Hospital Management System

Princess Sumaya University for Technology

جامعـــة الأميــرة سميّــة للتكنولوجيا

Nabeel Mazyad

Omar Abu Khalaf
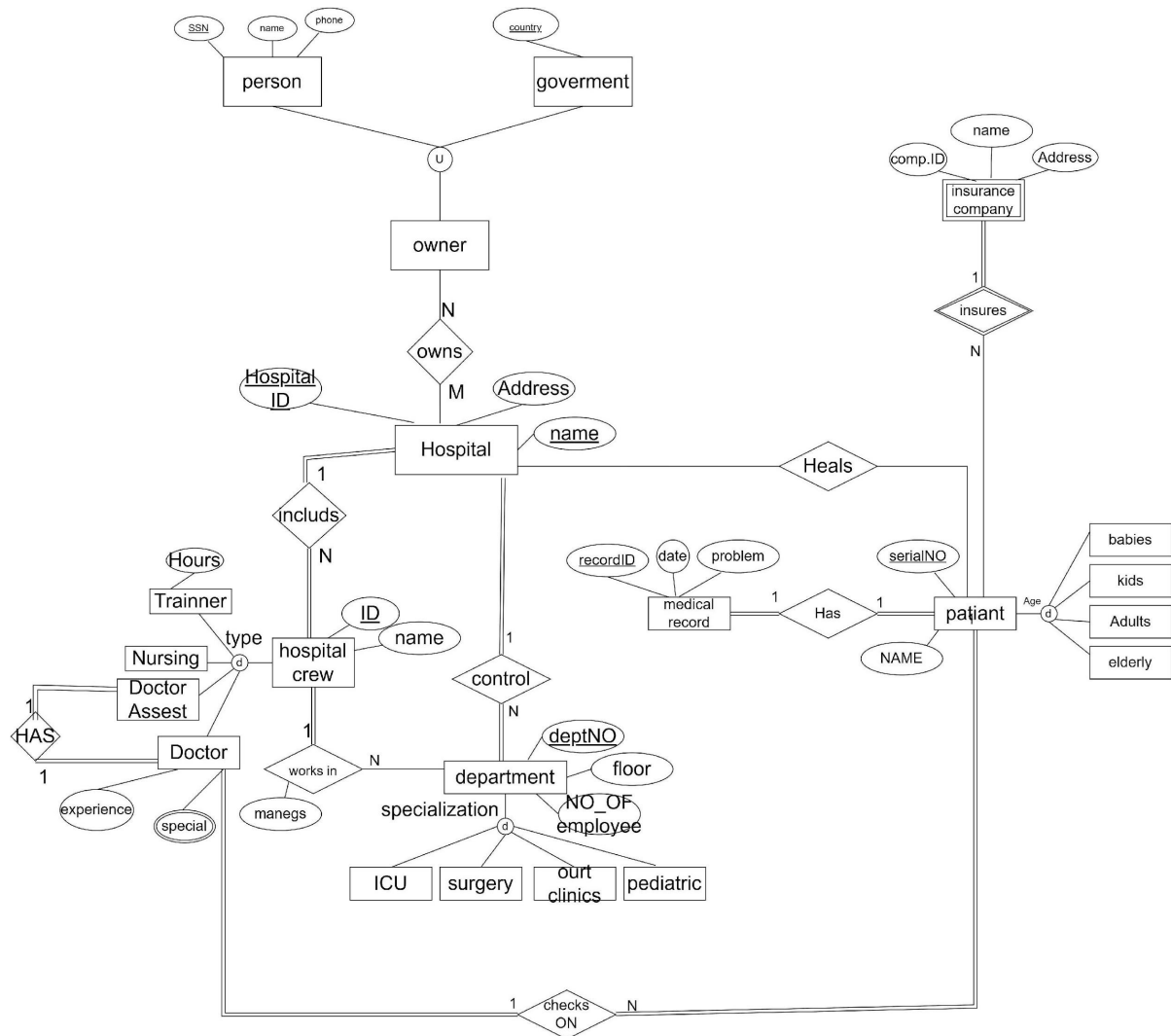
Omar Alkhatib

Abstract

This Hospital Management System includes registration of patients and their details into the system, along with the location and details of the Hospital. All the hospital crew whether they are Doctors, Nurses etc. along with which departments they work in and which patients they check on can all be found in this database system.

