

CHAPTER 10

DISCUSSIONS

Discussion 10-7

Consider the deletion of record 3 from the following file. Compare the relative merits of the following techniques for implementing the deletion.

- Shift all records from 4 ~ 11 one place up.
- Move record 11 to the space occupied by record 3.
- Mark record 3 as deleted, and move no records.

record 0	10101	Srinivasan	Comp. Sci.	65000	b)				c)			
record 1	12121	Wu										
record 2	15151	Mozart										
record 3	22222	Einstein										
record 4	3234											
record 5	3345											
record 6	4556											
record 7	5858											
record 8	7654											
record 9	7676											
record 10	8382											
record 11	9834											

record 0	10101	Srinivasan	Comp. Sci.	65000
record 1	12121	Wu		
record 2	15151	Mozart	Music	40000
record 3	22222	Einstein	Physics	95000
record 4				
record 5	33456	Gold	Physics	87000
record 6				
record 7	58583	Califieri	History	62000
record 8	76543	Singh	Finance	80000
record 9	76766	Crick	Biology	72000
record 10	83821	Brandt	Comp. Sci.	92000
record 11	98345	Kim	Elec. Eng.	80000

Discussion 10-8

A **sequential file** is designed for efficient processing of records in sorted order based on some search key. Ideally, all records should be stored in sorted order, but this is not always feasible after updates. Discuss how pointers can be used to support efficient sequential access employing the different techniques after deletion of record 3.

- a) ~~Shift all records from 4 ~ 11 one place up.~~
- b) Move record 11 to the space occupied by record 3.
- c) Mark record 3 as deleted, and move no records.

record 0	10101	Srinivasan	Comp. Sci.	65000
record 1	12121	Wu	Finance	90000
record 2	15151	Mozart	Music	40000
record 3	22222	Einstein	Physics	95000
record 4	32343	El Said	History	60000
record 5	33456	Gold	Physics	87000
record 6	45565	Katz	Comp. Sci.	75000
record 7	58583	Califieri	History	62000
record 8	76543	Singh	Finance	80000
record 9	76766	Crick	Biology	72000
record 10	83821	Brandt	Comp. Sci.	92000
record 11	98345	Kim	Elec. Eng.	80000

10101	Srinivasan	Comp. Sci.	65000	
12121	Wu	Finance	90000	
15151	Mozart	Music	40000	
22222	Einstein	Physics	95000	
32343	El Said	History	60000	
33456	Gold	Physics	87000	
45565	Katz	Comp. Sci.	75000	
58583	Califieri	History	62000	
76543	Singh	Finance	80000	
76766	Crick	Biology	72000	
83821	Brandt	Comp. Sci.	92000	
98345	Kim	Elec. Eng.	80000	

Figure 10.10 Sequential file for *instructor r*

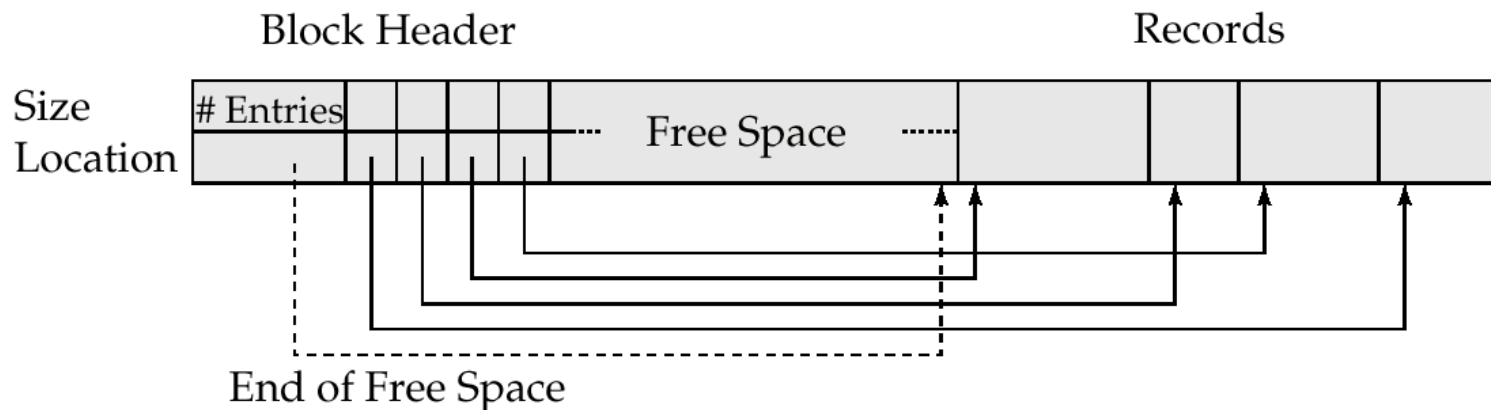
10101	Srinivasan	Comp. Sci.	65000	
12121	Wu	Finance	90000	
15151	Mozart	Music	40000	
22222	Einstein	Physics	95000	
32343	El Said	History	60000	
33456	Gold	Physics	87000	
45565	Katz	Comp. Sci.	75000	
58583	Califieri	History	62000	
76543	Singh	Finance	80000	
76766	Crick	Biology	72000	
83821	Brandt	Comp. Sci.	92000	
98345	Kim	Elec. Eng.	80000	
32222	Verdi	Music	48000	

Figure 10.11 Sequential file after an insertion.

