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A Comparative Study on Database Constraints

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Abstract: *Measure of database wellness depends on the schema. It is a data administrator's job to apply certain rules so that the database remains consistent in every state while DML statements are applied on the database. Security and redundancy is also a special factor to be noted. Oracle provides Certain Constraints to work on these factors.*

This study will help database administrators to design schema using I/O constraints or Business Constraints to remain their Database according to their Organizational need.

Keywords: *Data Constraints, I/O constraints, Business constraints, Check constraint.*

I. INTRODUCTION

Oracle facilitate database administrator to apply certain constraints to fulfil the integrity and maintain the consistency of the database. These constraints are mostly divided into I/O constraints and Business constraints. The I/O constraints are further divided into column level and table level. With Table level Constraint, we can define constraint for multiple columns where as for Column level we can define constraint only for specific column only.

Constraints check the validity of the each column domain and bound the database administrator to follow. These are just some kind of restrictions which specified on a database schema and restrict the data to be inserted wrongly. Organizations follows certain rules which are branding them these rules are called business rules different from I/O constraints.

II. TYPES OF CONSTRAINTS

This study includes each type of constraint in detail. Table level Constraints are defined separately after the columns are defined. A table level constraint can see every column in the table and they are generally composite in nature.

Column level Constraints are defined along with the columns and are more meaningful and sound syntactically. A column level constraint has scope only to the column it is defined on.

1. I/O Constraints:

Constraints applied when data is inserted or retrieved from a table are called I/O constraints these also determine the speed. These constraints are further divided into four types that are primary, unique, not null, foreign key constraints.

1.1 Primary Key Constraint

Primary key can be applied for reducing the redundancy of the tuples and uniqueness among other records in a table. This constraint can be applied on column(s). It's characteristics is that it is unique and Not null itself. It can be either simple that means applied on a single column or can be composite that means applied on more than one column. We can see primary key using the syntax and example listed below.

Primary key (Column Level)

Syntax : <col_name><data_type>(<size>) **primary key**.

Example : Create table Student(

Rno number(2) primary key,

name varchar2(15),

city varchar2(15)

);

Primary key (Table Level)

Syntax : **primary key**(<column1>,<column2>).

Example : Create table Emp(

Fname varchar2(15),

Lname varchar2(15),

salary number(7,2),

dept varchar2(10),

Primary key(Fname, Lname)

);

Note: Primary key can only be one in a table it may be single as well as composite.

1.2 Unique Key Constraint

Unique key can be applied for reducing the redundancy of the tuples and uniqueness among other records in a table. This constraint can be applied on column(s). It's characteristics is that it is unique but it may be left null. It can be either simple that means applied on a single column or can be composite that means applied on more than one column. We can see Unique key using the syntax and example listed below.

Unique(Column Level)

Syntax : <col_name> <data_type> (<size>) **Unique**.

Example : create table student(rno number(2) unique, name varchar2(15), city varchar2(15));

Unique(Table Level)

Syntax : **Unique**(<column1>,<column2>).

Example : Create table Emp(

Fname varchar2(15),

Lname varchar2(15),

salary number(7,2),

dept varchar2(10),

unique(Fname,Lname)

);

Note : Unique can be applied on multiple attributes in a table but we can't stop an attribute from being null.

1.3 Foreign Key Constraint

Foreign Key as the name implies references another table or we can say represents relations between two relations. Foreign key enforces the referential integrity. There are two tables master and a slave or parent and a child. As the priority says parent comes first after that a child will be. It forces to insert records in a child or slave table only if a column which is referenced from foreign table is available in that table.

Foreign Key (Column Level)

Syntax :<Col Name><Data Type>(<Size>) References <Relation's Name>(<Col Name>)

Example :

Parent Table

Create table Student(

Rno number(2) primary key,

Name varchar2(15),

City varchar2(15)

);

Child Table

Create table Stud_detail(

Rno number(2) references Student(Rno),

Address varchar2(30),

City varchar2(15)

);

Note: Whenever a table's schema is deleted than it must follow the bottom up approach that means if a child is Exists then parent can't be dropped or deleted. You first have to delete or drop the child or slave table.

2 Business Constraints:

Business organizations are following their own rules and regulations which establish them as a brand in Competition. For Example a company has decided that no employee should be paid under 5000/- either it is a fourth class employee. The business constraints forcing the data integrity and check the rule every time an write operation or insert operation is applied to a relation in oracle. The Business constraint can be followed by the check constraint and also not null constraint. Not null is in this list because it is decided by the company to which they want to make Not null. Check Constraint can be given directly but from the programmers point of view you must give a name to certain check constraints so that you easily delete a particular check constraint, it is also seen that multiple checks can be applied on a table. Like we want to insert mobile no. which is 10 digits and can't be a character value. Or inserted salary not less than 5000 in any condition. These constraints enforces the validation before inserting the record in a table if validation violated then disallow to insert.

2.1 Check Constraint

Syntax : Constraint <Constraint name> Check(<condition>).

Example : Create table Book(

ISBN number(5),

Bname varchar2(20),

Pages number(3),

constraint checkname check(Bname like('A%'))

2.2); Not Null Constraint

Not Null can be applied for forcing attribute to be filled when certain record inserted in a table. This constraint can be applied on column(s). It's characteristics is that it can't be null itself. The column where it is applied may be duplicate.

Syntax: <col_name><data_type>(<size>) Not Null.

Example : Create table Emp(

Fname varchar2(15) not null,

Lname varchar2(15) not null,

salary number(7,2),

dept varchar2(10),

);

Note: Not null constraint can be defined on column level only not on table level and more than an attribute can Have this not null constraint.

III. CONCLUSION

Organizations in today context uses vast variety of databases and it is a tedious job if a database administrator not analyze the database properly before finalizing it. The Oracle Data Constraint enhance the power of the administrator provided integrity and security & prevent the relations from being redundant or inconsistent. This study will sure help you to further research and development in the field of database. These above examples are well tested.

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