Patients Database

Ann Mary Maqdesy

12/10/2022

….

Table of Content

Table of Contents

Project Phase 1, database proposal

Name: Patients Database

Purpose: A database that contains Information about the patients that go to the dental office and its branches, including information about the doctor they see, the office they go to with the address of the office and what dental procedure are they going to have with its code and price.

Project Phase 2: Entities, relationships, Attributes & keys

Conceptual diagrams: identifying entities and their relationships

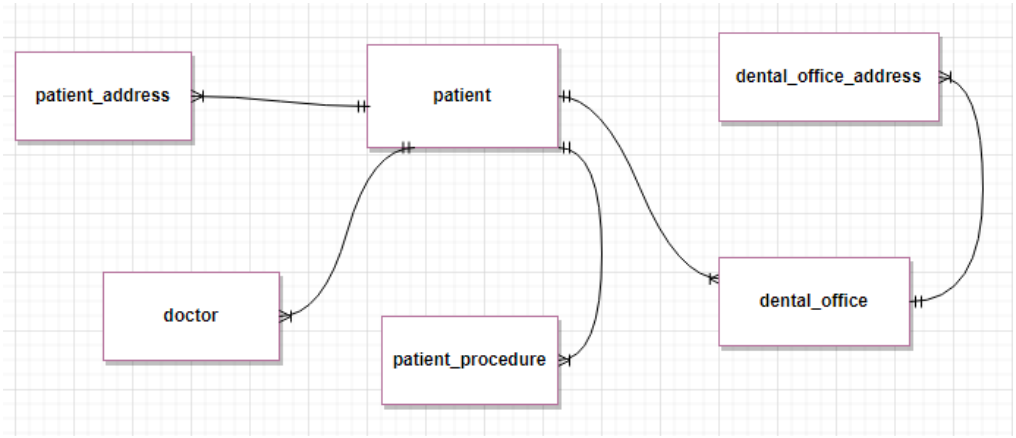

Figure 1 : conceptual diagram

Logical diagrams: Identifying Attributes & the key

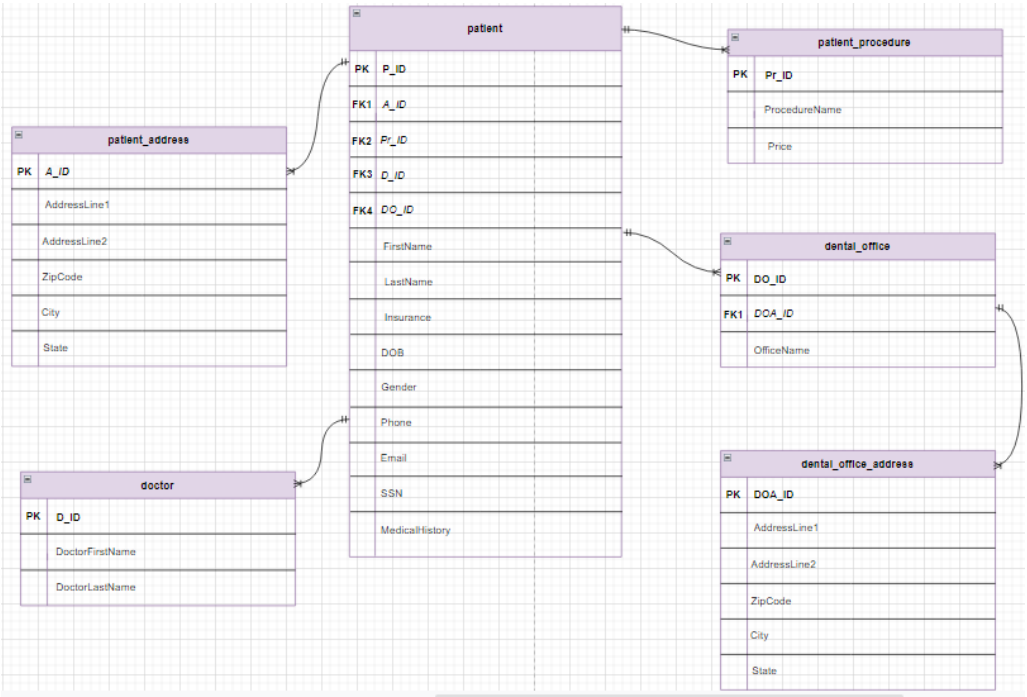

Figure 2 : Logical Diagram

Project Phase 3: ERD in 3NF, DD

Each table is in 3NF

Entity : patient: P_ID, *A_ID*, *Pr_ID*, *D_ID*, *DO_ID*, FirsName, LastName, Insurance, DOB, Gender, Phone, Email, SSN, MedicalHistory

patient		
PK	P_ID	int
FK1	A_ID	int
FK2	Pr_ID	int
FK3	D_ID	int
FK4	DO_ID	int
	FirstName	varchar,30
	LastName	varchar,30
	Insurance	int
	DOB	varchar,10
	Gender	varchar,6
	Phone	varchar,12
	Email	varchar,100
	SSN	varchar,11
	MedicalHistory	varchar,300

Figure 3 : patient in 3NF

Entity : patient_address: A_ID, AddressLine1, AddressLine2, ZipCode, City, State

patient_address		
PK	A_ID	int
	AddressLine1	varchar,50
	AddressLine2	varchar,50
	ZipCode	int
	City	varchar,20
	State	varchar,20

Figure 4 : patient_address in 3NF

Entity : patient_procedure: Pr_ID, ProcedureName,Price

patient_procedure		
PK	Pr_ID	int
	ProcedureName	varchar,45
	Price	decimal

Figure 5 : patient_procedure in 3NF

Entity : doctor: D_ID, DoctorFirstName, DoctorLastName

doctor		
PK	D_ID	int
	DoctorFirstName	varchar,30
	DoctorLastName	varchar,30

Figure 6 : doctor in 3NF

Entity : dental_office: DO_ID, *DOA_ID*, OfficeName

dental_office		
PK	DO_ID	int
FK1	*DOA_ID*	int
	OfficeName	varchar,30

Figure 7 : dental_office in 3NF

Entity : dental_office_address: DOA_ID, AddressLine1, AddressLine2, ZipCode, City, State

dental_office_address		
PK	DOA_ID	int
	AddressLine1	varchar,50
	AddressLine2	varchar,50
	ZipCode	int
	City	varchar,20
	State	varchar,20

