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Class: TY CSE CORE 3 Batch A

Exp - 01

Part A

Practical Objective:

1. Learning DDL commands to design sample diagrams.
2. Learning DML commands for inserting, retrieving, deleting and updating the data.
3. Understanding Entity-Relationship Diagrams (ER Diagrams)

Prerequisite: No

Software: MySQL, ERD Plus

CO Mapping:

CO1: Apply the concepts of database design and SQL.

Practical Outcomes: At the end of this practical student will be able to:

1. Design a database.
2. Design an ER Diagram for a database.
3. Convert ER Diagram into Database.

Theory:

Creating a database:

```
create database database_name;
```

Show all databases:

```
SHOW databases;
```

Set Defatult database:

```
Use database_name;
```

Create table syntax

```
create table table_name
(
column_name1 data_type(size) constraints,
column_name2 data_type(size) constraints,
column_name3 data_type(size) constraints,
....
);
```

Drop table or database:

```
Drop table table_name;
Drop database database_name;
```

Alter Command:

Alter table to add column:

```
alter table table_name add column_name datatype;
```

Alter table to drop column:

```
alter table table_name drop column column_name;
```

Alter table - modify column

```
alter table table_name modify column column_name datatype;
```

Add or drop primary key on alter table

```
Alter table persons add primary key (id);
```

```
Alter table persons drop primary key;
```

Creating Foreign Key:

```
create table orders (
    orderid int not null,
    ordernumber int not null,
    personid int,
    primary key (orderid),
    foreign key (personid) references persons(personid)
);
```

SQL CHECK on CREATE TABLE

```
create table persons (
    id int not null,
    lastname varchar(255) not null,
    firstname varchar(255),
    age int,
    check (age>=18)
);
```

SQL DEFAULT Constraint

The DEFAULT constraint is used to set a default value for a column. The default value will be added to all new records, if no other value is specified.

```
create table persons (
    id int not null, lastname varchar(255) not null, firstname varchar(255), age int, city
varchar(255) default 'sandnes'
);
```

Display Schema of Tables:

```
Desc Table_name;
```

SQL INSERT INTO Syntax

It is possible to write the INSERT INTO statement in two forms.

The first form does not specify the column names where the data will be inserted, only their values:

```
INSERT INTO table_name
VALUES (value1,value2,value3,...);
```

The second form specifies both the column names and the values to be inserted:

```
INSERT INTO table_name (column1,column2,column3,...)
VALUES (value1,value2,value3,...);
```

SQL SELECT Syntax

```
SELECT column_name(s) FROM table_name;
```

and

```
SELECT  * FROM table_name;
```

and

```
SELECT column_name(s) FROM table_name WHERE condition
```

SQL DELETE Syntax

```
DELETE FROM table_name WHERE condition;
```

SQL UPDATE Syntax

```
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;
```

Procedure:

1. Formulate the query for given problem.
2. Write the SQL query with proper input.

3. Execute the query.

Practice Exercise:

S.no	Query statement
1	(a) Create an Account with the following attributes acctno - Account Number – Integer bal – Balance – Interger (b) Add column acctHolderName attribute with type Number (c) Change column acctHolderName type to varchar (d) Delete column acctHolderName
2	Create the Depositor table with th following attributes custname – Customer Name – varchar custID – Customer ID – Integer
3	Create the Loan table with the following attributes loan_no_loan number – Integer br_name – Branch name – varchar amount –loan amount – float
4	Create the Borrower with the following attributes custname – Customer Name – varchar loan_no – loan number – Integer
5	Create Department Table with following columns and constraints: Column name Type & Size Dept_no numeric(2) Dname varchar(15) Location varchar(12)
6	Create Emp table with following columns and constraints: Column name Type & Size Emp_no numeric(4) Ename varchar(20) Gender char(1) Job varchar(12) Mgr numeric(4) Hiredate date Salary numeric(8) Comm numeric(8) Dept_no numeric(2)
7	Insert following data into Department table:

Dept_no	Dname	Location
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	MARKETING	BOSTON

8	Insert following data into Emp table:

E_no	Ename	Gender	Job	Mgr	Hiredate	Salary	Comm	Dept_no
7369	Smith	M	CLERK	7902	17-DEC-80	8000	-	20
7499	Allen	F	SALESMAN	7698	20-FEB-81	16000	3000	30
7521	Ward	M	SALESMAN	7698	22-FEB-81	12500	5000	30
7566	Jones	F	MANAGER	7839	02-APR-81	29750	-	20
7654	Martin	M	SALESMAN	7698	28-SEP-81	12500	14000	30
7698	Blake	M	MANAGER	7839	01-MAY-81	28500	-	30
7782	Clark	M	MANAGER	7839	09-JUN-81	24500	-	10
7788	Scott	M	ANALYST	7566	09-DEC-82	30000	-	20
7839	King	M	PRESIDENT	-	17-NOV-81	50000	-	10
7844	Turner	M	SALESMAN	7698	08-SEP-81	15000	-	30
7876	Adams	M	CLERK	7788	12-JAN-83	11000	-	20
7900	James	M	CLERK	7698	03-DEC-81	95000	-	30
7902	Ford	M	ANALYST	7566	03-DEC-81	30000	-	20
7934	Miller	F	CLERK	7782	23-JAN-82	13000	-	10

9	Display all the information of the EMP table?
10	Display all the information of the Department table?
11	Display name of all the departments?
12	Display all department name along with location?
13	Display name and salary of all female employees.

14	Display name of all male employees in department no 20.
15	Display name of all employee whose salary is more than 10000.
16	Display information of all clerks.
17	Display Employee no. and name of all male who is getting salary less than 20000.
18	Display information of all employees working in Dept. no. 20.
19	Display unique Jobs from EMP table?
20	Display the structure of all tables.
21	The database designers provide the following description 1. The company is organized into departments. Each department has a unique name, unique number, and particular employee to manage the department. We keep track of the start date and the employee begins managing the department. The department has several locations. 2. The department controls a number of projects each of which has a unique name, unique number, and a single location. 3. We store each employee's name social security number, address, salary, sex, and DoB. An employee is assigned to one department but may work on several projects, which are not necessarily controlled by the same department. We keep track of the department of each employee who works on each project. 4. We also keep track of the direct supervisor of each employee (who is another employee). 5. For insurance purposes, we keep each dependent's first name, sex, DoB, and relation. **Do the Followings:** **1. Find all entities and their attributes.** **2. Find all relationships and their attributes.** **3. Design the ER-Diagram for the given description in ERD Plus. Also Convert the ER-Diagram into Relational Database Model.**

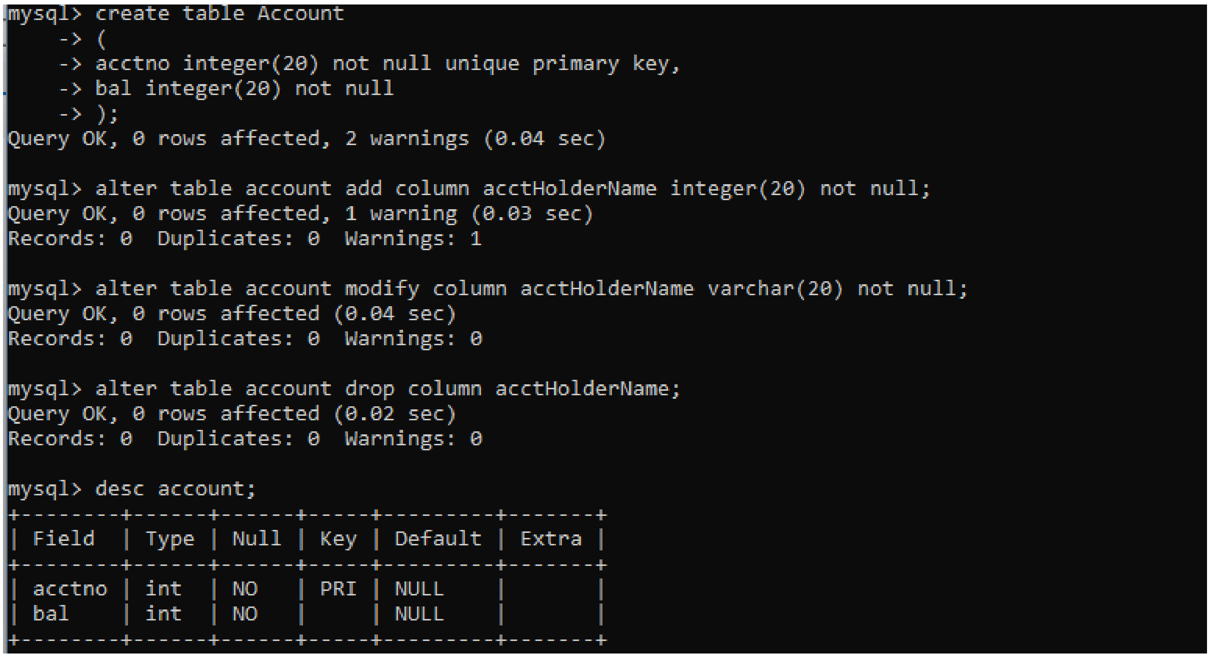
Instructions:

