SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur-603203.

CS3466 - DATABASE MANAGEMENT SYSTEMS LABORATORY

Lab Manual

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CS3466 DATABASE MANAGEMENT SYSTEMS LABORATORY L T P C
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COURSE OBJECTIVES:

• To learn and implement important commands in SQL.
• To learn the usage of nested and joint queries.
• To understand functions, procedures and procedural extensions of databases.
• To understand design and implementation of typical database applications.
• To be familiar with the use of a front end tool for GUI based application development.

LIST OF EXPERIMENTS:

1. Create a database table, add constraints (primary key, unique, check, Not null), insert rows, update and delete rows using SQL DDL and DML commands.
2. Create a set of tables, add foreign key constraints and incorporate referential integrity.
3. Query the database tables using different _where‘ clause conditions and also implement aggregate functions.
4. Query the database tables and explore sub queries and simple join operations.
5. Query the database tables and explore natural, equi and outer joins.
6. Write user defined functions and stored procedures in SQL.
7. Execute complex transactions and realize DCL and TCL commands.
8. Write SQL Triggers for insert, delete, and update operations in a database table.
9. Create View and index for database tables with a large number of records.
10. Case Study using any of the real life database applications from the following list

a) Inventory Management for a EMart Grocery Shop
b) Society Financial Management
c) Cop Friendly App – Eseva
d) Property Management – eMall
e) Star Small and Medium Banking and Finance

• Build Entity Model diagram. The diagram should align with the business and functionalgoals stated in the application.
• Apply Normalization rules in designing the tables in scope.
• Prepared applicable views, triggers (for auditing purposes), and functions for Enabling enterprise grade features.

TOTAL: 45 PERIODS

SOFTWARE Requirements:

Systems with MySql, Visual Studio, Systems with Oracle 11g Client

COURSE OUTCOMES:

At the end of this course, the students will be able to:

- Create databases with different types of key constraints.
- Construct simple and complex SQL queries using DML and DCL commands.
- Use advanced features such as stored procedures
- Create a trigger for the database.
- Create and manipulate database application.

Ex. No. 1 DATA DEFINITION LANGUAGE (DDL) COMMANDS IN RDBMS

AIM:

To execute and verify the Data Definition Language commands.

DDL (DATA DEFINITION LANGUAGE)

- ❖ CREATE
- ❖ ALTER
- ❖ DROP
- ❖ TRUNCATE
- ❖ COMMENT
- ❖ RENAME

PROCEDURE

STEP 1: Start

STEP 2: Create the table with its essential attributes.

STEP 3: Execute different Commands and extract information from the table.

STEP 4: Stop

SQL COMMANDS

1. COMMAND NAME: **CREATE**
   COMMAND DESCRIPTION: **CREATE** command is used to create objects in the database.
2. COMMAND NAME: **DROP**
   COMMAND DESCRIPTION: **DROP** command is used to delete the object from the database.
3. COMMAND NAME: **TRUNCATE**
   COMMAND DESCRIPTION: **TRUNCATE** command is used to remove all the records from the table
4. COMMAND NAME: **ALTER**
   COMMAND DESCRIPTION: **ALTER** command is used to alter the structure of database
5. COMMAND NAME: **RENAME**
   COMMAND DESCRIPTION: **RENAME** command is used to rename the objects.

QUERY: 01

Q1. Write a query to create a table employee with empno, ename, designation, and salary.

Syntax for creating a table:

```
SQL: CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE),
COLUMN NAME.1 <DATATYPE> (SIZE)............................................................... );
```

QUERY: 01

```
SQL>CREATE TABLE EMP (EMPNO NUMBER (4),
                      ENAME VARCHAR2 (10),
                      DESIGNATIN VARCHAR2 (10),
                      SALARY NUMBER (8,2));
Table created.
```

QUERY: 02

Q2. Write a query to display the column name and datatype of the table employee.

<u>Syntax for describe the table:</u>

```
SQL: DESC <TABLE NAME>;
SQL> DESC EMP;
Name                                        Null?    Type
------------------------------------ -------- ------------
EMPNO                                                NUMBER(4)
ENAME                                                VARCHAR2(10)
DESIGNATIN                                           VARCHAR2(10)
SALARY                                               NUMBER(8,2)
```

QUERY: 03

Q3. Write a query for create a from an existing table with all the fields

<u>Syntax For Create A from An Existing Table With All Fields</u>

SQL> CREATE TABLE <TRAGET TABLE NAME> SELECT * FROM <SOURCE TABLE NAME>;

QUERY: 03

```
SQL> CREATE TABLE EMP1 AS SELECT * FROM EMP;
Table created.
SQL> DESC EMP1
Name                                        Null?    Type
-------------------------------------- -------- -----------------
EMPNO                                              NUMBER(4)
ENAME                                              VARCHAR2(10)
DESIGNATIN                                           VARCHAR2(10)
SALARY                                               NUMBER(8,2)
```

QUERY: 04

Q4. Write a query for create a from an existing table with selected fields

<u>Syntax For Create A from An Existing Table With Selected Fields</u>

SQL> CREATE TABLE <TRAGET TABLE NAME> SELECT EMPNO, ENAME FROM <SOURCE TABLE NAME>;

QUERY: 04

```
SQL> CREATE TABLE EMP2 AS SELECT EMPNO, ENAME FROM EMP;
Table created.

SQL> DESC EMP2
```

```
Name                                    Null?    Type
--------------------------------------- -------- ---------------------
EMPNO                                            NUMBER (4)
ENAME                                            VARCHAR2 (10)
```

QUERY: 05

Q5. Write a query for create a new table from an existing table without any record:

Syntax for create a new table from an existing table without any record:

SQL> CREATE TABLE <TRAGET TABLE NAME> AS SELECT * FROM <SOURCE TABLE NAME> WHERE <FALSE CONDITION>;

QUERY: 05

SQL> CREATE TABLE EMP3 AS SELECT * FROM EMP WHERE 1>2;

Table created. SQL> DESC EMP3;

```
              Name                      Null?    Type
              ------------------------- -------- ----------------------
              - EMPNO                            NUMBER(4)
              ENAME                              VARCHAR2(10)
              DESIGNATIN                         VARCHAR2(10)
              SALARY                             NUMBER(8,2);
```

ALTER & MODIFICATION ON TABLE

QUERY: 06

Q6. Write a Query to Alter the column EMPNO NUMBER (4) TO EMPNO NUMBER (6).

Syntax for Alter & Modify on a Single Column:

SQL > ALTER <TABLE NAME> MODIFY <COLUMN NAME> <DATATYPE> (SIZE);

QUERY: 06

SQL>ALTER TABLE EMP MODIFY EMPNO NUMBER (6);

Table altered.

SQL> DESC EMP;

```
Name                                    Null?    Type
--------------------------------------- -------- --------------------------
              EMPNO                              NUMBER(6)
              ENAME                              VARCHAR2(10)
              DESIGNATIN                         VARCHAR2(10)
              SALARY                             NUMBER(8,2)
```

QUERY: 07

Q7. Write a Query to Alter the table employee with multiple columns (EMPNO, ENAME.)

Syntax for alter table with multiple column:

SQL > ALTER <TABLE NAME> MODIFY <COLUMN NAME1> <DATATYPE> (SIZE), MODIFY <COLUMN NAME2> <DATATYPE> (SIZE) ....;

QUERY: 07

```
SQL>ALTER TABLE EMP MODIFY (EMPNO NUMBER (7), ENAME VARCHAR2(12));
Table altered.
SQL> DESC EMP;
              Name                                Null?    Type
              ------------------------------------- -------- ------------------------
              EMPNO                                        NUMBER(7)
              ENAME                                        VARCHAR2(12)
              DESIGNATIN                                   VARCHAR2(10)
              SALARY                                       NUMBER(8,2);
```

QUERY: 08

Q8. Write a query to add a new column in to employee

Syntax for add a new column:

SQL> ALTER TABLE <TABLE NAME> ADD (<COLUMN NAME> <DATA TYPE> <SIZE>);

QUERY: 08

```
SQL> ALTER TABLE EMP ADD QUALIFICATION VARCHAR2(6);
Table altered.
SQL> DESC EMP;
              Name                                Null?    Type
              ------------------------------------- -------- ------------------------
              EMPNO                                        NUMBER(7)
              ENAME                                        VARCHAR2(12)
              DESIGNATIN                                   VARCHAR2(10)
              SALARY                                       NUMBER(8,2)
              QUALIFICATION                                VARCHAR2(6)
```

QUERY: 09

Q9. Write a query to add multiple columns in to employee

Syntax for add a new column:

SQL> ALTER TABLE <TABLE NAME> ADD (<COLUMN NAME1> <DATA TYPE> <SIZE>,(<COLUMN NAME2> <DATA TYPE> <SIZE>,..);

QUERY: 09

```
SQL>ALTER TABLE EMP ADD (DOB DATE, DOJ DATE);
Table altered.
SQL> DESC EMP;
Name                                              Null?    Type
------------------------------------- -------- ------------------------
```

```
EMPNO                                    NUMBER(7)
ENAME                                    VARCHAR2(12)
DESIGNATIN                               VARCHAR2(10)
SALARY                                   NUMBER(8,2)
QUALIFICATION                            VARCHAR2(6)
DOB                                      DATE
DOJ                                      DATE
```

REMOVE / DROP

QUERY: 10

Q10. Write a query to drop a column from an existing table employee

<u>Syntax for add a new column:</u>

```
SQL> ALTER TABLE <TABLE NAME> DROP COLUMN <COLUMN NAME>;
SQL> ALTER TABLE EMP DROP COLUMN DOJ;
Table altered.
SQL> DESC EMP;
Name                    Null?   Type
-------------------------------------- -------- ------------
EMPNO                         NUMBER(7)
ENAME                        VARCHAR2(12)
DESIGNATIN                  VARCHAR2(10)
SALARY                       NUMBER(8,2)
QUALIFICATION              VARCHAR2(6)
DOB                          DATE
```

QUERY: 11

Q11. Write a query to drop multiple columns from employee

<u>Syntax for add a new column:</u>

```
SQL> ALTER TABLE <TABLE NAME> DROP <COLUMN NAME1>,<COLUMN NAME2>,;
```

QUERY: 11

```
SQL> ALTER TABLE EMP DROP (DOB, QUALIFICATION);
Table altered.

SQL> DESC EMP;
            Name                          Null?    Type
            -------------------------------------- -------- ------------
            EMPNO                                  NUMBER(7)
            ENAME                                  VARCHAR2(12)
            DESIGNATIN                             VARCHAR2(10)
            SALARY                                 NUMBER(8,2)
```

REMOVE

QUERY: 12

Q12. Write a query to rename table emp to employee

Syntax for add a new column:

SQL> ALTER TABLE RENAME <OLD NAME> TO <NEW NAME>

QUERY: 12

```
SQL> ALTER TABLE EMP RENAME EMP TO EMPLOYEE;


SQL> DESC EMPLOYEE;
          Name                          Null?   Type
          ------------------------------------- -------- ------------
          EMPNO                                 NUMBER(7)
          ENAME                                 VARCHAR2(12)
          DESIGNATIN                            VARCHAR2(10)
          SALARY                                NUMBER(8,2)
```

RESULT

Thus executed and verify the Data Definition Language commands successfully.

Ex. No. 2 DATA MANIPULATION LANGUAGE (DML)

AIM

To execute and verify the DML commands.

DML (DATA MANIPULATION LANGUAGE)

- ❖ SELECT
- ❖ INSERT
- ❖ DELETE
- ❖ UPDATE

PROCEDURE

STEP 1: Start

STEP 2: Create the table with its essential attributes.