Figure 8 : dental_office_address in 3NF

Physical diagrams

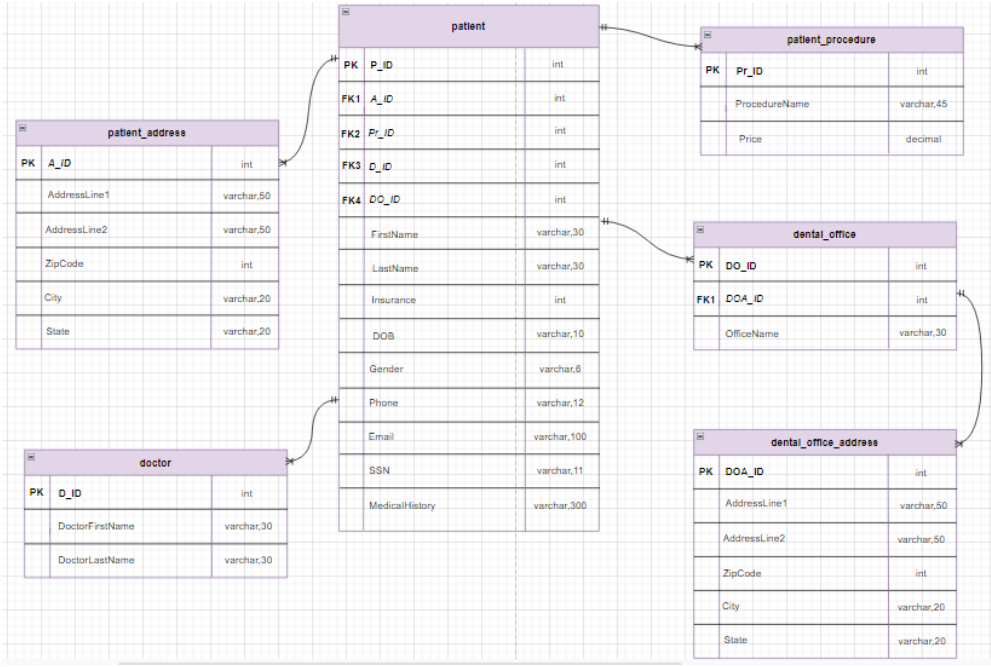

Figure 9 : Physical Diagram

Data Dictionary

Data Dictionary
Patients Database

Entity	Attribute	Data type	Length	Required(Y/N)	Key (PK/FK)	FK, Ref entity	Description
patient	P_ID	int		Y	PK		
	A_ID	int		Y	FK	PatientAddress	
	Pr_ID	int		Y	FK	Procedure	
	D_ID	int		Y	FK	Doctor	
	DO_ID	int		Y	FK	DentalOffice	
	FirstName	varchar	30	Y			
	Lastname	varchar	30	Y			
	Insurance	int		Y			
	DOB	varchar	10	Y			
	Gender	varchar	6	N			The Gender Is not required for a medical procedure
	Phone	varchar	12	Y			
	Email	varchar	100	Y			
	SSN	varchar	11	Y			
	MedicalHistory	varchar	300	Y			In case of any medical history that will affect the procedure

Figure 10 : Data Dictionary 1/3

Entity	Attribute	Data type	Length	Required(Y/N)	Key (PK/FK)	FK, Ref entity	Description
patient_address	A_ID	int		Y	PK		
	AddressLine1	varchar	50	Y			
	AddressLine2	varchar	50	N			You don't allways have a second line for an address
	ZipCode	int		Y			
	City	varchar	20	Y			
	State	varchar	20	Y			
patient_procedure	Pr_ID	int		Y	PK		
	ProcedureName	int		Y			
	Price	decimal		Y			
doctor	D_ID	int		Y	PK		
	DoctorFirstName	varchar	30	Y			
	DoctorLastName	varchar	30	Y			

Figure 11 : Data Dictionary 2/3

Entity	Attribute	Data type	Length	Required(Y/N)	Key (PK/FK)	FK, Ref entity	Description
dental_office	DO_ID	int		Y	PK		
	DOA_ID	int		Y	FK	DentalOfficeAddress	
	OfficeName	varchar	30	Y			
dental_office_address	DOA_ID	int		Y	PK		
	AddressLine1	varchar	50	Y			
	AddressLine2	varchar	50	N			You don't allways have a second line for an address
	ZipCode	int		Y			
	City	varchar	20	Y			
	State	varchar	20	Y			