1. Write and execute the query in MySQL.
2. Paste the snapshot of the output in input & output section.

Part B

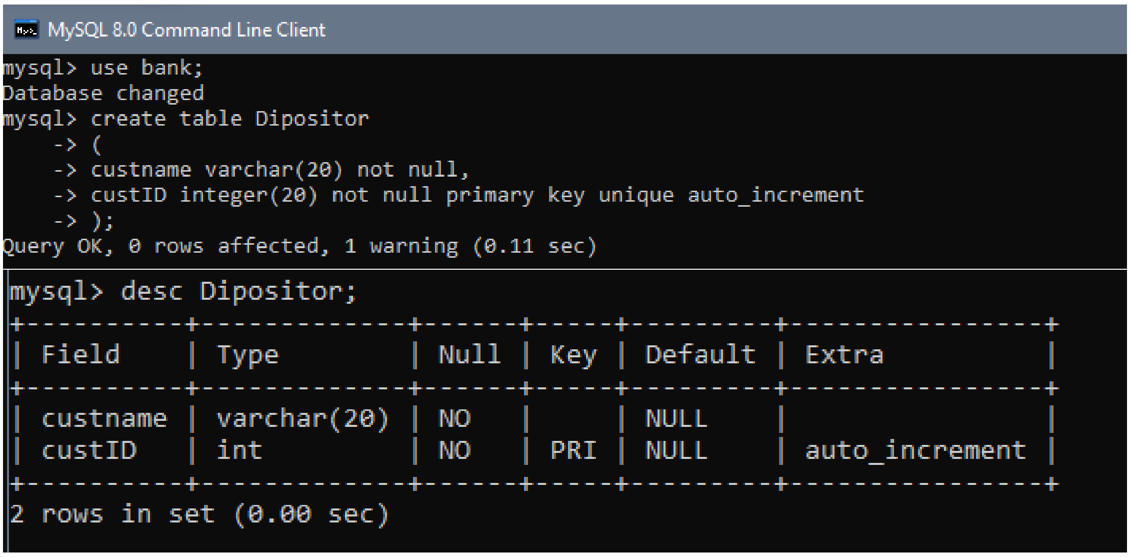
Input & Output:

1.



```
mysql> create table Account
    -> (
    -> acctno integer(20) not null unique primary key,
    -> bal integer(20) not null
    -> );
Query OK, 0 rows affected, 2 warnings (0.04 sec)

mysql> alter table account add column acctHolderName integer(20) not null;
Query OK, 0 rows affected, 1 warning (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> alter table account modify column acctHolderName varchar(20) not null;
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> alter table account drop column acctHolderName;
Query OK, 0 rows affected (0.02 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc account;
+--------+------+------+-----+---------+-------+
| Field  | Type | Null | Key | Default | Extra |
+--------+------+------+-----+---------+-------+
| acctno | int  | NO   | PRI | NULL    |       |
| bal    | int  | NO   |     | NULL    |       |
+--------+------+------+-----+---------+-------+
```

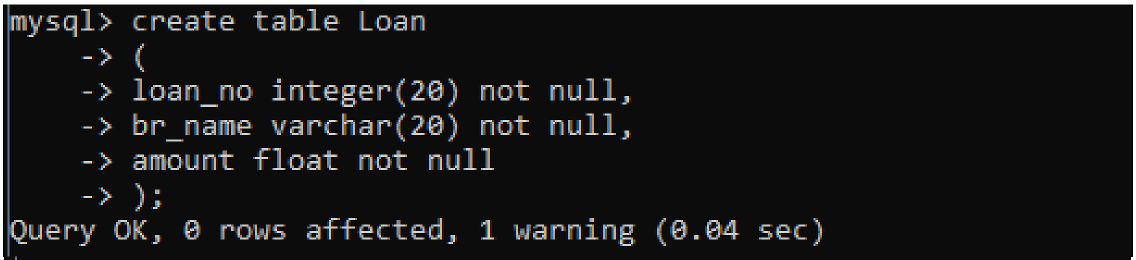
2.



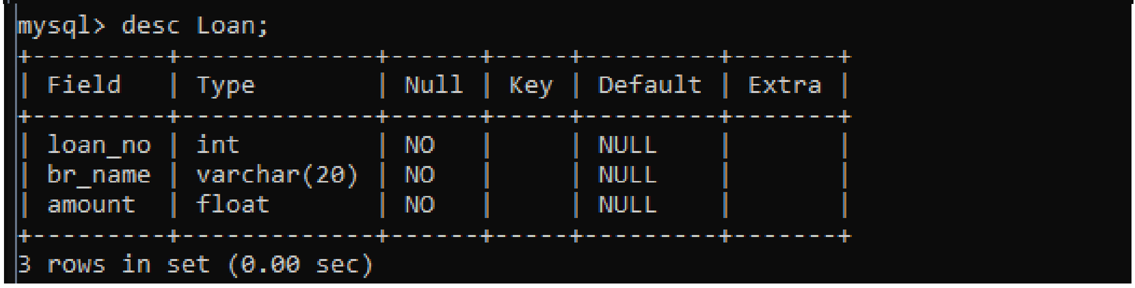
```
mysql> use bank;
Database changed
mysql> create table Dipositor
    -> (
    -> custname varchar(20) not null,
    -> custID integer(20) not null primary key unique auto_increment
    -> );
Query OK, 0 rows affected, 1 warning (0.11 sec)
```

```
mysql> desc Dipositor;
+----------+-------------+------+-----+---------+----------------+
| Field    | Type        | Null | Key | Default | Extra          |
+----------+-------------+------+-----+---------+----------------+
| custname | varchar(20) | NO   |     | NULL    |                |
| custID   | int         | NO   | PRI | NULL    | auto_increment |
+----------+-------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)
```

3.

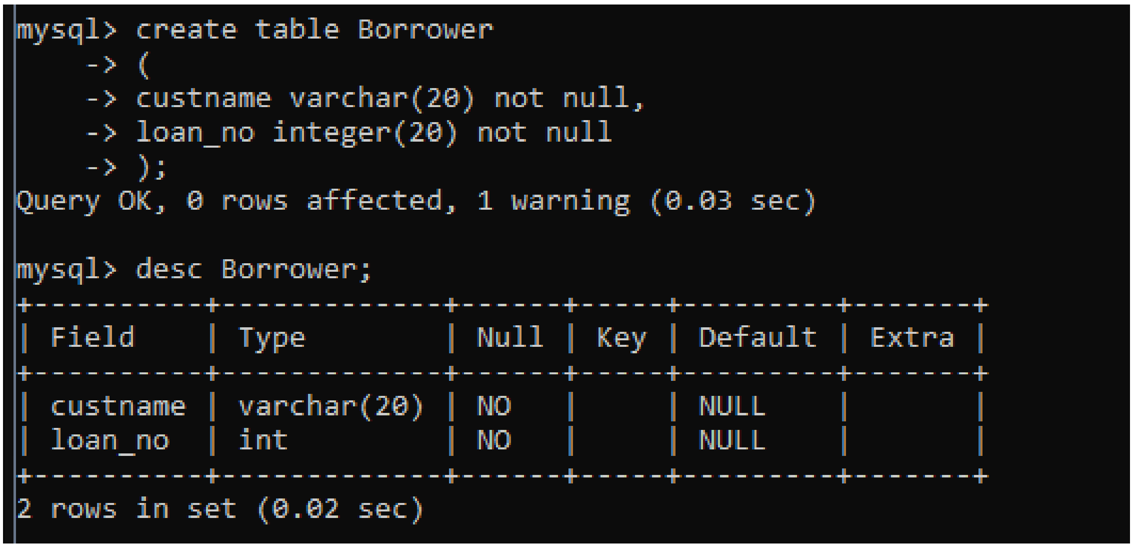


```
mysql> create table Loan
    -> (
    -> loan_no integer(20) not null,
    -> br_name varchar(20) not null,
    -> amount float not null
    -> );
Query OK, 0 rows affected, 1 warning (0.04 sec)
```