STEP 3: Insert the record into table

STEP 4: Update the existing records into the table

STEP 5: Delete the records in to the table

SQL COMMANDS

1. COMMAND NAME: **INSERT**

COMMAND DESCRIPTION: INSERT command is used to Insert objects in the database.

2. COMMAND NAME: **SELECT**

COMMAND DESCRIPTION: SELECT command is used to SELECT the object from the database.

3. COMMAND NAME: **UPDATE**

COMMAND DESCRIPTION: **UPDATE** command is used to UPDATE the records from the table

4. COMMAND NAME: **DELETE**

COMMAND DESCRIPTION: DELETE command is used to DELETE the Records form the table

INSERT

QUERY: 01

Q1. Write a query to insert the records in to employee.

<u>Syntax for Insert Records in to a table:</u>

SQL :> INSERT INTO <TABLE NAME> VALUES< VAL1, 'VAL2',…..);

QUERY: 01

INSERT A RECORD FROM AN EXISTING TABLE:

```
SQL>INSERT INTO EMP VALUES(101,'NAGARAJAN','LECTURER',15000);
1 row created.
```

SELECT

QUERY: 02

Q2. Write a query to display the records from employee.

<u>Syntax for select Records from the table:</u>

SQL> SELECT * FROM <TABLE NAME>;

QUERY: 02

<u>DISPLAY THE EMP TABLE:</u>

```
SQL> SELECT * FROM EMP;
```

```
EMPNO ENAME                      DESIGNATIN     SALARY
101 NAGARAJAN                    LECTURER       15000
```

INSERT A RECORD USING SUBSITUTION METHOD

QUERY: 03

Q3. Write a query to insert the records in to employee using substitution method.

Syntax for Insert Records into the table:

SQL :> INSERT INTO <TABLE NAME> VALUES< '&column name', '&column name 2',…..);

QUERY: 03

```
SQL> INSERT INTO EMP VALUES(&EMPNO,'&ENAME','&DESIGNATIN','&SALARY');
Enter value for empno: 102
Enter value for ename: SARAVANAN
Enter value for designatin: LECTURER
Enter value for salary: 15000
old  1: INSERT INTO EMP VALUES(&EMPNO,'&ENAME','&DESIGNATIN','&SALARY')
new   1: INSERT INTO EMP VALUES(102,'SARAVANAN','LECTURER','15000')
1 row created.

SQL> /
Enter value for empno: 103
Enter value for ename: PANNERSELVAM
Enter value for designatin: ASST. PROF
Enter value for salary: 20000
old  1: INSERT INTO EMP VALUES(&EMPNO,'&ENAME','&DESIGNATIN','&SALARY')
new  1: INSERT INTO EMP VALUES(103,'PANNERSELVAM','ASST. PROF','20000')
1 row created.

SQL> /
Enter value for empno: 104
Enter value for ename: CHINNI
Enter value for designatin: HOD, PROF
Enter value for salary: 45000
old  1: INSERT INTO EMP VALUES(&EMPNO,'&ENAME','&DESIGNATIN','&SALARY')
new   1: INSERT INTO EMP VALUES(104,'CHINNI','HOD, PROF','45000')
1 row created.


SQL> SELECT * FROM EMP;
             EMPNO ENAME       DESIGNATIN     SALARY
```

```
101 NAGARAJAN    LECTURER         15000
102 SARAVANAN    LECTURER         15000
103 PANNERSELVAM ASST. PROF      20000
104 CHINNI            HOD, PROF            45000
```

UPDATE

QUERY: 04

Q4. Write a query to update the records from employee.

Syntax for update Records from the table:

SQL> UPDATE <<TABLE NAME> SET <COLUMNANE>=<VALUE> WHERE <COLUMN NAME=<VALUE>;

QUERY: 04

```
SQL> UPDATE EMP SET SALARY=16000 WHERE EMPNO=101;
1 row updated.
SQL> SELECT * FROM EMP;
        EMPNO ENAME     DESIGNATIN    SALARY
         101 NAGARAJAN    LECTURER         16000
         102 SARAVANAN    LECTURER         15000
        103 PANNERSELVAM ASST. PROF     20000
        104 CHINNI   HOD, PROF                   45000
```

UPDATE MULTIPLE COLUMNS

QUERY: 05

Q5. Write a query to update multiple records from employee.

Syntax for update multiple Records from the table:

SQL> UPDATE <<TABLE NAME> SET <COLUMNANE>=<VALUE> WHERE <COLUMN NAME=<VALUE>;

QUERY: 05

```
SQL>UPDATE EMP SET SALARY = 16000, DESIGNATIN='ASST. PROF' WHERE EMPNO=102;
1 row updated.
SQL> SELECT * FROM EMP;
        EMPNO ENAME           DESIGNATIN    SALARY
         101 NAGARAJAN    LECTURER         16000
         102 SARAVANAN    LECTURER         16000
        103 PANNERSELVAM ASST. PROF     20000
        104 CHINNI   HOD, PROF                   45000
```

DELETE

QUERY: 06

Q5. Write a query to delete records from employee.

Syntax for delete Records from the table:

```
SQL> DELETE <TABLE NAME> WHERE <COLUMN NAME>=<VALUE>;
```

QUERY: 06

```
SQL> DELETE EMP WHERE EMPNO=103;
1 row deleted.
SQL> SELECT * FROM EMP;
              EMPNO ENAME     DESIGNATIN   SALARY
               101 NAGARAJAN    LECTURER        16000
               102 SARAVANAN    ASST. PROF      16000
               104 CHINNI       HOD, PROF       45000
```

RESULT

Thus executed and verified the DML commands successfully.

Ex. No. 3 **CONSTRAINTS**

AIM

To execute and verify constraints (Primary key, foreign key, not null).

<u>CONSTRAINTS</u>

Constraints are part of the table definition that limits and restriction on the value entered into its columns.

TYPES OF CONSTRAINTS:

1) Primary key
2) Foreign key/references
3) Check
4) Unique
5) Not null
6) Null
7) Default

CONSTRAINTS CAN BE CREATED IN THREE WAYS:

1) Column level constraints
2) Table level constraints
3) Using DDL statements-alter table command

OPERATION ON CONSTRAINT:

i) ENABLE
ii) DISABLE
iii) DROP

Column level constraints Using Primary key

Q1. Write a query to create primary constraints with column level

<u>Primary key</u>

Syntax for Column level constraints Using Primary key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)<TYPE OF CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE) ……………………………);

QUERY:1

```
SQL>CREATE TABLE EMPLOYEE(EMPNO NUMBER(4) PRIMARY
                                         KEY,
                                         ENAME
                                         VARCHAR2(10), JOB
                                         VARCHAR2(6),
                                         SAL  NUMBER(5), DEPTNO NUMBER(7));
```

Column level constraints Using Primary key with naming convention

Q2. Write a query to create primary constraints with column level with naming convention

Syntax for Column level constraints Using Primary key:

SQL: >CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)CONSTRAINTS <NAME OF THE CONSTRAINTS> <TYPE OF THE CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE) ……………………………);

QUERY:2

```
SQL>CREATE TABLE EMPLOYEE(EMPNO NUMBER(4)
                        CONSTRAINT EMP_EMPNO_PK PRIMARY KEY,
                        ENAME VARCHAR2(10), JOB VARCHAR2(6), SAL  NUMBER(5),
                        DEPTNO NUMBER(7));
```

Table Level Primary Key Constraints

Q3. Write a query to create primary constraints with table level with naming convention

Syntax for Table level constraints Using Primary key:

SQL: >CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE) , COLUMN NAME.1 <DATATYPE> (SIZE), CONSTRAINTS <NAME OF THE CONSTRAINTS> <TYPE OF THE CONSTRAINTS>);

QUERY: 3

```
SQL>CREATE TABLE EMPLOYEE (EMPNO NUMBER(6),
                                        ENAME VARCHAR2(20), JOB VARCHAR2(6),
                                        SAL NUMBER(7), DEPTNO NUMBER(5),
CONSTRAINT EMP_EMPNO_PK PRIMARY KEY(EMPNO));
```

Table level constraint with alter command (primary key):

Q4. Write a query to create primary constraints with alter command

Syntax for Column level constraints Using Primary key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE), COLUMN NAME.1 <DATATYPE> (SIZE));

SQL> ALTER TABLE <TABLE NAME> ADD CONSTRAINTS <NAME OF THE CONSTRAINTS> <TYPE OF THE CONSTRAINTS> <COLUMN NAME>);

QUERY: 4

```
SQL>CREATE TABLE EMPLOYEE(EMPNO NUMBER(5),
ENAME VARCHAR2(6), JOB VARCHAR2(6), SAL NUMBER(6), DEPTNO NUMBER(6));
SQL>ALTER TABLE EMP3 ADD CONSTRAINT EMP3_EMPNO_PK PRIMARY KEY
(EMPNO);
```

Reference /foreign key constraint

Column level foreign key constraint:

Q 5. Write a query to create foreign key constraints with column level

Parent Table:

Syntax for Column level constraints Using Primary key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)<TYPE OF CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE) ……………………………);

Child Table:

Syntax for Column level constraints Using foreign key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE), COLUMN NAME2 <DATATYPE> (SIZE) REFERENCES <TABLE NAME> (COLUMN NAME> ....);

QUERY: 5

```
SQL>CREATE TABLE DEPT(DEPTNO NUMBER(2) PRIMARY KEY,
                DNAME VARCHAR2(20),
                LOCATION
                VARCHAR2(15));
```

SQL>CREATE TABLE EMP4 (EMPNO
NUMBER(3), DEPTNO NUMBER(2)
REFERENCES DEPT(DEPTNO),
DESIGN VARCHAR2(10));

Column level foreign key constraint with naming conversions:

Parent Table:

Syntax for Column level constraints Using Primary key:

Q6. Write a query to create foreign key constraints with column level

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)<TYPE OF CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE)……………………………);

Child Table:

Syntax for Column level constraints using foreign key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE) , COLUMN NAME2 <DATATYPE> (SIZE) **CONSTRAINT <CONST. NAME>** REFERENCES <TABLE NAME> (COLUMN NAME> ……………………………);

QUERY:6

SQL>CREATE TABLE DEPT(DEPTNO NUMBER(2) PRIMARY KEY,
DNAME VARCHAR2(20), LOCATION VARCHAR2(15));
SQL>CREATE TABLE EMP4A (EMPNO NUMBER(3),
DEPTNO NUMBER(2) **CONSTRAINT EMP4A_DEPTNO_FK REFERENCES DEPT(DEPTNO),** DESIGN VARCHAR2(10));

Table Level Foreign Key Constraints

Q7. Write a query to create foreign key constraints with Table level

Parent Table:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)<TYPE OF CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE) ……………………………);

Child Table:

Syntax for Table level constraints using foreign key:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE), COLUMN NAME2 <DATATYPE> (SIZE), **CONSTRAINT <CONST. NAME>** REFERENCES <TABLE NAME> (COLUMN NAME>);

QUERY: 7

SQL>CREATE TABLE DEPT (DEPTNO NUMBER(2) PRIMARY KEY, DNAME VARCHAR2(20), LOCATION VARCHAR2(15));

SQL>CREATE TABLE EMP5 (EMPNO NUMBER(3), DEPTNO NUMBER(2), DESIGN VARCHAR2(10)**CONSTRAINT ENP2_DEPTNO_FK FOREIGN KEY(DEPT NO)REFERENCESDEPT(DEPTNO));**

Table Level Foreign Key Constraints with Alter command

Q 8. Write a query to create foreign key constraints with Table level with alter command.

