SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE NAME : 23ITB204 MODERN DATABASE MANAGEMENT SYSTEMS

II YEAR / III SEMESTER

Unit 1-Relational Databases

Topic 8: SQL Fundamentals

Advantages of SQL

- SQL is a high level language that provides a greater degree of abstraction than procedural languages.
- SQL enables the end users and systems personnel to deal with a number of database management systems where it is available.
- Applications written in SQL can be easily ported across systems.
- SQL as a language is independent of the way it is implemented internally.

Part of SQL

- DDL (Data Definition Language)
- DML (Data Manipulation Language)
- DQL (Data Query Language)
- DCL (Data control language) / TCL (Transaction Control language)
- View definition
- Embedded SQL and Dynamic SQL
- Integrity
- Authorization

SQL DATA TYPES

- Character (n) or varchar
  - This data type represents a fixed length string of exactly ‘n’ characters where ‘n’ is greater than zero and should be an integer.

Example

name character(10);

name varchar(10)

SQL DATA TYPES cont...

- Varchar2(n)

This data type represents a varying length string whose maximum length is ‘n’ characters.

Example

name varchar2(n);

SQL DATA TYPES cont...

- number(p,q)

  syntax

  number(l,d)

  Stores numeric data, where ‘l’ stand for length and ‘d’ for the number of decimal digits.

Example

price number (6,2);

SQL DATA TYPES cont...

- Integer

  An integer represents a signed integer represents a signed integer decimal or binary.

Example

Roll_no integer(5);

SQL DATA TYPES cont...

- Small int

A small integer is a machine independent subset of the integer domain type.

Example

Roll_no small int(3) ;

SQL DATA TYPES cont...

- Float (n)

  A floating point number, with precision of at least n digits.

Example

Rate float(5,2) ;

SQL DATA TYPES cont...

- Date

  A calender data containing a (four_digital year, month and day of the month).

Example

Date_of_birth date ;

SQL DATA TYPES cont...

- Time

  The time of day, in hours, minutes and seconds.

Example

Arrival_time time;

Data Definition Language

- It is used to create a table, alter the structure of a table and also drop the table.
- Create command
- Alter command
- Drop command
- Truncate command

Create Command

- It is used to create a table.

Syntax

Create table <table name> (
columnname1 datatype1,
columnname2 datatype2, etc…);

Example

SQL> create table emp
(empno number(4),
ename varchar2(30),
salary number(10,2),
deptno number(2));

Alter Command

- It is used to add a new column or modify existing column definitions.

Syntax

Alter table <table name>
Add (new columnname1 datatype1,
newcolumnname2 datatype2, etc…);

Alter table <table name>
Modify (oldcolumnname1 datatype1,
oldcolumnname2 datatype2, etc…);

Alter Command cont....

Example

SQL> alter table emp

add(comm number(6,2));

SQL> alter table emp

modify(empno number(5));

Drop Command

- This command is used to delete a table. [delete the contents (records and structure)].

Syntax

Drop table <table name>;

Example

SQL> drop table emp;

Truncate Command

- This command is used to delete the records but retain the structure.

Syntax

Truncate table <table name>;

Example

SQL> truncate table emp;

View the table structure

Syntax

Desc <table name>;

Example

SQL> desc emp;

Rename a table

Syntax

Rename <oldtablename> to <newtablename>;

Example

SQL> Rename emp to employee;

Data Manipulation Language

Insert, Update, Delete

Insert Command

- It is used to insert a new record in the database.

Syntax

Insert into <table name> values <a list of data values>;

Example

SQL> insert into emp values (100, ‘Raja’ 25000,10,500);

Insert Command cont…

Example

SQL> insert into emp (empno, salary) values (
101, 40000);

SQL> insert into emp values (&empno, ‘&name’,
&salary. &deptno, &comm);

SQL> \

SQL> save a. sql

SQL> get a. sql

SQL> run a. sql or start a.sql

update Command

- Changes can be made by using update command.

