
Ain Shams University / Faculty of Engineering

CSE Department

Course Name CSE227

# Hospital Management System

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# Abstract

In this report, we will demonstrate the different stages of developing a general database for hospitals starting from the Enhanced Entity Relationship diagram, converting it to a Relational Schema, then finally executing SQL commands to produce a running database. With every manipulation of the database, screenshots of the commands and output will be provided to prove validity and authenticity of the work done during this project.

# Contents

# Figures

# 1. Description

This project discusses the design of a database system for multiple hospitals and their structures. The hospital contains many departments, the same department can be found in multiple hospitals. It has a pharmacy, where the patients can take different medicines. Each hospital has one or more receptions that have many clinics, and receptionists. Employees are divided into pharmacists who work in the pharmacy, receptionists who work at the reception, nurses who assist doctors and assist in clinics, and doctors who must be either treating doctors who work in clinics, treat out-patients or surgeons who perform surgeries for in-patients.

Some employees might manage departments. A department must be managed by a certain employee. For each employee his/her full name, SSN, gender, salary, and age should be stored in the database. Patients visit the hospital and are classified into in-patients and out patients. In-patents stay in the hospital, have a room number, and get operations, the date of performing the operation should be stored. Out-patients visit the clinic and receive medications according to their diagnosis. For all patients, their national id, name, SSN, age, phone number, and disease should be stored.

## 2. Assumptions

1) Assume one hospital may contain one or more pharmacies, a pharmacy must belong to a hospital.

2) Assume a pharmacy must make one or more medications, and the medication may be made by one or more pharmacies.

3) Assume one hospital may have many employees, and each employee may belong to only one hospital.

4) Assume one or more hospitals must contain many departments, a department must belong to a hospital.

5) Assume one or more patients may visit one or more hospitals, a hospital must be visited by one or more patients.

6) Assume patients are classified into in and out patients only.

7) Assume one hospital must have one or more receptions, and there must be at least one reception in a hospital.

8) Assume one reception must have one or more clinics, and there must be at least one clinic in a reception.

9) Assume an outpatient may visit many clinics, and clinics may be visited by many outpatients.

10) Assume an outpatient may receive many medications, and a medication may be taken by many outpatients.

11) Assume one or more pharmacists must work at one pharmacy, and a pharmacy must have one or more pharmacists.

12) Assume an employee may manage a department, and a department must be managed by a certain employee.

13) Assume the employee may be a nurse, doctor, pharmacist or receptionist.

14) Assume a nurse must assist in a clinic, and a clinic may have one or more nurses.

15) Assume a reception must have one or more receptionist, and a receptionist may work in a reception.

16) Assume a surgeon must perform many operations, and an operation must be performed by one surgeon.

17) Assume many treating doctors must work in a clinic, and a clinic must have one or more treating doctors.

18) Assume many inpatients may get one or more operation, and an operation must be done on a patient.

19) Assume an outpatient must be treated by one or more treating doctors, and a treating doctor must treat one or more outpatients.

20) Assume one doctor must be assisted by one or more nurses, and each nurse must assist one doctor.

21) Assume a doctor must be a treating doctor or a surgeon.