Parent Table:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE)<TYPE OF CONSTRAINTS> , COLUMN NAME.1 <DATATYPE> (SIZE) ……………………………);

Child Table:

<u>Syntax for Table level constraints using foreign key:</u>

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE) , COLUMN NAME2 <DATATYPE> (SIZE));

SQL> ALTER TABLE <TABLE NAME> ADD CONSTRAINT <CONST. NAME> REFERENCES <TABLE NAME> (COLUMN NAME>);

QUERY:8

SQL>CREATE TABLE DEPT
(DEPTNO NUMBER(2) PRIMARY KEY, DNAME
VARCHAR2(20), LOCATION VARCHAR2(15));

SQL>CREATE TABLE EMP5 (EMPNO NUMBER(3), DEPTNO NUMBER(2), DESIGN VARCHAR2(10));

SQL>ALTER TABLE EMP6 ADD CONSTRAINT EMP6_DEPTNO_FK FOREIGN KEY(DEPTNO)REFERENCES DEPT(DEPTNO);

<u>Check constraint</u>

Column Level Check Constraint

Q 9. Write a query to create Check constraints with column level

<u>Syntax for clumn level constraints using Check:</u>

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE) CONSTRAINT <CONSTRAINTS NAME> <TYPE OF CONSTRAINTS> (CONSTRAITNS CRITERIA) , COLUMN NAME2 <DATATYPE> (SIZE));

QUERY:9

SQL>CREATE TABLE EMP7(EMPNO NUMBER(3), ENAME VARCHAR2(20), DESIGN VARCHAR2(15), SAL NUMBER(5)CONSTRAINT EMP7_SAL_CK CHECK(SAL>500 AND SAL<10001), DEPTNO NUMBER(2));

Table Level Check Constraint:

Q. 10 Write a query to create Check constraints with table level

Syntax for Table level constraints using Check:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE), (COLUMN NAME2 <DATATYPE> (SIZE), CONSTRAINT <CONSTRAINTS NAME> <TYPE OF CONSTRAINTS> (CONSTRAITNS CRITERIA)) ;

QUERY:10

SQL>CREATE TABLE EMP8(EMPNO NUMBER(3), ENAME VARCHAR2(20), DESIGN VARCHAR2(15), SAL NUMBER(5),DEPTNO NUMBER(2), CONSTRAINTS EMP8_SAL_CK CHECK(SAL>500 AND SAL<10001));

Check Constraint with Alter Command

Q 11. Write a query to create Check constraints with table level using alter command.

Syntax for Table level constraints using Check:

SQL:>CREATE <OBJ.TYPE> <OBJ.NAME> (COLUMN NAME.1 <DATATYPE> (SIZE), (COLUMN NAME2 <DATATYPE> (SIZE), CONSTRAINT <CONSTRAINTS NAME> <TYPE OF CONSTRAINTS> (CONSTRAITNS CRITERIA)) ;

QUERY:11

SQL>CREATE TABLE EMP9(EMPNO NUMBER, ENAME VARCHAR2(20), DESIGN VARCHAR2(15), SAL NUMBER(5));

SQL>ALTER TABLE EMP9 ADD CONSTRAINTS EMP9_SAL_CK CHECK(SAL>500 AND SAL<10001);

Unique Constraint

Column Level Constraint

Q12. Write a query to create unique constraints with column level

Syntax for Column level constraints with Unique:

SQL :> CREATE <OBJ.TYPE> <OBJ.NAME> (<COLUMN NAME.1> <DATATYPE> (SIZE) CONSTRAINT <NAME OF CONSTRAINTS><CONSTRAINT TYPE>, (COLUMN NAME2 <DATATYPE> (SIZE)) ;

QUERY:12

SQL>CREATE TABLE EMP10(EMPNO NUMBER(3), ENAME VARCHAR2(20), DESGIN VARCHAR2(15)CONSTRAINT EMP10_DESIGN_UK UNIQUE, SAL NUMBER(5));

Table Level Constraint

Q13. Write a query to create unique constraints with table level

Syntax for Table level constraints with Unique:

SQL :> CREATE <OBJ.TYPE> <OBJ.NAME> (<COLUMN NAME.1> <DATATYPE> (SIZE), (COLUMN NAME2 <DATATYPE> (SIZE), CONSTRAINT <NAME OF CONSTRAINTS> <CONSTRAINT TYPE>(COLUMN NAME);) ;

QUERY:13

SQL>CREATE TABLE EMP11(EMPNO NUMBER(3), ENAME VARCHAR2(20), DESIGN VARCHAR2(15), SAL NUMBER(5),CONSTRAINT EMP11_DESIGN_UK UNIGUE(DESIGN));

Table Level Constraint Alter Command

Q14. Write a query to create unique constraints with table level

Syntax for Table level constraints with Check Using Alter

SQL :> CREATE <OBJ.TYPE> <OBJ.NAME> (<COLUMN NAME.1> <DATATYPE> (SIZE), (COLUMN NAME2 <DATATYPE> (SIZE)) ;

SQL> ALTER TABLE ADD <CONSTRAINTS> <CONSTRAINTS NAME> <CONSTRAINTS TYPE>(COLUMN NAME);

QUERY:14

```
SQL>CREATE TABLE EMP12
(EMPNO NUMBER(3), ENAME VARCHAR2(20), DESIGN VARCHAR2(15), SAL
NUMBER(5));
SQL>ALTER TABLE EMP12 ADD CONSTRAINT EMP12_DESIGN_UK UNIQUE(DESING);
```

Not Null

Column Level Constraint

Q15.Write a query to create Not Null constraints with column level

Syntax for Column level constraints with Not Null:

SQL :> CREATE <OBJ.TYPE> <OBJ.NAME> (<COLUMN NAME.1> <DATATYPE> (SIZE) CONSTRAINT <NAME OF CONSTRAINTS> <CONSTRAINT TYPE>, (COLUMN NAME2 <DATATYPE> (SIZE)) ;

QUERY: 15

```
SQL>CREATE TABLE EMP13 (EMPNO
NUMBER(4), ENAME VARCHAR2(20)
CONSTRAINT EMP13_ENAME_NN NOT
NULL, DESIGN VARCHAR2(20),
              SAL NUMBER(3));
```

Null

Column Level Constraint

Q16. Write a query to create Null constraints with column level

Syntax for Column level constraints with Null:

```
SQL :> CREATE <OBJ.TYPE> <OBJ.NAME> (<COLUMN NAME.1>
              <DATATYPE> (SIZE) CONSTRAINT <NAME OF CONSTRAINTS>
              <CONSTRAINT TYPE>, (COLUMN NAME2 <DATATYPE> (SIZE)) ;
```

QUERY:16

```
SQL>CREATE TABLE EMP13 (EMPNO
NUMBER(4), ENAME VARCHAR2(20)
CONSTRAINT EMP13_ENAME_NN NULL,
```

DESIGN VARCHAR2(20),
SAL NUMBER(3));

<u>Constraint Disable \ Enable</u>

Constraint Disable

Q17. Write a query to disable the constraints

<u>Syntax for disabling a single constraint in a table:</u>

SQL>ALTER TABLE <TABLE-NAME> DISABLE CONSTRAINT <CONSTRAINT- NAME>

Constraint Enable

QUERY:17

SQL>ALTER TABLE EMP13 DISABLE CONSTRAINT EMP13_ENAME_NN NULL;

Write a query to enable the constraints

<u>Syntax for disabling a single constraint in a table:</u>

SQL>ALTER TABLE <TABLE-NAME> DISABLE CONSTRAINT <CONSTRAINT- NAME>

QUERY:17

SQL>ALTER TABLE EMP13 ENABLE CONSTRAINT EMP13_ENAME_NN NULL;

RESULT

Thus executed and verified constraints (Primary key, foreign key, not null).

Ex.No. 4 DATA RETRIEVAL (‘where‘ clause Condition) AND AGGREGATE FUNCTIONS

AIM

To query the database tables using different _where‘ clause conditions and also implement aggregate functions.

SQL COMMANDS

1. COMMAND NAME: **SELECT**
   COMMAND DESCRIPTION: **SELECT** command is used to select records from the table.
2. COMMAND NAME: **WHERE**
   COMMAND DESCRIPTION: **WHERE** command is used to identify particular elements.
3. COMMAND NAME: **HAVING**
   COMMAND DESCRIPTION: **HAVING** command is used to identify particular elements.
4. COMMAND NAME: **MIN (SAL)**
   COMMAND DESCRIPTION: **MIN (SAL)** command is used to find minimum salary.

DRL-DATA RETRIEVAL IMPLEMENTING ON SELECT COMMANDS

```
SQL> select * from emp;
           EMPNO ENAME      JOB   MGR HIREDATE   SAL          DEPTNO
           ---------------------------------------------------------------------
           7369 SMITH     CLERK        7902 17-DEC-80       800            2000

           7499 ALLEN      SALESMAN       7698 20-FEB-81      1600       3000

           7521 WARD       SALESMAN       7698 22-FEB-81      1250       5000

           7566 JONES     MANAGER       7839 02-APR-81      2975       2000
           4 rows selected.

SQL> select empno,ename,sal from emp;
EMPNO ENAME   SAL
 7369 SMITH         800
 7499 ALLEN         1600
 7521 WARD          1250
 7566 JONES        2975
SQL>select ename,job,sal,deptno from emp where sal not between 1500 and 5000;
           ENAME        JOB                     SAL              DEPTNO

           ------------         -----------                ------------          ------------
           SMITH        CLERK                   800              20
           WARD         SALESMAN                1250             30
           MARTIN       SALESMAN                1250             30
           ADAMS        CLERK                   1100             20
           JAMES        CLERK                   950              30
           MILLER       CLERK                   1300             10
6 rows selected.
SQL> select empno,ename,sal from emp where sal in (800,5000);
```

```
          EMPNO ENAME            SAL
                ------------ ------------
           7369 SMITH            800
           7839 KING            5000
SQL> select empno,ename,sal from emp where comm is null;
         EMPNO ENAME          SAL
           7369 SMITH            800
           7566 JONES          2975
           7698 BLAKE           2850
           7782 CLARK           2450
           7788 SCOTT           3000
           7839 KING            5000
           7876 ADAMS           1100
           7900 JAMES            950
           7902 FORD            3000
           7934 MILLER          1300
10 rows selected.
SQL> select empno,ename,sal from emp where comm is not null;
       EMPNO ENAME                 SAL

           7499 ALLEN           1600
           7521 WARD            1250
           7654 MARTIN          1250
           7844 TURNER          1500
SQL>  select empno,ename,job,sal from emp where ename like'S%';
         EMPNO ENAME         JOB          SAL
           7369 SMITH      CLERK           800
           7788 SCOTT      ANALYST         3000
SQL>  select empno,ename,job,sal from emp where  job not like'S%';
             EMPNO ENAME     JOB  SAL
           7369 SMITH      CLERK           800
           7566 JONES      MANAGER         2975
           7698 BLAKE      MANAGER         2850
           7782 CLARK      MANAGER         2450
           7788 SCOTT      ANALYST         3000
SQL> select ename,job,sal from emp where sal>2500;
       ENAME       JOB               SAL
       ---------------------------
       JONES      MANAGER        2975
       BLAKE      MANAGER         2850
       SCOTT      ANALYST        3000
       KING       PRESIDENT      5000
       FORD       ANALYST        3000
SQL> select ename,job,sal from emp where sal<2500;
```

```
           ENAME      JOB            SAL
          ------------
          SMITH      CLERK          800
          ALLEN      SALESMAN       1600
          WARD       SALESMAN       1250
          MARTIN     SALESMAN       1250
          CLARK      MANAGER        2450
          TURNER     SALESMAN       1500
          ADAMS      CLERK          1100
          JAMES      CLERK          950
          MILLER     CLERK          1300
9 rows selected.
SQL> select empno,ename,job,sal from emp order by sal;
EMPNO ENAME   JOB            SAL
  7369 SMITH     CLERK         800
  7900 JAMES     CLERK         950
  7876 ADAMS     CLERK         1100
  7521 WARD      SALESMAN      1250
  7654 MARTIN    SALESMAN      1250
  7934 MILLER    CLERK         1300
  7844 TURNER    SALESMAN      1500
  7499 ALLEN     SALESMAN      1600
  7782 CLARK     MANAGER       2450
  7698 BLAKE     MANAGER       2850
  7566 JONES     MANAGER       2975
  7788 SCOTT     ANALYST       3000
  7902 FORD      ANALYST       3000
  7839 KING      PRESIDENT     5000
  7788 SCOTT     ANALYST       3000
  7902 FORD      ANALYST       3000
  7839 KING      PRESIDENT     5000
14 rows selected.
SQL> select empno,ename,job,sal from emp order by sal desc;
                 EMPNO ENAME   JOB            SAL
               7839 KING      PRESIDENT     5000
               7788 SCOTT     ANALYST       3000
               7902 FORD      ANALYST       3000
               7566 JONES     MANAGER       2975
               7698 BLAKE     MANAGER       2850
               7782 CLARK     MANAGER       2450
               7499 ALLEN     SALESMAN      1600
               7844 TURNER    SALESMAN      1500
               7934 MILLER    CLERK         1300
```

```
        7521 WARD       SALESMAN        1250
        7654 MARTIN     SALESMAN        1250
        7876 ADAMS         CLERK        1100
        7900 JAMES         CLERK         950
14 rows selected.
SQL> SELECT ENAME FROM EMP2 WHERE SAL>(SELECT MIN(SAL) FROM EMP2 WHERE
DPTNO= (SELECT DEPTNO FROM DEPT2 WHERE LOCATION='UK'));
ENAME
MAHESH
MANOJ
KARTHIK
MANI
VIKI
MOHAN
NAVEEN
PRASAD
AGNESH
```

