GDC MEMORIAL COLLEGE
BAHAL (BHIWANI)-127028

Lab Manual

DBMS (B.Sc.(cs) & B.Com Vocational)
Department of Computer Science

***** 1 *****

INDEX

SR NO.	LIST OF EXPERIMENT
01	**INTRODUCTION TO ORACLE**
02	**DATA TYPES OF SQL**
03	**SQL COMMANDS**

INTRODUCTION TO ORACLE.

ORACLE

Oracle is one of the powerful RDBMS product that provide efficient solutions for database applications. Oracle is the product of Oracle Corporation which was founded by LAWRENCE ELLISION in 1977. The first commercial product of oracle was delivered in 1970. The first version of oracle 2.0 was written in assembly language. Nowadays commonly used versions of oracle are ORACLE 8, 8i & 9i Oracle 8 and onwards provide tremendous increase in performance, features and functionality.

FEATURES OF ORACLE

- ✓ Client/Server Architecture
- ✓ Large database and Space Management
- ✓ Concurrent Processing
- ✓ High transaction processing performance
- ✓ High Availability
- ✓ Many concurrent database users
- ✓ Controlled availability
- ✓ Openness industry standards
- ✓ Manageable security
- ✓ Database enforced integrity
- ✓ Distributed systems
- ✓ Portability
- ✓ Compatibility

ORACLE SERVER TOOL

Oracle is a company that produces most widely used server based multi-user RDBMS. Oracle server is a program installed on server hard-disk drive. This program must be loaded in RAM to that it can process the user requests. Oracle server takes care of following functions. Oracle server tools are also called as back end. Functions of server tool:

- ✓ Updates the data

- ✓ Retrieves the data sharing

- ✓ Manages the data sharing

- ✓ Accepts the query statements PL/SQL and SQL

- ✓ Enforce the transaction consistency

ORACLE CLIENT TOOL

Once Oracle engine is loaded into sever memory user would have to log in to engine in order to work done. Client tools are more useful in commercial application development. It provides facilities to work on database objects. These are more commonly used in commercial applications. Oracle client tools are also called front end.

APPLICATION DEVELOPMENT TOOLS

- **SQL*Plus** – A command line tool used to manipulate tables and other database objects in an Oracle database.

- **Developer** A suite of application development tools including Forms, Reports and Graphics.

- **Oracle Forms** – A screen based tool used to develop data entry forms and menus that access tables in an Oracle database.

- **Oracle Reports** – A screen based tool used to develop reports that access tables in an Oracle database.

- **Oracle Graphics** – A graphical tool used to develop charts and reports that access tables in an Oracle database.

- **Oracle JDeveloper** – A general purpose Java Integrated Development Environment that has been pre-loaded with classes and methods used to connect to and manipulate schemas in Oracle databases. A collection of code development wizards allow the developer to quickly create data entry forms as Java applications or applets as well as reports using Java Server Pages (JSP).

- **Oracle Designer** – A graphical tool used to create and display models contained in the CASE*Dictionary. The CASE*Dictionary is a repository for business rules, functional models and data models used for organizing and documenting an application development effort. CASE*Generator is a code generating tool that uses information stored in CASE*Dictionary to develop data entry forms, reports and graphics.

- **Programmer** – Including the Pro* precompilers – Libraries of routines and utilities that can be linked with "C", C++, FORTRAN, Java, ADA, COBOL or other host languages to allow access to Oracle databases.

RUNNING SQL*PLUS

In this section, we give some general directions on how to get into the SQL*Plus program and connect to an Oracle database. Specific instructions for your installation may vary depending on the version of SQL*Plus being used, whether or not SQL*Net or Net8 is in use, etc.

Some tips on Obtaining and Installing Oracle Software can be found on this link.
If you have the Oracle Express Edition installed, this link. will describe how to run SQL Commands in Oracle Application Express.
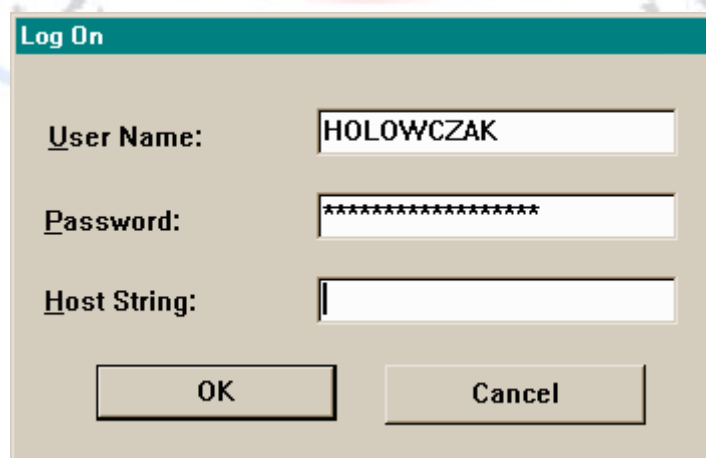Before using the SQL*Plus tool or any other development tool or utility, the user must obtain an Oracle account for the DBMS. This account will include a username, a password and, optionally, a host string indicating the database to connect to. This information can typically be obtained from the database administrator.