# 3. EER Diagram

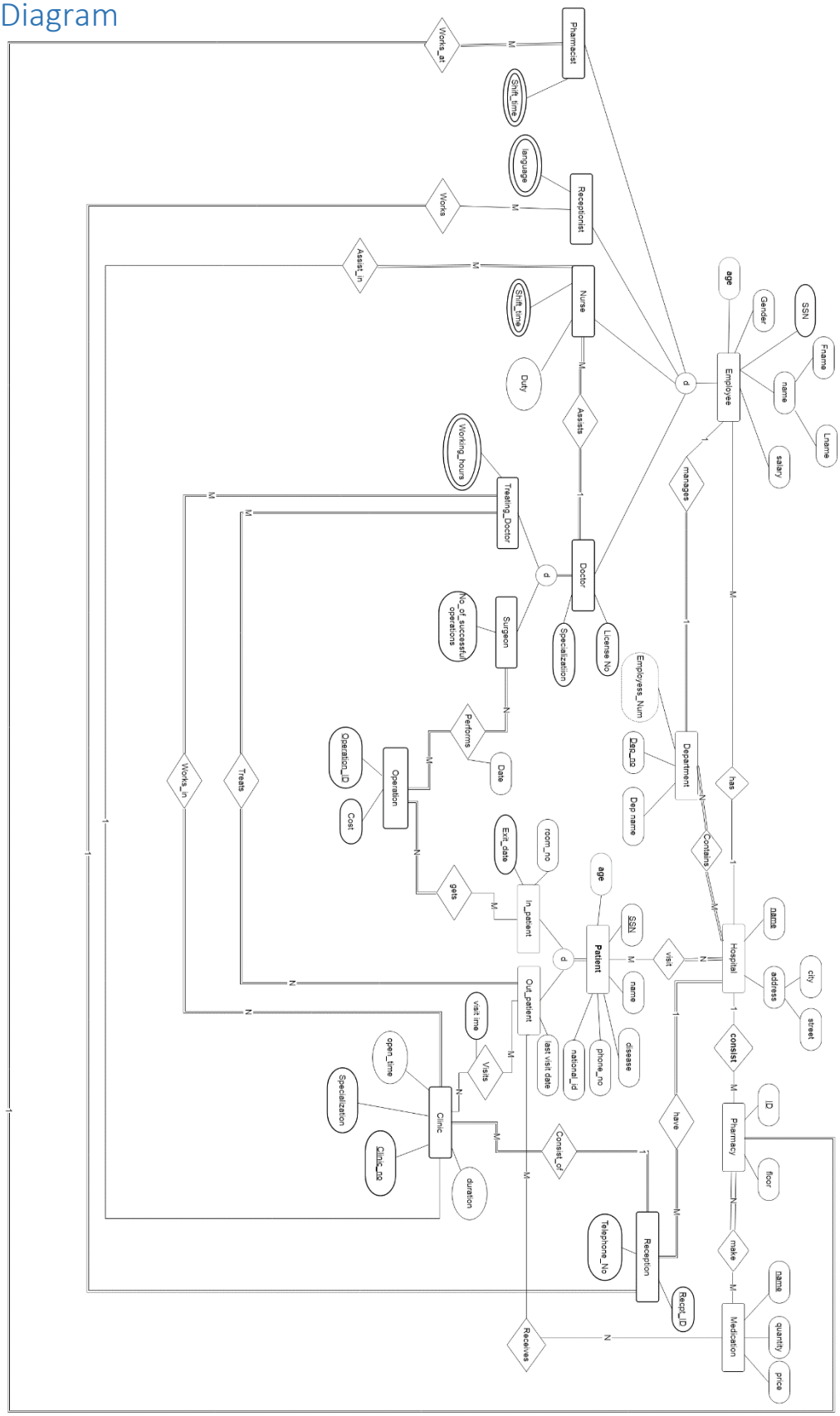


*Figure 1: Enhanced ER diagram*

# 4. Relational Schema

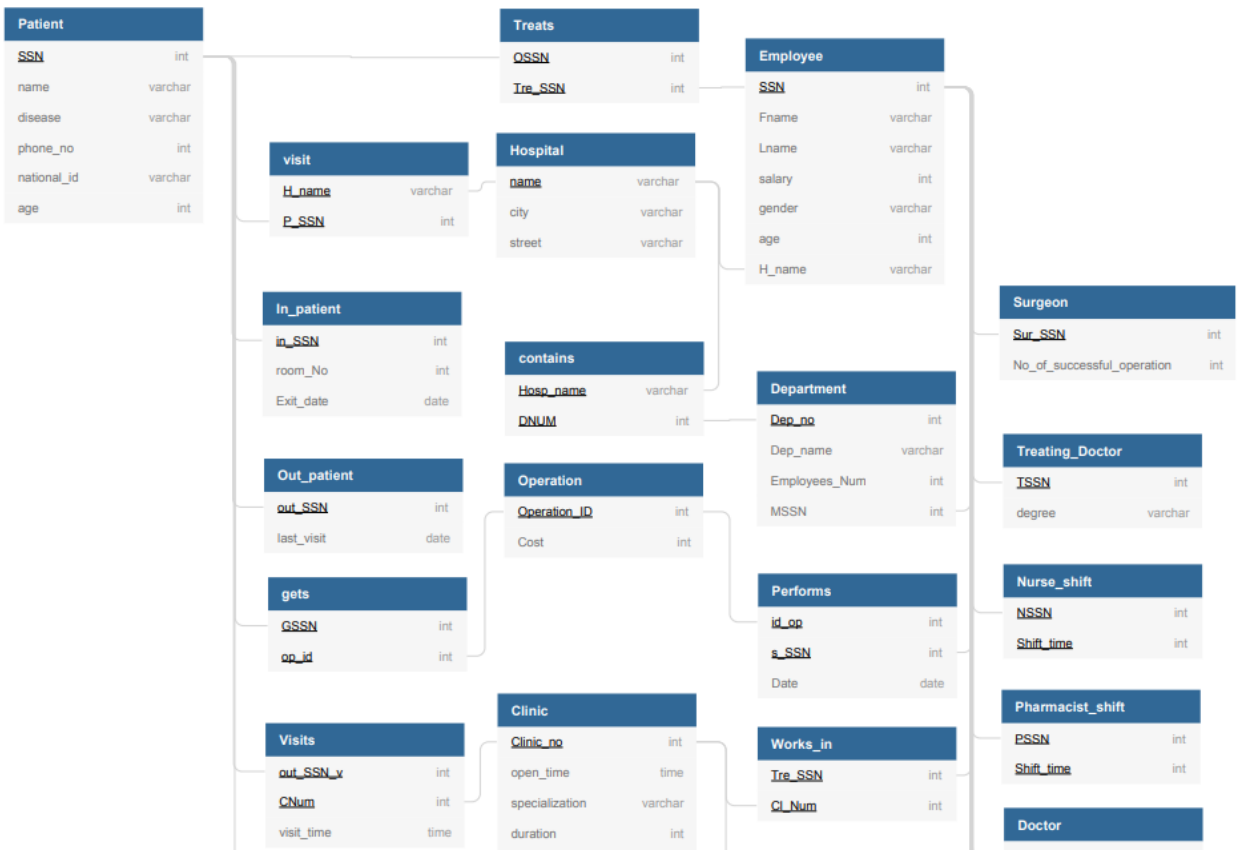


*Figure 2: Schema Part (1)*

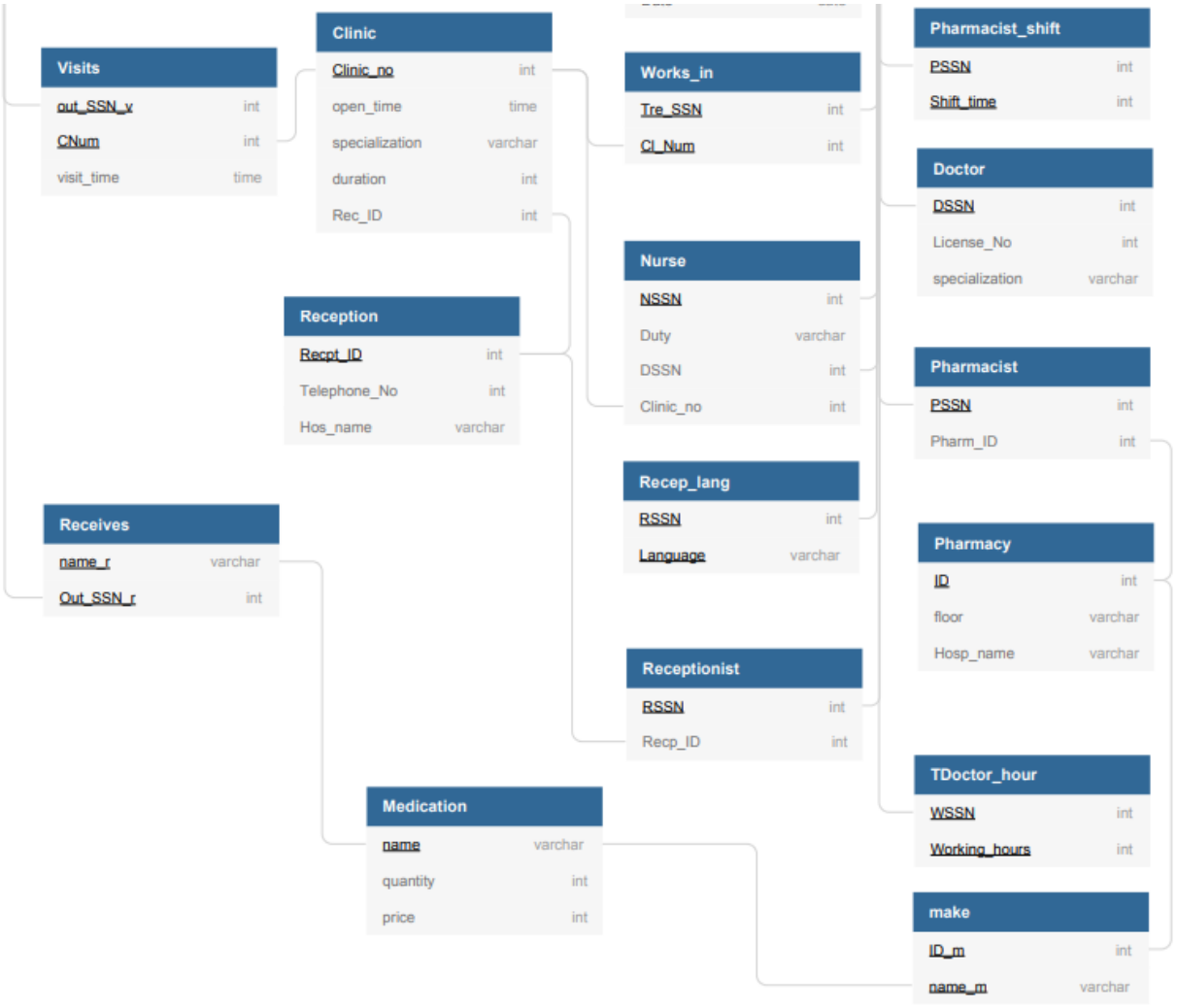


*Figure 3: Schema Part (2)*

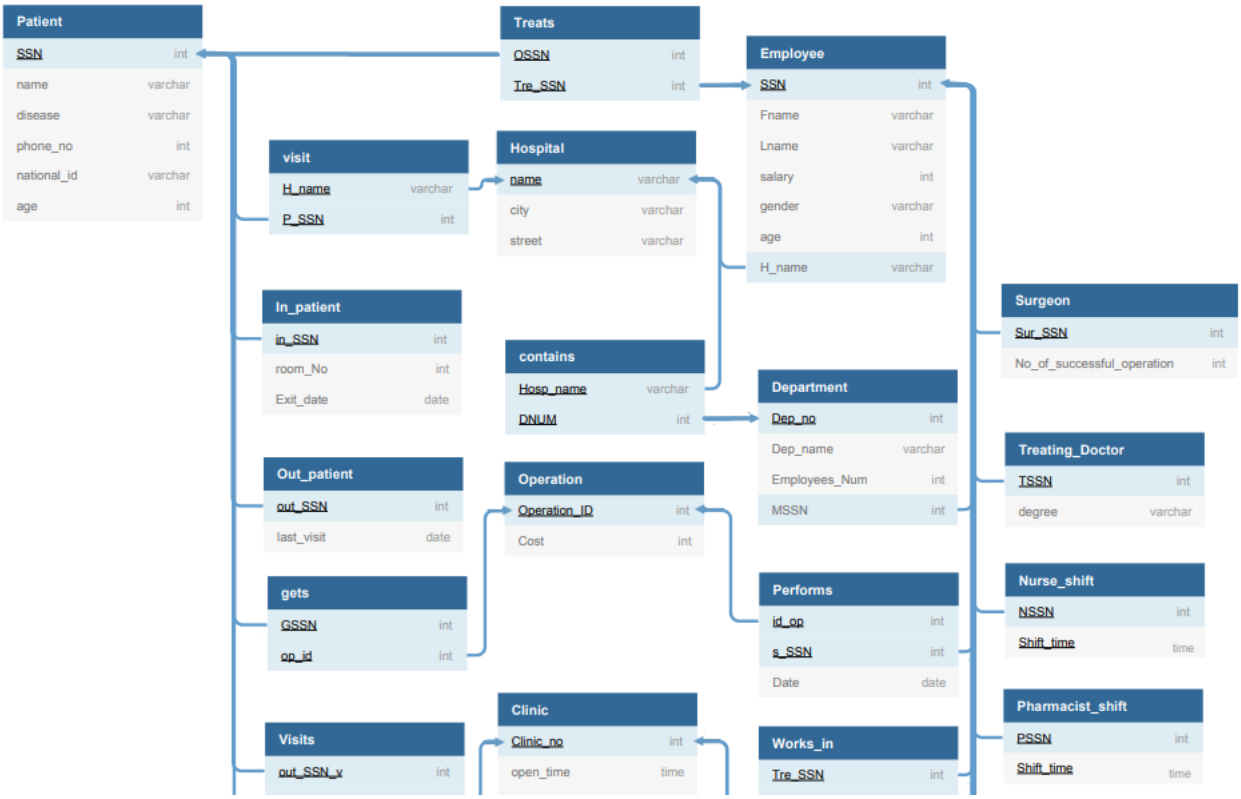


*Figure 4: Schema Part (3)*

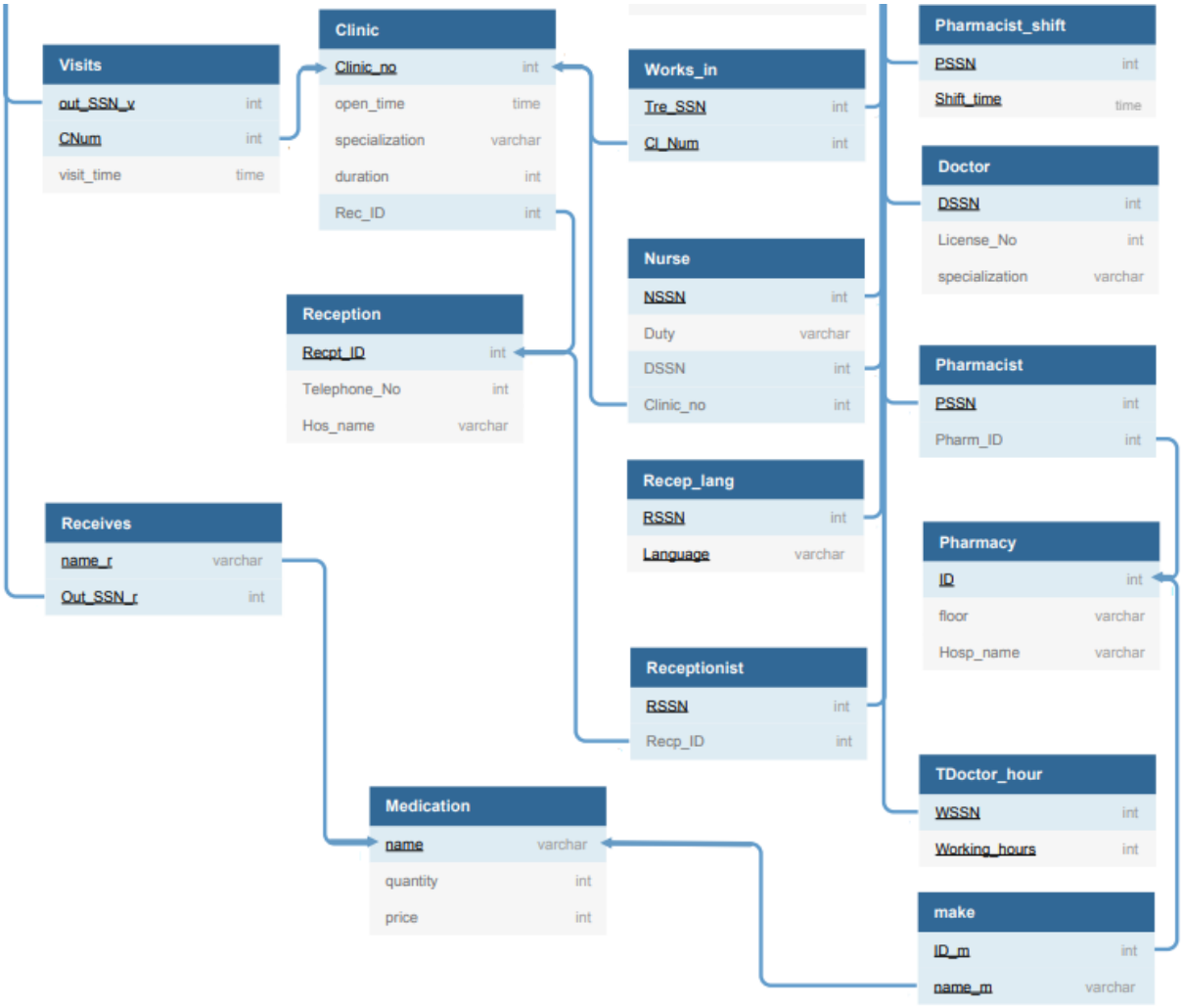


*Figure 5: Schema Part (4)*

## 4. SQL

```
CREATE TABLE Hospital
(
  name varchar(255) PRIMARY KEY,
  city varchar(255),
  street varchar(255)
);

CREATE TABLE Pharmacy
(
  ID int PRIMARY KEY,
  floor varchar(255),
  Hosp_name varchar(255)
);

CREATE TABLE Medication
(
  name varchar(255) PRIMARY KEY,
  quantity int,
  price int
);

CREATE TABLE make
(
  ID_m int,
  name_m varchar(255), PRIMARY KEY(ID_m, name_m)
);

CREATE TABLE Reception
(
  Recpt_ID int PRIMARY KEY,
  Telephone_No int,
  Hos_name varchar(255)
);

CREATE TABLE Receives
(
  name_r varchar(255),
  Out_SSN_r int, PRIMARY KEY(name_r, Out_SSN_r)
);

CREATE TABLE Patient
(
```

```
  SSN int PRIMARY KEY,
  name varchar(255),
  disease varchar(255),
  phone_no int,
  national_id varchar(255) UNIQUE NOT NULL,
  age int
);

CREATE TABLE Out_patient
(
  out_SSN int PRIMARY KEY,
  last_visit date
);

CREATE TABLE In_patient
(
  in_SSN int PRIMARY KEY,
  room_No int,
  Exit_date date
);

CREATE TABLE visit
(
  H_name varchar(255),
  P_SSN int PRIMARY KEY(H_name, P_SSN)
);

CREATE TABLE Clinic
(
  Clinic_no int PRIMARY KEY,
  open_time time,
  specialization varchar(255),
  duration int,
  Rec_ID int
);

CREATE TABLE Visits
(
  out_SSN_v int,
  CNum int, PRIMARY KEY(out_SSN_v, CNum),
  visit_time time
);

CREATE TABLE Department
(
```

```
  Dep_no int PRIMARY KEY,
  Dep_name varchar(255),
  Employees_Num int,
  MSSN int
);

CREATE TABLE contains
(
  Hosp_name varchar(255),
  DNUM int, PRIMARY KEY(Hosp_name, DNUM)
);

CREATE TABLE Operation
(
  Operation_ID int PRIMARY KEY,
  Cost int
);

CREATE TABLE gets
(
  GSSN int,
  op_id int, PRIMARY KEY(GSSN, op_id)
);

CREATE TABLE Performs
(
  id_op int,
  s_SSN int, PRIMARY KEY(id_op, s_SSN),
  Date date
);

CREATE TABLE Employee
(
  SSN int PRIMARY KEY,
  Fname varchar(255),
  Lname varchar(255),
  salary int,
  gender varchar(255),
  age int,
  H_name varchar(255)
);

CREATE TABLE Doctor
(
  DSSN int PRIMARY KEY,
```

```
  License_No int,
  specialization varchar(255)
);

CREATE TABLE Treating_Doctor
(
  TSSN int PRIMARY KEY,
  degree varchar(255)
);

CREATE TABLE Surgeon
(
  Sur_SSN int PRIMARY KEY,
  No_of_successful_operation int
);

CREATE TABLE Nurse
(
  NSSN int PRIMARY KEY,
  Duty varchar(255),
  DSSN int,
  Clinic_no int
);

CREATE TABLE Nurse_shift
(
  NSSN int,
  Shift_time time, PRIMARY KEY(NSSN, Shift_time)
);

CREATE TABLE Receptionist
(
  RSSN int PRIMARY KEY,
  Recp_ID int
);

CREATE TABLE Recep_lang
(
  RSSN int,
  Language varchar(255), PRIMARY KEY(RSSN, Language)
);

CREATE TABLE Pharmacist
(
  PSSN int PRIMARY KEY,
```

```
  Pharm_ID int
);

CREATE TABLE Pharmacist_shift
(
  PSSN int,
