

## **Normalization:**

Normalization is the process of organizing data in a database to reduce redundancy of data. There are several normal forms that can be achieved in a database, but Third Normal Form (3NF) is the most desired form. To achieve 3NF the database first needs to be in Second Normal Form (2NF) and then no transitive dependencies should exist for the database to be in 3NF. Before we can look at 2NF and 3NF we first needed to achieve First Normal Form (1NF).

### **First Normal Form (1NF):**

This is when the data is organized in a table with each cell containing a single value, avoiding repeating groups of data. Columns have unique names, rows represent unique records, and the order of rows and columns is insignificant. After we achieve NF1 in the Dentist Database we can move forward to 2NF.

### **Second Normal Form (2NF):**

Requires that every non-prime attribute of a table is fully functionally dependent on the entire primary key. This means that each attribute should depend on the whole primary key, not just part of it. We can see this looking at the tables in the dentist database. That all tables have a primary key and there is no partial dependencies meaning we can move on to achieve 3NF.

### **Third Normal Form (3NF):**

Third Normal Form (3NF) eliminates transitive dependencies, which means that no non-prime attribute should be functionally dependent on another non-prime attribute. For example, let's consider the Employees table. The IsAvailable attribute is only dependent on the Employee\_ID, which is the primary key. There are no apparent transitive dependencies in this table. Meaning we achieve 3NF in our Dentist database because we meet the criteria for 2NF and there is no transitive dependencies.