REQUIREMENTS:

---- Stored Procedure 1 ----

```
CREATE PROCEDURE CheckInsuranceCoverage
   @p_PatientID INT,
   @p_InsuranceCoverageType NVARCHAR(305) OUTPUT
AS
BEGIN
   SET @p_InsuranceCoverageType = NULL;

   SELECT @p_InsuranceCoverageType = Coverage
   FROM InsuranceCoverage
   WHERE PatientID = @p_PatientID;
END
```

```
DECLARE @InsuranceType NVARCHAR(255);
EXEC CheckInsuranceCoverage @p_PatientID = 101, @p_InsuranceCoverageType = @InsuranceType OUTPUT;
PRINT 'Insurance Coverage Type: ' + COALESCE(@InsuranceType, 'Not Available');
```

```
DECLARE @InsuranceType NVARCHAR(255);
EXEC CheckInsuranceCoverage @p_PatientID = 101, @p_InsuranceCoverageType = @InsuranceType OUTPUT;
PRINT 'Insurance Coverage Type: ' + COALESCE(@InsuranceType, 'Not Available');

DECLARE @InsuranceType1 NVARCHAR(255);
EXEC CheckInsuranceCoverage @p_PatientID = 102, @p_InsuranceCoverageType = @InsuranceType1 OUTPUT;
```

PRINT 'Insurance Coverage Type: ' + COALESCE(@InsuranceType1, 'Not Available');

DECLARE @InsuranceType2 NVARCHAR(255);

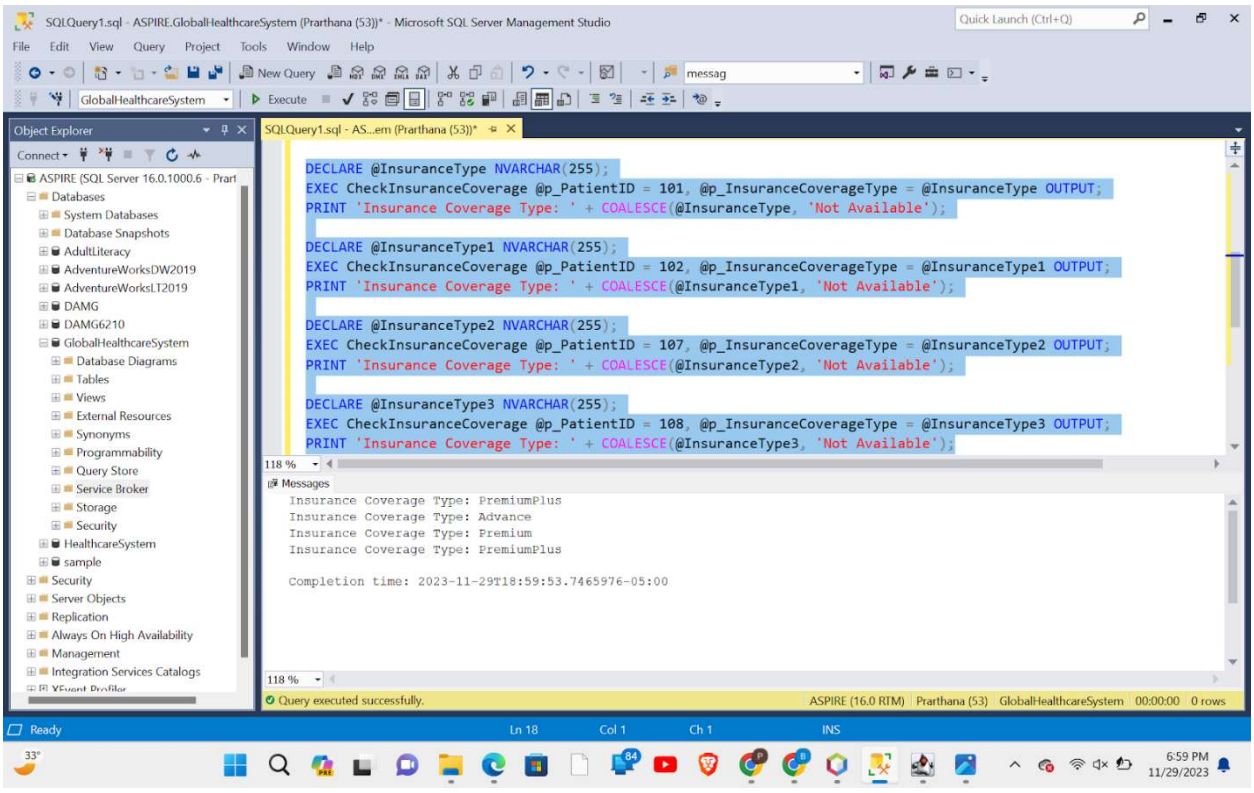
EXEC CheckInsuranceCoverage @p_PatientID = 107, @p_InsuranceCoverageType = @InsuranceType2 OUTPUT;