RESULT

Thus query for the database tables using different _where‘ clause conditions and also implemented aggregate functions.

Ex.No. 5 **JOIN OPERATION**

AIM

To create query for the database tables and explore natural, equi and outer joins.

OBJECTIVE:
SQL joins are used to query data from two or more tables, based on a relationship between certain columns in these tables.
PROCEDURE
STEP 1: Start
STEP 2: Create the table with its essential attributes.
STEP 3: Insert attribute values into the table
STEP 4: Execute different Commands and extract information from the table.
STEP 5: Stop
SQL COMMANDS
COMMAND NAME: **INNER JOIN**
COMMAND DESCRIPTION: The INNER JOIN keyword return rows when there is at least one match in both tables.
COMMAND NAME LEFT JOIN
COMMAND DESCRIPTION: The LEFT JOIN keyword returns all rows from the left table (table_name1), even if there are no matches in the right table (table_name2).
COMMAND NAME : **RIGHT JOIN**
COMMAND DESCRIPTION: The RIGHT JOIN keyword Return all rows from the right table (table_name2), even if there are no matches in the left table (table_name1).
COMMAND NAME : **FULL JOIN**
COMMAND DESCRIPTION: The FULL JOIN keyword return rows when there is a match in one of the tables.
Table:1 - ORDERS

```
SQL> CREATE  table orders(O_Id number(5),Orderno number(5), P_Id number(3));
Table created.
SQL> DESC orders;
Name        Null?   Type
O_ID        NUMBER(5)
ORDERNO     NUMBER(5)
P_ID        NUMBER(3)
```

INSERTING VALUES INTO ORDERS

```
SQL> INSERT into orders values(&O_Id,&Orderno,&P_Id); Enter value for o_id: 1
Enter value for orderno: 77895 Enter value for p_id: 3
old  1: INSERT into orders values(&O_Id,&Orderno,&P_Id)
new  1: INSERT into orders values(1,77895,3)
            1 row created.
SQL> INSERT into orders values(&O_Id,&Orderno,&P_Id);
```

```
Enter value for o_id: 2
Enter value for orderno: 44678
Enter value for p_id: 3
old  1: INSERT into orders values(&O_Id,&Orderno,&P_Id)
new  1: INSERT into orders values(2,44678,3)
1 row created.

SQL> INSERT into orders values(&O_Id,&Orderno,&P_Id);
Enter value for o_id: 3
Enter value for orderno: 22456 Enter value for p_id: 1
old  1: INSERT into orders values(&O_Id,&Orderno,&P_Id)
new  1: INSERT into orders values(3,22456,1)
1 row created.
SQL> INSERT into orders values(&O_Id,&Orderno,&P_Id);
Enter value for o_id: 4
Enter value for orderno: 24562
Enter value for p_id: 1
old  1: INSERT into orders values(&O_Id,&Orderno,&P_Id)
new  1: INSERT into orders values(4,24562,1)
1 row created.

SQL> INSERT into orders values(&O_Id,&Orderno,&P_Id);
Enter value for o_id: 5
Enter value for orderno: 34764
Enter value for p_id: 15
old  1: INSERT into orders values(&O_Id,&Orderno,&P_Id)
new  1: INSERT into orders values(5,34764,15)
1 row created.
```

<u>TABLE SECTION:</u>

```
SQL> SELECT * FROM orders;
                O_ID   ORDERNO     P_ID
                  1       77895          3
                  2       44678          3

                  3       22456          1

                  4       24562          1

                  5       34764         15
```

TABLE -2: PERSONS

```
SQL> CREATE table persons(p_Id number(5), LASTNAME varchar2(10), Firstname varchar2(15),
Address varchar2(20), city varchar2(10));
Table created.
SQL> INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city');
```

```
Enter value for p_id: 1
Enter value for lastname: Hansen
Enter value for firstname: Ola
Enter value for address: Timoteivn 10
Enter value for city: sadnes
old  1: INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city')
new  1: INSERT into persons values(1,'Hansen','Ola','Timoteivn 10','sadnes')
1 row created.
SQL> INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city');
Enter value for p_id: 2
Enter value for lastname: Svendson
Enter value for firstname: Tove
Enter value for address: Borgn 23
Enter value for city: Sandnes
old  1: INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city')
new  1: INSERT into persons values(2,'Svendson','Tove','Borgn 23','Sandnes')
1 row created.
SQL> INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city');
Enter value for p_id: 3
Enter value for lastname: Pettersen
Enter value for firstname: Kari
Enter value for address: Storgt 20
Enter value for city: Stavanger
old  1: INSERT into persons values(&p_Id,'&Lastname','&firstname','&Address','&city')
new  1: INSERT into persons values(3,'Pettersen','Kari','Storgt 20','Stavanger')

1 row created.

SQL> SELECT * FROM persons;
                 P_ID LASTNAME   FIRSTNAME   ADDRESS      CITY
                   1     Hansen       Ola            Timoteivn 10     sandnes
                   2    Svendson     Tove             Borgn 23        Sandnes

                   3     Pettersen    Kari             Storgt 20       Stavanger
```

LEFT JOIN SYNTAX

```
SQL> SELECT column_name(s) FROM table_name1 LEFT JOIN table_name2
        ON table_name1.column_name=table_name2.column_name
```

LEFT JOIN EXAMPLE

```
SQL> SELECT persons.lastname,persons.firstname,orders.orderno FROM persons
            LEFT JOIN orders ON persons.p_Id = orders.p_Id ORDER BY persons.lastname;
```

OUTPUT

```
        LASTNAME   FIRSTNAME ORDERNO
```

```
Hansen          Ola         22456
Hansen          Ola         24562
Pettersen       Kari        77895
Pettersen       Kari        44678
Svendson        Tove
```

FULL OUTTER JOIN

SQL> SELECT * FROM persons;

```
P_ID LASTNAME   FIRSTNAME   ADDRESS        CITY
 1    Hansen      Ola        Timoteivn 10   sandnes
 2    Svendson    Tove       Borgn 23       Sandnes
 3    Pettersen   Kari       Storgt 20      Stavanger
```

SQL> SELECT * FROM orders;

```
O_ID   ORDERNO   P_ID
  1     77895      3
  2     44678      3
  3     22456      1
  4     24562      1
  5     34764     15
```

<u>FULL OUTER JOIN SYNTAX</u>

```
SQL>SELECT
column_name(s)
FROM table_name1
FULL JOIN
table_name2
ON table_name1.column_name=table_name2.column_name
```

<u>FULL OUTER JOIN EXAMPLE</u>

SQL> SELECT persons.lastname,persons.firstname,orders.orderno FROM persons FULL OUTER JOIN orders ON persons.p_Id = orders.p_Id ORDER BY persons.lastname;

<u>RIGHT OUTTER JOIN</u>

<u>RIGHT OUTTER JOIN SYNTAX</u>

SQL>SELECT Persons.LastName, Persons.FirstName, Orders.OrderNo FROM Persons RIGHT JOIN Orders ON Persons.P_Id=Orders.P_Id ORDER BY Persons.LastName

<u>RIGHT OUTTER JOIN EXAMPLE</u>

SQL> SELECT persons.lastname,persons.firstname,orders.orderno FROM persons RIGHT OUTER JOIN orders ON persons.p_Id = orders.p_Id ORDER BY persons.lastname;

```
LASTNAME   FIRSTNAME ORDERNO
    Hansen     Ola              24562
    Hansen     Ola              22456
    Pettersen  Kari            44678
    Pettersen  Kari             77895
```

INNER JOIN

INNTER JOIN SYNTAX

```
SQL>SELECT column_name(s)
        FROM table_name1 INNER JOIN table_name2
         ON table_name1.column_name=table_name2.column_name
```

INNTER JOIN EXAMPLE

```
  SQL> SELECT persons.lastname,persons.firstname,orders.orderno FROM persons
INNER JOIN orders ON persons.p_Id = orders.p_Id
ORDER BY  persons.lastname;
```

```
LASTNAME   FIRSTNAME ORDERNO
    Hansen     Ola              24562
    Hansen     Ola              22456
    Pettersen  Kari            44678
    Pettersen  Kari             77895
```

```
LASTNAME   FIRSTNAME ORDERNO
    Hansen             Ola                  22456
    Hansen             Ola                  24562
    Pettersen          Kari                 77895
    Pettersen          Kari                 44678
    Svendson           Tove                34764
```

RESULT

Thus the query for the database tables and explore natural, equi and outer joins is executed successfully.

Ex. No. 6 A **CONTROL STRUCTURE**

AIM

To write a PL/SQL block using different control (if, if else, for loop, while loop,…) statements.

OBJECTIVE:

PL/SQL Control Structure provides conditional tests, loops, flow control and branches that let to produce well-structured programs.

Addition of Two Numbers:

1. Write a PL/SQL Program for Addition of Two Numbers

PROCEDURE

STEP 1: Start
STEP 2: Initialize the necessary variables.
STEP 3: Develop the set of statements with the essential operational parameters.

STEP 4: Specify the Individual operation to be carried out.

STEP 5: Execute the statements.

STEP 6: Stop.

