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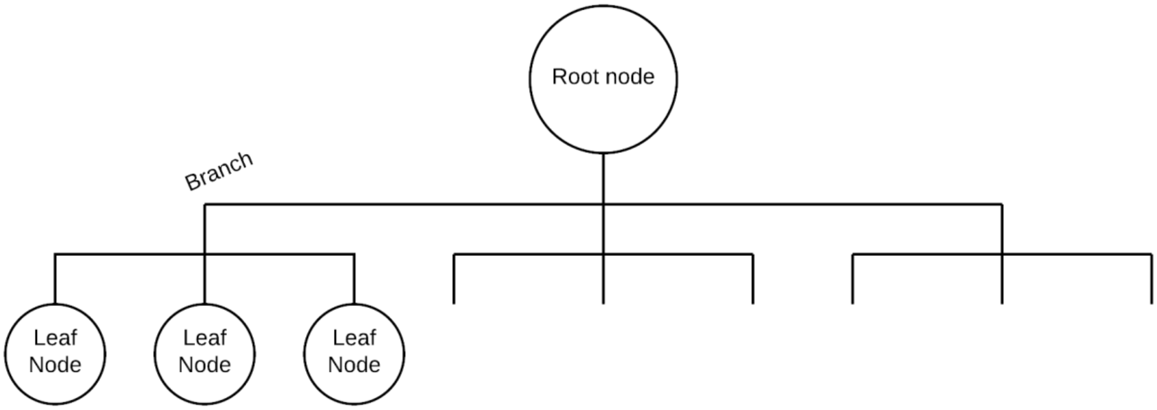
Info 445
Extra Credit: March 6th

Diagram a Balanced Tree Index



As more data is added to a balance tree, the structure of the tree gets wider, not deeper. There will only ever be two steps to get from the root to a leaf (unless the index is insanely large, then there will be two branch levels).

What is the difference between a clustered and non-clustered index? How do they work together?

Only one clustered index can exist on any table, and is most effective when indexed on small, sequential data, such as the primary key or a timestamp. These kinds of indexes work best in write-centric environments.

Many non-clustered indexes can exist any table, and they work best when the index is created from columns used in the WHERE clauses of queries. Non-clustered indexes are optimized for read-centric environments, and while both kinds of indexes harm write performance, non-clustered indexes perform worse for writing.

The only difference in the structure of the balanced tree for clustered and non-clustered indexes is in the lead node. Clustered index leaf nodes point to data in a table, while non-clustered index leaf nodes point to the root of a clustered index. By working together in such a way, the database is able to avoid computing more indexes than necessary by making use of already existing clustered indexes, leading to increased read performance while minimizing the write penalty.