

DataBase System - Assignment #1

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1.4 Suppose you want to build a video site similar to YouTube. Consider each of the points listed in Section 1.2 as disadvantages of keeping data in a file-processing system. Discuss the relevance of each of these points to the storage of actual video data, and to metadata about the video, such as title, the user who uploaded it, tags, and which users viewed it.

- If a video site is created using a file processing system without using a DBMS, various problems may occur. A single video site contains not only video but also various information, for example, video name, video uploaded date, uploaded user, video viewer, user's comments, number of likes, etc. Among the characteristics of these video sites, one of the easiest to understand is that obviously several people can access the site at the same time. Of course, if they only do "read" operations, there's no problem, but as mentioned earlier, most of the elements that make up the site's information are "write" elements. That is, the site information continues to perform Create, Read, Update, and Delete operations. If the file processing system is in charge of these tasks, it is expected that the data will not be synchronized in time, and the problem of simultaneous data access will occur, so that it will not be able to perform the function as a video site properly.

1.7 List four significant differences between a file-processing system and a DBMS.

The file processing system has four disadvantages compared to DBMS.

1. It is difficult to maintain data integrity.
2. Mismatch between data may occur.
3. Data recovery is not available.
4. No concurrency control is provided.

1.8 Explain the concept of physical data independence and its importance in database systems.

- Data independence is an attribute that does not affect the upper stage of any lower stage of data in the data structure. That is, if data independence exists, even if data is changed, the application program is not modified. This is an essential

property to achieve that DBMS's ultimate purpose, applications, are not subordinate to data.

1.10 List at least two reasons why database systems support data manipulation using a declarative query language such as SQL, instead of just providing a library of C or C++ functions to carry out data manipulation.

- C, C++ functions support tasks such as user input, display output, and network communication, which are used to interact with databases in applications. However, these functions cannot directly manipulate the database to manage data. In other words, data integrity can be achieved through functional separation that allows only SQL to be used to manage data, and prevents applications from directly manipulating the data.

1.11 Assume that two students are trying to register for a course in which there is only one open seat. What component of a database system prevents both students from being given that last seat?

- Concurrent-access anomalies