Requirements:

- Each Hospital has an ID, Name and Address. Hospitals can be owned by Person(s) and the Government.
- Each Person has a unique SSN, Name and Phone_No. The Government is owned by the country.
- Each Hospital includes Hospital Crew where they have a name. Hospital Crew may be categorized into one of the following (Trainer, Nurse, Assistant Doctor, and Doctor.
- Trainers are described by number of hours.
- Doctors are described by their years of experience and can be specialized in one or more areas.
- Each Doctor has an assistant Doctor.
- Each Hospital is controlled by many Departments.
- Each department has a unique Dept_No, floor, and No_Of_employees. Departments can be categorized into one of the following (IC, Surgery, Outer Clinics, Pediatric)
- Each Hospital crew must work in one or more Departments.
- Hospital can have many Patients, where each Patient has a unique Serial_No, Name, and Age.
- Patients may be categorized into one of the following (Babies, Kids, Adults, Elderly)
- Each Patient must have a Medical Record.
- Medical Records have a unique Record_ID, Problem, Date which is made of Day, Month and Year.
- Patients may be insured by an Insurance Company.
- Insurance Company has a unique Company_ID and an Address.
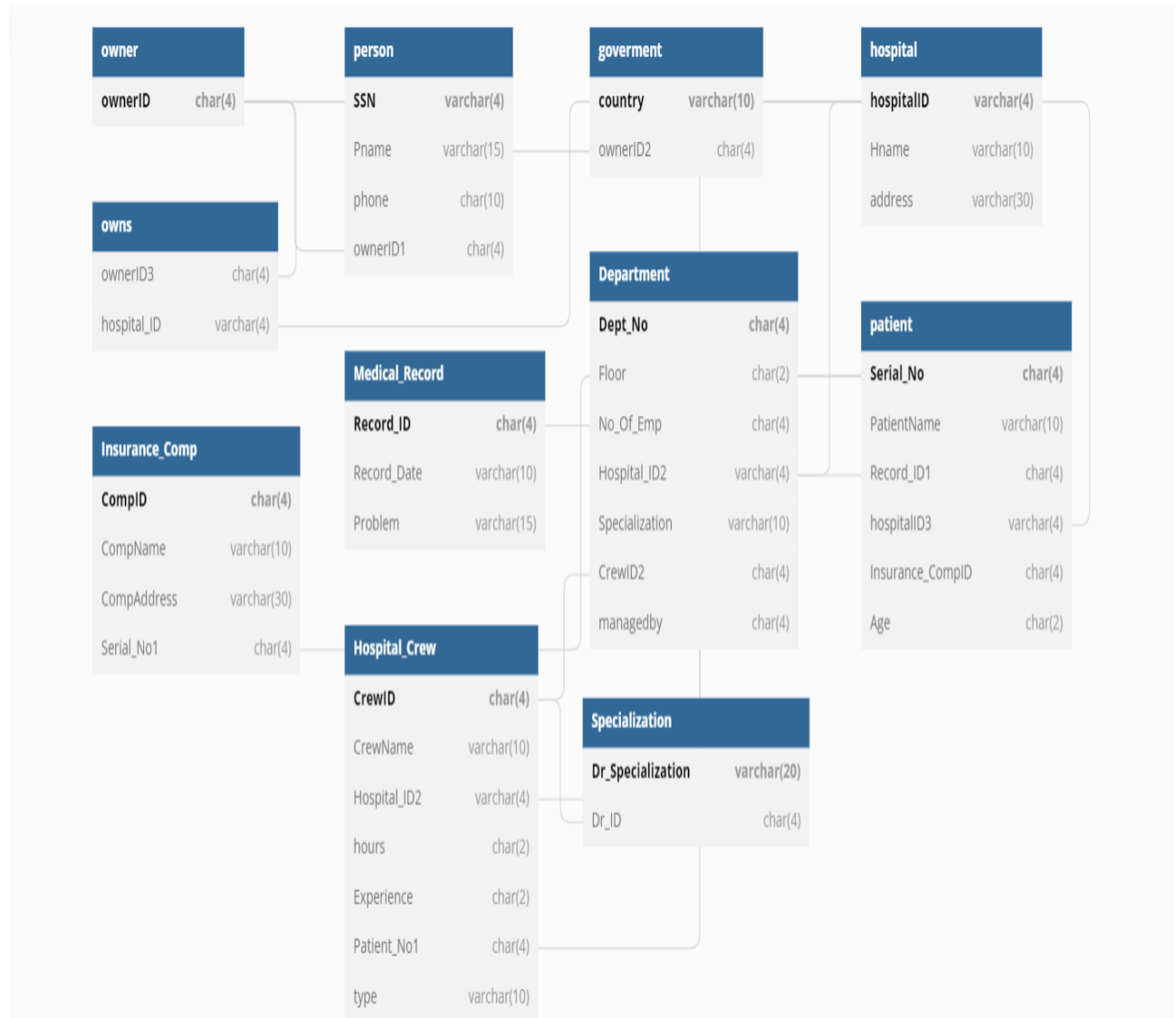- Each Doctor checks on many Patients.