The following directions apply to two commonly found installations: Windows XP or Windows 7 client (from here on, referred to simply as a Windows client) with an Oracle server, and a UNIX/LINUX installation.

RUNNING SQL*PLUS UNDER WINDOWS

To run the SQL*Plus command line program from **Windows**, click on the [Start] button, Programs, Oracle – OraHomeXX, Application Development and then SQL*Plus. The SQL*Plus login screen will appear after roughly 15 seconds.
(Note the XX is replaced with the version of the database you are using such as 81 for Oracle8i, 90 for Oracle9i etc.).

In the **User Name:** field, type in your Oracle username.

Press the TAB key to move to the next field.

In the **Password:** field, type your Oracle password.
Press the TAB key to move to the next field.

In the **Host String:** field, type in the *Service Name* of the Oracle host to connect to.
If the DBMS is Personal Oracle lite then this string might be ODBC:POLITE. If the DBMS is a local Personal Oracle8, 8i or 9i database, then the host string might be either beq-local or in some cases, you can leave this field blank to connect to your local database instance. Make certain your local instance is started. For Client/Server installations with SQL*Net or Net8, this string will be the service name set up by the SQL*Net or Net8 assistant software.

Finally, click on the OK button to complete the Oracle log in process. SQL*Plus will then establish a *session* with the Oracle DBMS and the SQL*Plus prompt (SQL>) will appear. The following figure shows the results of logging into Oracle using SQL*Plus:

DDL – DATA DEFINATION LANGUAGE

The SQL sentences that are used to create these objects are called
DDL's or Data Definition Language. The sql provides various commands for defining relation schemas, deleting relations, creating indexes and modify relation schemas. DDL is part of sql which helps a user in defining the data structures into the database. Following are the various DDL commands are

- ✓ Alter table & Create table & drop table
- ✓ Create index & drop index
- ✓ Create view & drop view

DML – DATA MANIPULATION LANGUAGE

The SQL sentences used to manipulate data within these objects are called DML's or Data Manipulation Language. It is language that enables users to
access or manipulate data as organized by appropriate data model. By data manipulation we have

- ➢ Retrieval of information stored in database.
- ➢ Insertion of new information into database.
- ➢ Deletion of information from database.
- ➢ Modification of data stored in database.

Two types of DML are

- ✓ Procedural DML
- ✓ Non-procedural DML

Following are DML commands are

- ➢ Select
- ➢ Update
- ➢ Delete
- ➢ Insert

DCL – DATA CONTROL LANGUAGE

The SQL sentences, which are used to control the behavior of these objects, are called DCL's or Data Control Language. It is language used to control data and access to the database. Following are some DCL commands are

- ➢ Commit
- ➢ Rollback
- ➢ Save point
- ➢ Set transaction

DATA TYPES OF SQL

- ✓ **CHAR :** This data type is used to store character strings values of fixed length. The size in brackets determines the number of characters the cell can hold. The maximum number of characters (i.e. the size) this data type can hold is 255 characters. Syntax is CHAR(SIZE) Example is CHAR (20)

- ✓ **VARCHAR :** This data type is used to store variable length alphanumeric data. The maximum this data type can hold is 4000 characters. One difference between this data type and the CHAR data type is ORACLE compares VARCHAR values using non-padded comparison semantics i.e. the inserted values will not be padded with spaces. Syntax is VARCHAR(SIZE) Example is VARCHAR (20) OR VARCHAR2 (20)

- ✓ **NUMBER :** The NUMBER data type is used to store numbers (fixed or floating point). Numbers of virtually any magnitude maybe stored up to 38 digits of precision. Numbers as large as $9.99 * 10$ to the power of 124, i.e. followed by 125 zeros can be stored. The precision, (P), determines the maximum length of the data, whereas the scale, (S), determines the number of

places to the right of the decimal. If scale is omitted then the default is zero. If precision is omitted values are stored with their original precision up to the maximum of 38 digits.

Syntax is NUMBER (P, S) Example is NUMBER (10, 2)

- ✓ **LONG :** This data type is used to store variable length character strings containing up to 2GB. LONG data can be used to store arrays of binary data in   ASCII format. LONG values cannot be indexed, and the normal character functions such as SUBSTR cannot be applied to LONG values.

  Syntax is LONG (SIZE) Example is LONG (20)

- ✓ **DATE :** This data type is used to represent data and time. The standard format id DD-MM-YY as in 13-JUL-85. To enter dates other than the standard format, use the appropriate functions. Date Time stores date in the 24-hour format. By default, the time in a date field is 12:00:00 am, if no time portion is specified. The default date for a date field is the first day of the current month.