PRINT 'Insurance Coverage Type: ' + COALESCE(@InsuranceType2, 'Not Available');

DECLARE @InsuranceType3 NVARCHAR(255);

EXEC CheckInsuranceCoverage @p_PatientID = 108, @p_InsuranceCoverageType = @InsuranceType3 OUTPUT;

PRINT 'Insurance Coverage Type: ' + COALESCE(@InsuranceType3, 'Not Available');



---- Stored Procedure 2 ----

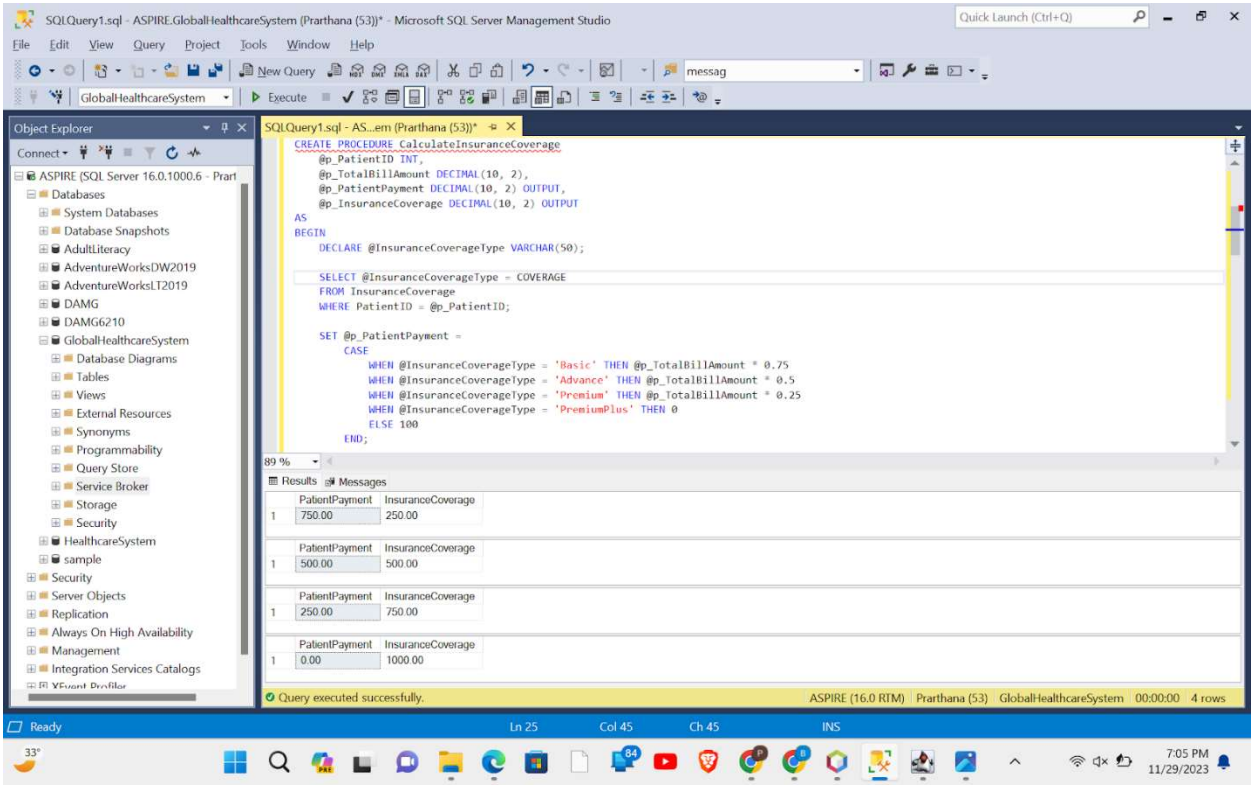
CREATE PROCEDURE CalculateInsuranceCoverage

