0/2 Questions Answered

Vitamin 5

STUDENT NAME

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Q1 Sorting
6 Points

For general external merge sort in two passes, fill in the blanks with the appropriate numerical expressions, where we have a file with 150 pages and 23 pages of available RAM (buffer pages).

How many sorted runs will be produced in pass 0?

Enter your answer here

What is the maximum number of pages that can be in the sorted runs produce during pass 0?

Enter your answer here

How many input buffers can be used in pass 1?

Enter your answer here

How many output buffers can be used in pass 1?

Enter your answer here

Enter your answer here

How many sorted runs will be produced in pass 1?

Enter your answer here

How many pages will be in the sorted run(s) produced pass 1?

Enter your answer here

What is the total cost in I/Os to sort this file?

Enter your answer here

Save Answer

Q2 Hashing
7 Points

We can process B x (B-1) pages of data with external hashing in two passes. For the first pass (the partitioning phase) of external hashing, answer the following questions with the appropriate number of pages being used where we have B pages of available RAM (buffer pages).

Q2.1 External Hashing

How many input buffers?

○ 1

○ B

○ B-1

○ sqrt(B)

○ ~~sqrt(B)~~

○ B(B-1)

How many partitions?

○ 1

○ B

○ B-1

○ sqrt(B)

○ B(B-1)

How many pages per partition? Assume a perfect hash function.

○ 1

○ B

○ B-1

○ sqrt(B)

○ B(B-1)

Q2.2 Pages for Hashing

If we had 10 buffer pages to externally hash elements, what is the maximum number of pages we could externally hash and guarantee that we would not have to do recursive partitioning?

Enter your answer here

Q2.3 Number of Pages to Ensure Recursive Partitioning

If we had 20 buffer pages to externally hash elements, what is the minimum number of pages we could externally hash to guarantee that we would have to use recursive partitioning?

Enter your answer here

Q2.4 Maximum Number of Pages w/o Recursive Partitioning

If we had 15 buffer pages to externally hash elements, and a hash function that partitions elements uniformly, what is the maximum number of pages we could externally hash without having to recursively partition?

Enter your answer here

Q2.5 Cost of Hashing

Assume that we have 72 KB of memory with 4 KB pages. What would be the cost in I/Os to externally hash a 128-page file? Assume that only one partition of 20 pages needs to be recursively partitioned once, and all other partitions are uniformly partitioned.

Enter your answer here

Save Answer

Save All Answers

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