**Data Integrity:-**

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* The concept of enforcing business rules into database table is called data integrity.
* Integrity Constraint(IC) is a condition specified on a database schema and restricts the data that can be stored in an instance of the database.
* If the database instance satisfies all the IC’s specified on the database schema, it is a legal instance.
* A DBMS enforces integrity constraints, in that it permits only legal instances to be stored in the database.
* The various controls/constraints are

1. Primary Key
2. Not Null
3. Unique
4. Default
5. Check
6. Foreign Key

Classification of Constraints:-

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Constraints can be broadly classified as:

1. Column level-->constraint is applied to a single column

2. Table level-->constraint is applied to more than one column.

**Primary key:-**

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* It can be defined as the single column or combination of columns which uniquely identify a row in a table.

**Ex:-**

SQL> create table student\_master

(

rollno number(4) primary key,

name varchar2(20)

);

Table created.

SQL> insert into student\_master values(1201,'Amulya');

1 row created.

SQL> insert into student\_master values(1202,'Bhanu');

1 row created.

SQL> insert into student\_master values(1201,'Vinod');

insert into student\_master values(1201,'Vinod')

\*

ERROR at line 1:

ORA-00001: unique constraint (SYSTEM.SYS\_C004032) violated

SQL> insert into student\_master values(null,'Vinod');

insert into student\_master values(null,'Vinod')

\*

ERROR at line 1:

ORA-01400: cannot insert NULL into ("SYSTEM"."STUDENT\_MASTER"."ROLLNO")

**2. Composite Primary Key:-**

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* When a primary key consists of multiple columns then it is called a Composite Primary Key.

SQL> create table student\_master1

(

rollno number(4),

name varchar2(20),

college\_code varchar2(20),

primary key(college\_code,rollno)

);

Table created.

SQL> insert into student\_master1 values(1206,'Danu','12');

1 row created.

SQL> insert into student\_master1 values(1207,'Eswar','12');

1 row created.

SQL> insert into student\_master1 values(1207,'Fasiha','12');

insert into student\_master1 values(1207,'Fasiha','12')

\*

ERROR at line 1:

ORA-00001: unique constraint (SYSTEM.SYS\_C004035) violated

**Note:**

**a table can have only one primary key.**

**II.NOT NULL**

**--------------------**

* To restrict null values into column.

**Ex:-**

SQL> create table staff

(

sid integer,

sname varchar2(20) not null

);

Table created.

SQL> insert into staff values(1,'Guru');

1 row created.

SQL> insert into staff values(2,'Masthan');

1 row created.

SQL> insert into staff(sid) values(3);

insert into staff(sid) values(3)

\*

ERROR at line 1:

ORA-01400: cannot insert NULL into ("SYSTEM"."STAFF"."SNAME")

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**UNIQUE:-**

* Unique constraint column doesnt allow duplicate values but one or more NULL values allowed.

Ex:-

SQL> create table staff1

(

sid number(2) unique,

sname varchar2(20)

);

Table created.

SQL> insert into staff1 values(12,'Kumar');

1 row created.

SQL> insert into staff1(sname) values('Vamsi');

1 row created.

SQL> insert into staff1 values(12,'Seetal');

insert into staff1 values(12,'Seetal')

\*

ERROR at line 1:

ORA-00001: unique constraint (SYSTEM.SYS\_C004037) violated

**testing:-**

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SQL> select \* from staff1;

SID SNAME

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12 Kumar

Vamsi

SQL> select nvl(sid,2) from staff1;

NVL(SID,2)

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12

2

**DEFAULT:-**

* if we do not specify a value for column in the INSERT statement, then the value specified in default clause gets inserted.

SQL> create table staff2

(

sid number(2),

sname varchar2(20),

dept\_id number(2) DEFAULT 12

);

Table created.

SQL> insert into staff2 values(1,'Kumar',11);

1 row created.

SQL> insert into staff2(sid,sname) values(2,'Kumar');

1 row created.

SQL> select \* from staff2;

SID SNAME DEPT\_ID

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1 Kumar 11

2 Kumar 12

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***CHECK:-**

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* Check constraint used to check the values in a column with user defined conditions.

**syntax:-**

column\_name datatype check (expression)

SQL> create table staff3

(

sid number(2),

sname varchar2(20),

scity varchar2(20) CHECK(scity='tpt' or scity='chennai')

);

Table created.

SQL> insert into staff3 values(1,'Kumar','tpt');

1 row created.

SQL> insert into staff3 values(2,'Prabhas','chennai');

1 row created.

SQL> insert into staff3 values(3,'Vishal','hyd');

insert into staff3 values(3,'Vishal','hyd')

\*

ERROR at line 1:

ORA-02290: check constraint (SYSTEM.SYS\_C004038) violated

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**i.entity integrity-->can be achived with the help of primary key and unique.**

**ii.domain integrity--> not null,check,default**

**iii.referrential integrity-->foreign key**

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**Adding,Removing and Altering Constraints:-**

**-------------------------------------------------------------**

**1. Adding Constraint in existing table**

SQL> desc student;

Name Null? Type

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SID NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

SQL> alter table student add primary key(SID);

Table altered.

SQL> desc student;

Name Null? Type

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SID NOT NULL NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

**EX2:-**

SQL> desc student1;

Name Null? Type

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RNO CHAR(10)

NAME VARCHAR2(25)

SQL> alter table student1 add primary key(rno,name);

Table altered.

SQL> desc student1;

Name Null? Type

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RNO NOT NULL CHAR(10)

NAME NOT NULL VARCHAR2(25)

**Note:- to know the constraints on all the tables**

SQL>select constraint\_name,constraint\_type, table\_name from user\_constraints;

**2. Removing Constraints:-**

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SQL> alter table student drop primary key;

Table altered.

SQL> desc student;

Name Null? Type

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SID NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

**Ex:-**

SQL> alter table student add constraint myconstaint primary key(sid);

Table altered.

SQL> desc student;

Name Null? Type

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SID NOT NULL NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

**Disabling and enabling constraints:-**

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SQL> alter table student disable constraint myconstaint;

Table altered.

SQL> desc student;

Name Null? Type

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SID NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

SQL> alter table student enable constraint myconstaint;

Table altered.

SQL> desc student;

Name Null? Type

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SID NOT NULL NUMBER(4)

SNAME VARCHAR2(20)

SUB1 NUMBER(3)

SUB2 NUMBER(3)

SUB3 NUMBER(3)

**FOREIGN KEY:-**

Foreign key is nothing but a column referencing values from another table primary key column (or) unique constraint column. By default foreign key column also duplicate values.

Foreign key column data type should be same as primary key column.

**Syntax:-**

create table parenttable

(

did number(2) primary key,

dname varchar2(23)

);

create table childtable

(

sid number(2) primary key,

sname varchar2(20),

did number(2) references parenttable(did)

);

create table childtable

(

sid number(2) primary key,

sname varchar2(20),

foreign key(did) references parenttable(did)

);