Conceptual Design:

EER Model:

Logical Design:

Relational Database model:

owner
ownerID	char(4)

owns
ownerID3	char(4)
hospital_ID	varchar(4)

Insurance_Comp
CompID	char(4)
CompName	varchar(10)
CompAddress	varchar(30)
Serial_No1	char(4)

person
SSN	varchar(4)
Pname	varchar(15)
phone	char(10)
ownerID1	char(4)

Medical_Record
Record_ID	char(4)
Record_Date	varchar(10)
Problem	varchar(15)

Hospital_Crew
CrewID	char(4)
CrewName	varchar(10)
Hospital_ID2	varchar(4)
hours	char(2)
Experience	char(2)
Patient_No1	char(4)
type	varchar(10)

goverment
country	varchar(10)
ownerID2	char(4)

Department
Dept_No	char(4)
Floor	char(2)
No_Of_Emp	char(4)
Hospital_ID2	varchar(4)
Specialization	varchar(10)
CrewID2	char(4)
managedby	char(4)

Specialization
Dr_Specialization	varchar(20)
Dr_ID	char(4)

hospital
hospitalID	varchar(4)
Hname	varchar(10)
address	varchar(30)

patient
Serial_No	char(4)
PatientName	varchar(10)
Record_ID1	char(4)
hospitalID3	varchar(4)
Insurance_CompID	char(4)
Age	char(2)

Physical Model:

DDL:

```
create table owner (
ownerID char(4) primary key
)
create table person(
SSN varchar(4) primary key,
Pname varchar(15) not null,
phone char(10),
ownerID1 char(4),
foreign key(ownerID1) references owner(ownerID)
)
create table goverment(
country varchar(10) primary key,
ownerID2 char(4),
foreign key(ownerID2) references owner(ownerID)
)
create table hospital(
hospitalID varchar(4) primary key,
Hname varchar(10) unique,
address varchar(30)
)
create table owns (
ownerID3 char(4),
hospital_ID varchar(4),
foreign key(ownerID3) references owner(ownerID),
foreign key(hospital_ID) references hospital(hospitalID)
)
create table Medical_Record(
Record_ID char(4) primary key,
Record_Date varchar(10),
Problem varchar(15)
)
create table patient(
Serial_No char(4) primary key,
PatientName varchar(10) not null,
Record_ID1 char(4),
hospitalID3 varchar(4),
foreign key(hospitalID3) references hospital(hospitalID),
foreign key(Record_ID1) references Medical_Record(Record_ID),
Insurance_CompID char(4),
patcategory char(2)
)
create table Hospital_Crew(
CrewID char(4) primary key,
```

```sql
CrewName varchar(10),
Hospital_ID2 varchar(4),
foreign key(Hospital_ID2) references hospital(hospitalID),
hours char(2),
Experience char(2),
Patient_No1 char(4),
type varchar(10),
foreign key(Patient_No1) references patient(Serial_No)
)
create table Department(
Dept_No char(4) primary key,
Floor char(2),
No_Of_Emp char(4),
Hospital_ID2 varchar(4),
Specialization varchar(10),
CrewID2 char(4),
managedby char(4),
foreign key(CrewID2) references Hospital_Crew(CrewID),
foreign key(Hospital_ID2) references hospital(hospitalID)
)
create table Insurance_Comp(
CompID char(4) primary key,
CompName varchar(10) not null,
CompAddress varchar(30),
Serial_No1 char(4),
foreign key(Serial_No1) references patient(Serial_No)
)
create table Specialization(
Dr_Specialization varchar(20) primary key,
Dr_ID char(4),
foreign key(Dr_ID ) references Hospital_Crew(CrewID)
)
```

DML:

Code for inserting Values into Hosptal Crew.