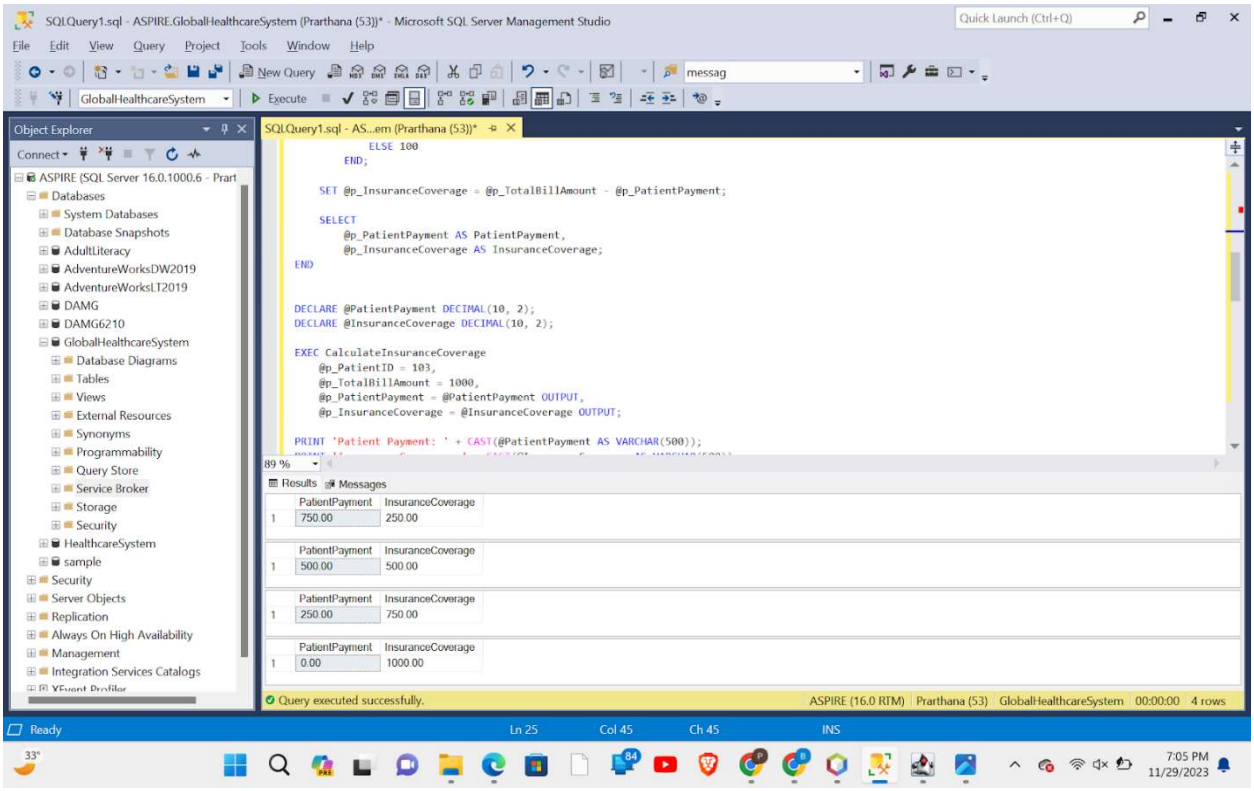
    @p_PatientID INT,

```
    @p_TotalBillAmount DECIMAL(10, 2),
    @p_PatientPayment DECIMAL(10, 2) OUTPUT,
    @p_InsuranceCoverage DECIMAL(10, 2) OUTPUT
AS
BEGIN
    DECLARE @InsuranceCoverageType VARCHAR(50);

    SELECT @InsuranceCoverageType = COVERAGE
    FROM InsuranceCoverage
    WHERE PatientID = @p_PatientID;

    SET @p_PatientPayment =
        CASE
            WHEN @InsuranceCoverageType = 'Basic' THEN @p_TotalBillAmount * 0.75
            WHEN @InsuranceCoverageType = 'Advance' THEN @p_TotalBillAmount * 0.5
            WHEN @InsuranceCoverageType = 'Premium' THEN @p_TotalBillAmount * 0.25
            WHEN @InsuranceCoverageType = 'PremiumPlus' THEN 0
            ELSE 100
        END;

    SET @p_InsuranceCoverage = @p_TotalBillAmount - @p_PatientPayment;

    SELECT
        @p_PatientPayment AS PatientPayment,
        @p_InsuranceCoverage AS InsuranceCoverage;
END

DECLARE @PatientPayment DECIMAL(10, 2);
DECLARE @InsuranceCoverage DECIMAL(10, 2);
```

```
EXEC CalculateInsuranceCoverage
    @p_PatientID = 103,
    @p_TotalBillAmount = 1000,
    @p_PatientPayment = @PatientPayment OUTPUT,
    @p_InsuranceCoverage = @InsuranceCoverage OUTPUT;

PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));

EXEC CalculateInsuranceCoverage
    @p_PatientID = 102,
    @p_TotalBillAmount = 1000,
    @p_PatientPayment = @PatientPayment OUTPUT,
    @p_InsuranceCoverage = @InsuranceCoverage OUTPUT;

PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));

EXEC CalculateInsuranceCoverage
    @p_PatientID = 107,
    @p_TotalBillAmount = 1000,
    @p_PatientPayment = @PatientPayment OUTPUT,
    @p_InsuranceCoverage = @InsuranceCoverage OUTPUT;

PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));
```

```
EXEC CalculateInsuranceCoverage
    @p_PatientID = 104,
    @p_TotalBillAmount = 1000,
    @p_PatientPayment = @PatientPayment OUTPUT,
    @p_InsuranceCoverage = @InsuranceCoverage OUTPUT;

PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));
```




