UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
DEHRADUN

DATABASE SYSTEMS LAB

LAB 3

To understand DDL and DML Command

MTECH-COMPUTER SCIENCE ENGINEERING

ARTIFICIAL INTELLIGENCE &

MACHINE LEARNING

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Title: To understand DDL and DML Command

Objective: To understand the concept of designing issues related to the database with creating, populating the tables. To understand the concept of data constraints that is enforced on data being stored in the table. Focus on Primary Key and the Foreign Key.

- **Create the tables for Company database as per ER diagram of Exp 2.**
- **Insert the following data into their respective tables of the Company database.**

DDL (Data Definition Language): defines structure of database objects

DDL Commands are blueprint commands. Used to create, change, or remove the structure of the database. Exp: CREATE, ALTER, DROP, TRUNCATE, RENAME.

DML(Data Manipulation Language): manipulates the data inside the tables

DML are the everyday use commands. Used to add, change, delete, or read the actual data inside the database. Exp: **INSERT, UPDATE, DELETE, SELECT.**

1. Created tables using **CREATE DATABASE;**

2. Insert data in the query using **INSERT INTO;**

While creating tables I encountered various errors which are listed at the end of the document.

Table1: Department

```
SELECT * FROM PROJECT;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Headquarters	1	888665555	1981-06-19
Administration	4	987654321	1995-01-01
Research	5	333445555	1988-05-22
NULL	NULL	NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

Output

Table 2: Employee

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	NULL	Smith	123456789	1965-01-09	731 Fondren, Houston TX	M	30000.00	333445555	5
Franklin	NULL	Wong	333445555	1965-12-08	638 Voss, Houston TX	M	40000.00	888665555	5
Joyce	NULL	English	453453453	1972-07-31	5631 Rice, Houston TX	F	25000.00	NULL	5
Ramesh	NULL	Narayan	666884444	1962-09-15	975 Fire Oak, Humble TX	M	38000.00	333445555	5
James	NULL	Borg	888665555	1937-11-10	450 Stone, Houston TX	M	55000.00	NULL	1
Jennifer	NULL	Wallace	987654321	1941-06-20	291 Berry, Bellaire TX	F	43000.00	888665555	4
Ahmad	NULL	Jabbar	987987987	1969-03-29	980 Dallas, Houston TX	M	25000.00	987654321	4
Alicia	NULL	Zelaya	999887777	1968-01-19	3321 Castle, Spring TX	F	25000.00	987654321	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

Table 3: Dept_Locations

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Houston
5	Sugarland
NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

Table 4: Project

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4
NULL	NULL	NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

Output

Action Output

Table 5: Works_On

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Essn	Pno	Hours
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
453453453	1	20.0
453453453	2	20.0
666884444	3	40.0
888665555	20	NULL
987654321	20	15.0
987654321	30	20.0
987987987	10	35.0
987987987	30	5.0
999887777	10	10.0
999887777	30	30.0
NULL	NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

Table 6: Dependent

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Essn	Dependent_name	Sex	Bdate	Relationship
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse
123456789	Michael	M	1988-01-04	Son
333445555	Alice	F	1986-04-04	Daughter
333445555	Joy	F	1958-05-03	Spouse
333445555	Theodore	M	1983-10-25	Son
987654321	Abner	M	1942-02-28	Spouse
NULL	NULL	NULL	NULL	NULL

EMPLOYEE 7 | DEPARTMENT 8 | DEPT_LOCATIONS 9 | PROJECT 10 | WORKS_ON 11 | DEPENDENT 12

UPDATE

DBMS lab 2*

```
Use Company;


UPDATE DEPARTMENT SET Mgr_ssn = '333445555' WHERE Dnumber = 5;
UPDATE DEPARTMENT SET Mgr_ssn = '987654321' WHERE Dnumber = 4;
UPDATE DEPARTMENT SET Mgr_ssn = '888665555' WHERE Dnumber = 1;

SELECT * FROM DEPARTMENT;
```

Result Grid

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Headquarters	1	888665555	1981-06-19
Administration	4	987654321	1995-01-01
Research	5	333445555	1988-05-22
NULL	NULL	NULL	NULL

```sql
CREATE DATABASE Company;
USE Company;

CREATE TABLE DEPARTMENT (
    Dname VARCHAR(15) NOT NULL,
    Dnumber INT NOT NULL,
    Mgr_ssn CHAR(9),
    Mgr_start_date DATE,
    PRIMARY KEY (Dnumber),
    UNIQUE (Dname)
);

CREATE TABLE EMPLOYEE (
    Fname VARCHAR(15) NOT NULL,
    Minit CHAR,
    Lname VARCHAR(15) NOT NULL,
    Ssn CHAR(9) NOT NULL,
    Bdate DATE,
    Address VARCHAR(30),
    Sex CHAR,
    Salary DECIMAL(10,2),
    Super_ssn CHAR(9),
    Dno INT NOT NULL,
    PRIMARY KEY (Ssn),
    FOREIGN KEY (Dno) REFERENCES DEPARTMENT(Dnumber),
    FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE(Ssn)
);

ALTER TABLE DEPARTMENT
ADD CONSTRAINT fk_mgr FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE(Ssn);

CREATE TABLE DEPT_LOCATIONS (
    Dnumber INT NOT NULL,
    Dlocation VARCHAR(15) NOT NULL,
    PRIMARY KEY (Dnumber, Dlocation),
    FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)
);

CREATE TABLE PROJECT (
    Pname VARCHAR(15) NOT NULL,
    Pnumber INT NOT NULL,
    Plocation VARCHAR(15),
    Dnum INT NOT NULL,
    PRIMARY KEY (Pnumber),
    UNIQUE (Pname),
    FOREIGN KEY (Dnum) REFERENCES DEPARTMENT(Dnumber)
);