Figure 12 : Data Dictionary 3/3

Project Phase 4, Implementation: build the database

Functioning prototype of the DBs with minimum of 5 records

```
INSERT INTO dental_office_address(DOA_ID,AddressLine1,AddressLine2,ZipCode,City,State)
VALUES (1,'8154 Harrison','St.Andrew',30144,'Kennesaw','GA');
INSERT INTO dental_office_address(DOA_ID,AddressLine1,ZipCode,City,State)
VALUES (2,'251 Devonshire Lane',60014,'Crystal Lake','IL');
INSERT INTO dental_office_address(DOA_ID,AddressLine1,ZipCode,City,State)
VALUES (3,'805 San Juan St',53546,'Janesville','W');
INSERT INTO dental_office_address(DOA_ID,AddressLine1,ZipCode,City,State)
VALUES (4,'38 Cherry Hill Avenue',48066,'Roseville','MI');
INSERT INTO dental_office_address(DOA_ID,AddressLine1,ZipCode,City,State)
VALUES (5,'375 Wrangler St.',14850,'Norwood','NY');

INSERT INTO doctor(D_ID,DoctorFirstName,DoctorLastName)
VALUES (1, 'Beatrice','Beatr');
INSERT INTO doctor(D_ID,DoctorFirstName,DoctorLastName)
VALUES (2, 'Dorothy',' Marttinez');
INSERT INTO doctor(D_ID,DoctorFirstName,DoctorLastName)
VALUES (3, 'Estelle','Lopez');
INSERT INTO doctor(D_ID,DoctorFirstName,DoctorLastName)
VALUES (4, 'Evelyn','Thomas');
INSERT INTO doctor(D_ID,DoctorFirstName,DoctorLastName)
VALUES (5, 'Frances','Moore');

INSERT INTO patient_address(A_ID,AddressLine1,ZipCode,City,State)
VALUES(1,'7573 Central Court',8540,'Princeton','NJ');
INSERT INTO patient_address(A_ID,AddressLine1,ZipCode,City,State)
VALUES(2,'387 Linda Street',17109,'Harrisburg','PA');
INSERT INTO patient_address(A_ID,AddressLine1,ZipCode,City,State)
VALUES(3,'58 Thorne St.',30024,'Suwanee','GA');
INSERT INTO patient_address(A_ID,AddressLine1,ZipCode,City,State)
VALUES(4,'6 Surrey Rd.',60409,'Calumet City','IL');
INSERT INTO patient_address(A_ID,AddressLine1,AddressLine2,ZipCode,City,State)
VALUES(5,'9496 Pin Oak Dr.','Oaks part',32708,'Winter Springs','Florida');
```

```
INSERT INTOpatient_procedure(Pr_ID,ProcedureName,Price)
VALUES(1,'D1111',321);
INSERT INTOpatient_procedure(Pr_ID,ProcedureName,Price)
VALUES(2,'D2222',54);
INSERT INTOpatient_procedure(Pr_ID,ProcedureName,Price)
VALUES(3,'M3333',3000);
INSERT INTOpatient_procedure(Pr_ID,ProcedureName,Price)
VALUES(4,'C4444',61);
INSERT INTOpatient_procedure(Pr_ID,ProcedureName,Price)
VALUES(5,'D5555',370);

INSERT INTO
patient(P_ID,A_ID,Pr_ID,D_ID,DO_ID,FirstName,LastName,Insurance,DOB,Gender,Phone,Email,SSN,MedicalHistory
)
VALUES (1,1,3,5,3,'Layla','Mardini',1111111,'8/1/2002','female','111-111-1111','laylamardini@gmail.com','111-11-
1111','No medical history');
INSERT INTO
patient(P_ID,A_ID,Pr_ID,D_ID,DO_ID,FirstName,LastName,Insurance,DOB,Gender,Phone,Email,SSN,MedicalHistory
)
VALUES (2,2,4,2,5,'Mary','Maisa',2222222,'12/1/1997','female','222-222-2222','marymaisa@gmail.com','222-22-
2222','Diabetes Patient');
INSERT INTO
patient(P_ID,A_ID,Pr_ID,D_ID,DO_ID,FirstName,LastName,Insurance,DOB,Gender,Phone,Email,SSN,MedicalHistory
)
VALUES (3,3,2,2,2,'Sam','Philip',3333333,'6/4/1992','male','333-333-3333','samphilip@gmail.com','333-33-
3333','No Medical History');
INSERT INTO patient
(P_ID,A_ID,Pr_ID,D_ID,DO_ID,FirstName,LastName,Insurance,DOB,Gender,Phone,Email,SSN,MedicalHistory)
VALUES (4,4,5,3,1,'Alexandre','Smith',4444444,'1/22/1971','male','444-444-4444',
'alexandresmith@gmail.com','444-44-4444',' Due to his age he has a shorten of breath and he is asthmatic');
INSERT INTO
patient(P_ID,A_ID,Pr_ID,D_ID,DO_ID,FirstName,LastName,Insurance,DOB,Phone,Email,SSN,MedicalHistory)
VALUES (5,5,1,3,4,'Andria','Mark',5555555,'5/2/2003','555-555-5555','andriamark@gmail.com','555-55-5555','No
Medical History');

INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (1,1,'A Little Wider Dentistry');
INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (2,2,'About Smiles Dentistry');
INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (3,3,'Affordable Family Dental');
INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (4,4,'New Dental Care');
INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (5,5,'Oasis Dental Care');
```

