Constraint

Constraint is a rule imposed on tables to restrict the values stored in it.

To maintain data integrity and accuracy.

There are five type of constraint .

NOT NULL

Unique

Primary Key

Foreign Key

Check

NOT NULL

Not null constraint checks the columns to be populated with non null values.

We will go not null constraint when column needs to be populated always.

Eg. Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Hiredate date,

Salary number(5));

Table created.

Now if we try to insert null to firstname then we will get error.

Insert into emp\_con(1,null,’rostan’,sysdate-10,10000);

Error:- cannot insert null into hr.emp\_con.firstname

To add NOT NULL CONSTRAINT to existing table.

By specifying constraint name

ALTER TABLE emp\_con modify lastname constraint lastname\_not\_null not null;

If all null values are present then it will throw error as below

Cannot enable null values found.

If we want to make then we can update that column with dummy values and then add constraint

Or

If we don’t want to change values but still want to add not null then add with novalidate keyword.

ALTER TABLE emp\_con modify lastname constraint lastname\_not\_null not null novalidate;

Without specifying constraint name.

Alter table emp\_con modify (lastname not null);

Alter table emp\_con modify (lastname not null novalidate);

DD

User\_constraint

All\_constraint

Not null constraint is stored with constraint type ‘C’ in data dictionary table

To drop the constraint

Alter table emp\_con drop constraint SYS\_C007585;

To Enable and Disable constraint .

Alter table emp\_con disable constraint SYS\_C007584;

Alter table emp\_con enable constraint SYS\_C007584;

Unique constraint

Checks where column has unqiue value or null values.

Can be added where you identify each values uniquely.

Unique key constraint column can contain null values.

At column level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100) unique,

Hiredate date,

Salary number(5));

At table level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5),

Constraint email\_uniue unique(email));

DD

User\_constraint

All\_constraint

Not null constraint is stored with constraint type ‘U’ in data dictionary table

To add unique constraint

Alter table emp\_con add(unique(email));

Alter table emp\_con add(constraint email\_unique unique(email));

PRIMARY KEY CONSTRAINT

Specifies the column that uniquely identifies a row in the table.

Primary key=not null+unique

Primary key does not allow NULL values.

A table can have one and only one primary key.

Composite primary key :- are defined when multiple columns are defined with primary key constraint.

Primary key constraint are nameable

It can be defined both on column level and table level.

Cannot contain more than 32 columns in a single primary key.

A column cannot be both primary and unique key.

When you specify primary key constraint on one or more columns then oacle will create a index on primary key.

Define at column level

Create table emp\_con

(empno number(5) primary key,

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5));

We can define by specifying name to constraint.

Create table emp\_con

(empno number(5) constraint empno\_primary primary key,

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5));

Insert into emp\_con values(1,’roshan’,’raj’,’roshan’,sysdate-10,10000);

I row inserted.

Insert into emp\_con values(null,’roshan’,’raj’,’roshan’,sysdate-10,10000);

ERROR:- cannot insert NULL into hr.emp\_Con.empno

Define at table level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5),

Constraint empno\_primary primary key(empno)); /// we can more then two col (Constraint empno\_primary primary key(empno,firstname));

DD

DD

User\_constraint

All\_constraint

Primary key constraint is stored with constraint type ‘P’ in data dictionary table

To add primary key constraint

Alter table emp\_con add(primary key (empno));

Alter table emp\_con add(constraint empno\_pri primary key(empno));

To DROP primary key constraint

Alter table emp\_con drop constraint empno\_primary;

Difference between Primary key and unique key

|  |  |
| --- | --- |
| PRIMARY KEY | UNIQUE KEY |
| Helps to identify a unique row from a table | Helps to maintain unique data in a column of a table |
| Does not allow null values | Nulls are allowed |
| One per table | Multiple per table |
| Unique index is created on the column where PK is defined | Unique index is created on the column where UK is defined |
| Foreign key can refer to PK | Foreign key can refer to UK |
| Column level and table level | Column level and table level |

Foreign key constraint

Specifies that the values in the columns must correspond to values in referenced primary key or unique columns or that they are NULL.

Foreign key column can contain NULL values.

AT table level

Create table dept\_demo(deptno number(5) primary key, deptname varchar2(20));

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5),

Constraint empno\_primary primary key(empno),

Constraint dept\_foreign foreign key(deptno) references dept\_con(deptno));

At column level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Hiredate date,

Salary number(5),

Deptno number(5) references dept\_con(deptno),

Constraint empno\_primary primary key(empno));

or

Deptno number(5) constraint dept\_for references dept\_con(deptno),

DD

User\_constraint

All\_constraint

Foreign key constraint is stored with constraint type ‘R’ in data dictionary table

To add foreign key constraint

Alter table emp\_con add(foreign key(deptno) references dept\_con(deptno));

Alter table emp\_con add(constraint dept\_fk foreign key(deptno) references dept\_con(deptno));

To DROP foreign key constraint

Alter table emp\_con drop constraint dept\_con;

Delete action

Foreign key

On delete set null

On delete cascade

On delete cascade :- if we delete record from main table then it will delete corresponding data from child table.

