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3/25/2019

Project Deliverable 2

## Physical Database Design

### 1. SQL DDL

#### A. CREATING TABLES

Based on the logical design of the database submitted in Part 1, the following tables are created using SQL DDL. I just started by creating strong tables (such as ***Breast cancer type, treatment and Oncologist***) to simplify constraint creation.

```
-- Creating the Breast Cancer table
CREATE TABLE Breast_Cancer
(
-- columns to the Breast Cancer table
BCancer_ID int identity,
BCancer_Type Varchar(50) NOT NULL,
-- constraint on the Breast Cancer table
CONSTRAINT PK_Breast_Cancer PRIMARY KEY (BCancer_ID),
CONSTRAINT U1_Breast_Cancer UNIQUE(BCancer_Type)
);
-- End creating the Breast Cancer table

-- Creating the ONCOLOGIST table
CREATE TABLE Oncologist
(
-- columns to the Oncologist table
Oncologist_ID int identity,
```

```

First_Name varchar(30) NOT NULL,
Last_Name varchar(30) NOT NULL,
Phone_Number int,
-- constraint on the Oncologist table
CONSTRAINT PK_Oncologist PRIMARY KEY (Oncologist_ID)
);
-- End creating the Oncologist table

--Creating TREATMENT table
CREATE TABLE Treatment
(
-- columns to the TREATMENT table
Treatment_ID int identity,
Treatment_Type Varchar(50) NOT NULL,
Oncologist_ID int NOT NULL,
-- constraint on the TREATMENT table
CONSTRAINT PK_Treatment PRIMARY KEY (Treatment_ID),
CONSTRAINT U1_Treatment UNIQUE(Treatment_Type),
CONSTRAINT FK_Treatment FOREIGN KEY (Oncologist_ID) REFERENCES dbo.Oncologist(Oncologist_ID)
);
--- End creating TREATMENT table

-- Creating the PATIENT table
CREATE TABLE Patient
(
-- coulms to the PATIENT table
Patient_ID int identity,
First_Name varchar(30) NOT NULL,
Last_Name varchar(30) NOT NULL,
Date_of_Birth Datetime NOT NULL,
Gender varchar(5),
Phone_Number int,
Email varchar(30),
BCancer_ID int,

```

```

Treatment_ID int
-- constraint on the PATIENT table
CONSTRAINT PK_PatientTreatment PRIMARY KEY (Patient_ID),
CONSTRAINT FK1_Patient FOREIGN KEY (BCancer_ID) REFERENCES dbo.Breast_Cancer(BCancer_ID),
CONSTRAINT FK2_Patient FOREIGN KEY (Treatment_ID) REFERENCES dbo.Treatment(Treatment_ID)
);
-- End creating the PATIENT table

--Creating Address Table
CREATE TABLE Address
(
-- columns to the Address table
Address_ID int identity,
Street varchar(30) NOT NULL,
City varchar(20) NOT NULL,
State varchar(20) NOT NULL,
Country varchar(20) NOT NULL,
Patient_ID int NOT NULL,
-- constraints on the Oncologist table
CONSTRAINT PK_Address PRIMARY KEY (Address_ID),
CONSTRAINT FK_Address FOREIGN KEY (Patient_ID) REFERENCES dbo.patient(Patient_ID)
);
-- End creating the Address table

-- Creating the NURSE table
CREATE TABLE Nurse
(
-- columns to the NURSE table
Nurse_ID int identity,
First_Name varchar(30) NOT NULL,
Last_Name varchar(30) NOT NULL,
Speciality varchar(50),
-- constraint on the NURSE table

