TD 2 SGBD

Exercise 1

A disk has the following characteristics:

- bytes per sector (bytes/sector) = 512
- sectors per track (sectors/track) = 50
- tracks per surface (tracks/surface) = 2 000
- number of platters = 5
- avg rotational speed = 54 ˙00 rpm (rotations/minutes)
- average seek time = 10 ms

Calculate the following parameters.

1. Tracks capacity (bytes), a surface capacity, total capacity of the disk.
2. Number of disk cylinders.
3. Average transfer time of a block of 4 096 byte.

Are 256, 2048 and 51 200 examples of valid block sizes?

Exercise 2

Consider the disk of the previous exercise with blocks of 4096 bytes to store a file with 100 000 records, each of 100 bytes and stored completely in a block.

Calculate the following parameters.

1. Number of records per block.
2. Number of blocks to store the file.
3. Number of cylinders to store the file.
4. Number of 100 byte records stored in the disk.

5. If the pages are stored on the disk by cylinder, with page 1 on block 1 of track 1, what page is stored on block 1 of track 1 of the next disk surface? What will change if the disk can read/write in parallel by all the array of heads?

6. What is the time to read serially a file with 100 000 records of 100 bytes? What will change if the disk is able to read/write in parallel from all the array of heads (with the data stored in the best way)?