Sec. 1 Quiz #2 Date: Oct 18, 2010

Question

Consider an unsorted sequential file of size 80 MB. 10MB main memory available.

r= 5 ms, s= 10 ms, ebt= 1 ms, B= 2400 byte, R= 400 byte

a. Find time needed to sort using replacement selection sort.

b. Merging: Find the number of passes with p= 2.

c. Merging: Time needed for one pass of merge (just give the block reading time).

Solution

a. Replacement selection sort means we have two disk units and therefore we overlap reading and writing

   Sorting time= b x ebt

   b= 80 Mb/B= 80 MB/2400B = 33333 blocks (approximations are also OK)

   b x ebt= 33333 ms ➔ 33 sec

b. Merging: we have 8 sorted segments ➔ number of passes: $\lceil \log_2 8 \rceil = 3$

c. (2 x b x ebt) = (2 x 33) sec= 66 sec

Sec. 2 Quiz #2 Date: Oct 18, 2010

Question

Consider an unsorted sequential file of size 60 MB. 10 MB main memory available.

r= 5 ms, s= 10 ms, ebt= 1 ms, B= 2400 byte, R= 400 byte p= 2

a. Find time needed for sorting using heap sort

b. Find time needed for merging

Solution

a. (2 x b x ebt) = (2 x 60MB / 2400 byte x 1 ms) = 2 x 25000 x 1 ms = 50000 ms
b. Cost of one pass: 2 x p x (nsg) x (r+s)+2 x b x ebt = 4 x 6 x 15ms + 50000 ms = 50360 ms.

   Time needed for merging: number of pass x cost of one pass = $\lceil \log_2 6 \rceil$ x 50360 ms = 3 x 50360 ms = 151080 ms

Sec. 3 Quiz #2 Date: Oct 19, **2010**

Question

Consider an unsorted sequential file of size 600 MB. 10 MB main memory available.

r= 2 ms, s= 4 ms, ebt= 1 ms, B= 2400 byte, R= 400 byte, p= 4

a. Find time needed for merging
b. Show its progress pass by pass.

Solution

a. Cost of one pass: p x 2 x (nsg) x (r+s)+2 x b x ebt = 8 x 60 x 6ms + 2 x 250000 x 1ms = 502880 ms.

   Time needed for merging: number of pass x cost of one pass = $\lceil \log_4 60 \rceil$ x 502880 ms = 3 x 502880 ms = 1508640 ms

b.

Pass	**1**	**2**	**3**
Segment Size (MB)	10	40	three 160 one 120
# of segments	60	15	4