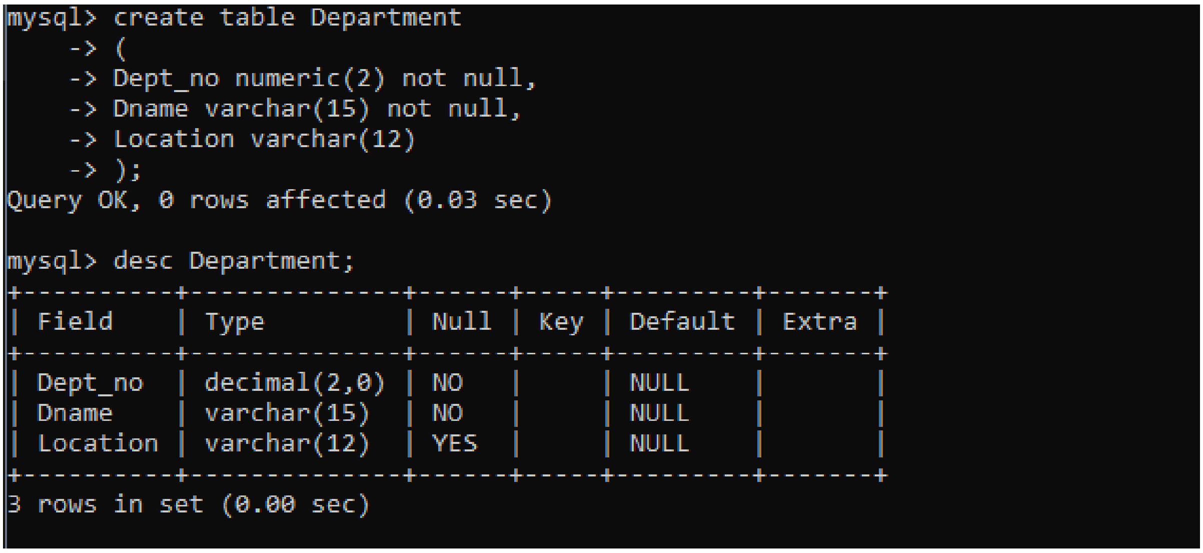
```
mysql> desc Loan;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| loan_no | int         | NO   |     | NULL    |       |
| br_name | varchar(20) | NO   |     | NULL    |       |
| amount  | float       | NO   |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

4.



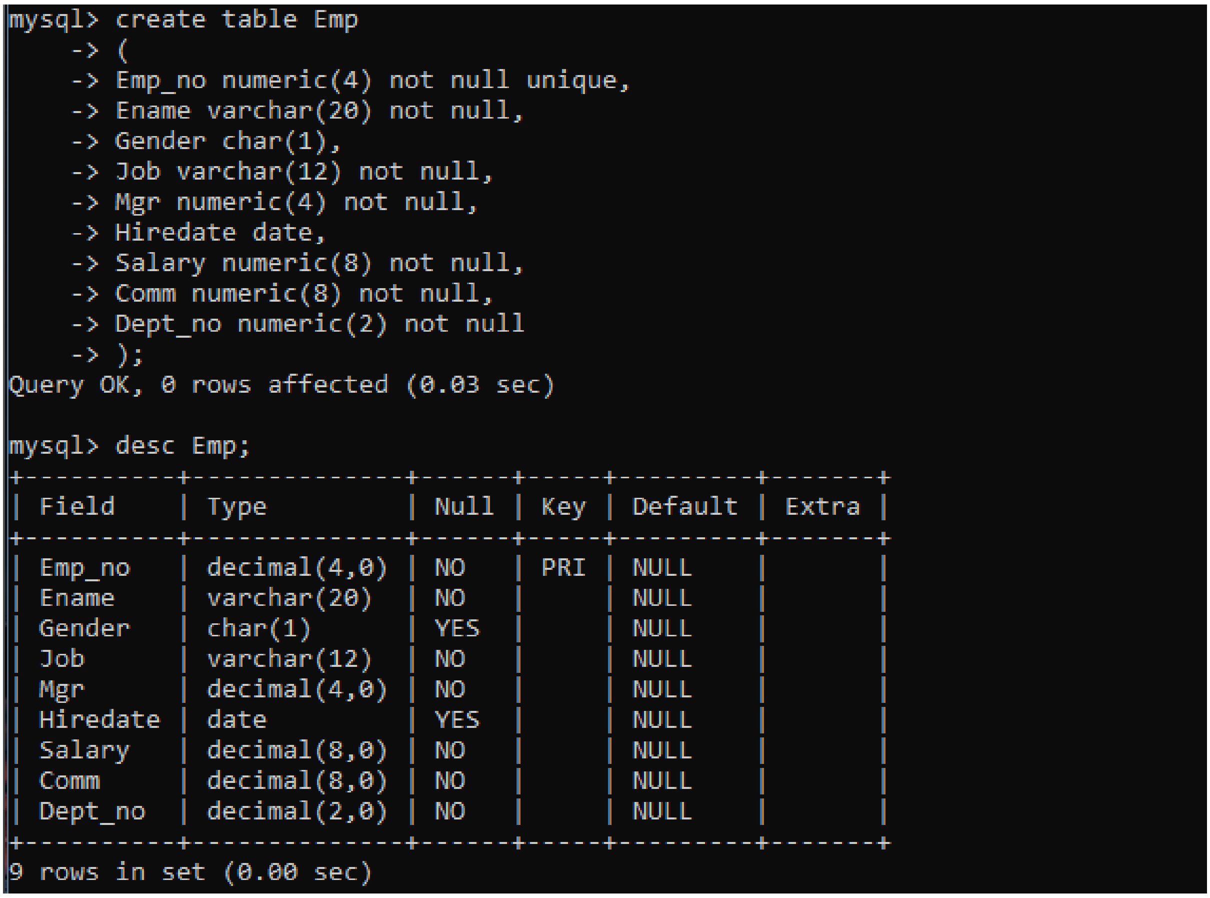
```
mysql> create table Borrower
    -> (
    -> custname varchar(20) not null,
    -> loan_no integer(20) not null
    -> );
Query OK, 0 rows affected, 1 warning (0.03 sec)

mysql> desc Borrower;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| custname | varchar(20) | NO   |     | NULL    |       |
| loan_no  | int         | NO   |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
2 rows in set (0.02 sec)
```

5.



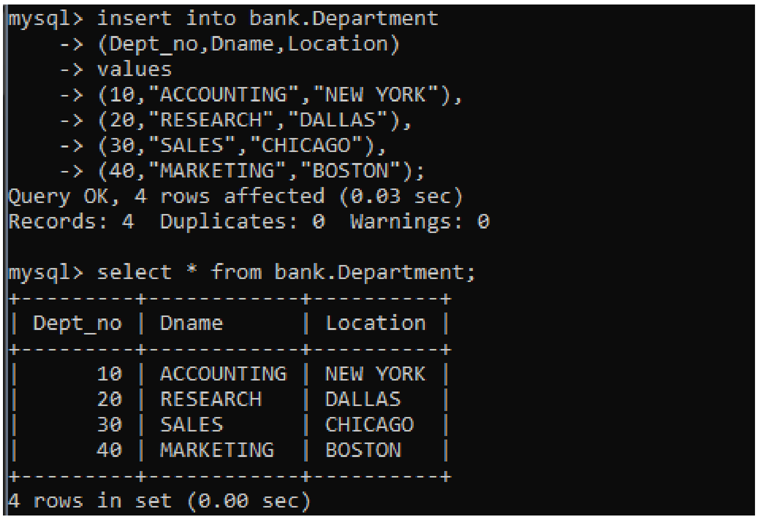
```
mysql> create table Department
    -> (
    -> Dept_no numeric(2) not null,
    -> Dname varchar(15) not null,
    -> Location varchar(12)
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> desc Department;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| Dept_no  | decimal(2,0) | NO   |     | NULL    |       |
| Dname    | varchar(15)  | NO   |     | NULL    |       |
| Location | varchar(12)  | YES  |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

6.