Entity : patient

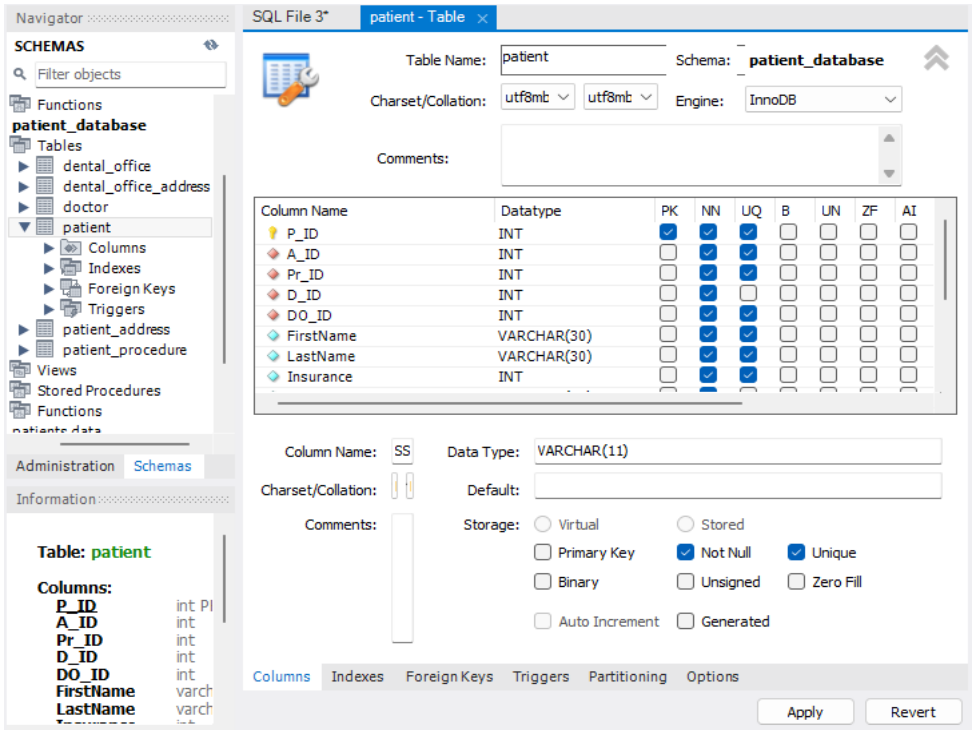

Figure 13 : patient column property 1

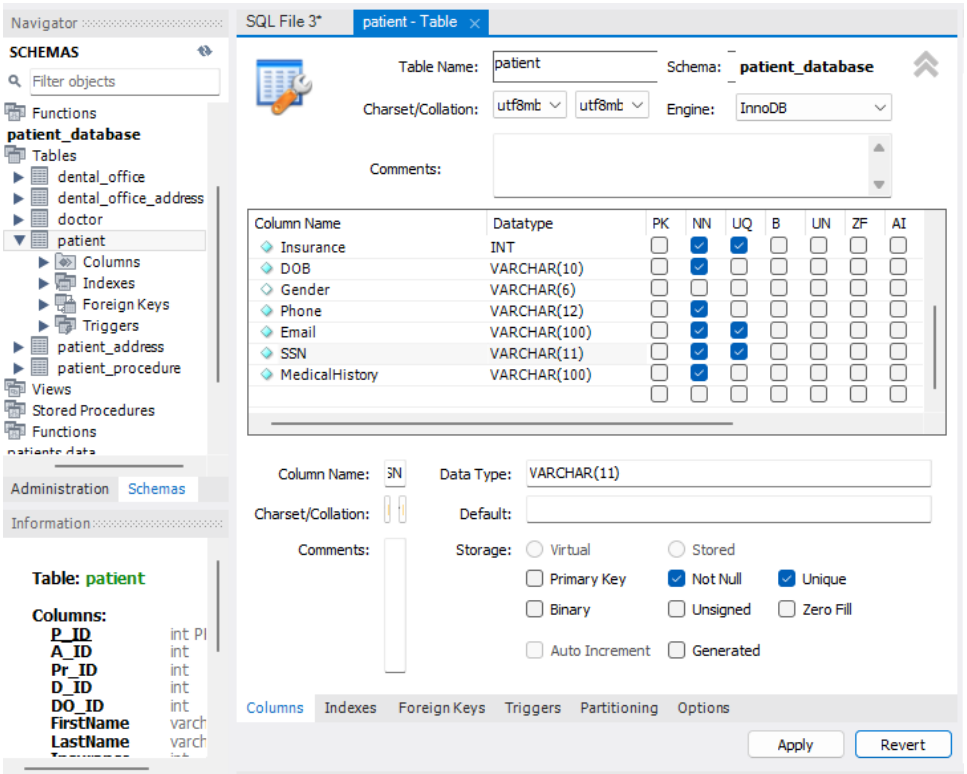

Figure 14 : patient column property 2

Table:

P_ID	A_ID	Pr_ID	D_ID	DO_ID	FirstName	LastName	Insurance	DOB	Gender	Phone	Email	SSN	MedicalHistory
1	1	3	5	3	Layla	Mardini	1111111	8/1/2002	female	111-111-1111	laylamardini@gmail.com	111-11-1111	No medical hist
2	2	4	2	5	Mary	Maisa	2222222	8/5/1997	female	222-222-2222	marymaisa@gmail.com	222-22-2222	Diabetes Patie
3	3	2	2	2	Sam	Philip	3333333	6/4/1992	male	333-333-3333	samphilip@gmail.com	333-33-3333	No Medical His
4	4	5	3	1	Alexandre	Smith	4444444	1/22/1971	male	444-444-4444	alexandresmith@gmail.com	444-44-4444	Due to his age
5	5	1	3	4	Andria	Mark	5555555	5/2/2003	NULL	555-555-5555	andriamark@gmail.com	555-55-5555	No Medical His
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 15: patient table