  Syntax is DATE

- ✓ **LONG RAW :** LONG RAW data types are used to store binary data, such as

   Digitized picture or image. Data loaded into columns of these data types are

stored without any further conversion. LONG RAW data type can contain up to 2GB. Values stored in columns having LONG RAW data type cannot be indexed. Syntax is LONGRAW (SIZE)

- ✓ **RAW :** It is used to hold strings of byte oriented data. Data type can have a maximum length of 255 bytes. Syntax is RAW(SIZE)

SQL COMMANDS

- ✓ **CREATE TABLE:** A table is basic unit of storage. It is composed of rows and columns. To create a table we will name the table and the columns of the table. We follow the rules to name tables and columns:-

  - ➢ It must begin with a letter and can be up to 30 characters long.
  - ➢ It must not be duplicate and not any reserved word.

Syntax to create a table is

CREATE TABLE tablename (column_name1 datatype (size), column_name2 datatype (size) …);

Example is

CREATE TABLE student (rollno number (4), name varchar2 (15));

```
SQL*Plus Worksheet                                                    [_][□][X]
  File  Edit  Worksheet  Help                                    ORACLE

  CREATE TABLE EMPLOYEEE(
  EMPID NUMBER(10) NOT NULL,
  FIRSTNAME CHAR(10),
  LASTNAME CHAR(10),
  EMPDATE DATE,
  ADDRESS VARCHAR(10)
  );


  SQL*Plus: Release 9.0.1.0.1 - Production on Mon Jan 1 00:42:21 2007

  (c) Copyright 2001 Oracle Corporation.  All rights reserved.

  Connected.
  CREATE TABLE EMPLOYEE(
                *
  ERROR at line 1:
  ORA-00955: name is already used by an existing object


  Table created.
```

✓ **SELECT :** The select command of sql lets you make queries on the database. A query is a command that is given certain specified information from the database tables. It can be used to retrieve a subset of rows or columns from one or more tables.

Syntax to create a table is

      SELECT <column_name1>,<column_name2> FROM <tablename>;

Example is

      SELECT empno, ename, sal from emp;

```
SQL*Plus Worksheet                                                    [_][□][✕]

   File  Edit  Worksheet  Help                                    ORACLE

   select * from employeee;




   _____

   1 row created.


   1 row created.


        EMPID FIRSTNAME  LASTNAME   ADDRESS
   ---------- ---------- ---------- ----------
           23 rty        sdf        sf45-h
           23 rty        sdf        sf45-h
           23 rty        sdf        sf45-h
           56 asb        sghd       fh89
          756 ysb        fbg        t23j
```