```

```

CONSTRAINT PK_Nurse PRIMARY KEY (Nurse_ID)
);
-- End creating the NURSE table

--Creating Visit Table
CREATE TABLE Visit
(
-- columns to the VISIT table
Visit_ID int identity,
Visit_Date datetime NOT NULL,
Visit_Time Datetime NOT NULL,
Oncologist_ID int NOT NULL,
Patient_ID int NOT NULL,
Nurse_ID int NOT NULL,
-- constraint on the VISIT table
CONSTRAINT PK_Visit PRIMARY KEY (Visit_ID),
CONSTRAINT FK1_Visit FOREIGN KEY (Oncologist_ID) REFERENCES dbo.Oncologist(Oncologist_ID),
CONSTRAINT FK2_Visit FOREIGN KEY (Patient_ID) REFERENCES dbo.patient(Patient_ID),
CONSTRAINT FK3_Visit FOREIGN KEY (Nurse_ID) REFERENCES dbo.Nurse(Nurse_ID)
);
--- End creating VISIT table

--Creating PATIENT_Visit_History Table
CREATE TABLE PATIENT_Visit_History
(
-- columns to the Patient Visit History table
Patient_Visit_ID int identity,
Visit_Blood_Pressure varchar(10) NOT NULL,
Visit_Pulse varchar(10) NOT NULL,
Visit_Weight varchar(10) NOT NULL,
Visit_drop_status varchar(10),
Visit_Oncologist_Note varchar(200),
Visit_ID int NOT NULL,

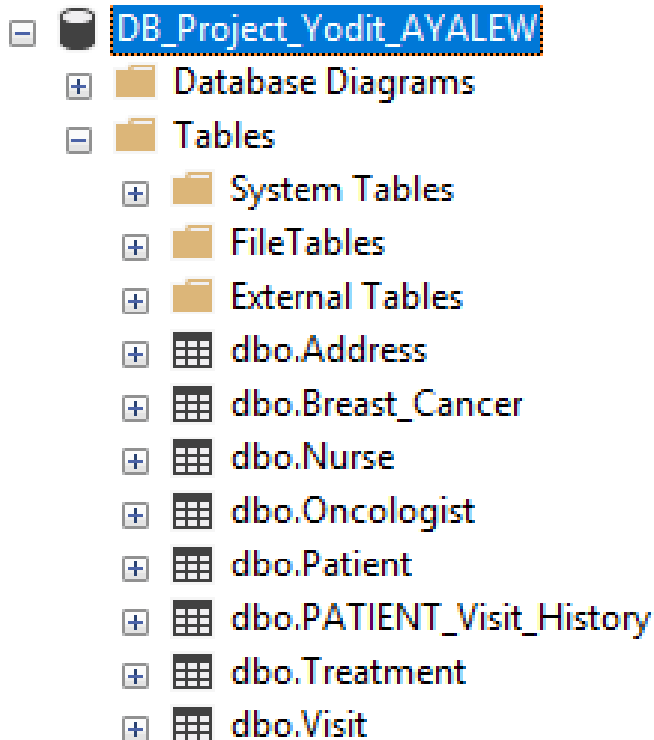
```

```
-- constraint on the Patient Visit History table
CONSTRAINT PK_Patient_Visit_History PRIMARY KEY (Patient_Visit_ID),
CONSTRAINT FK1_pPatient_Hisitory_Visit FOREIGN KEY (Visit_ID) REFERENCES dbo.Visit(Visit_ID)

);

--- End creating Patient Visit History table
```

Here is the screen shot of the created tables in my database named **DB\_Project\_Yodit\_AYALEW**.



## B. Modifying Tables

After creating tables based on the logical design, I've noticed that some of the tables require modification. For this, I also used SQL DDL as follows:

- Oncologist Table - just because the int data type of phone did not enable to insert in the format of phone 000-000-0000, I changed its data type from int to varchar.

```
ALTER TABLE Oncologist
```

```
ALTER COLUMN Phone_Number varchar(12);
```

- Patient and PATIENT\_Visit\_History Tables - the same issue like Oncologist table.

```
ALTER TABLE Patient
```

```
ALTER COLUMN Phone_Number varchar(12);
```

```
ALTER TABLE PATIENT_Visit_History
```

```
ALTER COLUMN Phone_Number varchar(12);
```

## 2. SQL DML

### A.Inserting Data

#### INSERT STATEMENT

#### Breast Cancer Table

##### Option 1:

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('DCIS');
```

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('LCIS');
```

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('IDC');
```

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('ILC');
```

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('IBC');
```

	BCancer_ID	BCancer_Type
1	1	DCIS
2	5	IBC
3	3	IDC
4	4	ILC
5	2	LCIS

##### Option 2:

Instead of inserting one row at a time, it is possible to execute one line of code to insert a number of rows.