CREATE TABLE WORKS_ON (
    Essn CHAR(9) NOT NULL,
    Pno INT NOT NULL,
    Hours DECIMAL(3,1),
    PRIMARY KEY (Essn, Pno),
    FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn),
```

```sql
    FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber)
);

CREATE TABLE DEPENDENT (
    Essn CHAR(9) NOT NULL,
    Dependent_name VARCHAR(15) NOT NULL,
    Sex CHAR,
    Bdate DATE,
    Relationship VARCHAR(8),
    PRIMARY KEY (Essn, Dependent_name),
    FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn)
);
INSERT INTO DEPARTMENT VALUES ('Research', 5, '333445555', '1988-05-22');
INSERT INTO DEPARTMENT VALUES ('Administration', 4, '987654321', '1995-01-01');
INSERT INTO DEPARTMENT VALUES ('Headquarters', 1, '888665555', '1981-06-19');

INSERT INTO EMPLOYEE VALUES ('John', NULL, 'Smith', '123456789', '1965-01-09', '731
Fondren, Houston TX', 'M', 30000, '333445555', 5);
INSERT INTO EMPLOYEE VALUES ('Franklin', NULL, 'Wong', '333445555', '1965-12-08', '638
Voss, Houston TX', 'M', 40000, '888665555', 5);
INSERT INTO EMPLOYEE VALUES ('Alicia', NULL, 'Zelaya', '999887777', '1968-01-19', '3321
Castle, Spring TX', 'F', 25000, '987654321', 4);
INSERT INTO EMPLOYEE VALUES ('Jennifer', NULL, 'Wallace', '987654321', '1941-06-20', '291
Berry, Bellaire TX', 'F', 43000, '888665555', 4);
INSERT INTO EMPLOYEE VALUES ('Ramesh', NULL, 'Narayan', '666884444', '1962-09-15', '975
Fire Oak, Humble TX', 'M', 38000, '333445555', 5);
INSERT INTO EMPLOYEE VALUES ('Joyce', NULL, 'English', '453453453', '1972-07-31', '5631
Rice, Houston TX', 'F', 25000, '333445555', 5);
INSERT INTO EMPLOYEE VALUES ('Ahmad', NULL, 'Jabbar', '987987987', '1969-03-29', '980
Dallas, Houston TX', 'M', 25000, '987654321', 4);
INSERT INTO EMPLOYEE VALUES ('James', NULL, 'Borg', '888665555', '1937-11-10', '450 Stone,
Houston TX', 'M', 55000, NULL, 1);

INSERT INTO PROJECT VALUES ('ProductX', 1, 'Bellaire', 5);
INSERT INTO PROJECT VALUES ('ProductY', 2, 'Sugarland', 5);
INSERT INTO PROJECT VALUES ('ProductZ', 3, 'Houston', 5);
INSERT INTO PROJECT VALUES ('Computerization', 10, 'Stafford', 4);
INSERT INTO PROJECT VALUES ('Reorganization', 20, 'Houston', 1);
INSERT INTO PROJECT VALUES ('Newbenefits', 30, 'Stafford', 4);

INSERT INTO WORKS_ON VALUES ('123456789', 1, 32.5);
INSERT INTO WORKS_ON VALUES ('123456789', 2, 7.5);
INSERT INTO WORKS_ON VALUES ('666884444', 3, 40.0);
INSERT INTO WORKS_ON VALUES ('453453453', 1, 20.0);
INSERT INTO WORKS_ON VALUES ('453453453', 2, 20.0);
INSERT INTO WORKS_ON VALUES ('333445555', 2, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 3, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 10, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 20, 10.0);
INSERT INTO WORKS_ON VALUES ('999887777', 30, 30.0);
INSERT INTO WORKS_ON VALUES ('999887777', 10, 10.0);
INSERT INTO WORKS_ON VALUES ('987987987', 10, 35.0);
INSERT INTO WORKS_ON VALUES ('987987987', 30, 5.0);
INSERT INTO WORKS_ON VALUES ('987654321', 30, 20.0);
INSERT INTO WORKS_ON VALUES ('987654321', 20, 15.0);
INSERT INTO WORKS_ON VALUES ('888665555', 20, NULL);
```

```sql
INSERT INTO DEPENDENT VALUES ('333445555', 'Alice', 'F', '1986-04-04', 'Daughter');
INSERT INTO DEPENDENT VALUES ('333445555', 'Theodore', 'M', '1983-10-25', 'Son');
INSERT INTO DEPENDENT VALUES ('333445555', 'Joy', 'F', '1958-05-03', 'Spouse');
INSERT INTO DEPENDENT VALUES ('987654321', 'Abner', 'M', '1942-02-28', 'Spouse');
INSERT INTO DEPENDENT VALUES ('123456789', 'Michael', 'M', '1988-01-04', 'Son');
INSERT INTO DEPENDENT VALUES ('123456789', 'Alice', 'F', '1988-12-30', 'Daughter');
INSERT INTO DEPENDENT VALUES ('123456789', 'Elizabeth', 'F', '1967-05-05', 'Spouse');

INSERT INTO DEPT_LOCATIONS VALUES (1, 'Houston');
INSERT INTO DEPT_LOCATIONS VALUES (4, 'Stafford');
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Bellaire');
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Houston');
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Sugarland');

SELECT * FROM EMPLOYEE;

SELECT * FROM DEPARTMENT;

SELECT * FROM DEPT_LOCATIONS;

SELECT * FROM PROJECT;

SELECT * FROM WORKS_ON;

SELECT * FROM DEPENDENT;
```