***** **11** *****

```
SQL*Plus Worksheet
File  Edit  Worksheet  Help                                    ORACLE

select firstname from employeee
where empid=56;




FIRSTNAME
----------
asb


FIRSTNAME
----------
asb


FIRSTNAME
----------
asb
```
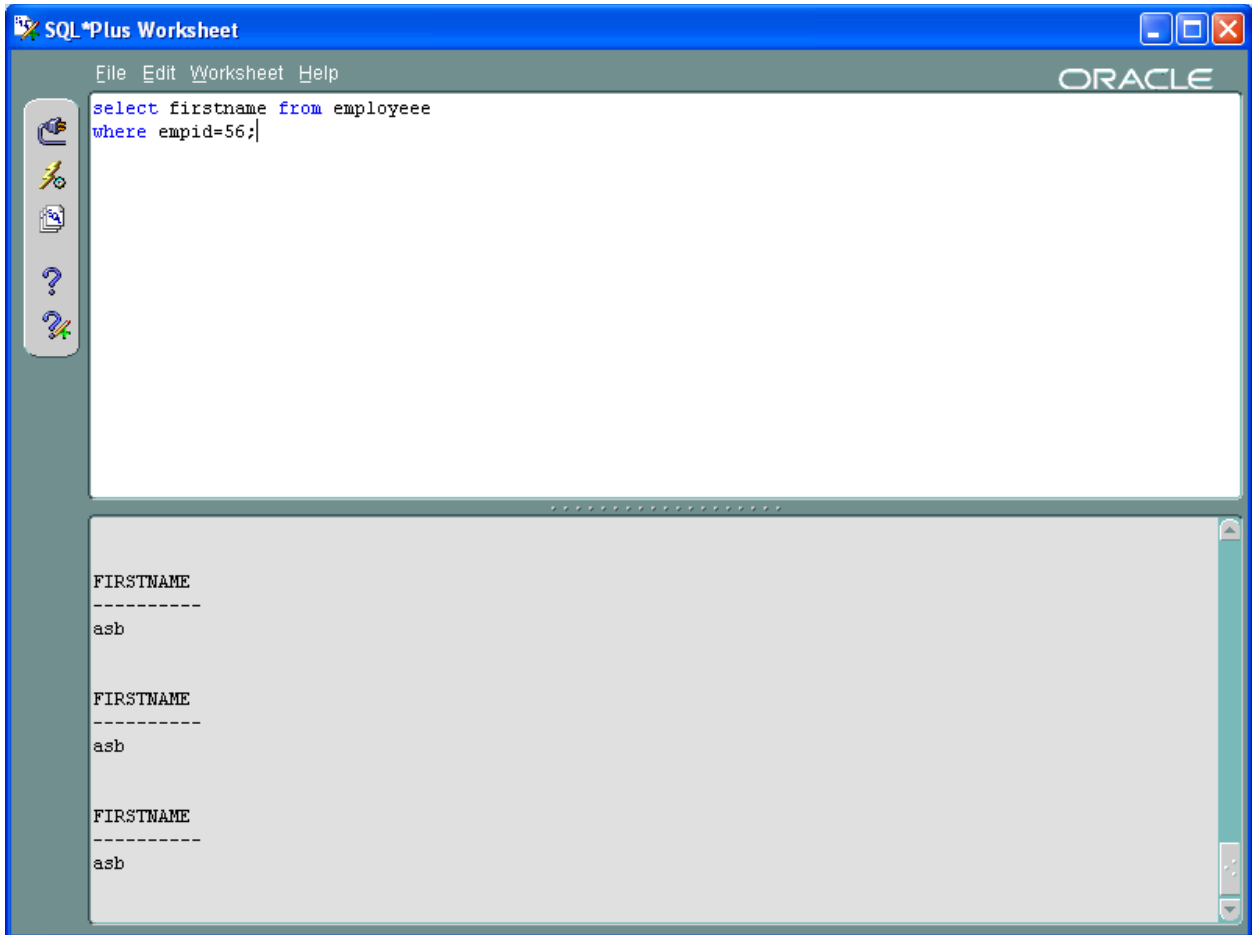
✓ **DESCRIBE :** To find information about columns like column name, their data types and other attributes of a table we can use DESCRIBE command. Syntax to describe table is
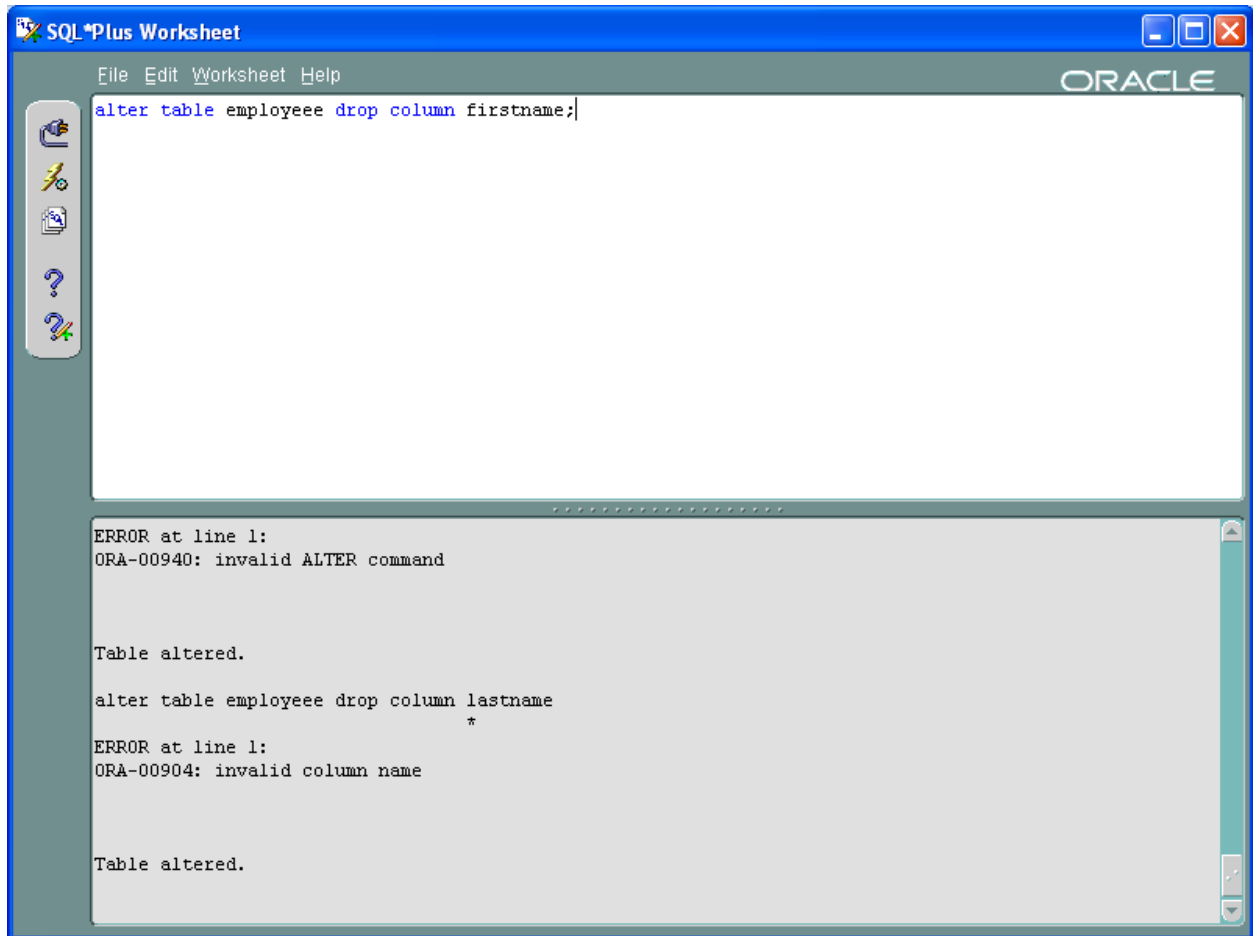
   DESCRIBE tablename;

```
SQL*Plus Worksheet

File  Edit  Worksheet  Help                                          ORACLE

DESC EMPLOYEEE;


                    *
ERROR at line 1:
ORA-00955: name is already used by an existing object


Table created.

Name                                      Null?    Type
----------------------------------------- -------- ---------------------------
EMPID                                     NOT NULL NUMBER(10)
FIRSTNAME                                          CHAR(10)
LASTNAME                                           CHAR(10)
EMPDATE                                            DATE
ADDRESS                                            VARCHAR2(10)
```
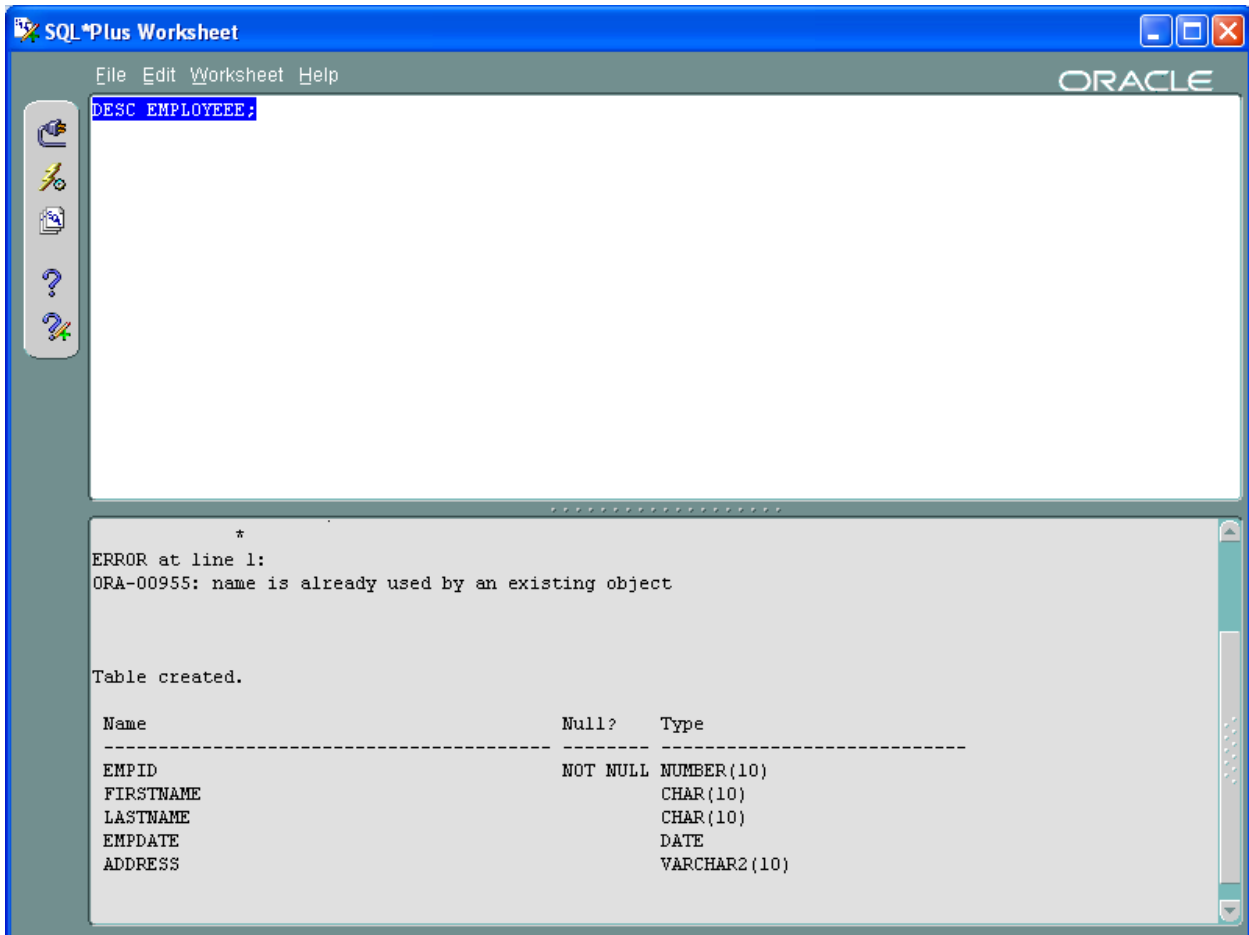
✓ **ALTER TABLE :** After creating a table one may have need to change the table either by add new columns or by modify existing columns. One can do so by using alter table command.

