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Homework 8

Database I

25.1) What are the two types of time, and how are they different? Why does it make sense to have both types of time associated with a tuple?

There are two types of times, transaction time and valid time. The transaction time for a fact is the time interval during which the fact is current within the database system. Facts in temporal relations have associated times when they are valid, which can be represented as a union of intervals. We need to have both types because for example, a client claim involving in a car accident. The agency need to determine the policy's term effected when the accident happened.

25.2) Suppose you have a relation containing the *x, y* coordinates and names of restaurants. Suppose also that the only queries that will be asked are of the following form: The query specifies a point, and asks if there is a restaurant exactly at that point. Which type of index would be preferable, R-tree or B-tree? Why?

This should use the B-tree index which contain a pair of attributes (x, y) because this query only searching for a point, not rebalancing or sorting.

25.3) Suppose you have a spatial database that supports region queries (with circular regions) but not nearest-neighbor queries. Describe an algorithm to find the nearest neighbor by making use of multiple region queries.

We need to find multiple region queries centered at the given point first. By doing that, we will query each region which is covers an area of points, the next time we will query a larger area until the result of a region query is not empty. So, then the distance from each point within the region will be calculated and the sets of the points from smallest will be reported.

25.9) Will functional dependencies be preserved if a relation is converted to a temporal relation by adding a time attribute? How is the problem handled in a temporal database?

No, because the functional dependencies may be violated when a relation is augmented to include a time attribute.

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