Entity: dental_office

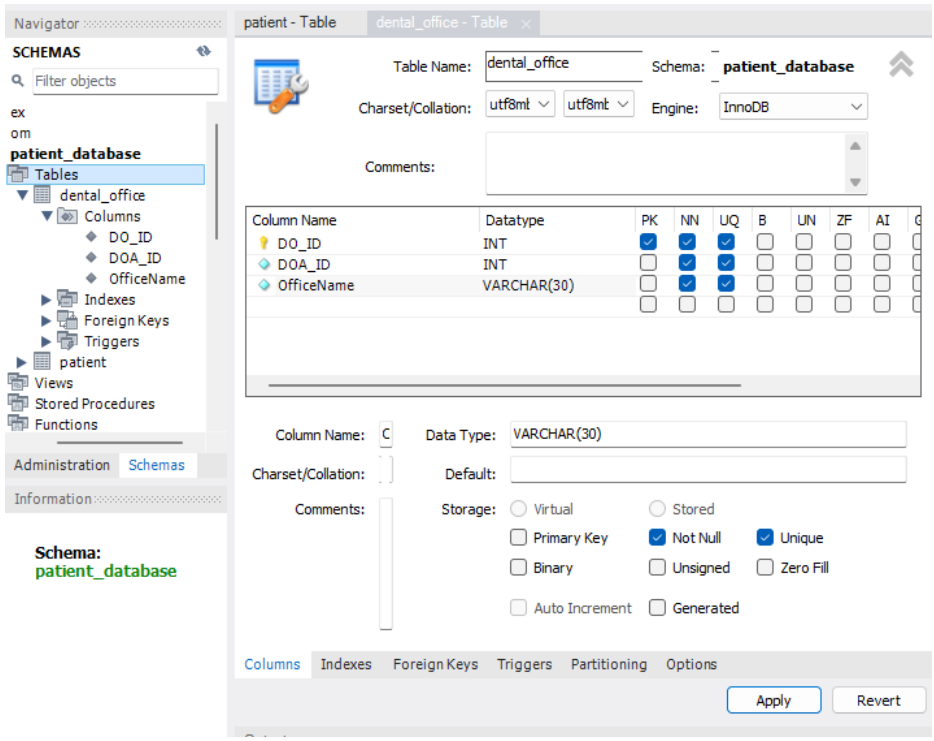

Figure 16 : dental_office column property

Table:

	DO_ID	DOA_ID	OfficeName
▶	1	1	A Little Wider Dentistry
	2	2	About Smiles Dentistry
	3	3	Affordable Family Dental
	4	4	New Dental Care
	5	5	Oasis Dental Care

Figure 17 : dental_office table

Entity: patient_procedure

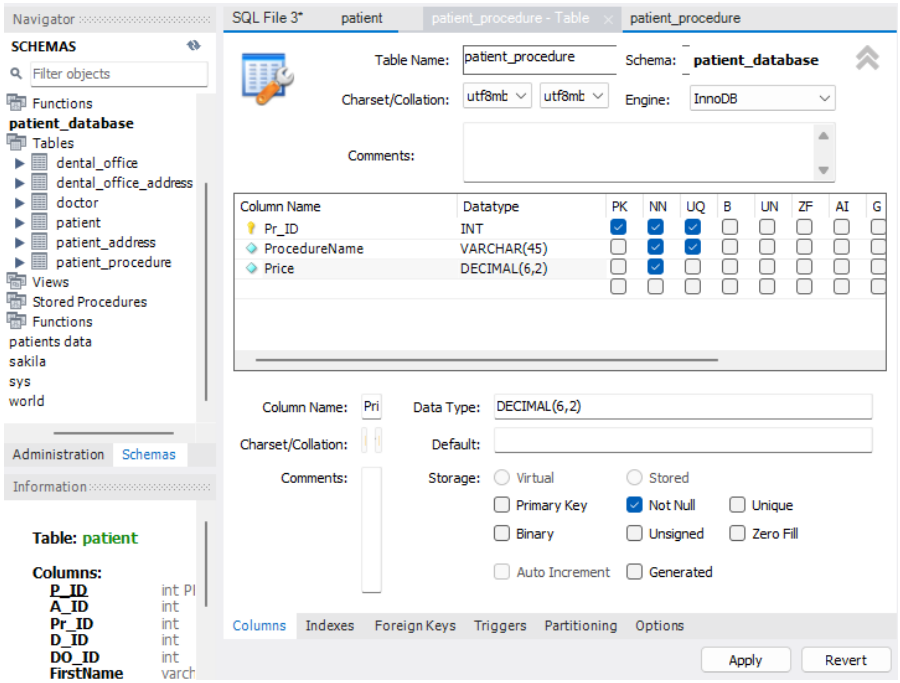

Figure 18 : patient_procerdure column property

Table:

	Pr_ID	ProcedureName	Price
▶	1	D1111	322.00
	2	D2222	55.00
	3	M3333	3000.00
	4	C4444	61.00
	5	D5555	370.00
*	NULL	NULL	NULL

Figure 19 : column property table

Entity: dental_office_address

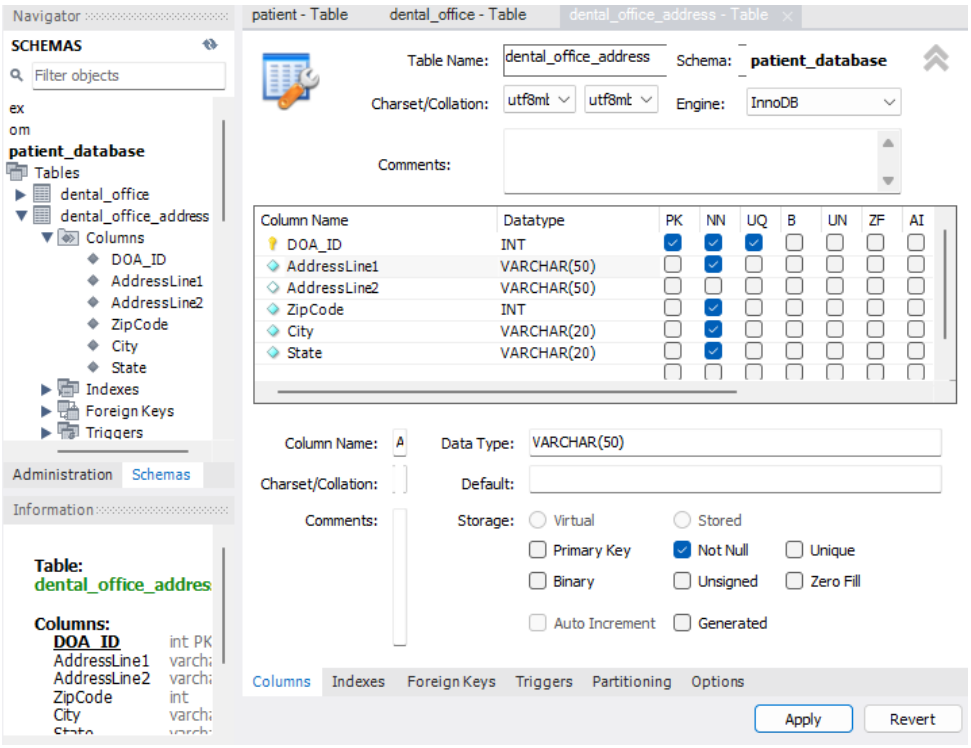

Figure 20 : dental_office_address column property

Table:

	DOA_ID	AddressLine1	AddressLine2	ZipCode	City	State
▶	1	8154 Harrison	St.Andrew	30144	Kennesaw	GA
	2	251 Devonshire Lane	NULL	60014	Crystal Lake	IL
	3	805 San Juan St	NULL	53546	Janesville	W
	4	38 Cherry Hill Avenue	NULL	48066	Roseville	MA
	5	375 Wrangler St.	NULL	14850	Norwood	NY

Figure 21 : dental_office_address table

Entity: doctor

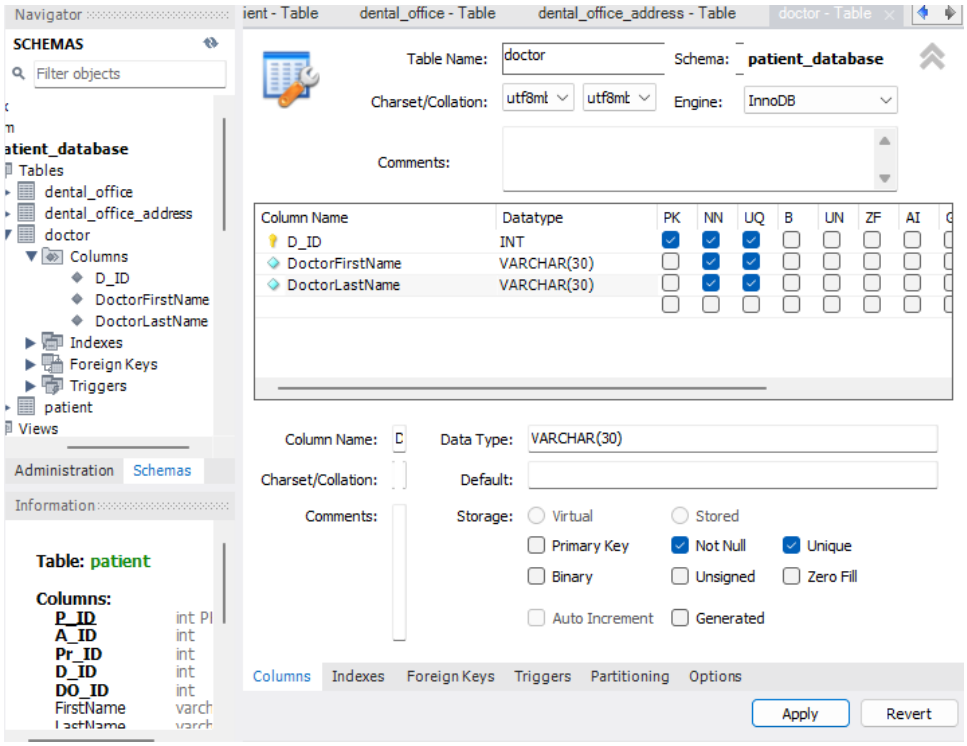

Figure 22 : doctor column property

Table:

	D_ID	DoctorFirstName	DoctorLastName
▶	1	Beatrice	Beatr
	2	Dorothy	Marttinez
	3	Estelle	Lopez
	4	Evelyn	Thomas
	5	Frances	Moore
*	NULL	NULL	NULL

Figure 23 : doctor table

Entity: patient_address

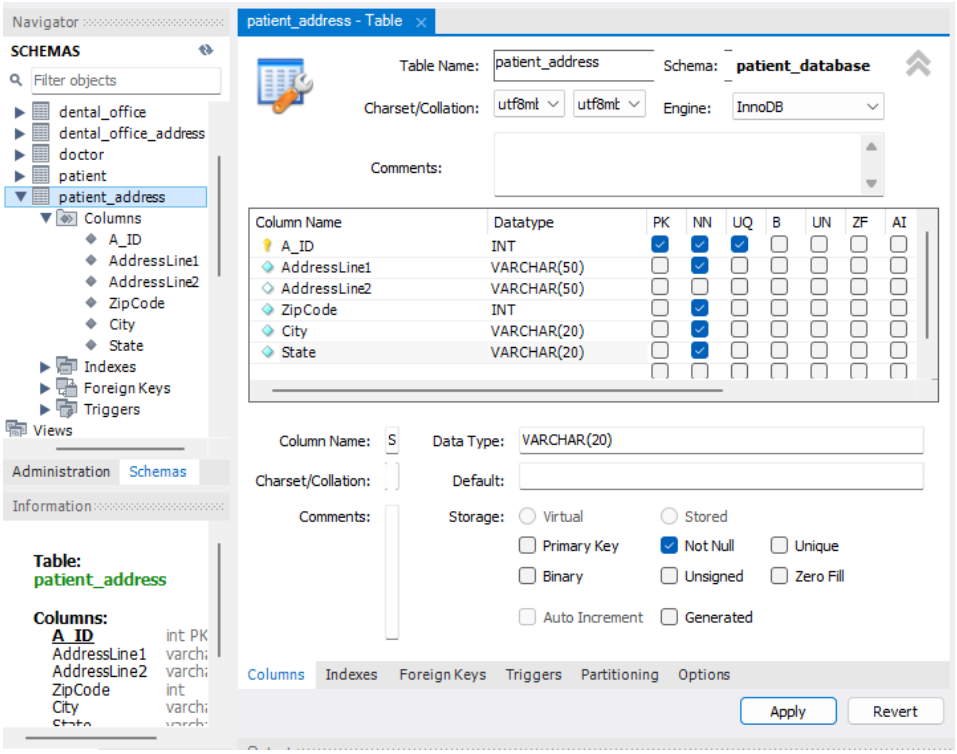

Figure 24 : patient_address column property

Table:

A_ID	AddressLine1	AddressLine2	ZipCode	City	State
1	7573 Central Court	NULL	8540	Princeton	NJ
2	387 Linda Street	NULL	17109	Harrisburg	PA
3	58 Thorne St.	NULL	30024	Suwanee	GA
4	6 Surrey Rd.	NULL	60409	Calumet City	IL
5	9496 Pin Oak Dr.	Oaks part	32708	Winter Springs	Florida
NULL	NULL	NULL	NULL	NULL	NULL

Figure 25 : patient_address table

SQL to add a record

write a SQL statement that **add** a record in one of the tables

The name of the entity(s) you chose to perform the activity on:

submit the script

1. **SQL statement that add a record in one of the tables**

Entity_Name: dental_office_address

before adding:

DOA_ID	AddressLine1	AddressLine2	ZipCode	City	State
1	8154 Harrison	St.Andrew	30144	Kennesaw	GA
2	251 Devonshire Lane	NULL	60014	Crystal Lake	IL
3	805 San Juan St	NULL	53546	Janesville	W
4	Obere Str.75	NULL	12209	westwood	MA
5	375 Wrangler St.	NULL	14850	Norwood	NY
NULL	NULL	NULL	NULL	NULL	NULL

Figure 26 : before adding record 1

after adding:

DOA_ID	AddressLine1	AddressLine2	ZipCode	City	State
1	8154 Harrison	St.Andrew	30144	Kennesaw	GA
2	251 Devonshire Lane	NULL	60014	Crystal Lake	IL
3	805 San Juan St	NULL	53546	Janesville	W
4	Obere Str.75	NULL	12209	westwood	MA
5	375 Wrangler St.	NULL	14850	Norwood	NY
6	216 Beacon Rd.	NULL	38654	Olive Branch	MA
NULL	NULL	NULL	NULL	NULL	NULL

Figure 27 : after adding record

Script :

```
INSERT INTO dental_office_address(DOA_ID,AddressLine1,ZipCode,City,State)
VALUES (6,'216 Beacon Rd.',38654,'Olive Branch','MA');
```

2. **SQL statement that add a record in one of the tables**

Entity_Name: doctor

before adding:

DO_ID	DOA_ID	OfficeName
1	1	A Little Wider Dentistry
2	2	About Smiles Dentistry
3	3	Affordable Family Dental
4	4	New Dental Care
5	5	Oasis Dental Care
NULL	NULL	NULL

Figure 28 : before adding record 2

after adding:

	DO_ID	DOA_ID	OfficeName
▶	1	1	A Little Wider Dentistry
	2	2	About Smiles Dentistry
	3	3	Affordable Family Dental
	4	4	New Dental Care
	5	5	Oasis Dental Care
	6	6	New England Dental Group
	NULL	NULL	NULL

Figure 29 : after adding record 2

Script :

```
INSERT INTO dental_office(DO_ID,DOA_ID,OfficeName)
VALUES (6,6,'New England Dental Group');
```

SQL to update a record

SQL statement that **update** a record in one of the tables

Entity_Name: dental_office_address

before update:

	DOA_ID	AddressLine1	AddressLine2	ZipCode	City	State
▶	1	8154 Harrison	St.Andrew	30144	Kennesaw	GA
	2	251 Devonshire Lane	NULL	60014	Crystal Lake	IL
	3	805 San Juan St	NULL	53546	Janesville	W
	4	38 Cherry Hill Avenue	NULL	48066	Roseville	MA
	5	375 Wrangler St.	NULL	14850	Norwood	NY

Figure 30 : before updating record

after update:

	DOA_ID	AddressLine1	AddressLine2	ZipCode	City	State
▶	1	8154 Harrison	St.Andrew	30144	Kennesaw	GA
	2	251 Devonshire Lane	NULL	60014	Crystal Lake	IL
	3	805 San Juan St	NULL	53546	Janesville	W
	4	Obere Str.75	NULL	12209	westwood	MA
	5	375 Wrangler St.	NULL	14850	Norwood	NY

Figure 31 : after updating

Script :

```
UPDATE dental_office_address
Set  AddressLine1='Obere Str.75', ZipCode=12209, City='westwood', State='MA'
Where  DOA_ID=4;
```

SQL to delete a record

SQL statement that **delete** a record in one of the tables

Entity_Name: patient

before update:

P_ID	A_ID	Pr_ID	D_ID	DO_ID	FirstName	LastName	Age	DOB	Gender	Phone	Email	SSN	MedicalHistory
1	1	3	5	3	Layla	Mardini	20	8/1/2002	female	111-111-1111	laylamardini@gmail.com	111-11-1111	No medical history
2	2	4	2	5	Mary	Maisa	25	8/5/1997	female	222-222-2222	marymaisa@gmail.com	222-22-2222	Diabetes Patient
3	3	2	2	2	Sam	Philip	30	6/4/1992	male	333-333-3333	samphilip@gmail.com	333-33-3333	No Medical History
4	4	5	3	1	Alexandre	Smith	NULL	1/22/1971	male	444-444-4444	alexandresmith@gmail.com	444-44-4444	Due to his age he
5	5	1	3	4	Andria	Mark	19	5/2/2003	NULL	555-555-5555	andriamark@gmail.com	555-55-5555	No Medical History
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 32 : before deleting record

after update:

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

P_ID	A_ID	Pr_ID	D_ID	DO_ID	FirstName	LastName	Age	DOB	Gender	Phone	Email	SSN	MedicalHistory
1	1	3	5	3	Layla	Mardini	20	8/1/2002	female	111-111-1111	laylamardini@gmail.com	111-11-1111	No medical history
2	2	4	2	5	Mary	Maisa	25	8/5/1997	female	222-222-2222	marymaisa@gmail.com	222-22-2222	Diabetes Patient
3	3	2	2	2	Sam	Philip	30	6/4/1992	male	333-333-3333	samphilip@gmail.com	333-33-3333	No Medical History
4	4	5	3	1	Alexandre	Smith	NULL	1/22/1971	male	444-444-4444	alexandresmith@gmail.com	444-44-4444	Due to his age he h
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 33 : after deleting record