  Shift_time time, PRIMARY KEY(PSSN, Shift_time)
);

CREATE TABLE Treats
(
  OSSN int,
  Tre_SSN int, PRIMARY KEY(OSSN, Tre_SSN)
);

CREATE TABLE Works_in
(
  Tre_SSN int,
  Cl_Num int, PRIMARY KEY(Tre_SSN, Cl_Num)
);

CREATE TABLE TDoctor_hour
(
  WSSN int,
  Working_hours int, PRIMARY KEY(WSSN, Working_hours)
);

ALTER TABLE make ADD FOREIGN KEY (ID_m) REFERENCES Pharmacy (ID);

ALTER TABLE Receives ADD FOREIGN KEY (name_r) REFERENCES Medication (name);

ALTER TABLE Receives ADD FOREIGN KEY (Out_SSN_r) REFERENCES Patient (SSN);

ALTER TABLE Out_patient ADD FOREIGN KEY (out_SSN) REFERENCES Patient (SSN);

ALTER TABLE In_patient ADD FOREIGN KEY (in_SSN) REFERENCES Patient (SSN);

ALTER TABLE visit ADD FOREIGN KEY (H_name) REFERENCES Hospital (name);

ALTER TABLE visit ADD FOREIGN KEY (P_SSN) REFERENCES Patient (SSN);

ALTER TABLE Clinic ADD FOREIGN KEY (Rec_ID) REFERENCES Reception (Recpt_ID);

ALTER TABLE Visits ADD FOREIGN KEY (out_SSN_v) REFERENCES Patient (SSN);
```

```
ALTER TABLE Visits ADD FOREIGN KEY (CNum) REFERENCES Clinic (Clinic_no);

ALTER TABLE Department ADD FOREIGN KEY (MSSN) REFERENCES Employee (SSN);

ALTER TABLE contains ADD FOREIGN KEY (Hosp_name) REFERENCES Hospital (name);

ALTER TABLE contains ADD FOREIGN KEY (DNUM) REFERENCES Department (Dep_no);

ALTER TABLE gets ADD FOREIGN KEY (GSSN) REFERENCES Patient (SSN);

ALTER TABLE gets ADD FOREIGN KEY (op_id) REFERENCES Operation (Operation_ID);

ALTER TABLE Performs ADD FOREIGN KEY (id_op) REFERENCES Operation (Operation_ID);

ALTER TABLE Performs ADD FOREIGN KEY (s_SSN) REFERENCES Employee (SSN);

ALTER TABLE Employee ADD FOREIGN KEY (H_name) REFERENCES Hospital (name);

ALTER TABLE Doctor ADD FOREIGN KEY (DSSN) REFERENCES Employee (SSN);

ALTER TABLE Treating_Doctor ADD FOREIGN KEY (TSSN) REFERENCES Employee (SSN);

ALTER TABLE Surgeon ADD FOREIGN KEY (Sur_SSN) REFERENCES Employee (SSN);

ALTER TABLE Nurse ADD FOREIGN KEY (NSSN) REFERENCES Employee (SSN);

ALTER TABLE Nurse ADD FOREIGN KEY (DSSN) REFERENCES Employee (SSN);

ALTER TABLE Nurse ADD FOREIGN KEY (Clinic_no) REFERENCES Clinic (Clinic_no);

ALTER TABLE Nurse_shift ADD FOREIGN KEY (NSSN) REFERENCES Employee (SSN);

ALTER TABLE Receptionist ADD FOREIGN KEY (RSSN) REFERENCES Employee (SSN);

ALTER TABLE Receptionist ADD FOREIGN KEY (Recp_ID) REFERENCES Reception
(Recpt_ID);

ALTER TABLE Recep_lang ADD FOREIGN KEY (RSSN) REFERENCES Employee (SSN);

ALTER TABLE Pharmacist ADD FOREIGN KEY (PSSN) REFERENCES Employee (SSN);

ALTER TABLE Pharmacist ADD FOREIGN KEY (Pharm_ID) REFERENCES Pharmacy (ID);

ALTER TABLE Pharmacist_shift ADD FOREIGN KEY (PSSN) REFERENCES Employee (SSN);
```

```
ALTER TABLE Treats ADD FOREIGN KEY (OSSN) REFERENCES Patient (SSN);

ALTER TABLE Treats ADD FOREIGN KEY (Tre_SSN) REFERENCES Employee (SSN);

ALTER TABLE Works_in ADD FOREIGN KEY (Tre_SSN) REFERENCES Employee (SSN);

ALTER TABLE Works_in ADD FOREIGN KEY (Cl_Num) REFERENCES Clinic (Clinic_no);

ALTER TABLE TDoctor_hour ADD FOREIGN KEY (WSSN) REFERENCES Employee (SSN);

ALTER TABLE make ADD FOREIGN KEY (name_m) REFERENCES Medication (name);

