

# Database concepts



Look up the definition of functional dependency. Can you find a good example? In relational database theory, a functional dependency is a constraint between two sets of attributes in a relation from a database. Cars

Suppose one is designing a system to track vehicles and the capacity of their engines. Each vehicle has a unique vehicle identification number (VINE). One would write  $VINE \twoheadrightarrow Engine\ Capacity$  because it would be inappropriate for a vehicle's engine to have more than one capacity. Assuming, in this case, that vehicles only have one engine. Transversely,  $Engine\ Capacity \twoheadrightarrow VINE$  is incorrect because there could be many vehicles with the same engine capacity. This functional dependency may suggest that the attribute Engine Capacity be placed in a relation with candidate key VINE. However, that may not always be appropriate. For example, if that functional dependency occurs as a result of the transitive dependencies  $VINE \twoheadrightarrow Vehicle\ Model$  and  $Vehicle\ Model \twoheadrightarrow Engine\ capacity$  then that would not result in a normalized relation. [http://en.wikipedia.org/Westminster\\_dependency](http://en.wikipedia.org/Westminster_dependency)

2. Look up the definition of transitive dependency. Can you find a good example? In Database Management System, a transitive dependency is a functional dependency which holds by virtue of transitivity. A transitive dependency can occur only in a relation that has three or more attributes. Let A, B, and C designate three distinct attributes (or distinct collections of attributes) in the relation.

Suppose all three of the following conditions hold: 1.  $A \twoheadrightarrow B$  2. It is not the case that  $A \twoheadrightarrow C$  3. Then the functional dependency  $A \twoheadrightarrow C$  (which follows from 1 and 3 by the axiom of transitivity) is a transitive dependency. In database normalization, one of the important features of third normal form is that it

excludes certain types of transitive dependencies. E. F. Cod, the inventor of the relational model, introduced the concepts of transitive dependence and third normal form in 1971. [http://en. Waked. Org/waistline's\\_dependency](http://en.wikipedia.org/wiki/Transitive_dependency)

Example A transitive dependency occurs In the following relation: Book Genre Author Author Nationality Twenty Thousand Leagues under the Sea Science Fiction Jules Verne French Leaves of Grass Poetry Walt Whitman American Anna Karen Literary Fiction Leo Tolstoy Russian A Confession Religious Autobiography 3. Look up " denationalization" and provide information on why anyone would want to do it.

In computing, denationalization is the process of attempting to optimize the read performance of a database by adding redundant data or by grouping In some cases, denationalization is a means of addressing performance or scalability in relational database software. A demoralized data model is not the same as a data model that has not been normalized, and denationalization should only take place after a satisfactory level of normalization has taken place and that any required constraints and/or rules have been created to deal with the inherent anomalies in he design.

For example, all the relations are in third normal form and any relations with Join and multi-valued dependencies are handled appropriately. Examples of denationalization techniques include: Materialized views, which may implement the following: Storing the count of the " many" objects in a one-to-many relationship as an attribute of the " one" relation Adding attributes to a relation from another relation with which it will be Joined Star schemas, which are also known as fact-dimension models and have been extended to snowflake schemas Overbuilt summarization or OLAP cubes )applications.

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