Script :

```
DELETE FROM patient WHERE P_ID=5;
```

SQL to joins 2 tables

1. SQL statement that **joins** 2 tables, sort the resulting dataset on one of the attributes

   Script:

```
SELECT patient.P_ID, patient.FirstName,patient.LastName,
        patient_procedure.ProcedureName,patient_procedure.Price
From patient, patient_procedure
WHERE patient.Pr_ID=patient_procedure.Pr_ID
ORDER BY P_ID;
```

   Entities_Name: patient, patient_procedure

   Attribute: P_ID

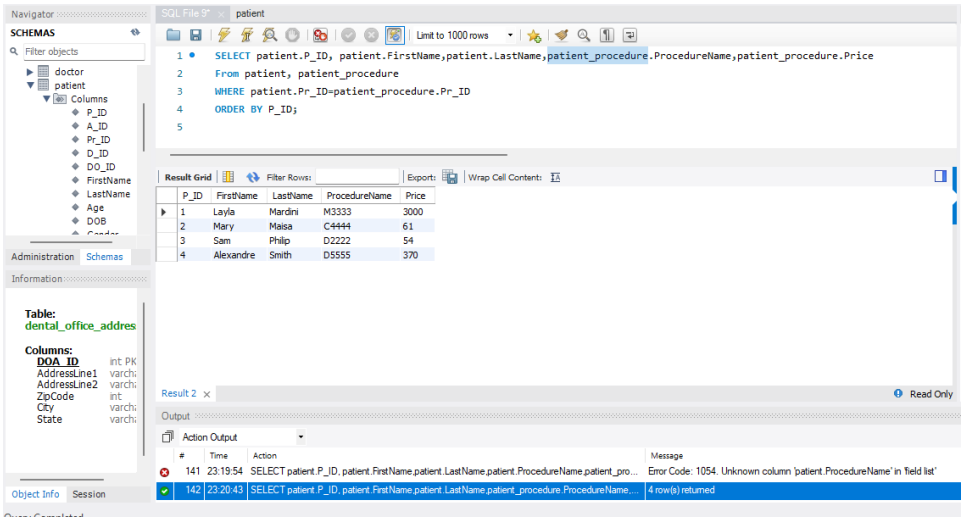

Figure 34 : join 1

2. SQL statement that **joins** 2 tables, sort the resulting dataset on one of the attributes

Script:

```
SELECT dental_office.DO_ID, dental_office.OfficeName,
        dental_office_address.AddressLine1, dental_office_address.AddressLine2,
        dental_office_address.ZipCode,dental_office_address.City,dental_office_addres
        s.State
FROM dental_office_address,dental_office
WHERE dental_office.DOA_ID=dental_office_address.DOA_ID
ORDER BY DO_ID;
```

Entities_Name: dental_office_address,dental_office

Attribute: DO_ID

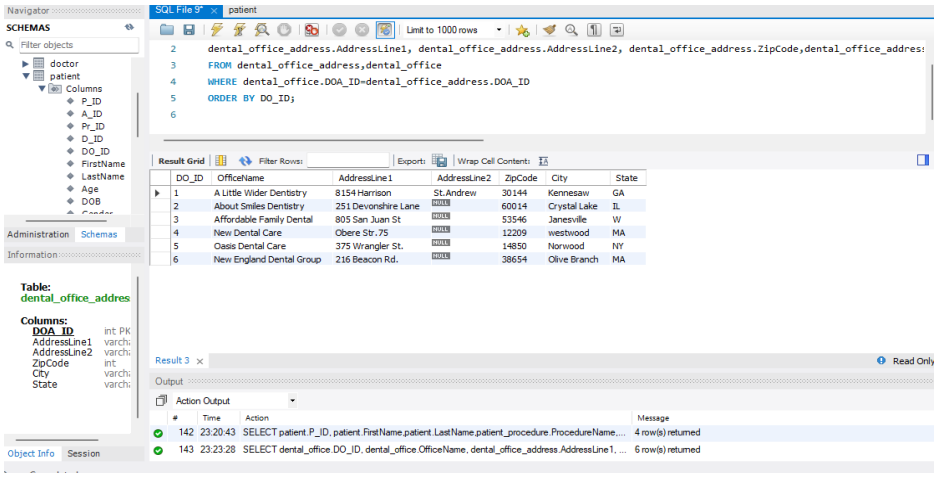

Figure 35 : join 2

Project final

My process at high level

1. Process of design, develop and implement
    a. Analyzed and narrowed down all choices and ideas of what the project can be and the finally chose to create a patient database.
    b. Creating the conceptual, logical & physical diagrams to help create and understand the project and data.
    c. Creating the database and adding data to it.
    d. Adjusting the Diagrams to the updates from the database.

2. Understanding the database:
    a. The database contains information about patients that visit the dentists in various dental offices.
    b. The database contains the addresses of the patients and the addresses of the dentist office they visit.
    c. It contains the doctors name with the procedure they are going to have with its price.

Lessons learned by doing project.

Throughout the project I have faced a lot of issues with the documentation because of some mistakes I have done in the physical diagram. This made me learn how to adjust my work and edit it while going through my work. One more thing that I have learnt is when I get an error, I don't need to start over with everything, but to try fixing the error and not stop, this happened because I lost a lot of time when I started over. One thing that I found out is that using a logical and conceptual diagram is very helpful although at the beginning I didn't think that they would be as helpful. The Data Dictionary Helped me a lot but even after creating it I found some issues in the implementation of the diagram because of so attribute types and requirements that I have set but weren't correct, so I had to adjust it afterwards.

Appendix