INSERT INTO Reception VALUES(1, 267912532, "AMS");

INSERT INTO Reception VALUES(2, 249452034, "BMS");

INSERT INTO Reception VALUES(3, 236856403, "CMS");

INSERT INTO Reception VALUES(4, 271293475, "DMS");

INSERT INTO Reception VALUES(5, 291375478, "EMS");

SELECT Telephone_No, Hos_name
FROM Reception
WHERE Recpt_ID IN (1,3,5)

UPDATE Reception
SET Hos_name = "FMS", Telephone_No = 286534120
WHERE Recpt_ID = 4

INSERT INTO Clinic VALUES(1, "12:00:00", "A", 6, 1);

INSERT INTO Clinic VALUES(2, "10:00:00", "B", 7, 2);

INSERT INTO Clinic VALUES(3, "15:00:00", "C", 5, 3);

INSERT INTO Clinic VALUES(4, "10:00:00", "D", 9, 4);

INSERT INTO Clinic VALUES(5, "14:00:00", "E", 8, 5);

UPDATE Clinic
SET Rec_ID = 2, specialization = "X"
WHERE Clinic_no = 3
```

```sql
UPDATE Clinic
SET Rec_ID = 4, specialization = "G"
WHERE Clinic_no = 5

/*UPDATE Reception
SET Hos_name = "BMS"
WHERE Recpt_ID = 5*/

SELECT Hos_name, open_time, COUNT(*) ,specialization
FROM Reception, Clinic
WHERE Rec_ID = Recpt_ID
GROUP BY REC_ID

INSERT INTO Hospital VALUES("Mokattam Hospital", "Cairo", "9th Street");
INSERT INTO Hospital VALUES("Ain Shams University Hospital", "Cairo",
"El-Khalifa El-Maamoun Street");
INSERT INTO Hospital VALUES("El Manial Specialized University Hospital", "Cairo",
"Abdel Aziz Al Saoud Street");

SELECT *
FROM Hospital
HAVING name LIKE "%University%"

UPDATE Hospital
SET street = "7th street"
WHERE name = "Mokattam Hospital"

DELETE FROM Hospital
WHERE street = "Abdel Aziz Al Saoud Street"

INSERT INTO Operation VALUES(1, 5000);
INSERT INTO Operation VALUES(2, 25000);
INSERT INTO Operation VALUES(3, 100000);

UPDATE Operation
SET Cost = 9000
WHERE Operation_ID = 1

DELETE FROM Operation
WHERE Operation_ID = 3

SELECT MAX(Cost)
FROM Operation
```

```sql
INSERT INTO Medication VALUES("Amlodipine", 50, 5000);
INSERT INTO Medication VALUES("Azithromycin", 250, 500);
INSERT INTO Medication VALUES("Vicodin ", 1000, 65);
INSERT INTO Medication VALUES("Simvastatin", 70, 5000);
INSERT INTO Medication VALUES("Lisinopril", 250, 700);
INSERT INTO Medication VALUES("Metformin", 1000, 65);

SELECT *
FROM Medication
WHERE quantity < 300
ORDER BY price


UPDATE Medication
SET quantity = 400, price = 400
WHERE name = "Azithromycin"

SELECT SUM(quantity)
FROM Medication


SELECT MAX(price), AVG(price), MIN(quantity)
FROM Medication


INSERT INTO Employee VALUES(1, "Mostafa", "ElRosasy", 7000, "M", 21, "Mokattam
Hospital");
INSERT INTO Employee VALUES(2, "Seif", "Mohamed", 8000, "M", 21, "Ain Shams
University Hospital");
INSERT INTO Employee VALUES(3, "Omar", "Magdy", 5000, "M", 20, "Ain Shams
University Hospital");


INSERT INTO Pharmacy VALUES(1564483, "1",
"Ain Shams University Hospital");
INSERT INTO Pharmacy VALUES(1578983, "4",
"Ain Shams University Hospital");
INSERT INTO Pharmacy VALUES(1526545, "2",
"Mokattam Hospital");

SELECT Fname, Lname, salary, age, name, city, street
FROM Employee, Hospital
WHERE H_name = name
Having salary > 6000
ORDER BY age
```

a) Reception table:

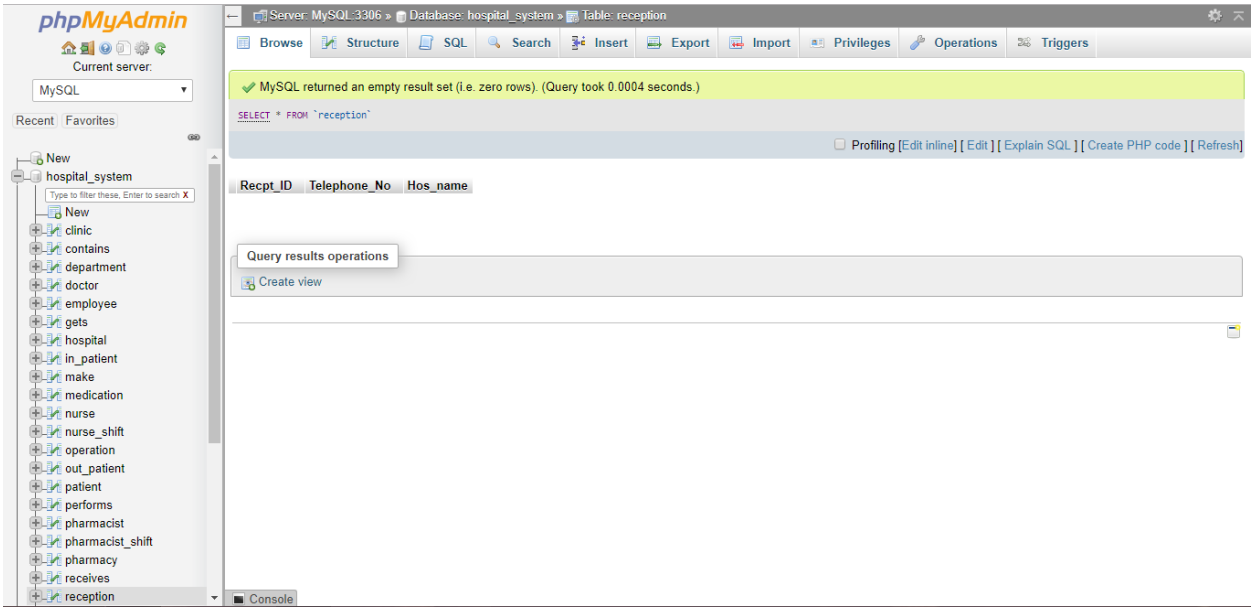


*Figure 6: Newly created "Reception" table*

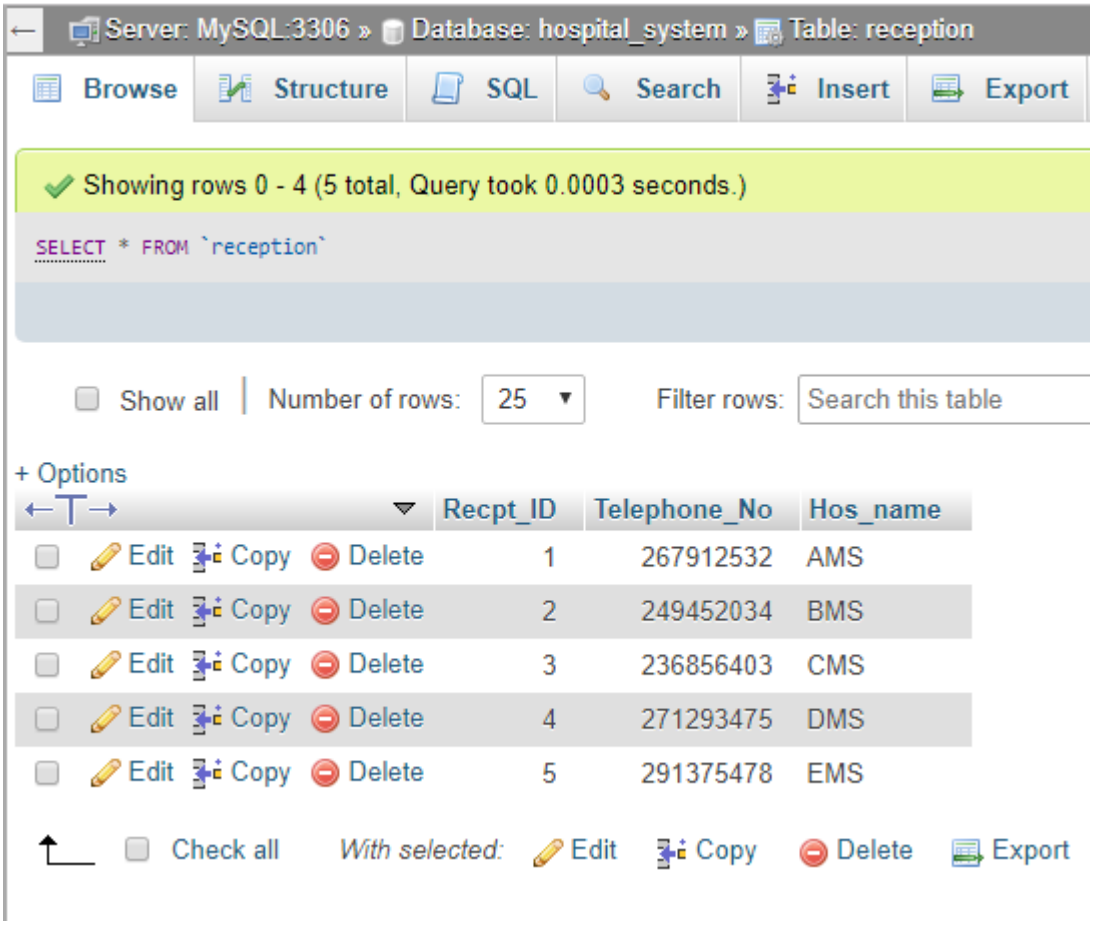


*Figure 7: Table contents after "Insert" command (present in the last lines of the SQL file)*