Syntax to add a column is

   ALTER TABLE tablename ADD(col1 datatype,col2 datatype);

Syntax to modify a column is

   ALTER TABLE tablename MODIFY(col1 datatype,col2 datatype);

```
SQL*Plus Worksheet
File  Edit  Worksheet  Help                          ORACLE

alter table employeee drop column firstname;




ERROR at line 1:
ORA-00940: invalid ALTER command


Table altered.

alter table employeee drop column lastname
                                   *
ERROR at line 1:
ORA-00904: invalid column name


Table altered.
```

✓ **DELETE :** One can delete data fron table by using delete from statement. The delete statement removes rows from table but it doesn't release storage space. Syntax of delete rows from table is

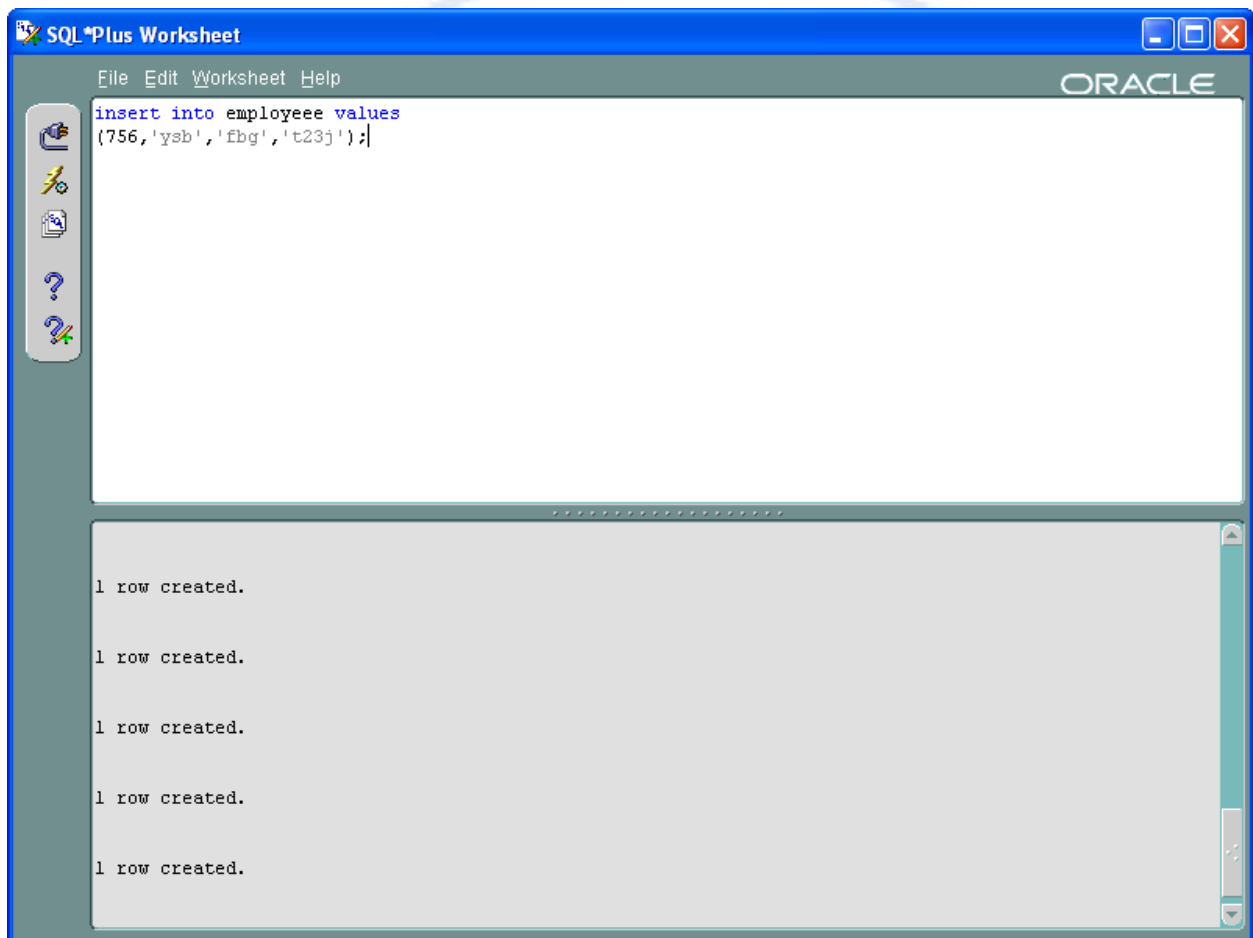DELETE FROM tablename WHERE <condition>;
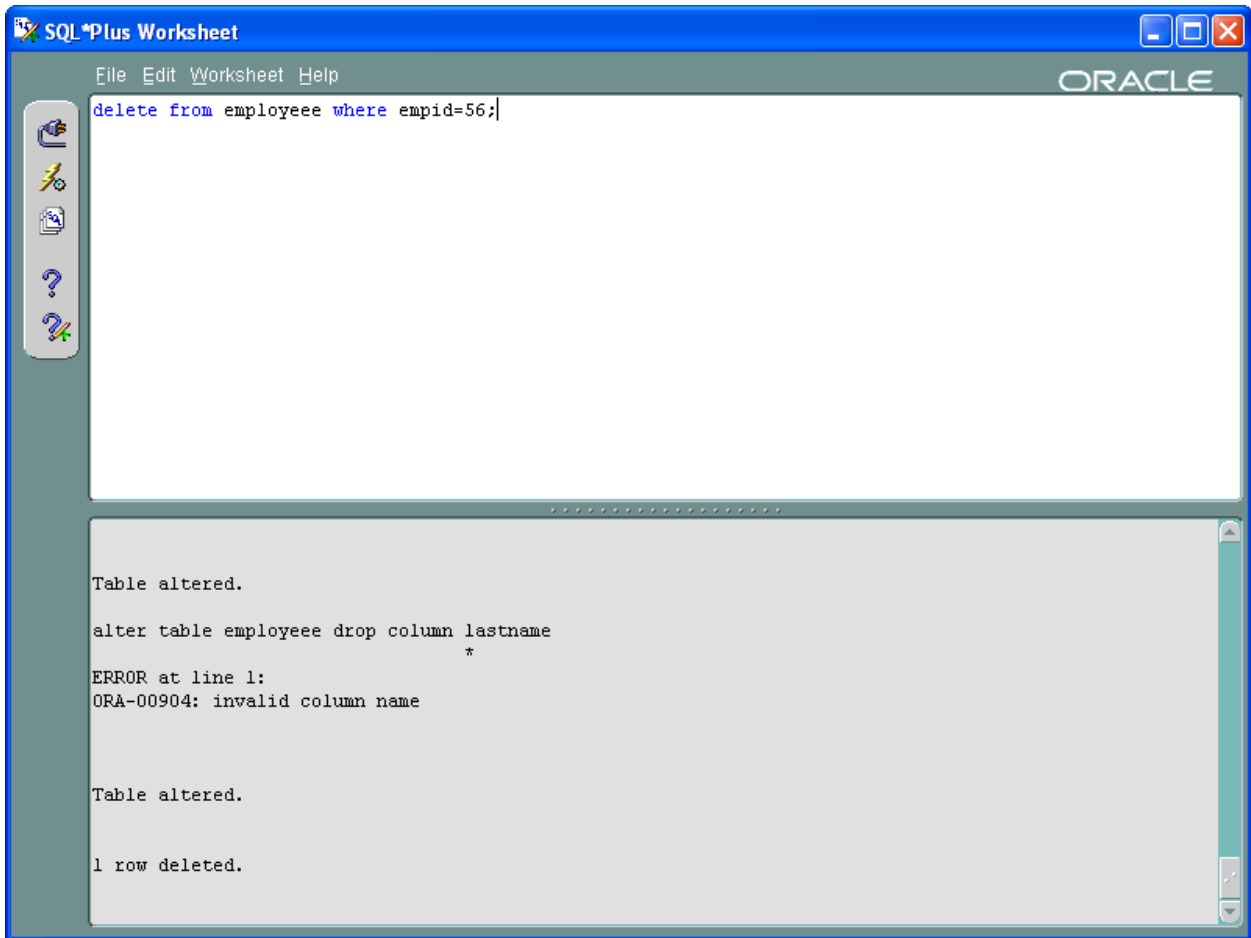
✓ **INSERT :** To add new rows in an existing oracle table the insert command is used. Syntax to add new fields is

       INSERT INTO tablename(col1,col2,col3,..)