```
INSERT INTO Breast_Cancer(BCancer_Type) VALUES('DCIS'), ('LCIS'), ('IDC'), ('ILC'), ('IBC');
```

#### INSERT DATA to Oncologist Table

```
INSERT INTO Oncologist(First_Name, Last_Name, Phone_Number)
```

```
VALUES
```

```
('Banu', 'Arun', '571-400-6728'),  
( 'Jose', 'Basela', '240-511-3982'),  
( 'Harold', 'Burstein', '731-267-8940'),  
( 'Saundra', 'Buys', '240-671-2307'),  
( 'Melody', 'Cobleigh', '571-239-5125'),  
( 'Susan', 'Domchek', '740-678-9012'),  
( 'Kevin', 'Fox', '240-672-3784'),  
( 'William', 'Gradishar', '201-510-7232'),  
( 'Alex', 'Peter', '240-654-7080'),  
( 'George', 'Raptis', '5713267890');
```

#### INSERT Data to Treatment Table

```
INSERT INTO Treatment(Treatment_Type, Oncologist_ID)
```

```
VALUES
```

```
('chemotherapy', 18),  
( 'hormonetheraphy', 23),  
( 'surgery', 19),  
( 'radiation theraphy', 20),  
( 'targeted theraphy', 21);
```

#### INSERT Data to Patient table

```
INSERT INTO Patient (First_Name, Last_Name, Email, Gender,Phone_Number, Date_of_Birth,  
BCancer_ID, Treatment_ID)
```

```
VALUES
```

```
('Kare', 'Dolligon', 'kdolligon0@columbia.edu', 'F', '115-691-6939', '09/27/2018', 4, 3),  
( 'Faydra', 'Abrey', 'fabrey1@newyorker.com', 'F', '425-113-1150', '05/07/2018', 1, 2),  
( 'Cornelle', 'Saunders', 'csaunders2@google.nl', 'F', '936-534-0236', '03/05/2019', 3, 5),  
( 'Jacinthe', 'Giscken', 'jgiscken3@cbslocal.com', 'F', '941-962-6078', '09/03/2018', 2, 1),  
( 'Tomas', 'Bragger', 'tbragger4@cnn.com', 'U', '947-724-0304', '12/08/2018', 5, 4),  
( 'Jeanie', 'Ebbins', 'jebbins5@eventbrite.com', 'F', '405-977-0341', '03/14/2019', 5, 2),
```



```
( 'Bell', 'O''Reilly', 'boreilly6@gizmodo.com', 'F', '603-586-6623', '06/23/2018', 3,4),
( 'Dacia', 'Weller', 'dweller7@imageshack.us', 'F', '973-998-6983', '09/03/2018', 5,3),
( 'Joe', 'Goves', 'jgoves8@blogtalkradio.com', 'U', '258-275-4674', '04/24/2018', 4,1),
( 'Christel', 'Bussell', 'cbussella@github.com', 'F', '369-945-8016', '08/16/2018', 3,5),
( 'Wilmar', 'O''Crevan', 'wocrevanb@so-net.ne.jp', 'U', '188-498-9730', '06/03/2018', 5,5),
( 'Janet', 'St. Ledger', 'jstledgere@discuz.net', 'F', '289-102-5641', '04/11/2018', 3,2),
( 'Gunilla', 'Reuben', 'greubeng@ebay.co.uk', 'F', '976-710-7397', '09/10/2018', 4,3),
( 'Addia', 'Luety', 'aluetyh@mac.com', 'F', '262-363-8177', '05/19/2018', 2,2),
( 'Mercy', 'Odd', 'moddi@wsj.com', 'F', '935-283-4203', '05/30/2018', 5,1),
( 'Anselma', 'Gricks', 'agricksk@china.com.cn', 'F', '661-122-4990', '03/04/2019', 4,5),
( 'Maitilde', 'MacGilfoyle', 'mmacgilfoylem@tmall.com', 'F', '687-902-1125',
'10/15/2018', 3,3);
```

## Address of Patients