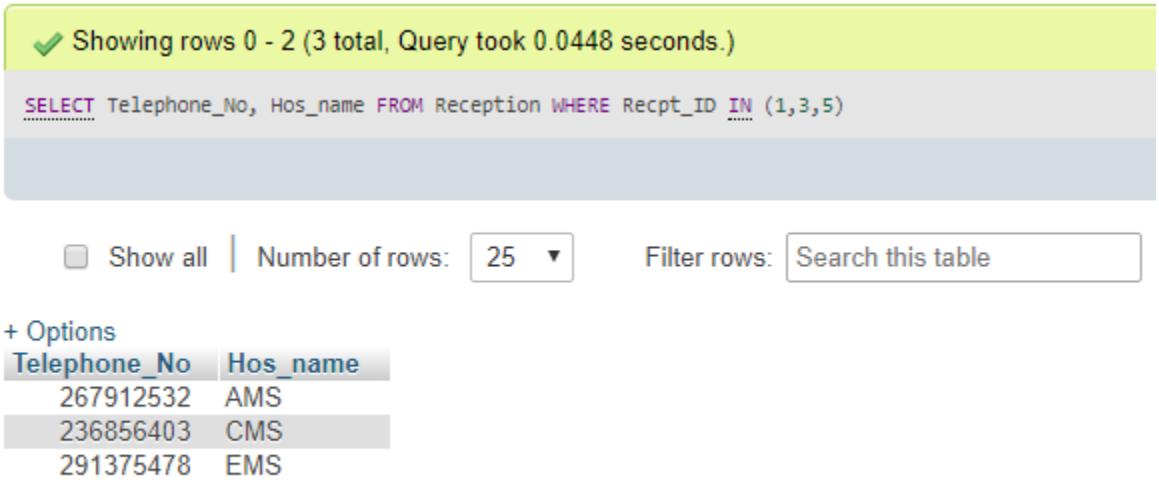


*Figure 8: Select command*

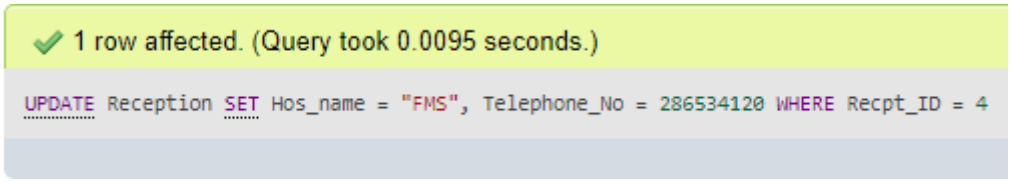


*Figure 9: Updating a tuple*

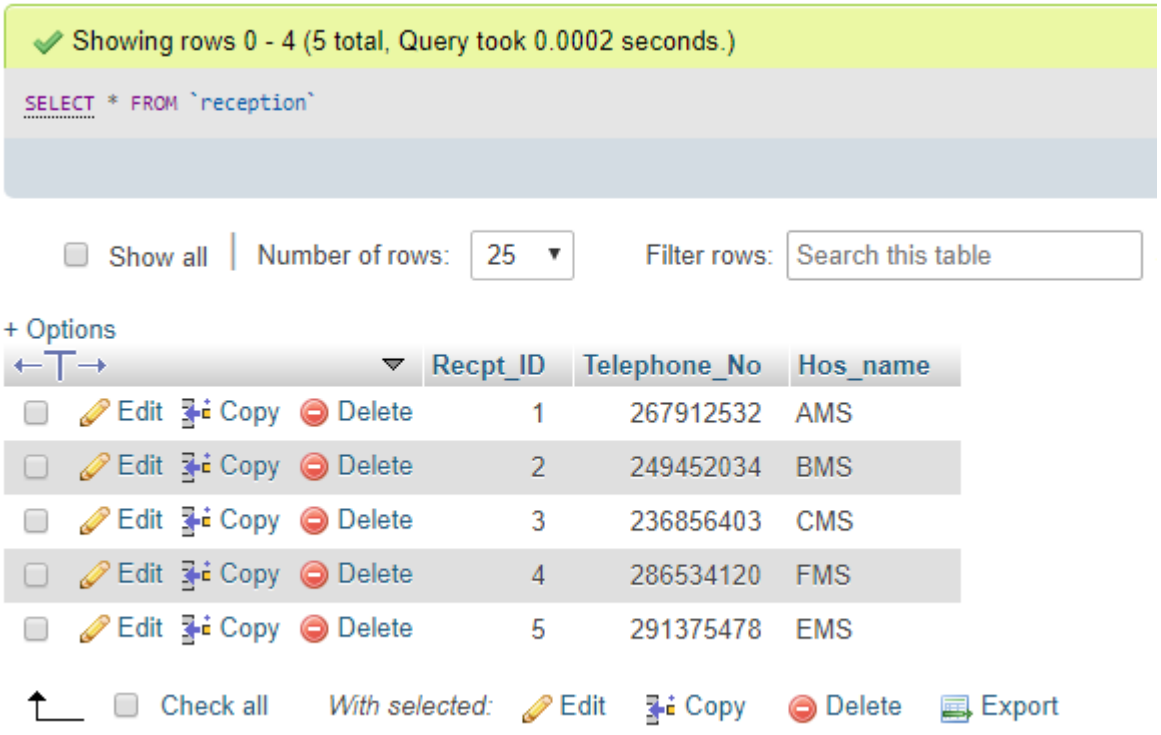


*Figure 10: Table contents after Update command*

b) Clinic table:

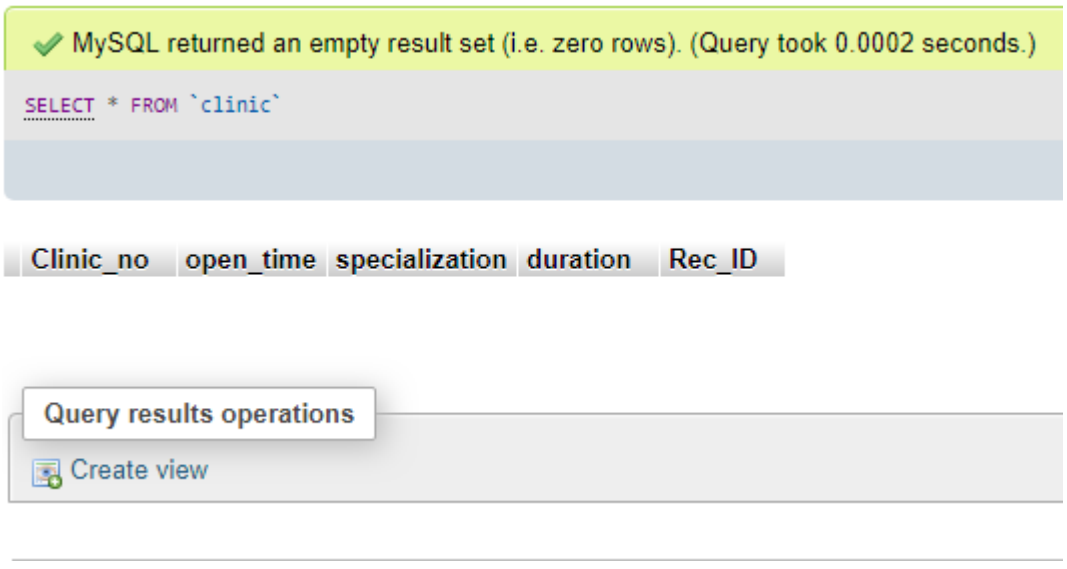


*Figure 11: Newly created "Clinic" table*


*Figure 12: Insert command*

Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT * FROM `clinic`
```

Show all | Number of rows: 25 Filter rows: Search this table Sort by key:

+ Options

| | Clinic_no | open_time | specialization | duration | Rec_ID |
|---|---|---|---|---|---|
| Edit Copy Delete | 1 | 12:00:00 | A | 6 | 1 |
| Edit Copy Delete | 2 | 10:00:00 | B | 7 | 2 |
| Edit Copy Delete | 3 | 15:00:00 | C | 5 | 3 |
| Edit Copy Delete | 4 | 10:00:00 | D | 9 | 4 |
| Edit Copy Delete | 5 | 14:00:00 | E | 8 | 5 |

Check all *With selected:* Edit Copy Delete Export

*Figure 13: Table after insertion*

1 row affected. (Query took 0.0003 seconds.)

```
UPDATE Clinic SET Rec_ID = 2, specialization = "X" WHERE Clinic_no = 3
```

*Figure 14: Update command*

1 row affected. (Query took 0.0003 seconds.)

```
UPDATE Clinic SET Rec_ID = 2, specialization = "X" WHERE Clinic_no = 3
```

*Figure 15: Update command*

Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT * FROM `clinic`
```

Show all | Number of rows: 25 Filter rows: Search this table Sort by key:

+ Options

| | Clinic_no | open_time | specialization | duration | Rec_ID |
|---|---|---|---|---|---|
| Edit Copy Delete | 1 | 12:00:00 | A | 6 | 1 |
| Edit Copy Delete | 2 | 10:00:00 | B | 7 | 2 |
| Edit Copy Delete | 3 | 15:00:00 | X | 5 | 2 |
| Edit Copy Delete | 4 | 10:00:00 | D | 9 | 4 |
| Edit Copy Delete | 5 | 14:00:00 | G | 8 | 4 |

Check all *With selected:* Edit Copy Delete Export

*Figure 16: Table contents after "Update" command*

Showing rows 0 - 2 (3 total, Query took 0.0005 seconds.)

```
SELECT Hos_name, open_time, COUNT(*) ,specialization FROM Reception, Clinic WHERE Rec_ID = Recpt_ID GROUP BY REC_ID
```

Profiling

Show all | Number of rows: 25 Filter rows: Search this table

+ Options

| Hos_name | open_time | COUNT(*) | specialization |
|---|---|---|---|
| AMS | 12:00:00 | 1 | A |
| BMS | 10:00:00 | 2 | B |
| FMS | 10:00:00 | 2 | D |

Show all | Number of rows: 25 Filter rows: Search this table

*Figure 17: Select command*

c) Hospital table:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
SELECT * FROM `hospital`
```

| name | city | street |
|---|---|---|

*Figure 18: Empty Hospital table*

1 row inserted. (Query took 0.0005 seconds.)

```
INSERT INTO Hospital VALUES("Mokattam Hospital", "Cairo", "9th Street")
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Hospital VALUES("Ain Shams University Hospital", "Cairo", "El-Khalifa El-Maamoun Street")
```

1 row inserted. (Query took 0.0002 seconds.)

