Exercises 6

3. June 2020

1 Physical storage and file organization

1. Which techniques for allocating file blocks on disk we discussed in lectures?

2. What is a primary file organization and which organizations we mentioned?

3. Illustrate in a table the complexity of insert, delete, search and sort operations for both Heap and Sorted files. For which applications are suitable Heap files and for which are more suitable Sorted files?

2 Heap files

1. In a heap file with fixed-sized records and unspanned organization i-th record of the file can be found in the block:

   $\left\lfloor \frac{i}{bfr} \right\rfloor$ at the position $(i \mod bfr)$

   Why this information cannot be useful for the search operation?

2. Suppose that an EMPLOYEE file has the following fields Ssn, 9 bytes; Last_name, 20 bytes; First_name, 20 bytes; Middle_init, 1 byte; Birth_date, 10 bytes; Address, 35 bytes; Phone, 12 bytes; deletion marker, 1 byte. The EMPLOYEE file has r = 20000 records, fixed-length format and unspanned blocking.

   Write appropriate formulas and calculate the following values if the EMPLOYEE file is an unsorted (heap file):

   (a) The record size R in bytes.

   (b) Calculate the blocking factor bfr and the number of file blocks b.

   (c) Calculate the average number of accesses to find a record.