Statement 198
insert into hospital_crew values ('6732', 'Ali','0006','10','','5896','Trainer')
1 row(s) inserted.

Statement 199
insert into hospital_crew values ('4354', 'Adham','0005','5','','4785','Trainer')
1 row(s) inserted.

Statement 200
insert into hospital_crew values ('9821', 'Ayham','0004','','3','2589','Dr Assist')
1 row(s) inserted.

Statement 201
insert into hospital_crew values ('5678', 'Layla','0002','','','2563','Nurse')
1 row(s) inserted.

Statement 202
insert into hospital_crew values ('5432', 'Reem','0003','5','','1793','Trainer')
1 row(s) inserted.

Statement 203
insert into hospital_crew values ('1234', 'Zaid','0001','','5','1452','Doctor')
1 row(s) inserted.

select * from hospital_crew

CREWID	CREWNAME	HOSPITAL_ID2	HOURS	EXPERIENCE	PATIENT_NO1	TYPE
6732	Ali	0006	10	-	5896	Trainer
4354	Adham	0005	5	-	4785	Trainer
9821	Ayham	0004	-	3	2589	Dr Assist
5678	Layla	0002	-	-	2563	Nurse
5432	Reem	0003	5	-	1793	Trainer
1234	Zaid	0001	-	5	1452	Doctor

Download CSV
6 rows selected.

Code for inserting Values into Medical Record:

Statement 124
INSERT INTO MEDICAL_RECORD VALUES ('1111','10/8/2021','NOT DETERMINE')
1 row(s) inserted.

Statement 125
INSERT INTO MEDICAL_RECORD VALUES ('2222','22/8/2021','NOT DETERMINE')
1 row(s) inserted.

Statement 126
INSERT INTO MEDICAL_RECORD VALUES ('3333','01/9/2021','NOT DETERMINE')
1 row(s) inserted.

Statement 127
INSERT INTO MEDICAL_RECORD VALUES ('4444','14/2/2021','NOT DETERMINE')
1 row(s) inserted.

Statement 128
INSERT INTO MEDICAL_RECORD VALUES ('5555','08/8/2021','NOT DETERMINE')
1 row(s) inserted.

Statement 129
INSERT INTO MEDICAL_RECORD VALUES ('6666','30/8/2021','NOT DETERMINE')
1 row(s) inserted.

SELECT *
FROM MEDICAL_RECORD

RECORD_ID	RECORD_DATE	PROBLEM
1111	10/8/2021	NOT DETERMINE
2222	22/8/2021	NOT DETERMINE
3333	01/9/2021	NOT DETERMINE
4444	14/2/2021	NOT DETERMINE
5555	08/8/2021	NOT DETERMINE
6666	30/8/2021	NOT DETERMINE

Download CSV
6 rows selected.

Other populated tables:

Statement **80**

🗑 Edit

```
select *
from PERSON
```

SSN	PNAME	PHONE	OWNERID1
0430	Omar Alkhatib	0781631142	0001
0321	Omar Abu Khalaf	0798941153	0002
0349	Nabil Mazyad	0798472981	0003
1234	Ahmad	0772291956	0004
5678	Rawan	0777224657	0004
9101	messi	0782225558	0006

Download CSV
6 rows selected.

Statement **189**

🗑 Edit

```
select *
from HOSPITAL
```

HOSPITALID	HNAME	ADDRESS
0001	AL Khalidi	Amman
0002	Abdali H	Amman
0003	Akilah	Irbid
0004	Al Dhalil	Zarqa
0005	Al Nadeem	Madaba
0006	Al Karak	Karak

Download CSV

6 rows selected.

Statement **81**

🗑 Edit

```
select *
from OWNER
```

OWNERID
0001
0002
0003
0004
0005
0006

Download CSV
6 rows selected.

o=590:17:1163:811869112:-NO::

Statement **117**

🗑 Edit

```
SELECT *
FROM GOVERMENT
```

COUNTRY	OWNERID2
Jordan	0007

Download CSV

Statement **144**

🗑 Edit

```
select *
from PATIENT
```

SERIAL_NO	PATIENTNAME	RECORD_ID1	INSURANCE_COMPID	AGE
1793	Lama	1111	-	22
1452	Khalid	2222	-	30
2563	Salah	3333	-	50
4785	Raya	4444	-	70
5896	Mohamad	5555	-	22

Download CSV
5 rows selected.