```
INSERT INTO Hospital VALUES("El Manial Specialized University Hospital", "Cairo", "Abdel Aziz Al Saoud Street")
```

*Figure 19: Insert command*

+ Options

| | name | city | street |
|---|---|---|---|
| Edit Copy Delete | Mokattam Hospital | Cairo | 9th Street |
| Edit Copy Delete | Ain Shams University Hospital | Cairo | El-Khalifa El-Maamoun Street |
| Edit Copy Delete | El Manial Specialized University Hospital | Cairo | Abdel Aziz Al Saoud Street |

Check all *With selected:* Edit Copy Delete Export

*Figure 20: Table after insertion*

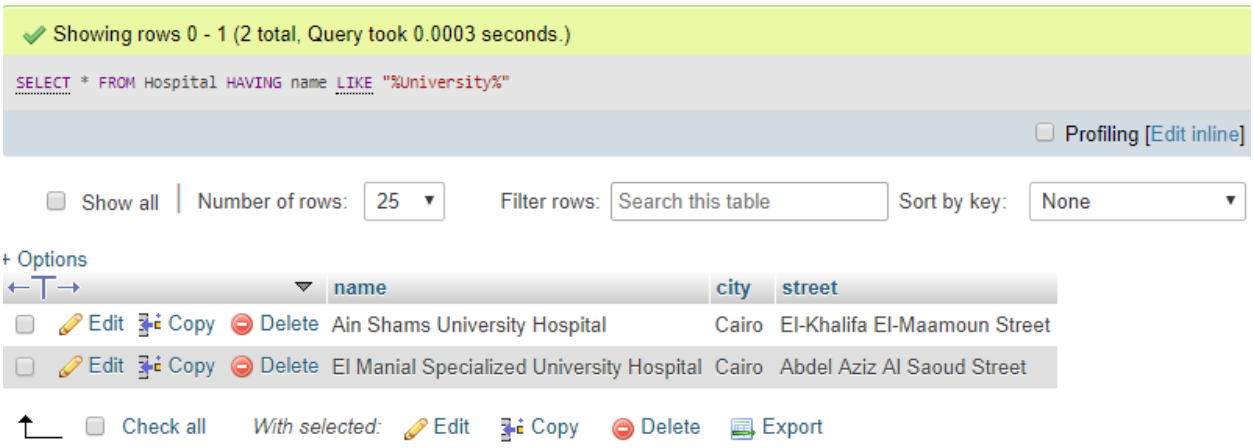


*Figure 21: Select command*

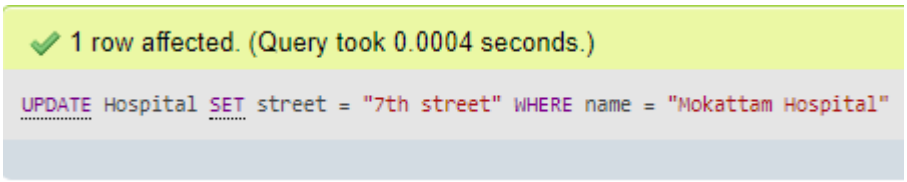


*Figure 22: Update command*


*Figure 23: Table after update*

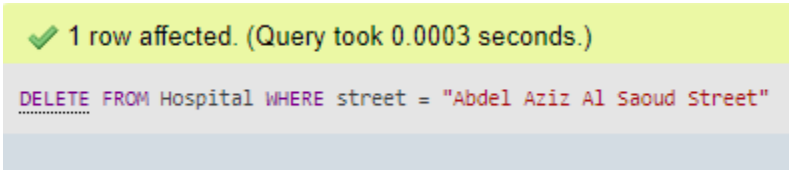


*Figure 24: Delete command*

+ Options

| | name | city | street |
|---|---|---|---|
| Edit Copy Delete | Mokattam Hospital | Cairo | 7th street |
| Edit Copy Delete | Ain Shams University Hospital | Cairo | El-Khalifa El-Maamoun Street |

*Figure 25: Table after delete*

d) Operation table:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
SELECT * FROM `operation`
```

| Operation_ID | Cost |
|---|---|

*Figure 26: Empty Operation table*

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Operation VALUES(1, 5000)
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Operation VALUES(2, 25000)
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Operation VALUES(3, 100000)
```

*Figure 27: Insert command*

+ Options

| | Operation_ID | Cost |
|---|---|---|
| Edit Copy Delete | 3 | 100000 |
| Edit Copy Delete | 2 | 25000 |
| Edit Copy Delete | 1 | 5000 |

*Figure 28: Table after insertion*

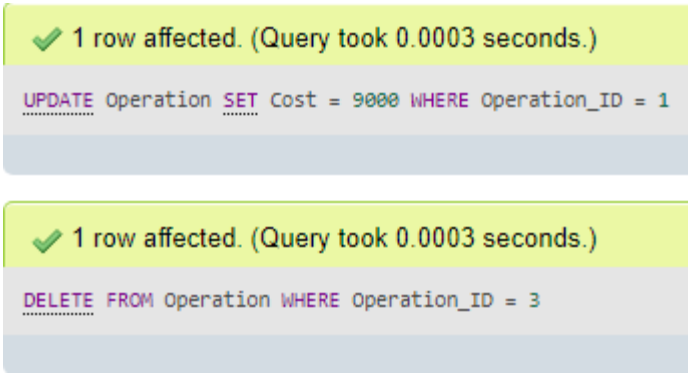


*Figure 29: Update and Delete commands*

+ Options

| | Operation_ID 1 | Cost |
|---|---|---|
| Edit Copy Delete | 1 | 9000 |
| Edit Copy Delete | 2 | 25000 |

*Figure 30: Table after update and deletion*

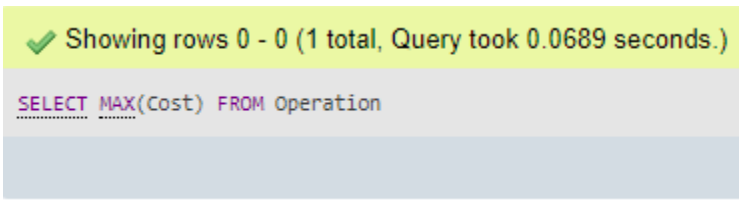


*Figure 31: Select command*

+ Options

| MAX(Cost) |
|---|
| 25000 |

*Figure 32: Column selected*

e) Medication table:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
SELECT * FROM `medication`
```

| name | quantity | price |
|---|---|---|

*Figure 33: Empty Medication table*

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Medication VALUES("Amlodipine", 50, 5000)
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Medication VALUES("Azithromycin", 250, 500)
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Medication VALUES("Vicodin ", 1000, 65)
```

1 row inserted. (Query took 0.0002 seconds.)

```
INSERT INTO Medication VALUES("Simvastatin", 70, 5000)
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Medication VALUES("Lisinopril", 250, 700)
```

1 row inserted. (Query took 0.0002 seconds.)

```
INSERT INTO Medication VALUES("Metformin", 1000, 65)
```

*Figure 34: Insert command*

+ Options

| | name | quantity | price |
|---|---|---|---|
| Edit Copy Delete | Amlodipine | 50 | 5000 |
| Edit Copy Delete | Azithromycin | 250 | 500 |
| Edit Copy Delete | Vicodin | 1000 | 65 |
| Edit Copy Delete | Simvastatin | 70 | 5000 |
| Edit Copy Delete | Lisinopril | 250 | 700 |
| Edit Copy Delete | Metformin | 1000 | 65 |

*Figure 35: Table after insertion*

Showing rows 0 - 3 (4 total, Query took 0.0003 seconds.) [price: **500... - 5000...**]

```
SELECT * FROM Medication WHERE quantity < 300 ORDER BY price
```

Show all | Number of rows: 25 Filter rows: Search this table

+ Options

| | name | quantity | price ▲ 1 |
|---|---|---|---|
| Edit Copy Delete | Azithromycin | 250 | 500 |
| Edit Copy Delete | Lisinopril | 250 | 700 |
| Edit Copy Delete | Simvastatin | 70 | 5000 |
| Edit Copy Delete | Amlodipine | 50 | 5000 |

*Figure 36: Select command*

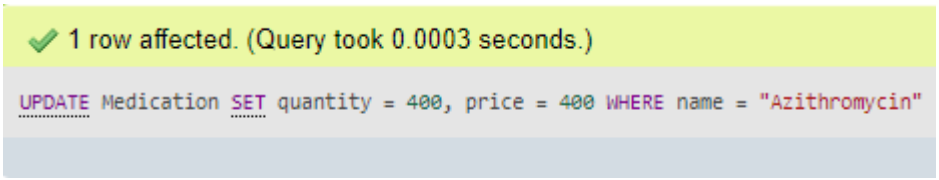


*Figure 37: Update command*

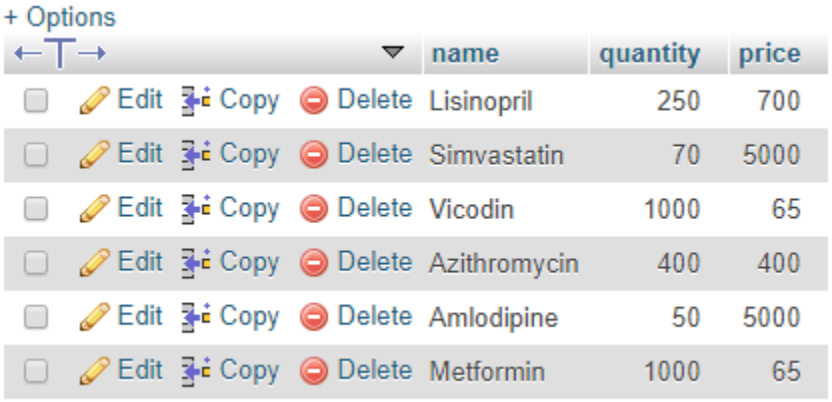


*Figure 38: Table after update*

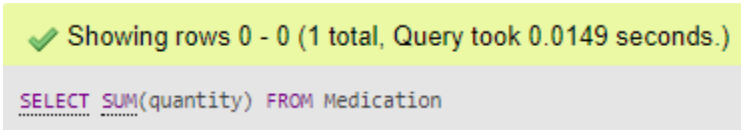


*Figure 39: Select command*

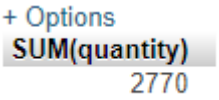


*Figure 40: Selected column*

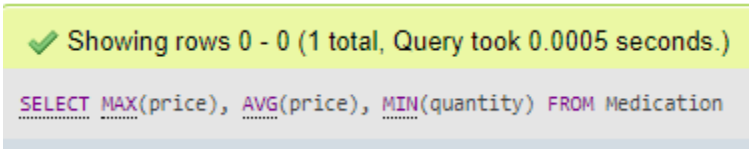


*Figure 41: Select command*


*Figure 42: Resulted table*

f) Pharmacy table:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
SELECT * FROM `pharmacy`
```