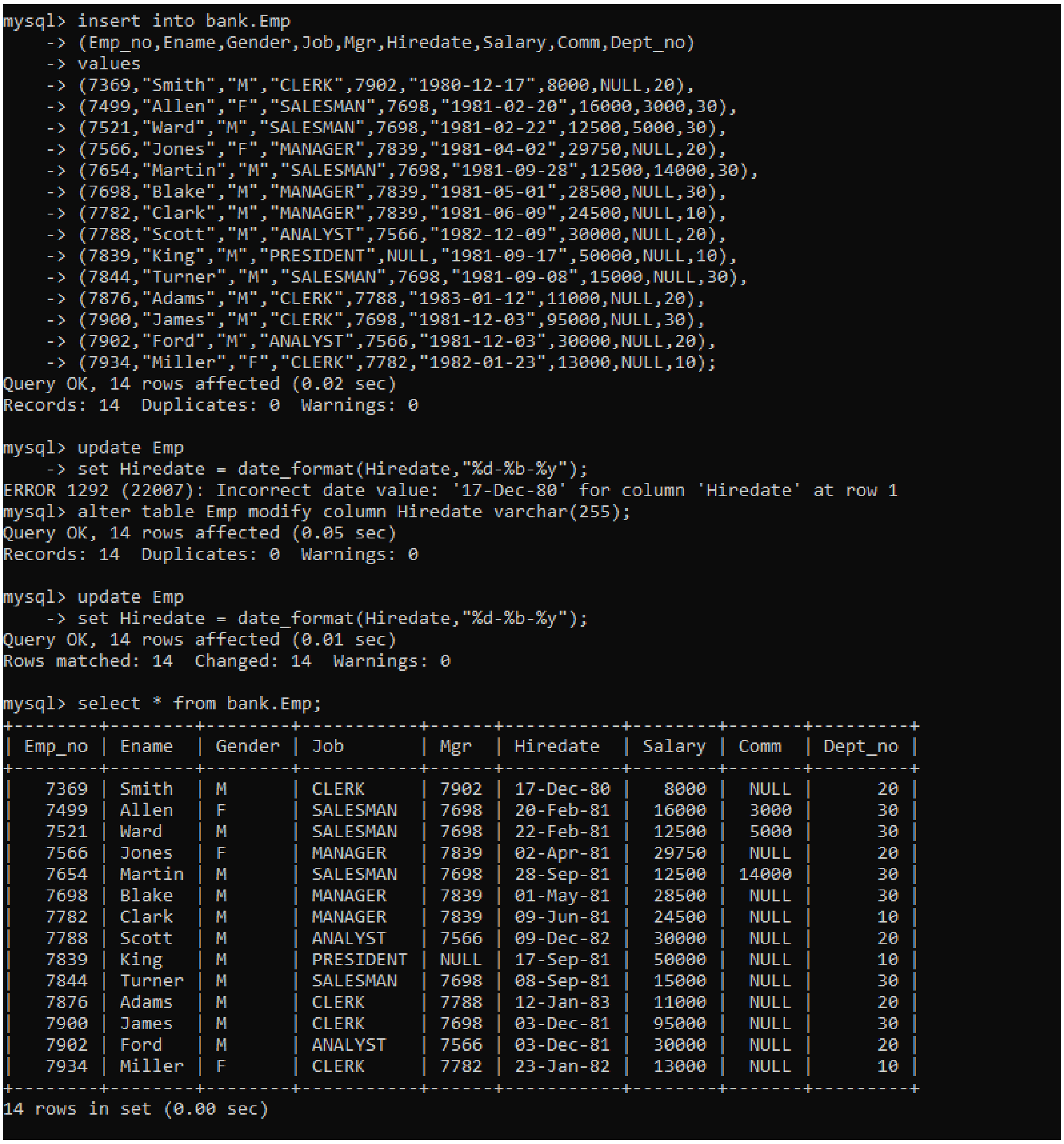
```
mysql> create table Emp
    -> (
    -> Emp_no numeric(4) not null unique,
    -> Ename varchar(20) not null,
    -> Gender char(1),
    -> Job varchar(12) not null,
    -> Mgr numeric(4) not null,
    -> Hiredate date,
    -> Salary numeric(8) not null,
    -> Comm numeric(8) not null,
    -> Dept_no numeric(2) not null
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> desc Emp;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| Emp_no   | decimal(4,0) | NO   | PRI | NULL    |       |
| Ename    | varchar(20)  | NO   |     | NULL    |       |
| Gender   | char(1)      | YES  |     | NULL    |       |
| Job      | varchar(12)  | NO   |     | NULL    |       |
| Mgr      | decimal(4,0) | NO   |     | NULL    |       |
| Hiredate | date         | YES  |     | NULL    |       |
| Salary   | decimal(8,0) | NO   |     | NULL    |       |
| Comm     | decimal(8,0) | NO   |     | NULL    |       |
| Dept_no  | decimal(2,0) | NO   |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

7.



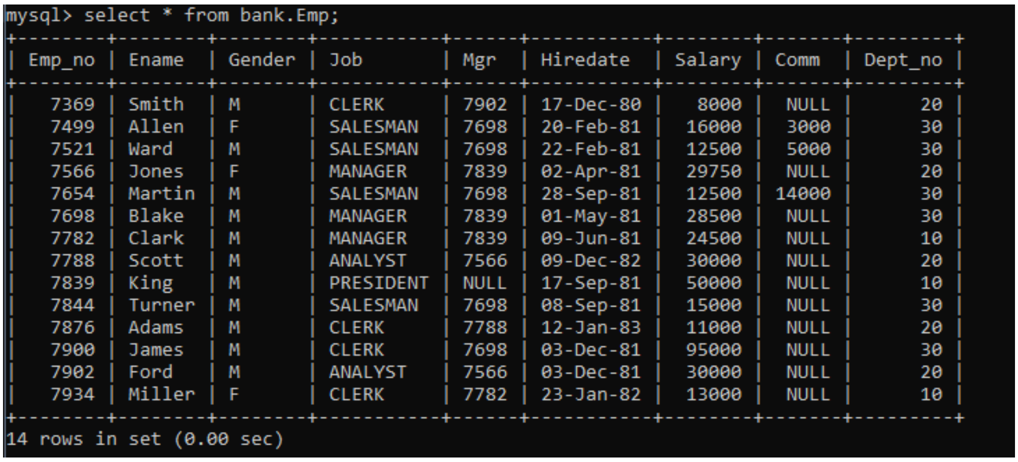
```
mysql> insert into bank.Department
    -> (Dept_no,Dname,Location)
    -> values
    -> (10,"ACCOUNTING","NEW YORK"),
    -> (20,"RESEARCH","DALLAS"),
    -> (30,"SALES","CHICAGO"),
    -> (40,"MARKETING","BOSTON");
Query OK, 4 rows affected (0.03 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> select * from bank.Department;
+---------+------------+----------+
| Dept_no | Dname      | Location |
+---------+------------+----------+
|      10 | ACCOUNTING | NEW YORK |
|      20 | RESEARCH   | DALLAS   |
|      30 | SALES      | CHICAGO  |
|      40 | MARKETING  | BOSTON   |
+---------+------------+----------+
4 rows in set (0.00 sec)
```

8.



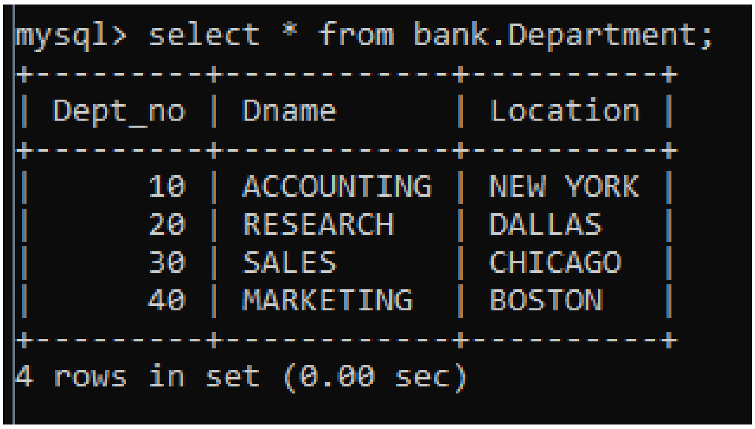
```
mysql> insert into bank.Emp
    -> (Emp_no,Ename,Gender,Job,Mgr,Hiredate,Salary,Comm,Dept_no)
    -> values
    -> (7369,"Smith","M","CLERK",7902,"1980-12-17",8000,NULL,20),
    -> (7499,"Allen","F","SALESMAN",7698,"1981-02-20",16000,3000,30),
    -> (7521,"Ward","M","SALESMAN",7698,"1981-02-22",12500,5000,30),
    -> (7566,"Jones","F","MANAGER",7839,"1981-04-02",29750,NULL,20),
    -> (7654,"Martin","M","SALESMAN",7698,"1981-09-28",12500,14000,30),
    -> (7698,"Blake","M","MANAGER",7839,"1981-05-01",28500,NULL,30),
    -> (7782,"Clark","M","MANAGER",7839,"1981-06-09",24500,NULL,10),
    -> (7788,"Scott","M","ANALYST",7566,"1982-12-09",30000,NULL,20),
    -> (7839,"King","M","PRESIDENT",NULL,"1981-09-17",50000,NULL,10),
    -> (7844,"Turner","M","SALESMAN",7698,"1981-09-08",15000,NULL,30),
    -> (7876,"Adams","M","CLERK",7788,"1983-01-12",11000,NULL,20),
    -> (7900,"James","M","CLERK",7698,"1981-12-03",95000,NULL,30),
    -> (7902,"Ford","M","ANALYST",7566,"1981-12-03",30000,NULL,20),
    -> (7934,"Miller","F","CLERK",7782,"1982-01-23",13000,NULL,10);
Query OK, 14 rows affected (0.02 sec)
Records: 14  Duplicates: 0  Warnings: 0

mysql> update Emp
    -> set Hiredate = date_format(Hiredate,"%d-%b-%y");
ERROR 1292 (22007): Incorrect date value: '17-Dec-80' for column 'Hiredate' at row 1
mysql> alter table Emp modify column Hiredate varchar(255);
Query OK, 14 rows affected (0.05 sec)
Records: 14  Duplicates: 0  Warnings: 0

mysql> update Emp
    -> set Hiredate = date_format(Hiredate,"%d-%b-%y");
Query OK, 14 rows affected (0.01 sec)
Rows matched: 14  Changed: 14  Warnings: 0