```
INSERT INTO Address (Street, City, State, Country, Patient_ID)
```

```
VALUES
```

```
( '17627 Carpenter Street', 'Newark', 'New Jersey', 'United States', 1),
( '740 Sugar Center', 'Tucson', 'Arizona', 'United States', 2),
( '1 Caliangt Pass', 'Louisville', 'Kentucky', 'United States', 3),
( '95 Morning Pass', 'Atlanta', 'Georgia', 'United States', 4),
( '636 Maple Hill', 'Naples', 'Florida', 'United States', 5),
( '55 Swallow Hill', 'Des Moines', 'Iowa', 'United States', 6),
( '886 Crest Line Alley', 'Van Nuys', 'California', 'United States', 7),
( '8983 Golf Course Place', 'Shawnee Mission', 'Kansas', 'United States', 8),
( '8 McBride Plaza', 'Washington', 'District of Columbia', 'United States', 9),
( '80 Brentwood Road', 'Topeka', 'Kansas', 'United States', 10),
( '9161 Everett Hill', 'Columbus', 'Ohio', 'United States', 17),
( '231 Cascade Pass', 'Silver Spring', 'Maryland', 'United States', 11),
( '5176 Caliangt Lane', 'Corpus Christi', 'Texas', 'United States', 12),
( '2 Hazelcrest Junction', 'Ann Arbor', 'Michigan', 'United States', 13),
( '16201 Claremont Trail', 'Panama City', 'Florida', 'United States', 14),
```

```
( '28 Marcy Road', 'Peoria', 'Illinois', 'United States',15),  
( '78 Claremont Lane', 'Columbus', 'Ohio', 'United States',16);
```

## Nurse Table

```
insert into Nurse (First_Name, Last_Name, Speciality) values ('Jacenta', 'Lohden', 'RN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Tobe', 'Howley', 'NP');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Bobbie', 'Stot', 'CNS');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Katheryn', 'Bygate', 'OCN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Lucille', 'Leebeter', 'OCN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Rori', 'Russen', 'RN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Denise', 'L' 'Hommee', 'NP');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Clarie', 'Groll', 'OCN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Emmye', 'Flatt', 'OCN');  
insert into Nurse (First_Name, Last_Name, Speciality) values ('Binny', 'Margrem', 'RN');
```

## Visit Table

### Option1

```
INSERT INTO Visit(Visit_Date, Visit_Time, Oncologist_ID, Patient_ID, Nurse_ID)
```

```
VALUES
```

```
( '08/19/2018', '12:11 PM', 18, 1, 3),  
( '09/22/2018', '9:33 AM', 20, 2, 4),  
( '12/17/2018', '8:49 AM', 21, 3, 6),  
( '02/11/2019', '10:40 AM', 22, 4, 5),  
( '11/26/2018', '3:53 PM', 23, 5, 1),  
( '11/23/2018', '3:24 PM', 24, 6, 9),  
( '10/08/2018', '4:03 PM', 27, 7, 10),  
( '12/12/2018', '1:15 PM', 25, 4, 6),  
( '09/22/2018', '2:11 PM', 20, 3, 6),
```

```
( '04/22/2018', '3:07 PM', 26, 2, 2),
( '02/08/2019', '11:07 AM', 19, 12, 3),
( '07/22/2018', '1:03 PM', 20,17, 7);
```

## **Option 2:Insert random data into a table that has a foreign key**

```
INSERT INTO Visit (Visit_Date, Visit_Time, Oncologist_ID, Patient_ID, Nurse_ID)
VALUES
( '06/25/2018', '9:21 AM', 22, 6,(SELECT Nurse_ID FROM (SELECT Nurse_ID FROM Nurse ORDER BY
dbms_random.VALUE) WHERE ROWNUM = 1));
```

## **Patient Visit History Table**

```
INSERT INTO PATIENT_Visit_History (Visit_Blood_Pressure, Visit_Pulse, Visit_Weight,
Visit_drop_status, Visit_Oncologist_Note, Visit_ID)
```