PL/ SQL General Syntax

```
SQL>    DECLARE

        <VARIABLE DECLARATION>;

        BEGIN

            <EXECUTABLE STATEMENT >;
            END;
```

PL/SQL CODING FOR ADDITION OF TWO NUMBERS

```
SQL> declare
a number;
b number;
c number;
begin
a:=&a;
b:=&b;
c:=a+b;
```

```
dbms_output.put_line('sum of'||a||'and'||b||'is'||c); end;
 /
```

INPUT:

```
Enter value for a: 23 old  6: a:=&a;
new  6: a:=23;   Enter value for b:
12 old  7: b:=&b;
new   7: b:=12;
```

OUTPUT:

```
sum of 23and12is35
PL/SQL procedure successfully completed.
```

PL/ SQL Program for IF Condition:

2. Write a PL/SQL Program using if condition

PROCEDURE

STEP 1: Start

STEP 2: Initialize the necessary variables.

STEP 3: invoke the if condition.

STEP 4: Execute the statements.

STEP 5: Stop.

PL/ SQL GENERAL SYNTAX FOR IF CONDITION:

```
SQL>        DECLARE
            <VARIABLE DECLARATION>;
            BEGIN
                IF(CONDITION)THEN
                  <EXECUTABLE STATEMENT >;
             END;
```

Coding for If Statement:

```
DECLARE

b number;

c number;

BEGIN

B:=10;

C:=20;

if(C>B)

THEN

dbms_output.put_line('C is maximum');

end if;
```

```
end;
/
```

OUTPUT:

```
C is maximum
PL/SQL procedure successfully completed.
```

PL/ SQL GENERAL SYNTAX FOR IF AND ELSECONDITION:

```
SQL>      DECLARE
                <VARIABLE DECLARATION>;
          BEGIN
              IF (TEST CONDITION) THEN
          <STATEMENTS>;
          ELSE
         ENDIF; END;
```

********************Less then or Greater Using IF ELSE ************************

```
SQL> declare n
number;
begin
dbms_output. put_line('enter a number');
n:=&number;
if n<5 then
dbms_output.put_line('entered number is less than 5');
else
dbms_output.put_line('entered number is greater than 5');
end if;

end;
/
```

Input

```
Enter value for number: 2

          old  5:  n:=&number;
          new   5:  n:=2;
```

Output:

```
entered number is less than 5
PL/SQL procedure successfully completed.
```

PL/ SQL GENERAL SYNTAX FOR NESTED IF:

************ GREATEST OF THREE NUMBERS USING IF ELSEIF**************

```
SQL> declare
a number;
b number;
c number;
d number;
begin
a:=&a;
b:=&b;
 c:=&b; if(a>b)and(a>c) then
dbms_output.put_line('A is maximum'); elsif(b>a)and(b>c)then
dbms_output.put_line('B is maximum'); else
dbms_output.put_line('C is maximum'); end if;
end;
  /
```

INPUT:

```
Enter value for a: 21 old  7: a:=&a;
new  7: a:=21;   Enter value for b:
12 old  8: b:=&b;
new  8: b:=12;  Enter value for b:
45 old  9: c:=&b;
new   9: c:=45;
```

OUTPUT:

```
C is maximum

PL/SQL procedure successfully completed.
```

*************SUMMATION OF ODD NUMBERS USING FOR LOOP*************

```
SQL> declare n number;
sum1 number default 0; endvalue
number; begin
endvalue:=&endvalue; n:=1;
for n in 1..endvalue loop
  if mod(n,2)=1 then
sum1:=sum1+n; end if;
 end loop;   dbms_output.put_line('sum ='||sum1);
end;
/
```

INPUT:

```
Enter value for endvalue: 4
```

```
old  6: endvalue:=&endvalue;
new   6: endvalue:=4;
```

OUTPUT:

```
sum =4

PL/SQL procedure successfully completed.
```

***********SUMMATION OF ODD NUMBERS USING WHILE LOOP************

```
SQL> declare n
number;
sum1 number default 0;
endvalue number;
begin
endvalue:=&endvalue;
n:=1;
while(n<endvalue)
loop
sum1:=sum1+n; n:=n+2;
end loop;
dbms_output.put_line('sum of odd no. bt 1 and' ||endvalue||'is'||sum1); end;
/
```

INPUT:

```
Enter value for endvalue: 4
old  6: endvalue:=&endvalue;
new   6: endvalue:=4;
```

OUTPUT:

```
sum of odd no. bt 1 and4is4
PL/SQL procedure successfully completed.
```

RESULT

Thus the PL/SQL block for different controls are verified and executed.

Ex. No. 6 B PROCEDURES

AIM

To write a PL/SQL block to display the student name, marks whose average mark is above 60%.

ALGORITHM

STEP1:Start
STEP2:Create a table with table name stud_exam
STEP3:Insert the values into the table and Calculate total and average of each student
STEP4: Execute the procedure function the student who get above 60%.
STEP5: Display the total and average of student STEP6: End

EXECUTION

SETTING SERVEROUTPUT ON:

```
SQL> SET SERVEROUTPUT ON
```

PROGRAM:

PROCEDURE USING POSITIONAL PARAMETERS:

```
SQL> SET SERVEROUTPUT ON
SQL> CREATE OR REPLACE PROCEDURE PROC1 AS
BEGIN
DBMS_OUTPUT.PUT_LINE('Hello from procedure...');
END;
/
```

Output:

```
Procedure created.
SQL> EXECUTE PROC1
Hello from procedure...
PL/SQL procedure successfully completed.
```

PROGRAM:

PROCEDURE USING NOTATIONAL PARAMETERS:

```
SQL> CREATE OR REPLACE PROCEDURE PROC2
(N1 IN NUMBER,N2 IN NUMBER,TOT OUT NUMBER) IS
BEGIN
TOT := N1 + N2;
END;
/
```

Output:

```
Procedure created.
SQL> VARIABLE T NUMBER SQL> EXEC PROC2(33,66,:T)
PL/SQL procedure successfully completed. SQL> PRINT T
   T
   99
```

PROCEDURE FOR GCD NUMBERS

PROGRAM:

```
SQL> create or replace procedure pro
is
a number(3);
b number(3);
c number(3);
d number(3); begin
a:=&a;
b:=&b; if(a>b) then
c:=mod(a,b); if(c=0) then
dbms_output.put_line('GCD is');
dbms_output.put_line(b);
else
dbms_output.put_line('GCD is');
dbms_output.put_line(c);
end if;
else
d:=mod(b,a);
if(d=0) then
dbms_output.put_line('GCD is');
dbms_output.put_line(a);
else
dbms_output.put_line('GCD is');
dbms_output.put_line(d);
end if;
end if;
end;
/
Enter value for a: 8
old  8: a:=&a;
new   8: a:=8;
Enter value for b: 16
old  9: b:=&b;
new   9: b:=16;
Procedure created.
SQL> set serveroutput on;
SQL> execute pro;
GCD is 8
PL/SQL procedure successfully completed.
```

PROCEDURE FOR CURSOR IMPLEMENATION

PROGRAM:

```
SQL> create table student(regno number(4),name varchar2)20),mark1 number(3), mark2 number(3),
mark3 number(3), mark4 number(3), mark5 number(3));
Table created
SQL> insert into student values (101,'priya', 78, 88,77,60,89);
1 row created.
SQL> insert into student values (102,'surya', 99,77,69,81,99);
1 row created.
SQL> insert into student values (103,'suryapriya', 100,90,97,89,91);
1 row created.
SQL> select * from student;
    regno   name      mark1 mark2  mark3  mark4  mark5

    -------------------------------------------------------
    101   priya         78    88    77     60      89
    102   surya         99   77    69     81      99
    103   suryapriya   100   90    97     89      91

SQL> declare
ave number(5,2);
tot number(3);
cursor c_mark is select*from student where mark1>=40 and mark2>=40 and mark3>=40
and mark4>=40 and mark5>=40;
begin
dbms_output.put_line('regno name mark1 mark2 mark3 mark4 mark4 mark5 total
average');
dbms_output.put_line('');
for student in c_mark
loop
tot:=student.mark1+student.mark2+student.mark3+student.mark4+student.mark5;
ave:=tot/5;
dbms_output.put_line(student.regno||rpad(student.name,15)
    ||rpad(student.mark1,6)||rpad(student.mark2,6)||rpad(student.mark3,6)
    ||rpad(student.mark4,6)||rpad(student.mark5,6)||rpad(tot,8)||rpad(ave,5)
    );
end loop;
end;
/
```

SAMPLE OUTPUT

```
    regno   name      mark1 mark2  mark3  mark4  mark5  total   average

    ------------------------------------------------------------
    101   priya         78    88    77     60      89    393    79
    102   surya         99   77    69     81      99    425    85
    103   suryapriya   100   90    97     89      91   467    93
```

PL/SQL procedure successfully completed.

EXPLICIT CURSORS AND EXPLICIT CURSORS IMPLEMENTATION
CREATING A TABLE EMP IN ORACLE

PROGRAM

```
SQL> select * from EMP;
EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7369 SMITH CLERK 7902 17-DEC-80 800 20
7499 ALLEN SALESMAN 7698 20-FEB-81 1600 300 30
7521 WARD SALESMAN 7698 22-FEB-81 1250 500 30

EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7566 JONES MANAGER 7839 02-APR-81 2975 20
7654 MARTIN SALESMAN 7698 28-SEP-81 1250 1400 30
7698 BLAKE MANAGER 7839 01-MAY-81 2850 30

EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7782 CLARK MANAGER 7839 09-JUN-81 2450 10
7788 SCOTT ANALYST 7566 09-DEC-82 3000 20
7839 KING PRESIDENT 17-NOV-81 5000 10

EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7844 TURNER SALESMAN 7698 08-SEP-81 1500 0 30
7876 ADAMS CLERK 7788 12-JAN-83 1100 20
7900 JAMES CLERK 7698 03-DEC-81 950 30

EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7902 FORD ANALYST 7566 03-DEC-81 3000 20
7934 MILLER CLERK 7782 23-JAN-82 1300 10

14 rows selected.
```

Implicit curscors:

```
SQL> DECLARE
2 ena EMP.ENAME%TYPE;
3 esa EMP.SAL%TYPE;
4 BEGIN
5 SELECT ENAME,SAL INTO ENA,ESA FROM EMP
6 WHERE EMPNO = &EMPNO;
7 DBMS_OUTPUT.PUT_LINE('NAME :' || ENA);
8 DBMS_OUTPUT.PUT_LINE('SALARY :' || ESA);
9 EXCEPTION
10 WHEN NO_DATA_FOUND THEN
11 DBMS_OUTPUT.PUT_LINE('Employee no does not exits');
```

```
12 END;
13 /
```

Output:

```
Enter value for empno: 7844
old 6: WHERE EMPNO = &EMPNO;
new 6: WHERE EMPNO = 7844;
PL/SQL procedure successfully completed.
```

Explicit Cursors:

```
SQL> DECLARE
2 ena EMP.ENAME%TYPE;
3 esa EMP.SAL%TYPE;
4 CURSOR c1 IS SELECT ename,sal FROM EMP;
5 BEGIN
6 OPEN c1;
7 FETCH c1 INTO ena,esa;
8 DBMS_OUTPUT.PUT_LINE(ena || ' salry is $ ' || esa);
9 FETCH c1 INTO ena,esa;
10 DBMS_OUTPUT.PUT_LINE(ena || ' salry is $ ' || esa);
11 FETCH c1 INTO ena,esa;
12 DBMS_OUTPUT.PUT_LINE(ena || ' salry is $ ' || esa);
13 CLOSE c1;
14 END;
15 /
```

Output:

```
SMITH salry is $ 800 ALLEN salry is $ 1600 WARD salry is $ 1250
```

RESULT

Thus the PL/SQL block to display the student name,marks,average is verified and executed.

Ex. No. 6 C **FUNCTIONS**

AIM

To write a Functional procedure to search an address from the given database.

