Identify your answer with the question or problem number.

from pages 29 - 31

* Answer Review Question (RQ) 5 . Answer, also, for Data Independence
  + Also give an example of each (different from the ones mentioned in class)
* Answer RQ 12 – consider more than $$ or monetary costs
  + don’t simply copy the words from the text, please
* Answer RQ 15
* for Figure P1.1
  + Answer Problem 2 and 4
* for Figure P1.9
  + Distinguish between attributes & entities.
  + What *entities* do you perceive in this figure?

Answer Problem 9

Review Question 5: What is structural independence, and why is it important? What is data independence and why is it important? Give an example of each.

Structural independence: Structural independence exists when you can change the file structure without affecting the application's ability to access the data. The ability to add different categories of data to a file (file X contains names, passwords, and now credit card numbers) and not affect the DBMS's ability to pull info from it is an exhibition of structural independence.

Data independence: Data independence exists when you can change the data storage characteristics without affecting the program's ability to access the data. For example, having some things stored in a CSV and others in a binary file. The DBMS should be able to work with both.

Review Question 12: What are the potential costs of implementing a database system? Consider more than monetary costs.

More than the monetary costs of the hardware, software, training, support, and invariable downtime as it is installed / upgraded, implementing a database system likely involves you with the vendor for a very long time. One should weigh security risks as a valid concern. DBMS vendors frequently upgrade their products by adding new functionality, and possibly requiring hardware improvements.

Review Question 15: What common problems does a collection of spreadsheets created by end users share with the typical file system?

Synchronization, authorization, authentication, difficulty leveraging data, limited data sharing, complex administration, etc.

Figure P1.1, Questions 2 and 4:

2: You'd have to search the texts for something that looks like a city, extract it, associate it with the rows in some fashion, sort the rows by those, and then return the rows. I'd have a table with columns that define an address and a column that gives a unique identifier to each, and give the unique identifier to the column of “MANAGER\_ADDRESS” and then you can sort according to city much easier, without having to search strings and whatnot (something that probably would have to be custom done).

4: The table doesn't seem to have a unified purpose. The data's there all willy-nilly and it's got the brilliant “Holly B. Parker” as a project manager for two projects, basically wasting rows. George has got two projects, and I'm pretty sure their phone numbers don't change. Unless they got a new phone and didn't update all projects under the owner with the new phone number.

Figure P1.9, Distinguish between attributes and entities. What entities do you perceive in this figure? Answer Question 9.

Not question 9: There's buildings, rooms, teachers, and times. Attributes would be \_FNAME, \_LNAME, \_INITIAL. Those times could be improved by using a time block table, and referring to unique identifiers on it to specify times.

9: Teachers should have a unique identifier assigned to them by their own table that describes first names, last names, and initials. Rooms should have their own unique identifier assigned in a table defining room numbers and building locations. Times should have their own table identifying where specified time is taking place, as well as when. It needs to be cleaned up, made pretty.