

Tutorial Sheet 2: Storage, Indexing and Hashing

1. Define (with the aid of diagrams, where necessary) Disk Pack, Track, Platter, Surface, Block/Page, Sector, Interblock Gap (IBG), Buffers, Read-Write Head.
2. Define Seek Time, Rotational Delay, Block Transfer Time.
 - a. What is the total time to locate and transfer a block from a given address related to these three times?
 - b. Which is the smallest of the them and what practical influence does that have on the storage and retrieval of data from disk?
3. Define the following terms: Primary Index, Secondary Index, Clustering Index, Binary Tree Index differentiating clearly between them.
4. Name three different forms of file organisation giving their advantages and disadvantages under the following headings: Searching, Inserting, Deleting, Modifying.
5. [2008 Q5a] Compare index and hashing techniques for data storage in database systems. Describe both of them. Which forms of database access do they support? Give criteria when to use these techniques. Can they be combined to further improve access?
6. [2001 Q5a] Illustrate, using an example, how data retrieval based on index-supported storage structures works. Use a student data file (containing Ids and names as the example. Assume that the file is sorted by the student ID.
7. [2002 Q5a] Illustrate the indexing techniques for data storage in database systems using an example. Which forms of database access does indexing support? Which variants exist? Give criteria for when to use these techniques.