PROCEDURE

STEP 1: Start

STEP 2: Create the table with essential attributes.

STEP 3: Initialize the Function to carryout the searching procedure.

STEP 4: Frame the searching procedure for both positive and negative searching.

STEP 5: Execute the Function for both positive and negative result .

STEP 6: Stop

EXECUTION

SETTING SERVEROUTPUT ON:

```
SQL> SET SERVEROUTPUT ON
```

IMPLEMENTATION OF FACTORIAL USING FUNCTION

I) PROGRAM:

```
SQL>create function fnfact(n number)
return number is
b number;
begin b:=1;
for i in 1..n
loop
b:=b*i;
end loop;
return b;
end;
/
SQL>Declare
n number:=&n;
y number;
begin y:=fnfact(n);
dbms_output.put_line(y);
end;
/

Function created.
Enter value for n: 5 old 2: n number:=&n; new 2: n number:=5; 120

PL/SQL procedure successfully completed.
```

II) PROGRAM

```
SQL> create table phonebook (phone_no number (6) primary key,username varchar2(30),doorno
varchar2(10), street varchar2(30),place varchar2(30),pincode char(6));
```

```
Table created.
SQL> insert into phonebook values(20312,'vijay','120/5D','bharathi street','NGO colony','629002');
1 row created.

SQL> insert into phonebook values(29467,'vasanth','39D4','RK bhavan','sarakkal vilai','629002');
1 row created.
SQL> select * from phonebook;
```

PHONE_NO USERNAME DOORNO STREET PLACE PINCODE

```
20312 vijay 120/5D bharathi street NGO colony 629002 29467 vasanth 39D4 RK bhavan sarakkal
vilai 629002
SQL> create or replace function findAddress(phone in number) return varchar2 as address
varchar2(100);
begin
select username||','||doorno ||','||street ||','||place||','||pincode into address from phonebook where
phone_no=phone;
return address;
exception
when no_data_found then return 'address not found';
end;
/
Function created.
SQL>declare
2 address varchar2(100);
3 begin
4 address:=findaddress(20312);
5 dbms_output.put_line(address);
6 end;
7 /
```

OUTPUT 1:

Vijay,120/5D,bharathi street,NGO colony,629002

PL/SQL procedure successfully completed.

```
SQL> declare
2 address varchar2(100);
3 begin
4 address:=findaddress(23556);
5 dbms_output.put_line(address);
6 end;
7 /
```

OUTPUT2:

Address not found

PL/SQL procedure successfully completed.

RESULT

Thus the Function for searching process has been executed successfully.

Ex. No. 7 **TCL AND DCL COMMANDS**

AIM
To execute complex transactions and realize DCL and TCL commands.

TCL (TRANSACTION CONTROL LANGUAGE)

- **COMMIT**
- **ROLL BACK**
- **SAVE POINT**
- **PROCEDURE**

STEP 1: use save point if any changes occur in any portion of the record to undo its original state.
STEP 2: use rollback for completely undo the records STEP 6: use commit for permanently save the records.

SQL COMMANDS

1. COMMAND NAME: **COMMIT**
COMMAND DESCRIPTION: **COMMIT** command is used to save the Records.
2. COMMAND NAME: **ROLLBACK**
COMMAND DESCRIPTION: **ROLL BACK** command is used to undo the Records.
3. COMMAND NAME: **SAVE POINT**
COMMAND DESCRIPTION: **SAVE POINT** command is used to undo the Records in a particular transaction.

SAVEPOINT:

QUERY: 01
Q1. Write a query to implement the save point.
<u>Syntax for save point:</u>
SQL> SAVEPOINT <SAVE POINT NAME>;
QUERY: 01

```
SQL> SAVEPOINT S1;
Savepoint created.
SQL> SELECT * FROM EMP;
              EMPNO ENAME    DESIGNATIN   SALARY
               101 NAGARAJAN    LECTURER       16000
               102 SARAVANAN    ASST. PROF     16000
               104 CHINNI       HOD, PROF        45000
SQL> INSERT INTO EMP VALUES(105,'PARTHASAR','STUDENT',100);
1 row created.
SQL> SELECT * FROM EMP;
EMPNO ENAME      DESIGNATINSALARY
            105 PARTHASAR    STUDENT         100
            101 NAGARAJAN    LECTURER        16000
```

```
102 SARAVANAN    ASST. PROF      16000
104 CHINNI            HOD, PROF       45000
```

ROLL BACK

QUERY: 02

Q2. Write a query to implement the Rollback.

Syntax for save point:

```
SQL> ROLL BACK <SAVE POINT NAME>;
```

QUERY: 02

```
SQL> ROLL BACK S1;
Rollback complete.
SQL> SELECT * FROM EMP;
             EMPNO ENAME                  DESIGNATIN SALARY
               101 NAGARAJAN    LECTURER        16000
               102 SARAVANAN    ASST. PROF      16000
              103 PANNERSELVAM ASST. PROF          20000
              104 CHINNI           HOD, PROF        45000
```

COMMIT

QUERY: 03

Q5. Write a query to implement the Commit.

Syntax for commit:

```
SQL> COMMIT;
```

QUERY: 03

```
SQL> COMMIT;
Commit complete.
```

DCL (DATA CONTROL LANGUAGE)

CREATING A USER

```
SQL>CONNECT SYSTEM/MANAGER;
SQL>CREATE USER "USERNAME" IDENTIFIED BY "PASSWORD"
SQL>GRANT DBA TO "USERNAME" SQL>CONNECT "USERNAME"/"PASSWORD";
```

EXAMPLE

CREATING A USER

```
SQL>CONNECT SYSTEM/MANAGER; SQL>CREATE USER CSE2 IDENTIFIED BY CSECSE;
SQL>GRANT DBA TO CSE2;
SQL>CONNECT CSE2/CSECSE;

SQL>REVOKE DBA FROM CSE2;
```

RESULT

Thus the complex transactions and realize DCL and TCL commands is executed successfully.

Ex.No. 8 **TRIGGER**

AIM

To create Triggers for insert, delete, and update operations in a database table.

PROCEDURE

STEP 1: Start

STEP 2: Initialize the trigger with specific table id.

STEP 3:Specify the operations (update, delete, insert) for which the trigger has to be executed.

STEP 4: Execute the Trigger procedure for both Before and After sequences

STEP 5: Carryout the operation on the table to check for Trigger execution.

STEP 6: Stop

EXECUTION

1. Create a Trigger to pop-up the DML operations

```
SQL> create table empa(id number(3),name varchar2(10),income number(4),expence
number(3),savings number(3));
Table created.
SQL> insert into empa values(2,'kumar',2500,150,650); 1 row
created.
SQL> insert into empa values(3,'venky',5000,900,950); 1 row
created.
SQL> insert into empa values(4,'anish',9999,999,999); 1 row created.
SQL> select * from empa;
          ID         NAME         INCOME    EXPENCE    SAVINGS
   ------------ ------------ ------------ ------------ ---------------------------------------------
           2          kumar         2500        150            650
           3          venky         5000         900             950
            4         anish         9999        999             999
```

TYPE 1- TRIGGER AFTER UPDATE

```
SQL> CREATE OR REPLACE TRIGGER VIJAY
           AFTER UPDATE OR INSERT OR DELETE ON EMP
           FOR EACH ROW
           BEGIN
          IF UPDATING THEN
          DBMS_OUTPUT.PUT_LINE('TABLE IS UPDATED');
          ELSIF INSERTING THEN
          DBMS_OUTPUT.PUT_LINE('TABLE IS INSERTED');
          ELSIF DELETING THEN
          DBMS_OUTPUT.PUT_LINE('TABLE IS DELETED');
          END IF;
          END;
```

```
            /
Trigger created.
SQL> update emp set income =900 where empname='kumar';
TABLE IS UPDATED
   1 row updated.

SQL> insert into emp values ( 4,'Chandru',700,250,80);
TABLE IS INSERTED
   1 row created.

SQL> DELETE FROM EMP WHERE EMPID = 4;
TABLE IS DELETED
   1 row deleted.
SQL> select * from emp;

    EMPID EMPNAME       INCOME   EXPENSE   SAVINGS

    -------- -------------   -----------  -----------   -----------
       2        vivek            830          150          100
       3        kumar           5000          550           50
       9        vasanth          987         6554          644
```

TYPE 2 - TRIGGER BEFORE UPDATE

```
SQL> CREATE OR REPLACE TRIGGER VASANTH
        BEFORE UPDATE OR INSERT OR DELETE ON
        EMPLOYEE FOR EACH ROW
        BEGIN
        IF UPDATING THEN
        DBMS_OUTPUT.PUT_LINE('TABLE IS UPDATED');
        ELSIF INSERTING THEN
        DBMS_OUTPUT.PUT_LINE('TABLE IS INSERTED');
        ELSIF DELETING THEN
        DBMS_OUTPUT.PUT_LINE('TABLE IS DELETED');
        END IF;
        END;
        /
        Trigger created.
SQL> INSERT INTO EMP VALUES
(4,'SANKAR',700,98,564); TABLE IS INSERTED
1 row created.
SQL> UPDATE EMP SET EMPID = 5 WHERE EMPNAME = 'SANKAR';
TABLE IS UPDATED
```

```
1 row updated.
SQL> DELETE EMP WHERE
EMPNAME='SANKAR'; TABLE IS DELETED
1 row deleted.
```

2. **Create a Trigger to check the age valid or not Using Message Alert**

```
SQL> CREATE TABLE TRIG(NAME CHAR(10),AGE
NUMBER(3)); SQL> DESC TRIG;
Table created.
Name        Null?   Type
 NAME        CHAR(10)
 AGE        NUMBER(3)
```

<u>PROGRAM:</u>

```
SQL> SET SERVEROUTPUT ON;
SQL> CREATE TRIGGER TRIGNEW
                AFTER INSERT OR UPDATE OF AGE ON
                TRIG FOR EACH ROW
                BEGIN
                IF(:NEW.AGE<0)
                THEN
                DBMS_OUTPUT.PUT_LINE('INVALID AGE');
                ELSE
                DBMS_OUTPUT.PUT_LINE('VALID AGE');
                END IF;
                END;
                /
Trigger created.
SQL> insert into trig values('abc',15);
Valid age
        1 row created.
SQL> insert into trig values('xyz',-12);
Invalid age
        1 row created.
        NAME          AGE
        abc          15
        xyz         -12
```

3. **Create a Trigger to check the age valid and Raise appropriate error code and error message.**

```
SQL> create table data(name char(10),age number(3));
Table created.
SQL> desc data;
        Name                        Null?   Type
         NAME                               CHAR(10)
```

```
            AGE                              NUMBER(3)

SQL>  CREATE TRIGGER DATACHECK
AFTER INSERT OR UPDATE OF AGE ON DATA
FOR EACH ROW
BEGIN
IF(:NEW.AGE<0) THEN
RAISE_APPLICATION_ERROR(-20000,'NO NEGATIVE AGE ALLOWED');
END IF;
END;
/
Trigger created.
SQL> INSERT INTO DATA VALUES('ABC',10);
1 ROW CREATED.

SQL> INSERT INTO DATA VALUES ('DEF',-15)
*  ERROR at line 1:
ORA-20000: No negative age allowed
ORA-06512: at "4039.DATACHECK", line 3
ORA-04088: error during execution of trigger '4039.DATACHECK'
            NAME          AGE
            abc           10
```

