

Chapter 57: Table Design

Section 57.1: Properties of a well designed table

A true relational database must go beyond throwing data into a few tables and writing some SQL statements to pull that data out.

At best a badly designed table structure will slow the execution of queries and could make it impossible for the database to function as intended.

A database table should not be considered as just another table; it has to follow a set of rules to be considered truly relational. Academically it is referred to as a 'relation' to make the distinction.

The five rules of a relational table are:

1. Each value is *atomic*; the value in each field in each row must be a single value.
2. Each field contains values that are of the same data type.
3. Each field heading has a unique name.
4. Each row in the table must have at least one value that makes it unique amongst the other records in the table.
5. The order of the rows and columns has no significance.

A table conforming to the five rules:

Id	Name	DOB	Manager
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1	Fred	11/02/1971	3
2	Fred	11/02/1971	3
3	Sue	08/07/1975	2

- Rule 1: Each value is atomic. Id, Name, DOB and Manager only contain a single value.
- Rule 2: Id contains only integers, Name contains text (we could add that it's text of four characters or less), DOB contains dates of a valid type and Manager contains integers (we could add that corresponds to a Primary Key field in a managers table).
- Rule 3: Id, Name, DOB and Manager are unique heading names within the table.
- Rule 4: The inclusion of the Id field ensures that each record is distinct from any other record within the table.

A badly designed table:

Id	Name	DOB	Name
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1	Fred	11/02/1971	3
1	Fred	11/02/1971	3
3	Sue	Friday the 18th July 1975	2, 1

- Rule 1: The second name field contains two values - 2 and 1.
 - Rule 2: The DOB field contains dates and text.
 - Rule 3: There's two fields called 'name'.
 - Rule 4: The first and second record are exactly the same.
 - Rule 5: This rule isn't broken.
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