mysql> select * from bank.Emp;
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
| Emp_no | Ename  | Gender | Job       | Mgr  | Hiredate  | Salary | Comm  | Dept_no |
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
|   7369 | Smith  | M      | CLERK     | 7902 | 17-Dec-80 |   8000 |  NULL |      20 |
|   7499 | Allen  | F      | SALESMAN  | 7698 | 20-Feb-81 |  16000 |  3000 |      30 |
|   7521 | Ward   | M      | SALESMAN  | 7698 | 22-Feb-81 |  12500 |  5000 |      30 |
|   7566 | Jones  | F      | MANAGER   | 7839 | 02-Apr-81 |  29750 |  NULL |      20 |
|   7654 | Martin | M      | SALESMAN  | 7698 | 28-Sep-81 |  12500 | 14000 |      30 |
|   7698 | Blake  | M      | MANAGER   | 7839 | 01-May-81 |  28500 |  NULL |      30 |
|   7782 | Clark  | M      | MANAGER   | 7839 | 09-Jun-81 |  24500 |  NULL |      10 |
|   7788 | Scott  | M      | ANALYST   | 7566 | 09-Dec-82 |  30000 |  NULL |      20 |
|   7839 | King   | M      | PRESIDENT | NULL | 17-Sep-81 |  50000 |  NULL |      10 |
|   7844 | Turner | M      | SALESMAN  | 7698 | 08-Sep-81 |  15000 |  NULL |      30 |
|   7876 | Adams  | M      | CLERK     | 7788 | 12-Jan-83 |  11000 |  NULL |      20 |
|   7900 | James  | M      | CLERK     | 7698 | 03-Dec-81 |  95000 |  NULL |      30 |
|   7902 | Ford   | M      | ANALYST   | 7566 | 03-Dec-81 |  30000 |  NULL |      20 |
|   7934 | Miller | F      | CLERK     | 7782 | 23-Jan-82 |  13000 |  NULL |      10 |
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
14 rows in set (0.00 sec)
```

9.



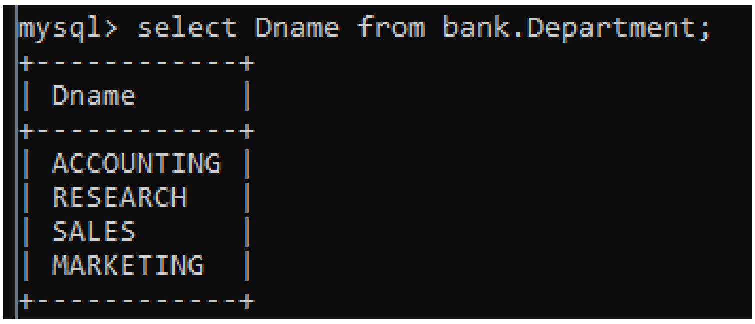
```
mysql> select * from bank.Emp;
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
| Emp_no | Ename  | Gender | Job       | Mgr  | Hiredate  | Salary | Comm  | Dept_no |
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
|   7369 | Smith  | M      | CLERK     | 7902 | 17-Dec-80 |   8000 |  NULL |      20 |
|   7499 | Allen  | F      | SALESMAN  | 7698 | 20-Feb-81 |  16000 |  3000 |      30 |
|   7521 | Ward   | M      | SALESMAN  | 7698 | 22-Feb-81 |  12500 |  5000 |      30 |
|   7566 | Jones  | F      | MANAGER   | 7839 | 02-Apr-81 |  29750 |  NULL |      20 |
|   7654 | Martin | M      | SALESMAN  | 7698 | 28-Sep-81 |  12500 | 14000 |      30 |
|   7698 | Blake  | M      | MANAGER   | 7839 | 01-May-81 |  28500 |  NULL |      30 |
|   7782 | Clark  | M      | MANAGER   | 7839 | 09-Jun-81 |  24500 |  NULL |      10 |