4. **Create a Trigger for EMP table it will update another table SALARY while inserting values.**

```
 SQL> CREATE TABLE SRM_EMP2(INAME VARCHAR2(10),
                                        IID NUMBER(5),
                                        SALARY
                                        NUMBER(10));
 Table created.

SQL>  CREATE TABLE SRM_SAL2(INAME VARCHAR2(10),
                                        TOTALEMP NUMBER(5),
                                        TOTALSAL
                                        NUMBER(10));
Table created.
SQL> CREATE OR REPLACE TRIGGER EMPTRIGR22 AFTER INSERT ON SRM_EMP2
FOR EACH ROW
DECLARE
A VARCHAR2(10);
BEGIN
A:=:NEW.INAME;
UPDATE SRM_SAL2 SET
TOTALSAL=TOTALSAL+:NEW.SALARY,TOTALEMP=TOTALEMP+1
WHERE INAME=A;
```

```
END;
      /
Trigger created.
SQL> INSERT INTO SRM_SAL2 VALUES('VEC',0,0);
1 row created.
SQL>  INSERT INTO SRM_SAL2 VALUES('SRM',0,0);
1 row created.
SQL> INSERT INTO SRM_EMP2 VALUES('VEC',100,1000);
1 row created.
SQL> SELECT * FROM SRM_SAL2;
      INAME        TOTALEMP   TOTALSAL
      ---------------------------
      VEC               1       1000
      SRM               0         0
SQL> INSERT INTO SRM_EMP2 VALUES('SRM',200,3000);
1 row created.
SQL>  SELECT * FROM SRM_SAL2;
INAME   TOTALEMP  TOTALSAL
      ----------------------------
      VEC               1       1000
      SRM               1       3000
SQL>  INSERT INTO SRM_EMP2 VALUES('VEC',100,5000);
1 row created.
SQL>  SELECT * FROM SRM_SAL2;
INAME          TOTALEMP  TOTALSAL
 ----------------------------
 VEC               2       6000
 SRM               1       3000
SQL> INSERT INTO SRM_EMP2 VALUES('VEC',100,2000);
      1 row created.
SQL> SELECT * FROM SRM_SAL2;
INAME          TOTALEMP  TOTALSAL
 ----------------------------
 VEC               3       8000
 SRM               1       3000
SQL> INSERT INTO SRM_EMP2 VALUES('SRM',200,8000);
1 row created.
SQL> SELECT * FROM SRM_SAL2;
INAMETOTALEMP  TOTALSAL
      ------------------------------
      VEC               3       8000
      SRM               2      11000
```

RESULT

Thus the Triggers for insert, delete, and update operations in a database table has been executed successfully.

Ex. No. 9 **VIEWS**

AIM

To execute and verify the SQL commands for Views.

OBJECTIVE:

- Views Helps to encapsulate complex query and make it reusable.
- Provides user security on each view - it depends on your data policy security.
- Using view to convert units - if you have a financial data in US currency, you can create view to convert them into Euro for viewing in Euro currency.

PROCEDURE

STEP 1: Start
STEP 2: Create the table with its essential attributes.
STEP 3: Insert attribute values into the table.
STEP 4: Create the view from the above created table.
STEP 5: Execute different Commands and extract information from the
View. STEP 6: Stop

SQL COMMANDS

1. COMMAND NAME: **CREATE VIEW**
   COMMAND DESCRIPTION: **CREATE VIEW** command is used to define a view.
2. COMMAND NAME: **INSERT IN VIEW**
   COMMAND DESCRIPTION: **INSERT** command is used to insert a new row into the view.
3. COMMAND NAME: **DELETE IN VIEW**
   COMMAND DESCRIPTION: **DELETE** command is used to delete a row from the view.
4. COMMAND NAME: **UPDATE OF VIEW**
   COMMAND DESCRIPTION: **UPDATE** command is used to change a value in a tuple without changing all values in the tuple.
5. COMMAND NAME: **DROP OF VIEW**
   COMMAND DESCRIPTION: **DROP** command is used to drop the view table

<u>COMMANDS EXECUTION</u>

CREATION OF TABLE

```
SQL> CREATE TABLE EMPLOYEE (EMPLOYEE_NAMEVARCHAR2(10),
EMPLOYEE_NONUMBER(8), DEPT_NAME VARCHAR2(10), DEPT_NO NUMBER
(5),DATE_OF_JOIN DATE);
Table created.
```

TABLE DESCRIPTION

```
SQL> DESC EMPLOYEE;
          NAME                  NULL?        TYPE
          EMPLOYEE_NAME                  VARCHAR2(10)
          EMPLOYEE_NO                    NUMBER(8)
          DEPT_NAME                      VARCHAR2(10)
```

```
DEPT_NO                    NUMBER(5)
DATE_OF_JOIN               DATE
```

SYNTAX FOR CREATION OF VIEW

```
SQL> CREATE <VIEW>  <VIEW NAME>  AS SELECT
          <COLUMN_NAME_1>, <COLUMN_NAME_2> FROM <TABLE NAME>;
```

CREATION OF VIEW

```
SQL> CREATE VIEW EMPVIEW AS SELECT
EMPLOYEE_NAME,EMPLOYEE_NO,DEPT_NAME,DEPT_NO,DATE_OF_JOIN FROM
EMPLOYEE;
VIEW CREATED.
```

DESCRIPTION OF VIEW

```
SQL> DESC EMPVIEW;
        NAME                      NULL?   TYPE
    ------------------------------------------ --------- ------------------------------

         EMPLOYEE_NAME                     VARCHAR2(10)
          EMPLOYEE_NO                     NUMBER(8)
         DEPT_NAME                        VARCHAR2(10)
         DEPT_NO                         NUMBER(5)
```

DISPLAY VIEW:

```
SQL> SELECT  *  FROM EMPVIEW;
        EMPLOYEE_N EMPLOYEE_NO DEPT_NAME        DEPT_NO

        ----------------------------------------
        RAVI         124 ECE          89
        VIJAY         345 CSE          21
        RAJ          98 IT            22
        GIRI         100 CSE          67
```

INSERTION INTO VIEW

<u>INSERT STATEMENT:</u>

<u>SYNTAX:</u>

```
SQL> INSERT INTO <VIEW_NAME> (COLUMN NAME1,………) VALUES(VALUE1,….);
SQL> INSERT INTO EMPVIEW VALUES ('SRI', 120,'CSE', 67,'16-NOV-1981');
1 ROW CREATED.

SQL> SELECT * FROM EMPVIEW;

EMPLOYEE_N EMPLOYEE_NO DEPT_NAME    DEPT_NO
           ------------------------------
        RAVI         124 ECE          89
        VIJAY         345 CSE          21
        RAJ          98 IT          22
```

```
              GIRI           100 CSE            67
              SRI           120 CSE            67
SQL> SELECT * FROM EMPLOYEE;

EMPLOYEE_N EMPLOYEE_NO DEPT_NAME    DEPT_NO DATE_OF_J
              ---------------------------
              RAVI           124 ECE           89 15-JUN-05
              VIJAY           345 CSE           21 21-JUN-06
              RAJ             98 IT              22 30-SEP-06
              GIRI           100 CSE           67 14-NOV-81
              SRI           120 CSE           67 16-NOV-81
```

DELETION OF VIEW

DELETE STATEMENT: SYNTAX:

SQL> DELETE <VIEW_NMAE>WHERE <COLUMN NMAE> =’VALUE’; SQL> DELETE FROM EMPVIEW WHERE EMPLOYEE_NAME='SRI';

```
              1 ROW DELETED.

SQL> SELECT * FROM EMPVIEW;
EMPLOYEE_N EMPLOYEE_NO DEPT_NAME    DEPT_NO
              ----------------------------------
              RAVI           124 ECE            89
              VIJAY           345 CSE            21
              RAJ             98 IT               22
              GIRI           100 CSE            67
```

UPDATE STATEMENT:

SYNTAX:

AQL>UPDATE <VIEW_NAME> SET< COLUMN NAME> = <COLUMN NAME> +<VIEW> WHERE <COLUMNNAME>=VALUE;

SQL> UPDATE EMPKAVIVIEW SET EMPLOYEE_NAME='KAVI' WHERE EMPLOYEE_NAME='RAVI';

```
1 ROW UPDATED.
SQL> SELECT * FROM EMPKAVIVIEW;

EMPLOYEE_N EMPLOYEE_NO DEPT_NAME    DEPT_NO
              ----------------------------------
              RAVI           124 ECE            89
              VIJAY           345 CSE            21
              RAJ             98 IT               22
              GIRI           100 CSE            67
```

DROP A VIEW:

SYNTAX:

SQL> DROP VIEW <VIEW_NAME>

EXAMPLE

SQL>DROP VIEW EMPVIEW; VIEW DROPED

CREATE A VIEW WITH SELECTED FIELDS: SYNTAX:

SQL>CREATE [OR REPLACE] VIEW <VIEW NAME>AS SELECT <COLUMN

NAME1>…..FROM <TABLE ANME>;

EXAMPLE-2:

```
SQL> CREATE OR REPLACE VIEW EMPL_VIEW1 AS SELECT EMPNO, ENAME, SALARY
FROM EMPL;
SQL> SELECT * FROM EMPL_VIEW1;
```

EXAMPLE-3:

```
SQL> CREATE OR REPLACE VIEW EMPL_VIEW2 AS SELECT * FROM EMPL WHERE
DEPTNO=10;
SQL> SELECT * FROM EMPL_VIEW2;
```

Note:

Replace is the keyboard to avoid the error "ora_0095:name is already used by an existing abject".

CHANGING THE COLUMN(S) NAME M THE VIEW DURING AS SELECT STATEMENT:

TYPE-1:

```
SQL> CREATE OR REPLACE VIEW EMP_TOTSAL(EID,NAME,SAL) AS SELECT
EMPNO,ENAME,SALARY FROM EMPL;
View created.
              EMPNO ENAME       SALARY
              7369 SMITH          1000
              7499 MARK           1050
              7565 WILL           1500
              7678 JOHN           1800
              7578 TOM            1500
              7548 TURNER         1500
6 rows selected. View created.
              EMPNO ENAME SALARY   MGRNO     DEPTNO
              7578 TOM         1500       7298        10
              7548 TURNER      1500       7298        10
View created.
SQL> SELECT * FROM EMP_TOTSAL;
```

TYPE-2:

```
SQL> CREATE OR REPLACE VIEW EMP_TOTSAL AS SELECT EMPNO "EID",ENAME
"NAME",SALARY "SAL" FROM EMPL;
SQL> SELECT * FROM EMP_TOTSAL;
```

EXAMPLE FOR JOIN VIEW:

TYPE-3:

```
SQL> CREATE OR REPLACE VIEW DEPT_EMP AS SELECT A.EMPNO "EID",A.ENAME
"EMPNAME",A.DEPTNO "DNO",B.DNAME "D_NAME",B.LOC "D_LOC" FROM EMPL
A,DEPMT B WHERE A.DEPTNO=B.DEPTNO;

SQL> SELECT * FROM DEPT_EMP;
          EID    NAME          SAL
```

```
     7369 SMITH              1000
     7499 MARK               1050
     7565 WILL             1500
     7678 JOHN             1800
     7578 TOM              1500
     7548 TURNER             1500
6 rows
selected. View
created.
EID     NAME               SAL

     7369 SMITH              1000
     7499 MARK               1050
     7565 WILL             1500
     7678 JOHN             1800
     7578 TOM              1500
     7548 TURNER             1500
6 rows
selected. View
created.
   EID EMPNAME      DNO        D_NAME   D_LOC
 --------------------- ----------- ----------- --------------------------
     7578 TOM              10     ACCOUNT   NEW YORK
     7548 TURNER           10     ACCOUNT   NEW YORK
     7369 SMITH            20      SALES        CHICAGO
      7678 JOHN             20      SALES        CHICAGO
      7499 MARK             30   RESEARCH      ZURICH
       7565 WILL             30    RESEARCH    ZURICH
```

VIEW READ ONLY AND CHECK OPTION:

READ ONLY CLAUSE:

You can create a view with read only option which enable other to only query .no dml operation can be performed to this type of a view.