Statement **224**

🗑 Edit

```
select * from owns
```

OWNERID3	HOSPITAL_ID
0001	0002
0003	0003
0002	0001
0004	0004
0005	0005
0006	0006

Download CSV

6 rows selected.

Statement **214**

🗑 Edit

```
select * from depatrment
```

DEPTNO	FLOOR	NO_OFEMPLOYEE	SPECIALIZATION	HOSPITAL_ID	HOSPITAL_CREWID	MANEGEDBY
1	3	-	ICU	0001	-	-
3	2	-	Surgery	0001	-	Zaid
2	5	-	ICU	0003	-	-
4	1	-	Clinic	0002	-	-
5	3	-	Pediatric	0005	-	-
6	2	-	ICU	0004	-	-

Download CSV
6 rows selected.

Data Retrievals:

1)Simple Query:

Statement
226

```
select patientname,Record_Id1 from Patient where Serial_No='2563'
```

PATIENTNAME	RECORD_ID1
Salah	3333

Download CSV

2) Nested Queries:

Statement 230

🗑 Edit

```
select crewid from hospital_crew where hospital_id2 in(select hospital_id from depatrment where deptno='1')
```

Statement
230

```
select crewid from
```

CREWID
1234

Download CSV

3) Group By:

Statement
236

```
select specialization,count(*) from depatrment GROUP BY specialization
```

SPECIALIZATION	COUNT(*)
Pediatric	1
Clinic	1
ICU	3
Surgery	1

Download CSV
4 rows selected.

4)Order By:

Statement 243

```
select pname from person order by pname desc
```

PNAME
messi
Rawan
PSUT
Omar Alkhatib
Omar Alkhatib
Omar Abu Khalaf
Nabil Mazyad
Ahmad

Download CSV

8 rows selected.

5) Nested Queries:

Select the patient name and thier insurance company name who taked care by the the hospital crew with crewID='1234'

```
SELECT PATIENTNAME,COMPNAME
FROM PATIENT,INSURANCE_COMP
WHERE (SERIAL_NO1=SERIAL_NO) AND SERIAL_NO IN (SELECT PATIENT_NO1
                    FROM HOSPITAL_CREW
                    WHERE CREWID='1234')
```

PATIENTNAME	COMPNAME
Khalid	MiddleEast

Download CSV

6) Exists:

select the ssn and name for a person who owns a hospital and use Umniah as a SIM Phone

```
SELECT SSN,PNAME
FROM PERSON
WHERE PHONE LIKE '078_____' AND EXISTS (SELECT OWNERID3
                    FROM OWNS
                    WHERE OWNERID3=OWNERID1)
```

SSN	PNAME
0430	Omar Alkhatib
9101	messi

Download CSV
2 rows selected.

7) NOT Exists:

select the crew name with hospital id where he/she works , if he/she was not a manager for any dapatrment

```
SELECT CREWNAME ,HOSPITAL_ID2
FROM HOSPITAL_CREW
WHERE NOT EXISTS (SELECT MANEGEDBY
                    FROM DEPARTMENT
                    WHERE MANEGEDBY=CREWNAME)
```

CREWNAME	HOSPITAL_ID2
Adham	0005
Ayham	0004
Reem	0003
Ali	0006

Download CSV
4 rows selected.

8) INNER JOIN:

Join Hospital table with Hospital_crew table and select the crew name with hospital table

```
SELECT CREWNAME,HNAME
FROM HOSPITAL INNER JOIN HOSPITAL_CREW  ON HOSPITALID=HOSPITAL_ID2
```

CREWNAME	HNAME
Ali	Al Karak
Adham	Al Nadeem
Ayham	Al Dhalil
Layla	Abdali H
Reem	Akilah
Zaid	AL Khalidi

Download CSV
6 rows selected.

9) COUNT(*) & Nested Queries:

Statement **488**

retrieve the total number of patients in Amman"s Hospitals

```
SELECT COUNT(*)
FROM PATIENT
WHERE HOSPITAL_ID IN (SELECT HOSPITALID
                            FROM HOSPITAL
                            WHERE ADDRESS='Amman')
```

COUNT(*)
3

Download CSV