```
VALUES
(121/85, 74, 110, 'No', 'Change Theraphy', 22),
(141/76, 57, 81, 'YES', 'Improved', 17),
(117/64, 95, 114, 'NO', 'Change Theraphy', 50),
(113/63, 100, 97, 'NO', 'Change Theraphy', 6),
(103/72, 80, 102, 'NO', 'Change Theraphyn', 37),
(129/68, 61, 107, 'NO', 'Change Theraphy', 50),
(177/97, 67, 84, 'NO', 'Improved', 9),
(127/96, 79, 92, 'NO', 'Improved', 43),
(167/64, 107, 108, 'NO', 'Improved', 41),
(156/61, 79, 101, 'NO', 'Improved', 33),
(117/85, 109, 112, 'YES', 'Improved', 45),
(139/96, 96, 96, 'NO', 'Less Hope', 50),
(140/82, 70, 86, 'NO', 'Less Hope', 38),
(144/82, 92, 93, 'NO', 'Less Hope', 39),
(167/71, 57, 81, 'NO', 'Change Theraphyn', 41),
(170/68, 104, 90, 'NO', 'Change Theraphy', 22),
```

```
(148/93, 68, 117, 'NO', 'Change Theraphy', 27),
(118/74, 90, 108, 'NO', 'Change Theraphy', 25),
(176/93, 57, 83, 'NO', 'Improved', 13),
(116/82, 57, 91, 'YES', 'Improved', 14),
(129/97, 95, 99, 'NO', 'Improved', 8);
```

## B. Checking Constraints

In order to check that all constraints mentioned in the logical design are addressed in the creation of tables, the following test are made as a sample.

### UNIQUE Constraint

```
INSERT INTO Treatment(Treatment_Type, Oncologist_ID)
VALUES
('chemotherapy', 30);
```

Response:

Msg 2627, Level 14, State 1, Line 18

Violation of UNIQUE KEY constraint 'U1\_Treatment'. Cannot insert duplicate key in object 'dbo.Treatment'. The duplicate key value is (chemotherapy)

### Foreign Key Constraint

```
INSERT INTO Treatment(Treatment_Type, Oncologist_ID)
VALUES
('chemoLates', 30);
```

Response:

Msg 547, Level 16, State 0, Line 18

The INSERT statement conflicted with the FOREIGN KEY constraint "FK\_Treatment". The conflict occurred in database "DB\_Project\_Yodit\_AYALEW", table "dbo.Oncologist", column 'Oncologist\_ID'.

### Data Type Constraint

```
INSERT INTO Patient (First_Name, Last_Name, Email, Gender,Phone_Number, Date_of_Birth,
BCancer_ID, Treatment_ID)
VALUES
('Kare', 'Dolligon', 'kdolligon@columbia.edu', 'F', '115-691-6939', '123456', 4, 3);
```

Response:

The conversion of a varchar data type to a datetime data type resulted in an out-of-range value.

### 3. Answering Sample Data Questions

#### 1. Patient By Breast Cancer Type

```
CREATE VIEW PatientsByCancerType AS
```

```
SELECT First_Name, Last_Name, BCancer_Type  
FROM Patient  
JOIN Breast_Cancer ON Patient.BCancer_ID = Breast_Cancer.BCancer_ID;
```

	First_Name	Last_Name	BCancer_Type
1	Kare	Dolligon	ILC
2	Faydra	Abrey	DCIS
3	Comelle	Saunders	IDC
4	Jacinthe	Giscken	LCIS
5	Tomas	Bragger	IBC
6	Jeanie	Ebbins	IBC
7	Bell	O'Reilly	IDC
8	Dacia	Weller	IBC
9	Joe	Goves	ILC

#### 2. Patient By Treatment Type

```
CREATE VIEW PatientByTreatmentType AS
```

```
SELECT First_Name, Last_Name, Treatment_Type  
FROM Patient  
JOIN Treatment ON Patient.Treatment_ID = Treatment.Treatment_ID;
```

To see top 10 of the above view table

```
SELECT TOP (10) [First_Name]  
              , [Last_Name]  
              , [Treatment_Type]  
FROM [DB_Project_Yodit_AYALEW].[dbo].[PatientByTreatmentType]
```

	First_Name	Last_Name	Treatment_Type
1	Kare	Dolligon	surgery
2	Faydra	Abrey	homonetheraphy
3	Comelle	Saunders	targeted theraphy
4	Jacinthe	Giscken	chemotherapy
5	Tomas	Bragger	radiation theraphy
6	Jeanie	Ebbins	homonetheraphy
7	Bell	O'Reilly	radiation theraphy
8	Dacia	Weller	surgery
9	Joe	Goves	chemotherapy
10	Christel	Russell	targeted theraphy

### 3. Most common Breast Cancer Type

