CS540 Assignment 4

Winter 2020

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1: Query processing (2 points)

(a) Assume that there are 10 blocks available in the main memory. What is the fastest join algorithm for computing the join of R and S? What is the cost of this algorithm?

Ans: Because amount of buffer is small, therefore we use improved block-base nested-loop join. The cost would be B(R)B(S)/M = (80000*20000)/10 = 160000000 number of I/Os accesses.

(b) Assume that there are 350 blocks available in the main memory. What is the fastest join algorithm to compute the join of R and S? What is the cost of this algorithm?

Ans: Because B(R)+B(S)<=M^2, thus we can choose the optimized sort merge join algorithm, the cost would be = 3B(R)+3B(S)= 300000 number of I/Os accesses.

(c) Assume that there are 110,000 blocks available in the main memory. We like to have the output sorted based on the join attribute. What is the fastest join algorithm to compute the join of R and S? What is the cost of this algorithm?

Ans: Because we want the sorted output and B(R)+B(S)<M, therefore we can fit both relations in main memory and choose internal memory sort merge join algorithm to fulfill the requirement. The cost would be B(R)+B(S)=100000 number of I/Os accesses.

2: Query processing (4 points)

Use command “g++ -std=c++11 main.cpp -o main.out” to compile the main.cpp, and then use command “./main.out” to run.