**Rules of E.F CODD**

1. The data i.e. stored in the cell must be single value data.
2. According to E.F. Codd we can store the data in multiple tables, if needed we can establish a connection between the 2 tables using “Key Attributes”.
3. We can validate the data entering into the tables in 2 steps.

* By assigning data types.
* By assigning constraints.

Data types are mandatory whereas constraints are optional.

**Data Types:** Data type is used to specify the type of data that we are going to store in a particular memory location.

**Data Types in SQL**

* CHAR
* VARCHAR/VARCHAR2
* NUMBER
* DATE
* LARGE OBJECT

1. **CHAR:**

🡪 CHAR data type can accept ‘A-Z’, ‘a-z’, ‘0-9’, ‘special characters (\*,&,$.......).

🡪Whenever we use char data type we have to mention size for it.

**Size:** It describes the maximum number of characters that it can accept.

**Syntax: char (size)**

CHAR is a type of fixed length memory allocation.

Ex: char (10) ------> (Refer class notes)

CHAR data type can accept about 2000 characters.

**2. VARCHAR:**

🡪 VARCHAR data type can accept ‘A-Z’, ‘a-z’, ‘0-9’, ‘special characters’

(\*,&,$.......).

**Syntax: VarChar (size)**

VARCHAR is a type of variable length memory allocation.

Ex: VarChar (10) ------> (Refer class notes)

VARCHAR data type can accept about 2000 characters.

**VARCHAR2**

It is an updated version of VARCHAR in which it can accept 4000 characters.

**3. NUMBER:**

Number data type can accept 2 arguments i.e.

* PRECISION
* SCALE

**Syntax: NUMBER (PRECISION [, SCALE])**

**PRECISION:** It determines the number of digit required to store the value.

Ex: NUMBER (5) ------> (Refer class notes)

The **maximum** precision can be **38**.

**SCALE:** Scale is used to determine the number of digits required to store decimal value in the precision.

Ex: NUMBER (5, 2)

.:. P>S ------> (Refer class notes)

The **maximum** scale can be **127**.

**NOTE:**

If the precision = scale

Ex: NUMBER (4, 4) .:. P=S ------> (Refer class notes)

If the precision < scale

Ex: NUMBER (3, 6) .:. P<S ------> (Refer class notes)

**4. DATE:**

The oracle specified date formats are

‘DD-MON-YY’ OR ‘DD-MON-YYYY’

**Syntax: DATE**

**5. LARGE OBJECT:**

Large object are used to store huge values up to 4 GB of size.

* CHARACTER LARGE OBJECT (CLOB) : CLOB are used to store characters up to 4 GB of size.
* BINARY LARGE OBJECT (BLOB) : BLOB are used to store binary values of images, mp3, mp4 etc up to 4 GB of size.

**ASSIGNMENT**

1. List the difference between CHAR and VARCHAR.

**NULL**

NULL is a keyword which is used to represent empty cell or nothing.

Characteristics of NULL

* NULL does not represent 0 or space.
* NULL does not consume memory.
* We can’t equate 2 NULL’s. (NULL=NULL)
* Any arithmetic operations performed on NULL will result in NULL itself.