|   7788 | Scott  | M      | ANALYST   | 7566 | 09-Dec-82 |  30000 |  NULL |      20 |
|   7839 | King   | M      | PRESIDENT | NULL | 17-Sep-81 |  50000 |  NULL |      10 |
|   7844 | Turner | M      | SALESMAN  | 7698 | 08-Sep-81 |  15000 |  NULL |      30 |
|   7876 | Adams  | M      | CLERK     | 7788 | 12-Jan-83 |  11000 |  NULL |      20 |
|   7900 | James  | M      | CLERK     | 7698 | 03-Dec-81 |  95000 |  NULL |      30 |
|   7902 | Ford   | M      | ANALYST   | 7566 | 03-Dec-81 |  30000 |  NULL |      20 |
|   7934 | Miller | F      | CLERK     | 7782 | 23-Jan-82 |  13000 |  NULL |      10 |
+--------+--------+--------+-----------+------+-----------+--------+-------+---------+
14 rows in set (0.00 sec)
```

10.



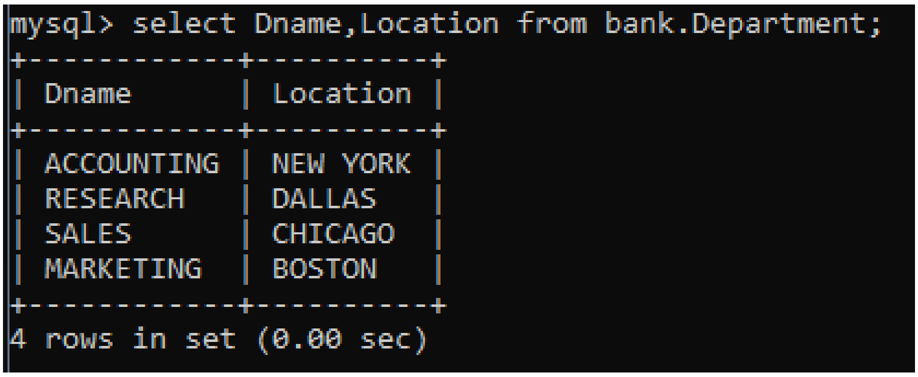
```
mysql> select * from bank.Department;
+---------+------------+----------+
| Dept_no | Dname      | Location |
+---------+------------+----------+
|      10 | ACCOUNTING | NEW YORK |
|      20 | RESEARCH   | DALLAS   |
|      30 | SALES      | CHICAGO  |
|      40 | MARKETING  | BOSTON   |
+---------+------------+----------+
4 rows in set (0.00 sec)
```

11.



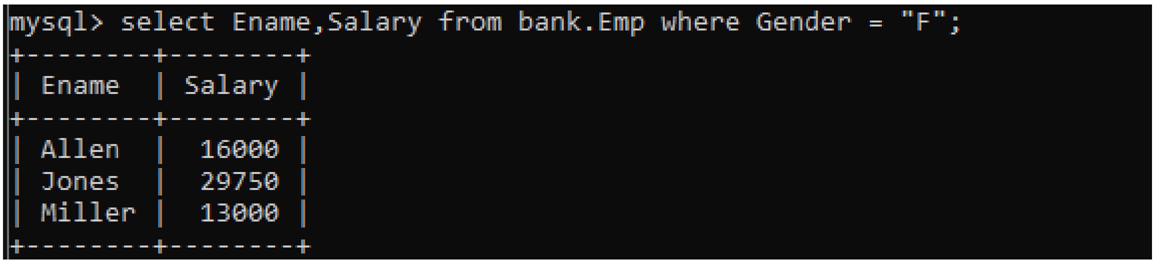
```
mysql> select Dname from bank.Department;
+------------+
| Dname      |
+------------+
| ACCOUNTING |
| RESEARCH   |
| SALES      |
| MARKETING  |
+------------+
```

12.



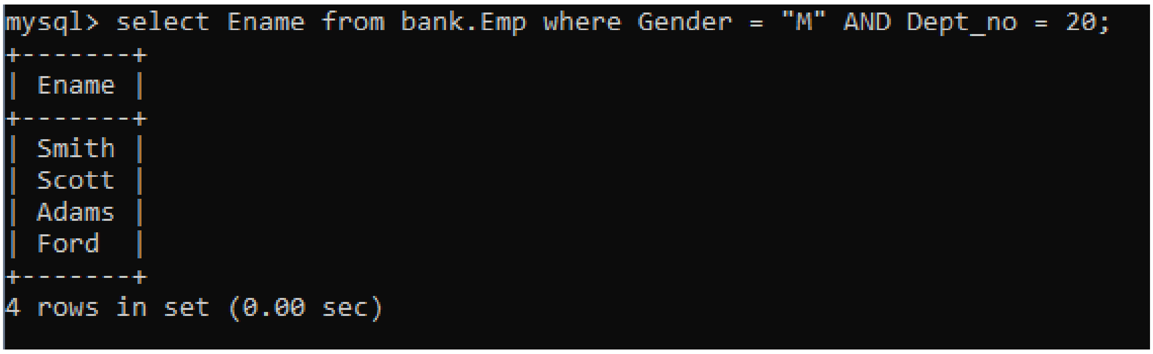
```
mysql> select Dname,Location from bank.Department;
+------------+----------+
| Dname      | Location |
+------------+----------+
| ACCOUNTING | NEW YORK |
| RESEARCH   | DALLAS   |
| SALES      | CHICAGO  |
| MARKETING  | BOSTON   |
+------------+----------+
4 rows in set (0.00 sec)
```

13.



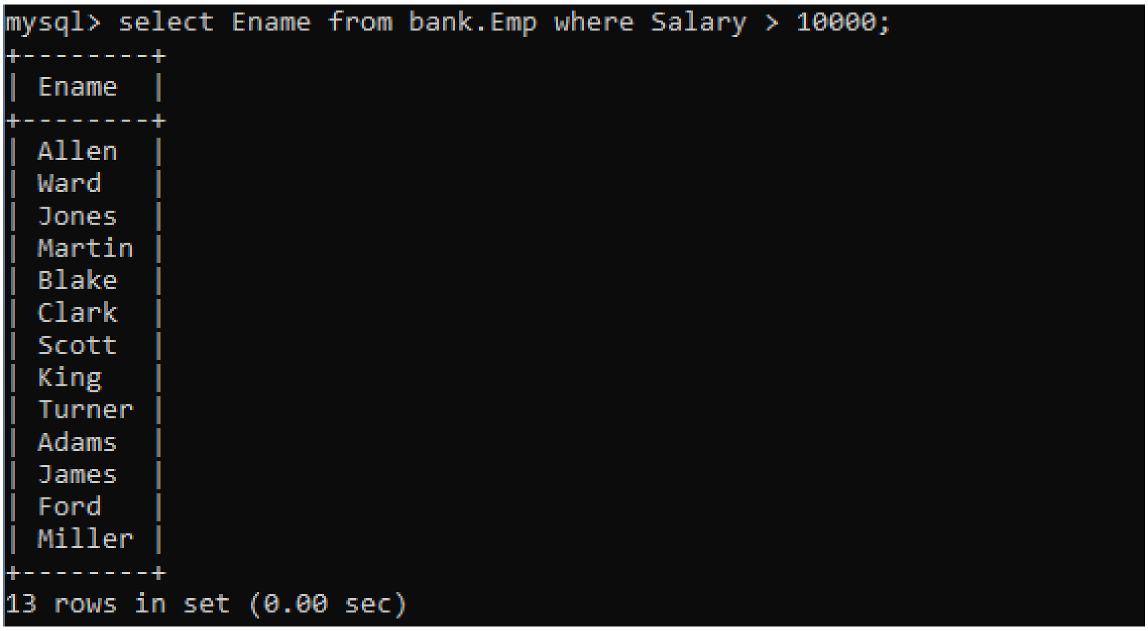
```
mysql> select Ename,Salary from bank.Emp where Gender = "F";
+--------+--------+
| Ename  | Salary |
+--------+--------+
| Allen  |  16000 |
| Jones  |  29750 |
| Miller |  13000 |
+--------+--------+
```

14.



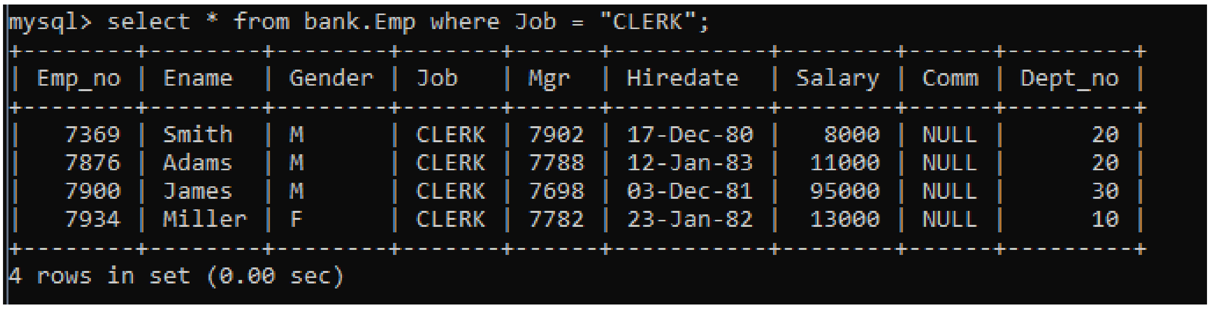
```
mysql> select Ename from bank.Emp where Gender = "M" AND Dept_no = 20;
+-------+
| Ename |
+-------+
| Smith |
| Scott |
| Adams |
| Ford  |
+-------+
4 rows in set (0.00 sec)
```

15.



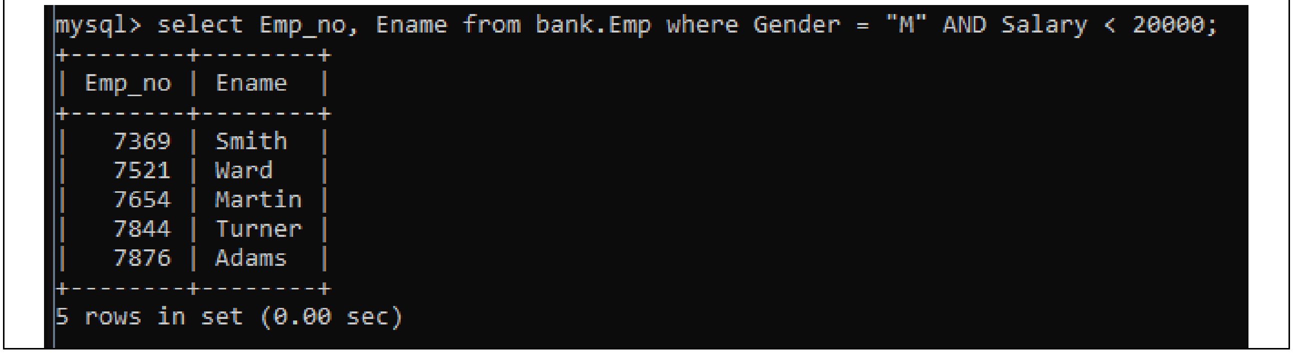
```
mysql> select Ename from bank.Emp where Salary > 10000;
+--------+
| Ename  |
+--------+
| Allen  |
| Ward   |
| Jones  |
| Martin |
| Blake  |
| Clark  |
| Scott  |