Syntax

Update <table name> set filedname = values where <Condition>;

Example

SQL> update emp set comm=500 where eno=100;

update Command cont…

Example

SQL>SQL> update emp set comm=1000; SQL>

update emp set comm=comm+500;

SQL> update emp set ename =‘Raj kumar’ where ename =‘Raj’;

SQL> update emp set comm=2000 where ename =‘Raja’ and salary>=30000; SQL> update emp set comm =40 where comm is null;

SQL> update emp set salary = salary*0.1 where comm is notnull;

SQL> update emp set salary =50000, comm=1500 where eno=27;

Delete Command

- Rows can be deleted using delete command.

Syntax

Delete from <table name> where <Condition>;

Example

SQL> delete from emp where ename =‘abc’;

SQL> select * from emp;

Delete Command cont…

Example

SQL> delete from emp where salary<30000;

SQL> delete from emp;

Transaction Control Language

Commit, Rollback, Savepoint

Transaction Control Language

- The TCL statements give you flexibility to undo transactions or write transactions to the disk.
- Transactions provide consistency in case of a system failure.

Commit

- Current transaction and writes all changes permanent to the disk.

Save point

- Marks a point in the current transaction. Roll back [To savepoint n]

- Undoing all changes if a to savepoint.

TCL cont…

Example

SQL> insert into emp values (&empno, '&name', &salary. &deptno, &comm);

SQL> /

Input some record

SQL> select * from emp; SQL>

commit;

SQL> delete from emp where comm> 2500; SQL>

select * from emp;

SQL> Rollback;

SQL> select * from emp;

SQL> delete from emp where eno=200; SQL>

save point x;

SQL> delete from emp where salary<30000;

SQL> rollback to x;

Data Control Language

Grant , Revoke

Data Control Language

Privileges

- Select, insert, update, delete, reference

Grant Command

- Give the permission to others user.

Syntax

Grant <privileges> on <table name> to <username>;

Example

SQL> Grant select on emp to user1;

SQL> Grant select, insert on emp to user2 ; SQL> Grant update (comm) on emp to user3;

SQL> Grant update(salary , comm) on emp to user4;

SQL> Grant select(dno=10) on emp to user5;

Revoke Command

- Get back the permission to others user.

Syntax

Revoke <privileges> on <table name> from <username>;

Example

SQL> Revoke select on emp from user1;

SQL> Revoke select, insert on emp from user2 ; SQL> Revoke update (comm) on emp from user3;

SQL> Revoke update(salary , comm) on emp from user4;

SQL> Revoke select(dno=10) on emp from user5;

DML

select

SELECT STATEMENTS

- The select command is used to retrieve data from an oracle database.

Syntax

Select <field names> from <table name> where <condition>

Example

SQL> select * from emp;

Display all records.

SELECT STATEMENTS cont…

Example

SQL> select ename, salary, comm from emp;

Display selected field only.

SQL> select * from emp where dno=10;

SQL> select salary+500 from emp where dno=10;

SQL> select * from emp where dno=10 and salary>5000;

Sub Queries

Create table

emp	Dept
Eno	Dno
Ename	Dname
Salary	loc
Job	
dno	

SQL> select dno from dept where dname='sales';

- SQL> select * from emp where dno=10;
- SQL> select * from emp where dno=(select dno from dept where dname='sales');
- SQL> select * from emp where dno in (select dno from dept where loc='salem');
- SQL> select ename, salary from emp where salary = (select max(salary) from emp);
- SQL> select ename, salary from emp where salary > (select avg(salary) from emp);

in

- SQL> select ename, salary from emp where job='salesman' or job='manager';

- SQL> select ename, salary from emp where job in ('manager' , 'salesman');

Not in

- SQL> select ename, salary from emp where job notin (‘manager’ , ‘salesman’);

like

- SQL> select * from emp where ename like ‘Raj’;
- SQL> select * from emp where ename notlike ‘Raj’;
- SQL> select * from emp where ename like ‘s%’; (More than one characters)
- SQL> select * from emp where ename like ‘-a-a%’; (- single characters)

between

- SQL> select * from emp where salary <3000 or salary>10000;
- SQL> select * from emp where salary between 5000 and 10000;
- SQL> select * from emp where salary notbetween 5000 and 10000;

Thank You