EXAMPLE-4:

SQL>CREATE OR REPLACE VIEW EMP_NO_DML AS SELECT * FROM EMPL WITH READ ONLY;

WITH CHECK OPTION CLAUSE

EXAMPLE-4:

SQL> CREATE OR REPLACE VIEW EMP_CK_OPTION AS SELECT EMPNO,ENAME,SALARY,DEPTNO FROM EMPL WHERE DEPTNO=10 WITH CHECK OPTION;

```
SQL> SELECT * FROM EMP_CK_OPTION;
```
JOIN VIEW:

EXAMPLE-5:

```
SQL> CREATE OR REPLACE VIEW DEPT_EMP_VIEW AS SELECT A.EMPNO, A.ENAME,
A.DEPTNO, B.DNAME, B.LOC FROM EMPL
 A,DEPMT B WHERE A.DEPTNO=B.DEPTNO;
SQL> SELECT * FROM DEPT_EMP_VIEW;
View created.
EMPNO ENAME       SALARY        DEPTNO
                  7578 TOM                    1500       10
                  7548 TURNER               1500        10
View created.

              EMPNO ENAME DEPTNO        DNAME   LOC
              7578 TOM                  10    ACCOUNT   NEW YORK
              7548 TURNER               10    ACCOUN      NEW
                                              T           YORK
               7369 SMITH               20     SALES      CHICAGO
               7678 JOHN                20      SALES       CHICAGO
               7499 MARK                 30  RESEARC        ZURICH
                                             H
               7565 WILL                30  RESEARCH  ZURICH
              6 rows selected.
```

FORCE VIEW

EXAMPLE-6:

```
SQL> CREATE OR REPLACE FORCE VIEW MYVIEW AS SELECT * FROM XYZ;
SQL> SELECT * FROM MYVIEW;

SQL> CREATE TABLE XYZ AS SELECT EMPNO,ENAME,SALARY,DEPTNO FROM
EMPL;
SQL> SELECT * FROM XYZ;
SQL> CREATE OR REPLACE FORCE VIEW MYVIEW AS SELECT * FROM XYZ;
SQL> SELECT * FROM MYVIEW;
Warning: View created with compilation errors.
SELECT * FROM MYVIEW
* ERROR at line 1:
ORA-04063: view "4039.MYVIEW" has errors
              Table created.
                 EMPNO ENAME              SALARY    DEPTNO
                  7369 SMITH              1000              20
                  7499 MARK               1050              30
```

```
     7565 WILL              1500              30
     7678 JOHN              1800              20
     7578 TOM               1500              10
     7548 TURNER             1500              10
6 rows
selected. View
created.
  EMPNO ENAME               SALARY    DEPTNO
     7369 SMITH              1000              20
     7499 MARK               1050              30
     7565 WILL              1500              30
     7678 JOHN              1800              20
     7578 TOM               1500              10
     7548 TURNER             1500              10
6 rows selected
```

COMPILING A VIEW

SYNTAX:

ALTER VIEW <VIEW_NAME> COMPILE;

EXAMPLE:

SQL> ALTER VIEW MYVIEW COMPILE;

RESULT

Thus the SQL commands for View has been verified and executed successfully.

Ex. No. 10 Front-end tools – Visual Basic/Developer 2000

Database connectivity using Front End Tools (Application Development using Oracle/ Mysql)
Mini Project

a) Inventory Management for a EMart Grocery Shop
b) Society Financial Management
c) Cop Friendly App – Eseva
d) Property Management – eMall
e) Star Small and Medium Banking and Finance

Aim: To demonstrate embedded SQL or Database connectivity

Procedure:

1. Develop database tables in oracle
2. Design the required screen in Visual Basic with all the required tools and objects(textboxes, labels, combo box, option box)
3. Write the coding for connecting the oracle database table with the visual basicapplication.
4. Run the application.
5. Verify the database connectivity by adding, deleting and viewing records throughVisual Basic application.

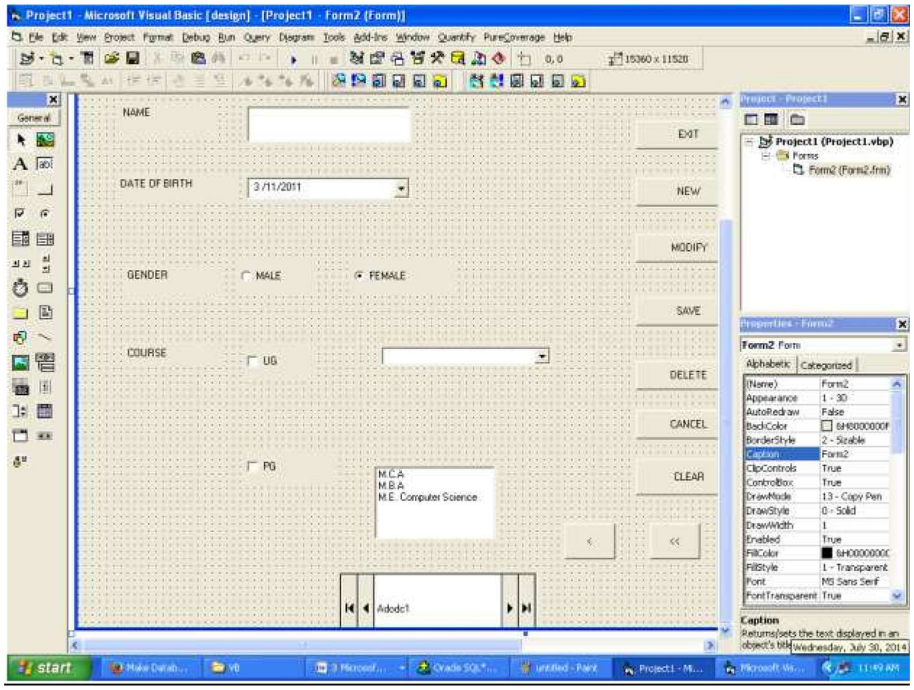
Program:

```
Dim cnn1 As
ADODB.ConnectionDim
rs As ADODB.Recordset
Dim strcnn As String

Private Sub
ADD_Click()
With rs
   .Fields("sname") = nametxt.Text
   .Fields("dob") = DTPicker1.Value
   .Fields("gender") = maleopt.Value
   .Fields("UG") = ugchk.Value
   .Fields("PG") = pgchk.Value
   .Fields("ugcourse") = ugcourse.Text
   .Fields("pgcourse") = pgcourse.Text
   .U
pdate
End
With
  rs.Ad
dNew
End
```

```
Sub
Private Sub
   cancelcmd_Click()
   rs.CancelBatch
   cnn1.CommitTrans
End Sub

Private Sub clrcmd_Click()

  nametxt.Text = "
  " maleopt.Value =
  True
  femaleopt.Value
  = True
  ugchk.Value = 0
  pgchk.Value
  = 0
  ugcourse.Te
  xt = ""
  pgcourse.Te
  xt = ""
End Sub

Private Sub
  delcmd_Click()
  cnn1.BeginTrans
  rs.Delete
  rs.UpdateBatch
  cnn1.CommitTrans
   MsgBox ("Record
 Deleted")End Sub

Private Sub
 endcmd_Click()End
End Sub

Private Sub
 firstcmd_Click()On
 Error GoTo l1:
    rs.Open "Select * from personal", cnn1, adOpenKeyset,
adLockBatchOptimisticl1:  rs.MoveFirst
    transfer

End Sub
```

```
Private Sub
 Form_Load()
 Form2.WindowSta
 te = 2

 Set cnn1 = New
 ADODB.ConnectionSet rs =
 New ADODB.Recordset
 rs.CursorLocation =
 adUseClient
 strcnn = "User ID =scott; Password=tiger; Data Source = leo; Persist Security Info
=False"'strcnn = "Provider=MSDAORA.1;User ID=scott;Password=tiger;Data
Source=dbserver;Persist Security Info=False"
 strcnn = "Provider=Microsoft.Jet.OLEDB.4.0;Data Source=E:\student.mdb;Persist
SecurityInfo=False"
 cnn1.Open strcnn

End Sub

Private Sub lastcmd_Click()
On Error GoTo l5:

    rs.Open "Select * from personal", cnn1, adOpenKeyset,
adLockBatchOptimisticl5:  rs.MoveLast
    tra
nsfer
End
Sub
Private Sub
 modcmd_Click()On
 Error GoTo l3:
    rs.Open "Select * from personal", cnn1, adOpenKeyset,
adLockBatchOptimisticl3: cnn1.BeginTrans


End Sub

Private Sub
newcmd_Click()On
Error GoTo l6:
   rs.Open "Select * from personal", cnn1, adOpenKeyset, adLockBatchOptimistic

l6:
    cnn1.Begin
   Trans
   rs.AddNew

End Sub

Private Sub
 nextcmd_Click()On
 Error GoTo l2:
    rs.Open "Select * from personal", cnn1, adOpenKeyset,
adLockBatchOptimisticl2:  rs.MoveNext
    tra
nsfer
End
Sub

Private Sub
pgchk_Click()If
pgchk.Value = 1
Then
pgcourse.Enabled =
True Else
 pgcourse.Enabled =
FalseEnd If
End Sub



Private Sub
prevcmd_Click()On
Error GoTo l4:
    rs.Open "Select * from personal", cnn1, adOpenKeyset,
adLockBatchOptimisticl4:  rs.MovePrevious
    tra
nsfer
End
Sub
Private Sub savecmd_Click()
With rs
    .Fields("sname") = nametxt.Text
    .Fields("dob") = DTPicker1.Value
    .Fields("gender") = maleopt.Value
    .Fields("UG") = ugchk.Value
    .Fields("PG") = pgchk.Value
     .Fields("ugcourse") = ugcourse.Text
     .Fields("pgcourse") = pgcourse.Text
     .UpdateBa
tch End With
cnn1.Commit
Trans
 MsgBox ("Record is saved
successfully")End Sub
Private Sub
  ugchk_Click() If
  ugchk.Value = 1
  Then
  ugcourse.Enabled =
  True Else
    ugcourse.Enabled =
  FalseEnd If

End Sub


Public Sub
transfer()With
rs
  If .EOF = False Then
     nametxt.Text =
      .Fields("sname")
      DTPicker1.Value =
      .Fields("dob")If
      .Fields("gender") <> 0
      Then maleopt.Value =
      True
      Else
        femaleopt.Value
      = TrueEnd If

      ugchk.Value = .Fields("UG")
     pgchk.Value = .Fields("PG")
     ugcourse.Text =
     .Fields("ugcourse")
     If .Fields("pgcourse") <> ""
          Then pgcourse.Text =
          .Fields("pgcourse")
    E
nd
```

```
  If
  En
  d If
  En
  d
  Wit
  h


End Sub
```



(Name)	Form2
Appearance	1 - 3D
AutoRedraw	False
BackColor	&H8000000F
BorderStyle	2 - Sizable
Caption	Form2
ClipControls	True
ControlBox	True
DrawMode	13 - Copy Pen
DrawStyle	0 - Solid
DrawWidth	1
Enabled	True
FillColor	&H00000000
FillStyle	1 - Transparent
Font	MS Sans Serif
FontTransparent	True

Caption
Returns/sets the text displayed in an object's title

RESULT:
Thus the program has been executed successfully.