

Rule 1: The Information Rule: Data can be retrieved by matching identifiers; so in essence data is retrieved without reference to the underlying file systems a simple SELECT statement explaining how a unique value was returned using a primary key.

Rule 2: The Guaranteed Access Rule: Data from a table can be accessed to field level again a simple SELECT statement demonstrating that unique values can be accessed in a table via a combination of table name, primary key and column name.

Rule 3: Systematic Treatment of Null Values: An example of a table that has a NULL value associated with a number of columns execute a query against it and both data types where NULL appears should be treated the same.

Rule 4: Dynamic Online Catalog based on the relational model: The meta data (data about data) i.e. the tables you create are stored in special tables called the INFORMATION_SCHEMA an example of the entries for your tables will suffice.

Rule 5: The Comprehensive Data Sub Language Rule: Every DBMS needs a language to modify data structures and query them; in the vast majority of cases it is SQL so some create statements for DDL and a number of queries for DML.

Rule 6: The View Updating Rule: Views are based on underlying tables so build a view execute an UPDATE query against; note the value UPDATED. Run a SELECT query against the base table and you should see the new value.

Rule 7: High Level Insert Update and Delete Rule: An example here of any Insert, Update or Delete that modifies more than one row in any of your tables.

Rule 8: Physical Data Independence: This is related to the theory of data independence and the ANSI/SPARC model covered in week 1. Data can be accessed via the same queries even if you move the physical location of the files on the file system i.e. where the data is stored on the operating system; in theory we could move the location of XAMPP on our machine and it would have no impact on the operation of our database **YOU DO NOT NEED TO DO THIS** although in previous years a number of students have completed this.

Rule 9: Logical Data Independence: Basically this means that if we change the databases at a logical level (tables) as distinct from a physical level (file system) it will have no effect on existing applications or queries. So for example if you created a new table your existing queries will still work.

Rule 10: Integrity Independence: This is basically the need for The relationship between Primary and Foreign Keys. A query that demonstrates this working in your database.

Rule 11: Distributed Independence: Queries should work the same way regardless of where the data is stored so in our database the patients table could be split on location and the queries for Insert, Update etc would work. Theory example only required.

Rule 12 Non Subversion Rule: Code other than SQL should not be able to change data values; in the past Operating System calls were sometimes employed; this has once again become relevant with hacking and injection of SQL from sources other than the DBMS. Theory example only required.