

# Relational Database Management System

## What is RDBMS?

RDBMS stands for Relational Database Management System. RDBMS is the basis for SQL, and for all modern database systems like MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access.

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

## What is a table?

The data in an RDBMS is stored in database objects which are called as **tables**. This table is basically a collection of related data entries and it consists of numerous columns and rows.

Remember, a table is the most common and simplest form of data storage in a relational database. The following program is an example of a CUSTOMERS table –

Table 1

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Mumbai	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	MP	4500.00
7	Muffy	24	Indore	10000.00

## What is a field?

Every table is broken up into smaller entities called fields. The fields in the CUSTOMERS table consist of ID, NAME, AGE, ADDRESS and SALARY.

A field is a column in a table that is designed to maintain specific

information about every record in the table.

### What is a Record or a Row?

A record is also called as a row of data is each individual entry that exists in a table. For example, there are 7 records in the above CUSTOMERS table. Following is a single row of data or record in the CUSTOMERS table –

Table 2

1	Ramesh	32	Ahmedabad	2000.00
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A record is a horizontal entity in a table.

### What is a column?

A column is a vertical entity in a table that contains all information associated with a specific field in a table.

For example, a column in the CUSTOMERS table is ADDRESS, which represents location description and would be as shown below –

Table 3

ADDRESS
Ahmedabad
Delhi
Kota
Mumbai
Bhopal
MP
Indore

### What is a NULL value?

A NULL value in a table is a value in a field that appears to be blank, which means a field with a NULL value is a field with no value.

It is very important to understand that a NULL value is different than a zero value or a field that contains spaces. A field with a NULL value is the one that has been left blank during a record creation.

## SQL Constraints

Constraints are the rules enforced on data columns on a table. These are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database.

Constraints can either be column level or table level. Column level constraints are applied only to one column whereas, table level constraints are applied to the entire table.

Following are some of the most commonly used constraints available in SQL —

- NOT NULL Constraint — Ensures that a column cannot have a NULL value.
- DEFAULT Constraint — Provides a default value for a column when none is specified.
- UNIQUE Constraint — Ensures that all the values in a column are different.
- PRIMARY Key — Uniquely identifies each row/record in a database table.
- FOREIGN Key — Uniquely identifies a row/record in any another database table.
- CHECK Constraint — The CHECK constraint ensures that all values in a column satisfy certain conditions.
- INDEX — Used to create and retrieve data from the database very quickly.

## Data Integrity

The following categories of data integrity exist with each RDBMS —

- **Entity Integrity** — There are no duplicate rows in a table.
- **Domain Integrity** — Enforces valid entries for a given column by

restricting the type, the format, or the range of values.

- **Referential integrity** — Rows cannot be deleted, which are used by other records.

**User-Defined Integrity** — Enforces some specific business rules that do not fall into entity, domain or referential integrity.