| King   |
| Turner |
| Adams  |
| James  |
| Ford   |
| Miller |
+--------+
13 rows in set (0.00 sec)
```

16.



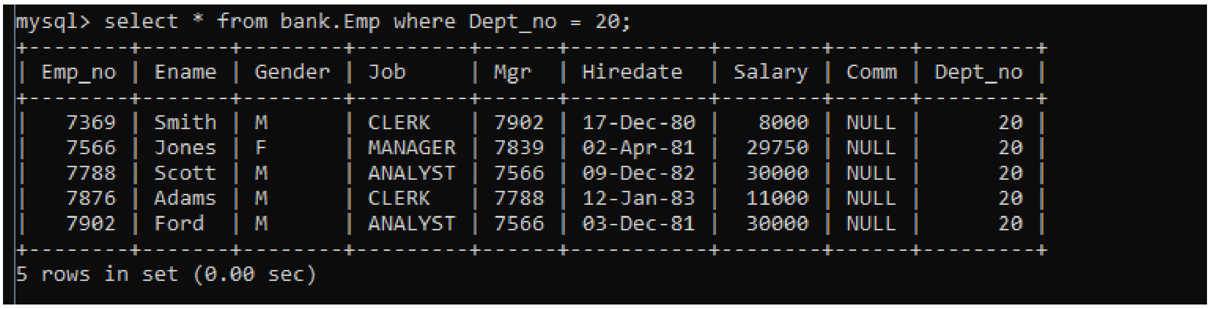
```
mysql> select * from bank.Emp where Job = "CLERK";
+--------+--------+--------+-------+------+-----------+--------+------+---------+
| Emp_no | Ename  | Gender | Job   | Mgr  | Hiredate  | Salary | Comm | Dept_no |
+--------+--------+--------+-------+------+-----------+--------+------+---------+
|   7369 | Smith  | M      | CLERK | 7902 | 17-Dec-80 |   8000 | NULL |      20 |
|   7876 | Adams  | M      | CLERK | 7788 | 12-Jan-83 |  11000 | NULL |      20 |
|   7900 | James  | M      | CLERK | 7698 | 03-Dec-81 |  95000 | NULL |      30 |
|   7934 | Miller | F      | CLERK | 7782 | 23-Jan-82 |  13000 | NULL |      10 |
+--------+--------+--------+-------+------+-----------+--------+------+---------+
4 rows in set (0.00 sec)
```

17.



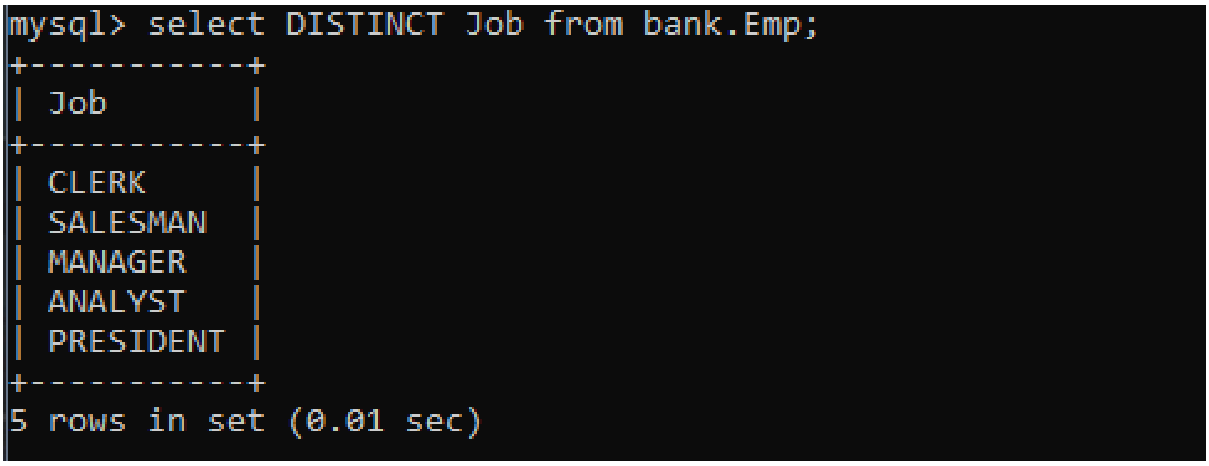
```
mysql> select Emp_no, Ename from bank.Emp where Gender = "M" AND Salary < 20000;
+--------+--------+
| Emp_no | Ename  |
+--------+--------+
|   7369 | Smith  |
|   7521 | Ward   |
|   7654 | Martin |
|   7844 | Turner |
|   7876 | Adams  |
+--------+--------+
5 rows in set (0.00 sec)
```

18.



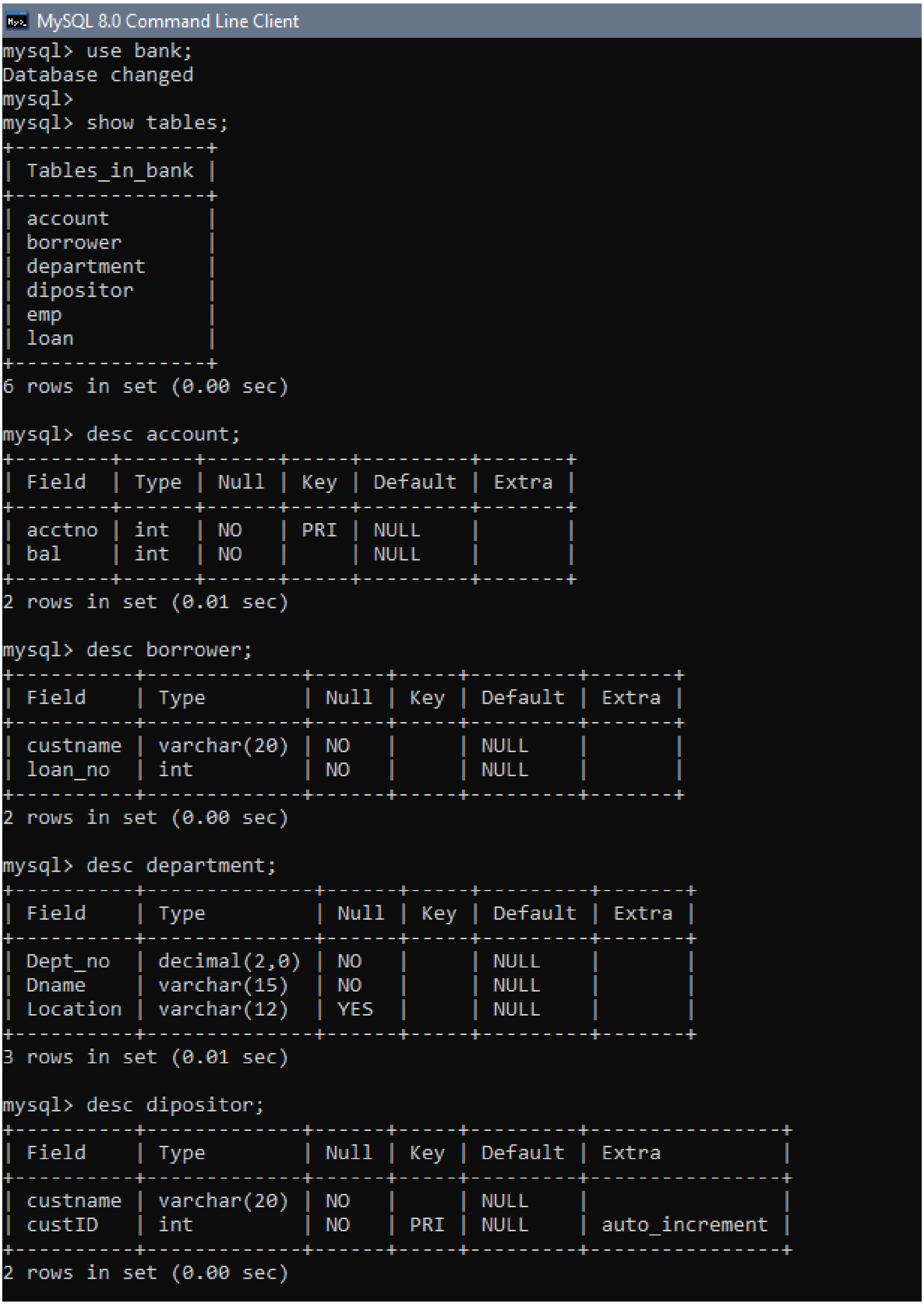
```
mysql> select * from bank.Emp where Dept_no = 20;
+--------+-------+--------+---------+------+-----------+--------+------+---------+
| Emp_no | Ename | Gender | Job     | Mgr  | Hiredate  | Salary | Comm | Dept_no |
+--------+-------+--------+---------+------+-----------+--------+------+---------+
|   7369 | Smith | M      | CLERK   | 7902 | 17-Dec-80 |   8000 | NULL |      20 |
|   7566 | Jones | F      | MANAGER | 7839 | 02-Apr-81 |  29750 | NULL |      20 |
|   7788 | Scott | M      | ANALYST | 7566 | 09-Dec-82 |  30000 | NULL |      20 |
|   7876 | Adams | M      | CLERK   | 7788 | 12-Jan-83 |  11000 | NULL |      20 |
|   7902 | Ford  | M      | ANALYST | 7566 | 03-Dec-81 |  30000 | NULL |      20 |
+--------+-------+--------+---------+------+-----------+--------+------+---------+
5 rows in set (0.00 sec)
```

19.



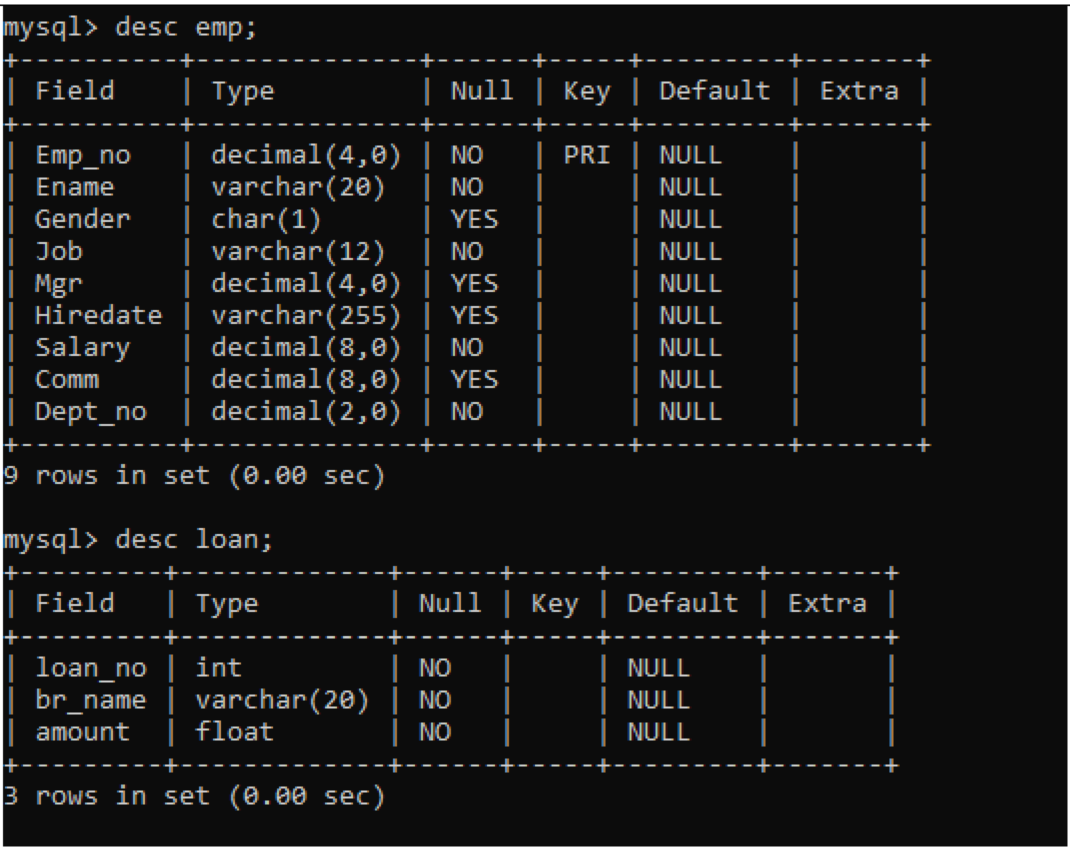
```
mysql> select DISTINCT Job from bank.Emp;
+-----------+
| Job       |
+-----------+
| CLERK     |
| SALESMAN  |
| MANAGER   |
| ANALYST   |
| PRESIDENT |
+-----------+
5 rows in set (0.01 sec)
```

20.



MySQL 8.0 Command Line Client