```
SELECT BCancer_Type, COUNT(*) AS Frequency
FROM PatientsByCancerType
GROUP BY BCancer_Type
ORDER BY COUNT(*) DESC;
```

	BCancer_Type	Frequency
1	IBC	5
2	IDC	5
3	ILC	4
4	LCIS	2
5	DCIS	1

### 4. Dominant Treatments

```
SELECT Treatment_Type, COUNT(*) AS Frequency
FROM PatientByTreatmentType
GROUP BY Treatment_Type
ORDER BY COUNT(*) ASC;
```

	Treatment_Type	Frequency
1	radiation theraphy	2
2	chemotherapy	3
3	homonetheraphy	4
4	surgery	4
5	targeted theraphy	4

## 5. Oncologists per Patient Size

```
SELECT Last_Name, COUNT(*) AS Frequency
FROM Oncologist
join Visit on Oncologist.Oncologist_ID = Visit.Oncologist_ID
GROUP BY Last_Name
ORDER By COUNT(*) DESC;
```

	Last_Name	Frequ
1	Burstein	8
2	Cobleigh	8
3	Fox	6
4	Gradishar	5
5	Domchek	5
6	Peter	4
7	Buys	4
8	Basela	4
9	Arun	3
10	Raptis	3

## 6. Assigned Oncologist and Nurse to Patients

- This is to show how to query data from three or more tables

```
Create View PatientByDoctorandNurse AS
SELECT Patient.Last_Name AS PatientName, Oncologist.Last_Name As OncologistName,
Nurse.Last_Name As NurseName
FROM Visit
join Oncologist on Visit.Oncologist_ID = Oncologist.Oncologist_ID
join Patient on Visit.Patient_ID = Patient.Patient_ID
join Nurse on Visit.Nurse_ID = Nurse.Nurse_ID;
```

- Top 10 patients

```
SELECT TOP (10) [PatientName]
, [OncologistName]
, [NurseName]
FROM [DB_Project_Yodit_AYALEW].[dbo].[PatientByDoctorandNurse]
```

	PatientName	OncologistName	NurseName
1	Dolligon	Arun	Stot
2	Abrey	Burstein	Bygate
3	Saunders	Buys	Russen
4	Giscken	Cobleigh	Leebeter
5	Bragger	Domchek	Lohden
6	Ebbins	Fox	Flatt
7	O'Reilly	Raptis	Margrem
8	Giscken	Gradishar	Russen
9	Saunders	Burstein	Russen
10	Abrey	Peter	Howley

## 7. Drop Status Frequency

```
SELECT visit_drop_status, COUNT(*) AS Frequency
FROM Patient_Visit_History
GROUP BY Visit_drop_status
ORDER BY COUNT(*) ASC;
```

	visit_drop_status	Frequency
1	YES	12
2	NO	88

## 8. Nurse and No. Of Assigned Patients

```
SELECT [NurseName], COUNT(*) AS Frequency
FROM [DB_Project_Yodit_AYALEW].[dbo].[PatientByDoctorandNurse]
GROUP BY NurseName
ORDER BY COUNT(*) DESC;
```

	NurseName	Frequenc
1	Russen	8
2	Stot	7
3	Bygate	6
4	Flatt	5
5	Howley	5
6	L'Hommee	5
7	Margrem	5
8	Leebeter	3
9	Lohden	3
10	Groll	3



## 9. More required types Nurse Speciality

