University of Central Florida CGS 2545 Database Concepts

- What is RDBMS?
 - RDBMS stands for <u>R</u>elational <u>D</u>atabase
 <u>M</u>anagement <u>S</u>ystem
 - 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.

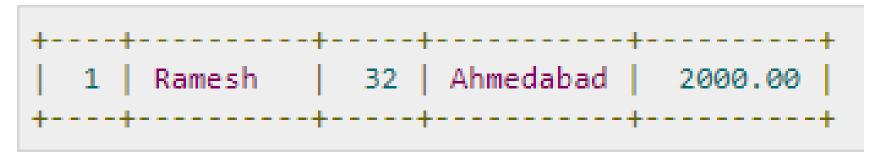
- What is a table?
 - The data in an RDBMS is stored in database objects which are called as tables.
 - This table is basically a collection of related data entries and it consists of numerous columns and rows.
 - IT is the most common and simplest form of data storage in a relational database

- What is a table?
 - example of a CUSTOMERS table

```
NAME
                 AGE
                       ADDRESS
                                     SALARY
ΙD
                       Ahmedabad
     Ramesh
                  32
                                      2000.00
     Khilan
                       Delhi
                                      1500.00
     kaushik
                  23
                                      2000.00
                        Kota
     Chaitali
                       Mumbai
                  25 I
                                      6500.00
     Hardik
                       Bhopal
                  27
                                      8500.00
     Komal
                  22
                       MP
                                      4500.00
     Muffy
                       Indore
                  24
                                     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
 - 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
 - A record is a horizontal entity in a table.
 - Following is a single row of data or record in the CUSTOMERS 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 to the right

```
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.

- SQL Constraints
 - Following are some of the most commonly used constraints available in SQL
 - NOT NULL Ensures that a column cannot have a NULL value.
 - DEFAULT Provides a default value for a column when none is specified.
 - UNIQUE 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 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.