```
mysql> use bank;
Database changed
mysql>
mysql> show tables;
+----------------+
| Tables_in_bank |
+----------------+
| account        |
| borrower       |
| department     |
| dipositor      |
| emp            |
| loan           |
+----------------+
6 rows in set (0.00 sec)

mysql> desc account;
+--------+------+------+-----+---------+-------+
| Field  | Type | Null | Key | Default | Extra |
+--------+------+------+-----+---------+-------+
| acctno | int  | NO   | PRI | NULL    |       |
| bal    | int  | NO   |     | NULL    |       |
+--------+------+------+-----+---------+-------+
2 rows in set (0.01 sec)

mysql> desc borrower;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| custname | varchar(20) | NO   |     | NULL    |       |
| loan_no  | int         | NO   |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> desc department;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| Dept_no  | decimal(2,0) | NO   |     | NULL    |       |
| Dname    | varchar(15)  | NO   |     | NULL    |       |
| Location | varchar(12)  | YES  |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
3 rows in set (0.01 sec)

mysql> desc dipositor;
+----------+-------------+------+-----+---------+----------------+
| Field    | Type        | Null | Key | Default | Extra          |
+----------+-------------+------+-----+---------+----------------+
| custname | varchar(20) | NO   |     | NULL    |                |
| custID   | int         | NO   | PRI | NULL    | auto_increment |
+----------+-------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)
```



```
mysql> desc emp;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| Emp_no   | decimal(4,0) | NO   | PRI | NULL    |       |
| Ename    | varchar(20)  | NO   |     | NULL    |       |
| Gender   | char(1)      | YES  |     | NULL    |       |
| Job      | varchar(12)  | NO   |     | NULL    |       |
| Mgr      | decimal(4,0) | YES  |     | NULL    |       |
| Hiredate | varchar(255) | YES  |     | NULL    |       |
| Salary   | decimal(8,0) | NO   |     | NULL    |       |
| Comm     | decimal(8,0) | YES  |     | NULL    |       |
| Dept_no  | decimal(2,0) | NO   |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
9 rows in set (0.00 sec)

mysql> desc loan;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| loan_no | int         | NO   |     | NULL    |       |
| br_name | varchar(20) | NO   |     | NULL    |       |
| amount  | float       | NO   |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

21.

1. Mini-world Description:

The database designers provide the following description

i. The company is organized into departments. Each department has a unique name, unique number, and particular employee to manage the department. We keep track of the start date and the employee begins managing the department. The department has several locations.

ii. The department controls a number of projects each of which has a unique name, unique number, and a single location.

iii. We store each employee's name social security number, address, salary, sex, and DoB. An employee is assigned to one department but may work on several projects, which are not necessarily controlled by the same department. We keep track of the department of each employee who works on each project.

iv. We also keep track of the direct supervisor of each employee (who is another employee).

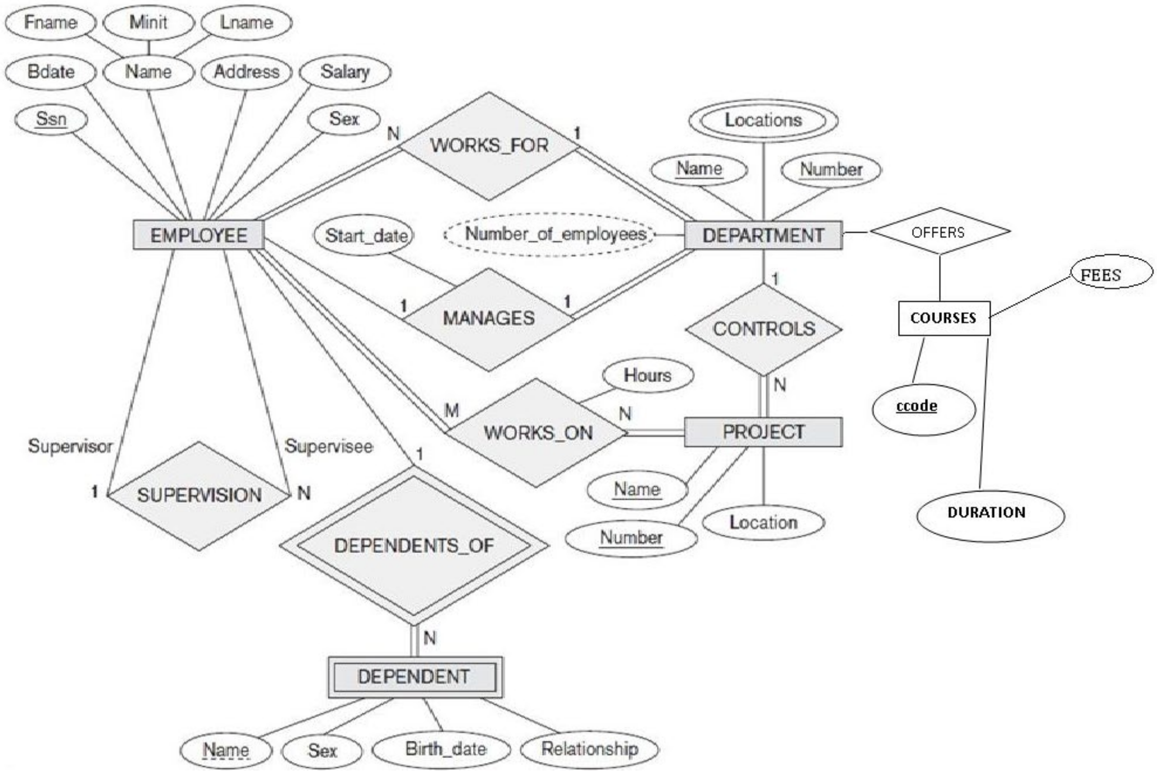
v. For insurance purposes, we keep each dependent's first name, sex, DoB, and relation.

2. Entities and Attributes
   - EMPLOYEE
     - Name: composite (Fname, Minit, Lname), single-valued, string
     - Bdate: simple, single-valued, date
     - Address: simple, single-valued, string
     - Salary: simple, single-valued, real
     - SSN: simple, key attribute single-valued, string

- DEPARTMENT
  - Name: simple, single-valued, string
  - Number: simple, single-valued, integer, key attribute
  - Locations: simple, multi-valued, string
  - Number_of_employees: derived, single-valued, integer
- PROJECT
  - Name: simple, single-valued, string
  - Number: simple, single-valued, integer, Key attribute
  - Locations: simple, single-valued, string
- DEPENDENT (week entity)
  - Name: simple, single-valued, string, weak key attribute
  - Sex: simple, single-valued, char type with values of either 'M' or 'F'
  - Birth_date: simple, single-valued, date
  - Relationship: simple, single-valued, string

3. Relationships
   - WORKS_FOR
     - N:1 relationship
     - An employee can only work for one department, but a department can have many employees.
     - EMPLOYEE is total participation; DEPARTMENT is total participation.
   - MANGES
     - 1:1 relationship
     - One employee can only manage one department, and one department can only be managed by one employee.
     - Has an attribute Start_date of date type for keeping track of the starting time for managing the department.
     - EMPLOYEE is partial participation; DEPARTMENT is total participation.
   - WORKS_ON
     - M:N relationship
     - One employee can work on multiple projects, and each project can have multiple employees worked on it.
     - Has an attribute Hours of real type for keeping track of the number of hours that the employee works on the project per week.
     - EMPLOYEE is total participation; PROJECT is total participation
   - SUPERVISION
     - 1:1 relationship
     - Each employee can only have one supervisor, and each supervisor can only supervise one employee.
     - Both are partial participation
   - CONTROLS
     - 1:N relationship
     - Each department can have multiple projects, but each project can only be host by one department.
     - DEPARTMENT is partial participation; PROJECT is total participation.
   - DEPENDENTS_OF
     - 1:N relationship
     - Each employee can have multiple dependents, and each dependent is the dependent of one employee.
     - EMPLOYEE is partial participation; DEPENDENT is total participation

4. ER-diagram



Observation & Learning:

Write your observation and learning after performing the task.

Conclusion:

Write statement of conclusion here.

Questions:

1. What is DDL (Data Definition Language)?
2. How the strings are inserted into the table?
3. What happen if one attribute is not there in insertion list?
4. What happen if domain type of data inserted is different from that of column?
5. What happen if where clause is not given in query?
6. What are the various comparison operator used in condition part?