```
SELECT Speciality, COUNT(*) AS Frequency
FROM Nurse
GROUP BY Speciality
ORDER BY COUNT(*) DESC;
```

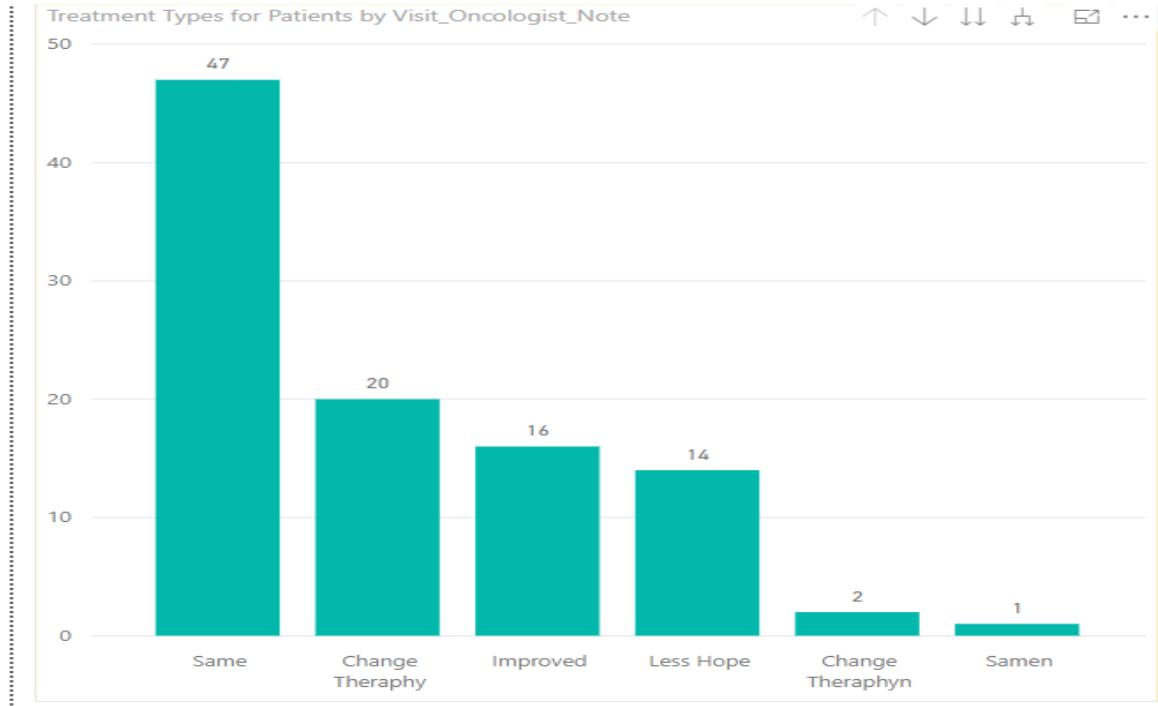
	Speciality	Frequency
1	OCN	4
2	RN	3
3	NP	2
4	CNS	1

## 4. Accessing Database using POWER BI

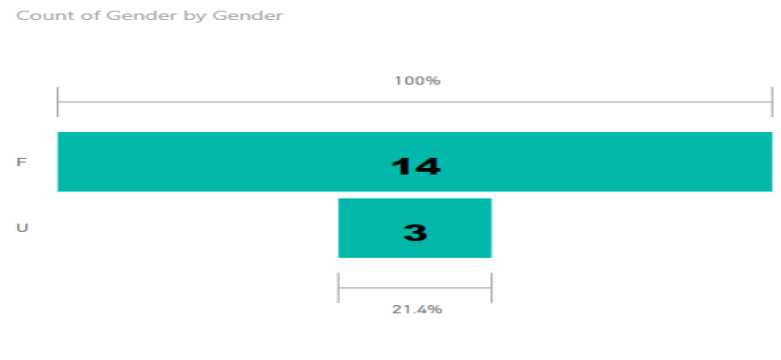
### 1. List of Oncologists

First_Name	Last_Name	Oncologist_ID	Phone_Number
Alex	Peter	26	240-654-7080
Banu	Arun	18	571-400-6728
George	Raptis	27	571-326-7890
Harold	Burstein	20	731-267-8940
Jose	Basela	19	240-511-3982
Kevin	Fox	24	240-672-3784
Maya	Solomon	28	
Melody	Cobleigh	22	571-239-5125
Sandra	Buys	21	240-671-2307
Susan	Domchek	23	740-678-9012

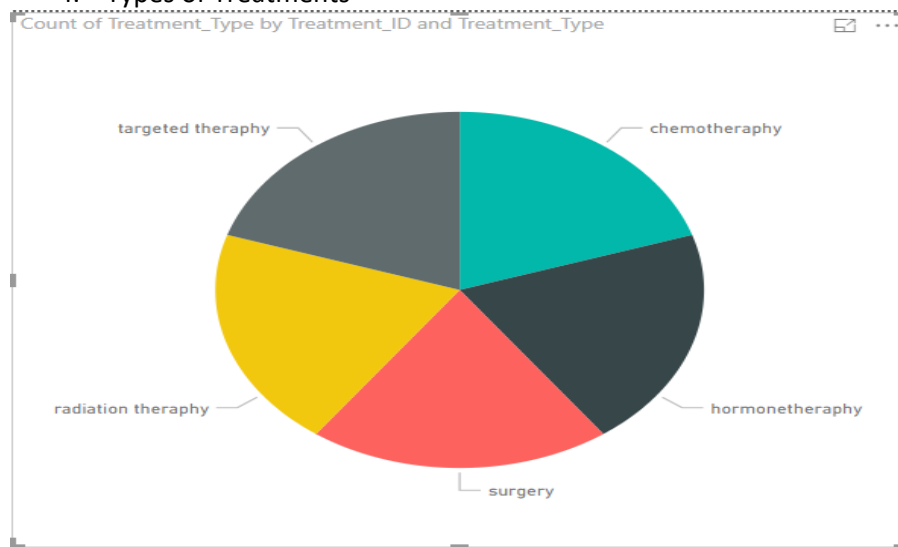
## 2. Treatment Types Distribution



## 3. Patients by Gender



#### 4. Types of Treatments



#### 5. Patient Visit History

Patient_Visit_ID	Visit_Blood_Pressure	Visit_Pulse	Visit_Weight	Visit_drop_status	Visit_Oncologist_Note	Visit_ID
1	1	74	110	No	Change Theraphy	22
2	1	57	81	YES	Improved	17
3	1	95	114	No	Change Theraphy	50
4	1	100	97	No	Change Theraphy	6
5	1	80	102	No	Change Theraphyn	37
6	1	61	107	No	Change Theraphy	50
7	1	67	84	No	Improved	9
8	1	79	92	No	Improved	43
9	2	107	108	No	Improved	41
10	2	79	101	No	Improved	33
11	1	109	112	YES	Improved	45
12	1	96	96	No	Less Hope	50
13	1	70	86	No	Less Hope	38
14	1	92	93	No	Less Hope	39