       VALUES(value1,value2,value3);

Example is

       INSERT INTO employee(emp_id,ename,desg,basic_pay)

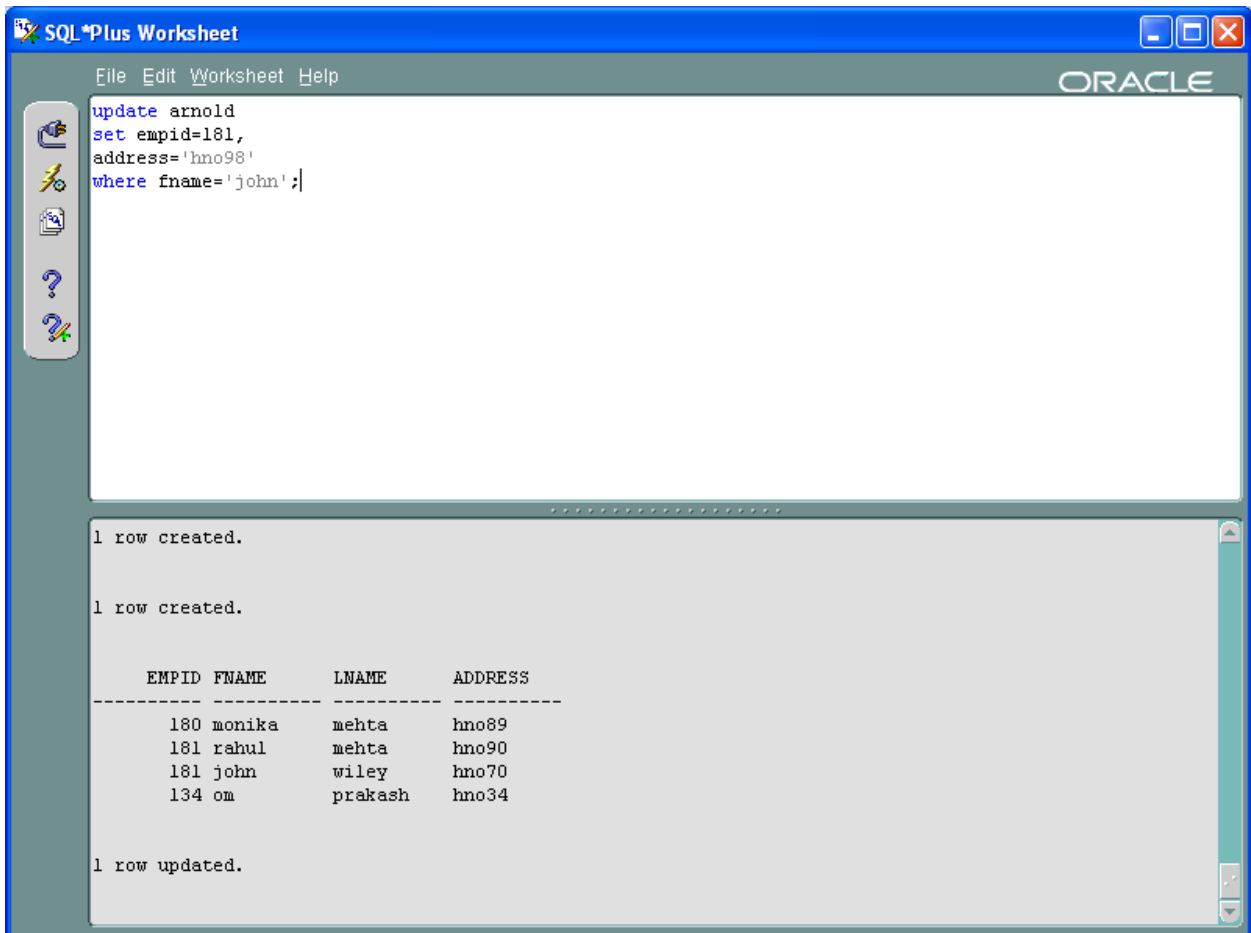   VALUES(100001,'MOHIT','MANAGER',55000);

✓ **UPDATE :** The update command enables user to change the values of existing rows. Syntax to update value of table is

> UPDATE tablename SET col1=value1,col2=value2;

Example is

> UPDATE emp_info SET salary =salary +100;

```
SQL*Plus Worksheet

File  Edit  Worksheet  Help                        ORACLE

update arnold
set empid=181,
address='hno98'
where fname='john';
```

```
1 row created.


1 row created.


    EMPID FNAME      LNAME      ADDRESS
---------- ---------- ---------- ----------
       180 monika     mehta      hno89
       181 rahul      mehta      hno90
       181 john       wiley      hno70
       134 om         prakash    hno34


1 row updated.
```

✓ **DROP TABLE :** To remove the definition of oracle table, the drop table statement is used. Syntax to drop table is

> DROP TABLE tablename

✓ **RENAME :** One can change the name of a table by rename command Syntax to rename table is

> RENAME oldname TO newname