Topic: Selection Operator Implementation

Assigned reading: Section 8.4 from Raghu 14.1 Ramakrishnan's book

The selection operator selects a subset of tuples from the given relation. The equivalent SQL construct is SELECT * FROM [Relation Name] WHERE [Selection Condition]

In general, selection condition can be quite complex. However, we will restrict our analysis to the case where the condition involves only a single attribute with equality check. For example: SELECT * FROM Student WHERE CPI=8.0

The most naïve way to implement selection is to scan the whole datafile. If the size of the datafile is M pages, then the I/O cost will be M pages. This corresponds to the Heap file organization. With sorted file organization, the first qualifying record can be located with just (LOG_2M) page I/Os using the binary search. Clustered B+ tree organization will further reduce this cost by increasing the base of logarithm from 2 to the branching factor of the B+ tree. When records are sorted (SORTED and Clustered B+ tree file organizations), retrieval of other qualifying records requires retrieval of a few successive pages from the datafile.

Unclustered B+ tree file organization will locate the first tuple in the same manner as the Clustered B+ Tree file organization. However for each qualifying record, we might need a page I/O. With Hash Index based file organization, we can locate the bucket of qualifying records using only a constant number of page I/Os. However, retrieval of each qualifying record will need a separate page I/O.