# RDBMS

RDBMS stands for Relational Database Management System. An RDBMS is a type of DBMS with a row-based table structure that connects related data elements and includes functions that maintain the security, accuracy, integrity and consistency of the data. RDBMS is the basis for SQL, and for all modern database systems like MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access.

A RDBMS is a database management system DBMS that is based on the relational model as introduced by E. F. Codd.

# E.F Codd’s twelve commandments:

* If a management system or software follows any of 5-6 rules proposed by E.F.Codd, it qualifies to be a Database Management System (DBMS).
* If a management system or software follows any of 7-9 rules proposed by E.F.Codd, it qualifies to be a semi-Relational Database Management System (semi- RDBMS).
* If a management system or software follows 9-12 rules proposed by E.F. Codd, it qualifies to be a complete Relational Database Management System (RDBMS).

## Rule 0: Foundation rule

A system can be RDBMS if it is able to manage databases entirely through its relational capabilities.

## Rule 1: Information rule

Relational Databases should store the data in the form of relations. Tables are relations in RDBMS. Be it any user defined data or meta-data, it is important to store the value as an entity in the table cells.

## Rule 2: Guaranteed Access rule

Every datum (atomic value) in a relational database is guaranteed to be logically accessible by using a right combination of the table name, primary key represented by a specific row value and column name represented by attribute value.

## Rule 3: Systematic treatment of Null values

Null values are completely supported in relational databases. They should be uniformly considered as ‘missing information’. Null values are independent of any data type. They should not be mistaken for blanks or zeroes or empty strings. Null values can also be interpreted as ‘inapplicable data’ or ‘unknown information.’

## Rule 4: Rule of Active and online relational Catalog

In the Database Management Systems ‘metadata’ is the data about the database or the data about the data. The active online catalog that stores the metadata is called ‘Data dictionary’. Data dictionary is accessible only by authored users who have the required privileges and the query languages used for accessing the database should be used for accessing the data of data dictionary.

## Rule 5: Rule of Comprehensive Data Sub-language

A relational system may support several languages and various modes of terminal use. However, there must be at least one language whose statements are expressible, per some well-defined syntax, as character strings and that is comprehensive in supporting all of the following items: Data definition, View definition, Data manipulation (interactive and by program), Integrity constraints, Authorization, Transaction boundaries (begin, commit and rollback).

## Rule 6: Rule of Updating Views

All views that are theoretically updatable are also updatable by the system.

## Rule 7: Rule of Set level insertion, update and deletion

A single operation should be sufficient to retrieve, insert, update and delete the data.

## Rule 8: Physical Data Independence rule

Application programs and terminal activities remain logically unimpaired whenever any changes are made in either storage representations or access methods.

## Rule 9: Logical Data Independence rule

Application programs and terminal activities remain logically unimpaired when information-preserving changes of any kind that theoretically permit unimpairment are made to the base tables.

## Rule 10: Integrity Independence rule

Integrity constraints should be available and stored as metadata in data dictionary and not in the application programs.

## Rule 11: Distribution Independence rule

The Data Manipulation Language of the relational system should not be concerned about the physical data storage and no alterations should be required if the physical data is centralized or distributed. The end-user must not be able to see that the data is distributed over various locations. Users should always get the impression that the data is located at one site only.

## Rule 12: Non Subversion rule

Any row should obey the security and integrity constraints imposed. No special privileges are applicable.