15	2	57	81	No	Change Theraphyn	41
16	2	104	90	No	Change Theraphy	22
17	1	68	117	No	Change Theraphy	27
18	1	90	108	No	Change Theraphy	25
19	1	57	83	No	Improved	13
20	1	57	91	YES	Improved	14
21	1	95	99	No	Improved	8
22	1	92	119	No	Improved	19
23	1	64	90	No	Improved	9
24	1	70	94	No	Change Theraphy	5
25	1	91	84	No	Change Theraphy	34
26	1	62	113	No	Change Theraphy	33
27	1	69	108	YES	Improved	25
28	1	70	87	No	Improved	21
29	2	57	100	No	Improved	6
30	2	99	119	No	Improved	10
31	1	70	93	YES	Improved	18
32	2	100	91	No	Less Hope	46
33	2	95	81	No	Less Hope	42
34	1	98	92	No	Less Hope	3
35	1	103	101	No	Less Hope	16
36	1	92	95	No	Change Theraphy	42
37	1	58	96	YES	Change Theraphy	39
38	1	70	98	No	Change Theraphy	45
39	2	81	119	No	Change Theraphy	37

## 6. **Reflection**

- Designing the database and actually creating it is very different. I had to go back and change many things after the fact. I have only realized the issue when I try to insert data in to the tables. All in all, what I learnt is that the database has to be tested with data properly before we give it to the end user.
- This database design didn't address security of the system as to who has access for what. If there were a part 3 deliverable for this project, I would definitely address that.
- I used Power BI because, I am familiar with it
- The data used is a dummy data