Discussion 10-9

Show the status of the block in **slotted page structure** is after performing the following operations in order. Assume the block size is 500B and empty initially.

1. insert record A (length 20B)
2. insert record B (length 40B)
3. insert record C (length 30B)
4. delete record B
5. insert record D (length 50B)



Discussion 10-10

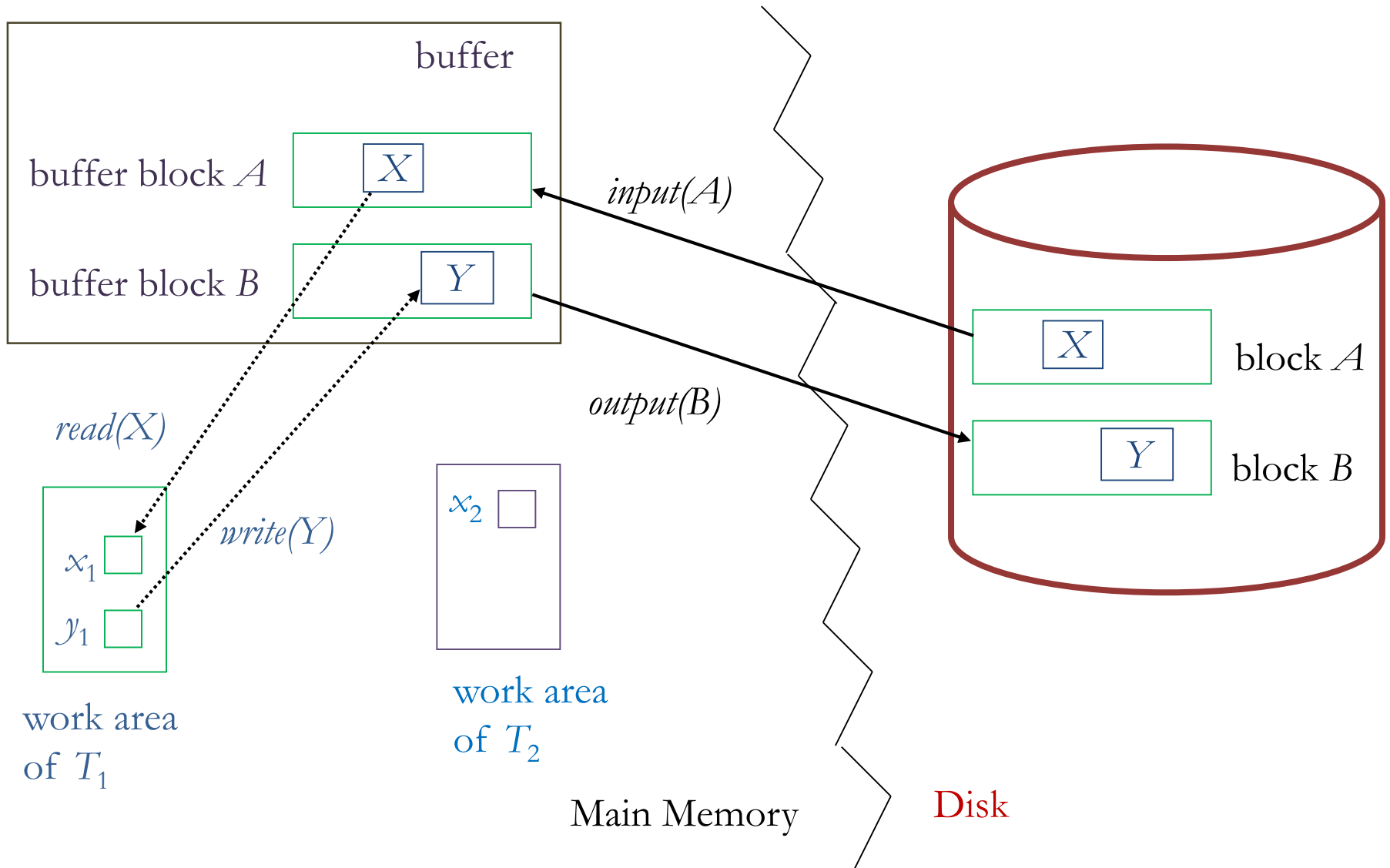
A record in a disk is usually identified logically by *< fileID, block#, rec# >* rather than using the physical address *< track#, sector#, offset >*.

- a. What may be the reason for this?
- b. Describe the information that should be kept in a file header that keeps track of the blocks in the file.

Discussion 10-11

Suppose transaction $T1$ requests **write**(X) on a database item X , and the DBMS subsequently responds with a success message. Does this mean that X is updated in the disk? Explain.

Example of Data Access



Discussion 10-12

Given the characteristics of *flash memory* and the mechanics of data access in disk based databases, suggest ways in which flash memory can be used to enhance database performance.