| ID | floor | Hosp_name |
|---|---|---|

*Figure 43: Empty Pharmacy table*

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Pharmacy VALUES(1564483, "1", "Ain Shams University Hospital")
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Pharmacy VALUES(1578983, "4", "Ain Shams University Hospital")
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Pharmacy VALUES(1526545, "2", "Mokattam Hospital")
```

*Figure 44: Insert command*

+ Options

| | ID | floor | Hosp_name |
|---|---|---|---|
| Edit Copy Delete | 1564483 | 1 | Ain Shams University Hospital |
| Edit Copy Delete | 1578983 | 4 | Ain Shams University Hospital |
| Edit Copy Delete | 1526545 | 2 | Mokattam Hospital |

*Figure 45: Table after insertion*

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
SELECT * FROM `employee`
```

| SSN | Fname | Lname | salary | gender | age | H_name |
|---|---|---|---|---|---|---|

*Figure 46: Empty Employee table*

1 row inserted. (Query took 0.0002 seconds.)

```
INSERT INTO Employee VALUES(1, "Mostafa", "ElRosasy", 7000, "M", 21, "Mokattam Hospital")
```

1 row inserted. (Query took 0.0002 seconds.)

```
INSERT INTO Employee VALUES(2, "Seif", "Mohamed", 8000, "M", 21, "Ain Shams University Hospital")
```

1 row inserted. (Query took 0.0003 seconds.)

```
INSERT INTO Employee VALUES(3, "Omar", "Magdy", 5000, "M", 20, "Ain Shams University Hospital")
```

*Figure 47: Insert command*

+ Options

| | SSN ▲ 1 | Fname | Lname | salary | gender | age | H_name |
|---|---|---|---|---|---|---|---|
| Edit Copy Delete | 1 | Mostafa | ElRosasy | 7000 | M | 21 | Mokattam Hospital |
| Edit Copy Delete | 2 | Seif | Mohamed | 8000 | M | 21 | Ain Shams University Hospital |
| Edit Copy Delete | 3 | Omar | Magdy | 5000 | M | 20 | Ain Shams University Hospital |

*Figure 48: Table after insertion*

Showing rows 0 - 1 (2 total, Query took 0.0004 seconds.)

```
SELECT Fname, Lname, salary, age, name, city, street FROM Employee, Hospital WHERE H_name = name Having salary > 6000 ORDER BY age
```

Profiling [Edit inline]

*Figure 49: Select command*

+ Options

| Fname | Lname | salary | age ▲ 1 | name | city | street |
|---|---|---|---|---|---|---|
| Seif | Mohamed | 8000 | 21 | Ain Shams University Hospital | Cairo | El-Khalifa El-Maamoun Street |
| Mostafa | ElRosasy | 7000 | 21 | Mokattam Hospital | Cairo | 7th street |

*Figure 50: Resulted table*

# 5. Samples

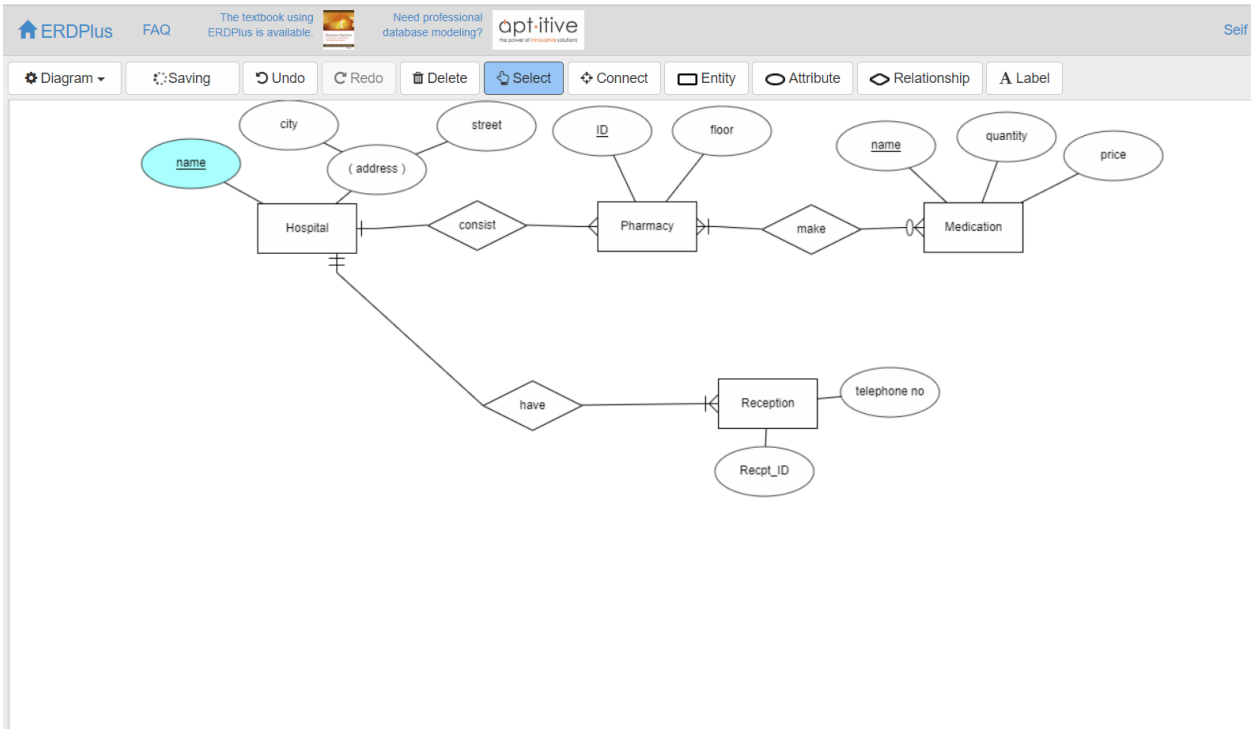


*Figure 51: ERD sample*

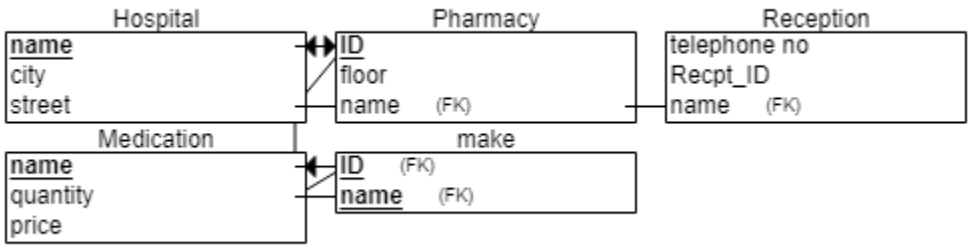


*Figure 52: Schema sample*

SQL Sample:

```
CREATE TABLE Hospital
(
  name INT NOT NULL,
  city INT NOT NULL,
  street INT NOT NULL,
  PRIMARY KEY (name)
);

CREATE TABLE Pharmacy
(
  ID INT NOT NULL,
  floor INT NOT NULL,
  name INT NOT NULL,
  PRIMARY KEY (ID),
  FOREIGN KEY (name) REFERENCES Hospital(name)
);

CREATE TABLE Reception
(
  telephone_no INT NOT NULL,
```

```
  Recpt_ID INT NOT NULL,
  name INT NOT NULL,
  FOREIGN KEY (name) REFERENCES Hospital(name)
);

CREATE TABLE Medication
(
  name INT NOT NULL,
  quantity INT NOT NULL,
  price INT NOT NULL,
  PRIMARY KEY (name)
);

CREATE TABLE make
(
  ID INT NOT NULL,
  name INT NOT NULL,
  PRIMARY KEY (ID, name),
  FOREIGN KEY (ID) REFERENCES Pharmacy(ID),
  FOREIGN KEY (name) REFERENCES Medication(name)
);
```