In user\_constraint delete\_rule colum will be with cascade.

On delete set null:- :- if we delete record from main table then it will set null corresponding data from child table.

In user\_constraint delete\_rule colum will be with “SET NULL”.

NOTE:- to delete data from main table, first we need to delete record from child table first.

CHECK CONSTRAINT

Used to specify a wide range of rules for the contents of a table.

A Boolean expression is specified for check constraint , Expression must be satisfied for all the rows of the table.

If any violation occurs during INSERT t UPDATE entire statement will be rolled back.

Can be defined at table level and column level.

At column level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Gender char(1) check (gender in (‘M’,’F’)),

Hiredate date,

Salary number(5),

Deptno number(5) references dept\_con(deptno),

Constraint empno\_primary primary key(empno));

AT table level

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Gender char(1) ,

Hiredate date,

Salary number(5),

Deptno number(5) references dept\_con(deptno),

Constraint empno\_primary primary key(empno),

Constraint gender\_ck check(gender in (‘M’,’F’)));

DD

User\_constraint

All\_constraint

Check constraint is stored with constraint type ‘C’ in data dictionary table

To add foreign key constraint

Alter table emp\_con add(check (gender in (‘M’,’F’));

Alter table emp\_con add(constraint gender\_ck check (gender in (‘M’,’F’)))

To DROP foreign key constraint

Alter table emp\_con drop constraint gender\_ck;

DEFAULT CONSTRAINT

Default constraint is used to provide a default value to a column.

Default value will be added to column if no other value is specified.

It is not actual constraint type.

Create table emp\_con

(empno number(5),

Firstname varchar2(10) not null,

Lastname varchar2(10),

Email varchar2(100),

Gender char(1) ,

Hiredate date default sysdate,

Salary number(5),

Deptno number(5) references dept\_con(deptno),

Constraint empno\_primary primary key(empno),

Constraint gender\_ck check(gender in (‘M’,’F’)));

To add to already existing column.

Alter table emp\_con modify hiredate default sysdate;

We can check default values in

User\_Tab\_cols.data\_default

DEFFERED constraint

Defered constraint are checked only at the time of transaction is committed.

Deferrable immediate

Deferrable deffered

Deferrable immediate

Data will checked immediately when data is inserted or updated.

Create table testdef(col1 number(5),col2 varchar2(10) unique );

Or

Create table testdef(col1 number(5),col2 varchar2(10) unique deferrable initially immediate);

Both statements are same

Insert into testdef values(1,’A’);

Commit;

Insert into testdef values(2,’A’);

Error : cannot insert duplicate values

Deferrable deffered

Data will checked when transaction is commited.

Create table testdef(col1 number(5),col2 varchar2(10) unique deferrable initially deffered);

Insert into testdef values(1’A’);

I row inserted

Insert into testdef values(2,’A’);

1 row inserted.

Commit;

Error 02091 : transaction rolled back

Unique constraint violated

Here unique values are checked during the transaction commit

All the above inserts will be rolled back.

Few facts about constraint

It is good to have primary key for all tables.

Too many constraints are difficult to maintain in future

Do not create too many check constraint

To find all the constaint on a table.

select \* from user\_constraints where table\_name=’EMP\_CON’;

to disable all constraint on table

DECLARE

L\_error\_msg varchar2(4000);

BEGIN

L\_error\_msg := ‘Error while opening cursor for constraint’;

For I in (select table\_name,constraint\_name from user\_constraint where table\_name=’EMP\_CON’)

LOOP

Execute immediate ‘ Alter table ‘||i.table\_name ||’ disable constraint ‘||i.constraint\_name;

END LOOP;

EXCEPTION WHEN OTHERS THEN

L\_error\_msg := substr(l\_error\_msg||SQLCODE||SQLERRM,1,3000);

RAISE\_APPLICATION\_ERROR(-20001,l\_error\_msg);

END;

/

to enable all constraint on table

DECLARE

L\_error\_msg varchar2(4000);

BEGIN

L\_error\_msg := ‘Error while opening cursor for constraint’;

For I in (select table\_name,constraint\_name from user\_constraint where table\_name=’EMP\_CON’)

LOOP

Execute immediate ‘ Alter table ‘||i.table\_name ||’ enable constraint ‘||i.constraint\_name;

END LOOP;

EXCEPTION WHEN OTHERS THEN

L\_error\_msg := substr(l\_error\_msg||SQLCODE||SQLERRM,1,3000);

RAISE\_APPLICATION\_ERROR(-20001,l\_error\_msg);

END;

/

to drop all constraint on table

DECLARE

L\_error\_msg varchar2(4000);

BEGIN

L\_error\_msg := ‘Error while opening cursor for constraint’;

For I in (select table\_name,constraint\_name from user\_constraint where table\_name=’EMP\_CON’)

LOOP

Execute immediate ‘ Alter table ‘||i.table\_name ||’ drop constraint ‘||i.constraint\_name;

END LOOP;

EXCEPTION WHEN OTHERS THEN

L\_error\_msg := substr(l\_error\_msg||SQLCODE||SQLERRM,1,3000);

RAISE\_APPLICATION\_ERROR(-20001,l\_error\_msg);

END;

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