SQLQuery1.sql - ASPIRE.GlobalHealthcareSystem (Prarthana (53))* - Microsoft SQL Server Management Studio
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Database Diagrams
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Security
HealthcareSystem
sample
Security
Server Objects
Replication
Always On High Availability
Management
Integration Services Catalogs
SQLQuery1.sql - AS...em (Prarthana (53))*
ELSE 100
END;
SET @p_InsuranceCoverage = @p_TotalBillAmount - @p_PatientPayment;
SELECT
@p_PatientPayment AS PatientPayment,
@p_InsuranceCoverage AS InsuranceCoverage;
END
DECLARE @PatientPayment DECIMAL(10, 2);
DECLARE @InsuranceCoverage DECIMAL(10, 2);
EXEC CalculateInsuranceCoverage
@p_PatientID = 103,
@p_TotalBillAmount = 1000,
@p_PatientPayment = @PatientPayment OUTPUT,
@p_InsuranceCoverage = @InsuranceCoverage OUTPUT;
PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
89 %
Results
Messages
PatientPayment InsuranceCoverage
1 750.00 250.00
PatientPayment InsuranceCoverage
1 500.00 500.00
PatientPayment InsuranceCoverage
1 250.00 750.00
PatientPayment InsuranceCoverage
1 0.00 1000.00
Query executed successfully.
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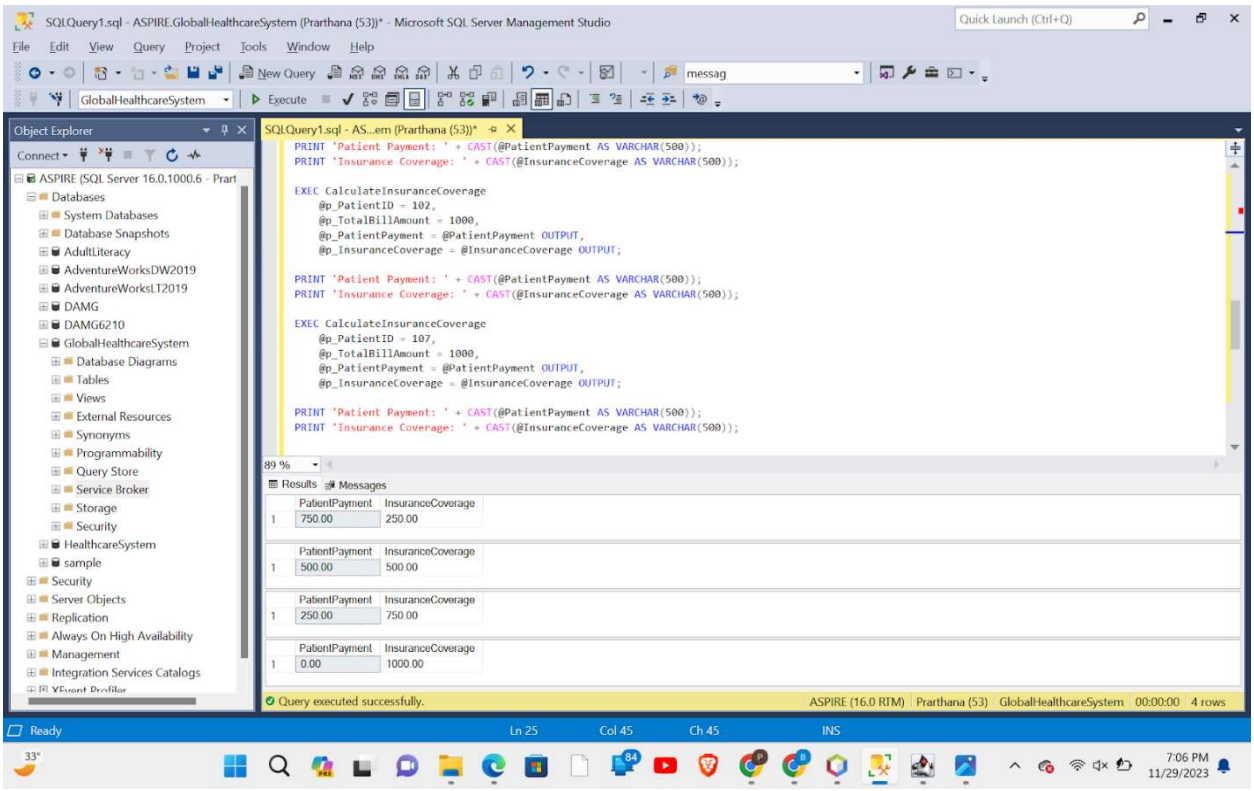
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sample
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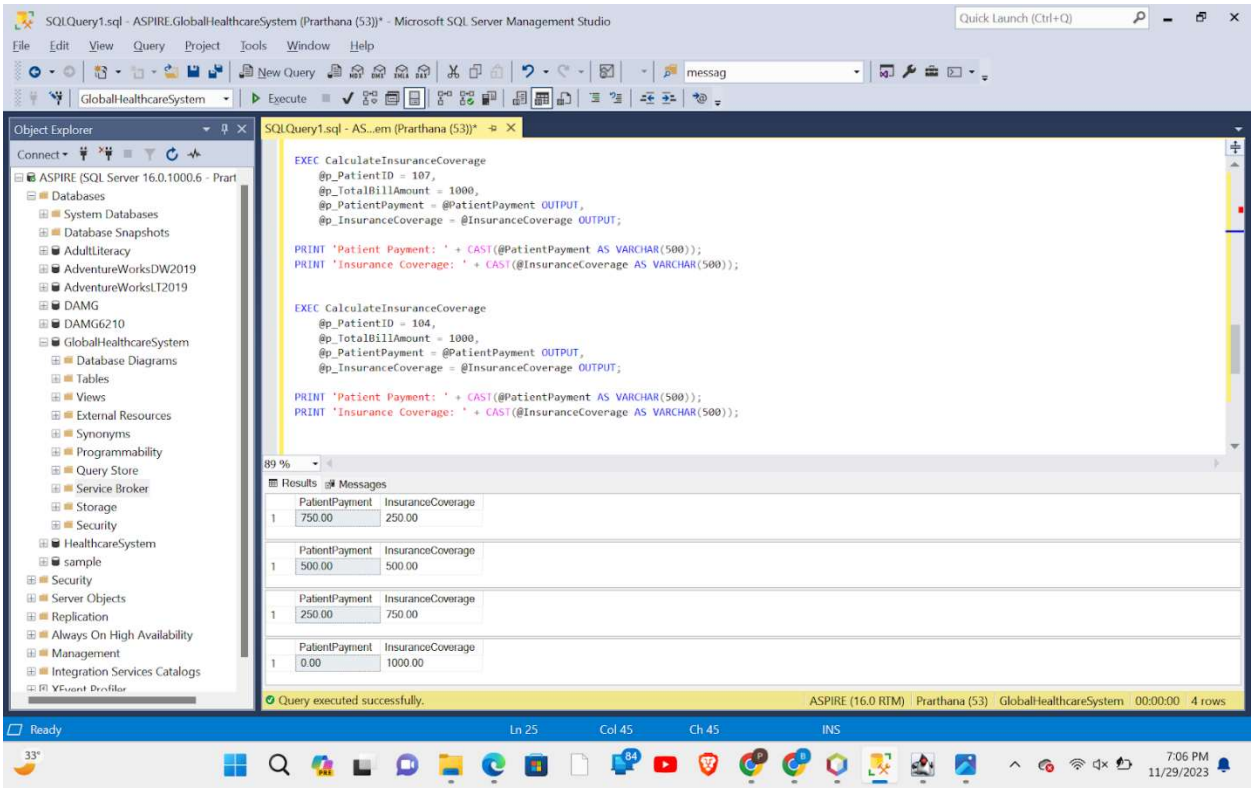
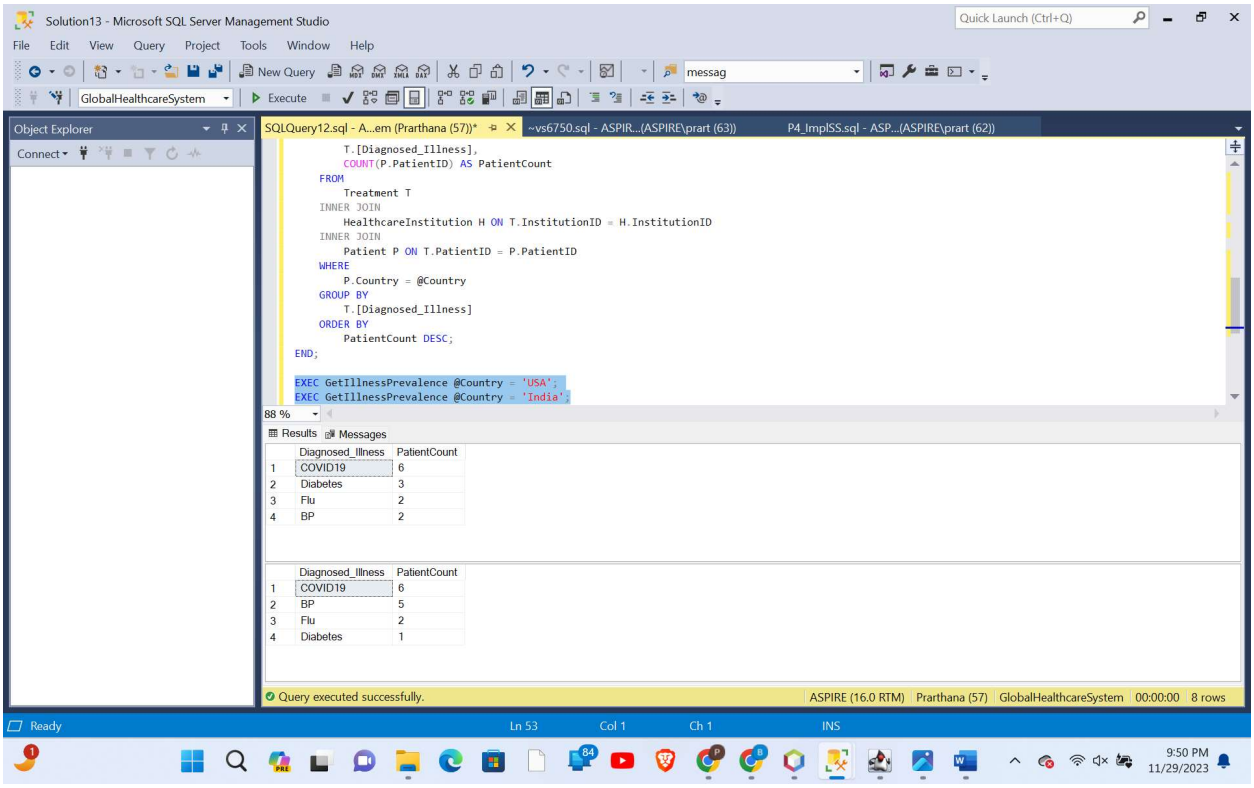
Always On High Availability
Management
Integration Services Catalogs
SQLQuery1.sql - AS...em (Prarthana (53))*
PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));
EXEC CalculateInsuranceCoverage
@p_PatientID = 102,
@p_TotalBillAmount = 1000,
@p_PatientPayment = @PatientPayment OUTPUT,
@p_InsuranceCoverage = @InsuranceCoverage OUTPUT;
PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));
EXEC CalculateInsuranceCoverage
@p_PatientID = 107,
@p_TotalBillAmount = 1000,
@p_PatientPayment = @PatientPayment OUTPUT,
@p_InsuranceCoverage = @InsuranceCoverage OUTPUT;
PRINT 'Patient Payment: ' + CAST(@PatientPayment AS VARCHAR(500));
PRINT 'Insurance Coverage: ' + CAST(@InsuranceCoverage AS VARCHAR(500));
89 %
Results
Messages
PatientPayment InsuranceCoverage
1 750.00 250.00
PatientPayment InsuranceCoverage
1 500.00 500.00
PatientPayment InsuranceCoverage
1 250.00 750.00
PatientPayment InsuranceCoverage
1 0.00 1000.00
Query executed successfully.
ASPIRE (16.0 RTM) Prarthana (53) GlobalHealthcareSystem 00:00:00 4 rows
Ready
Ln 25 Col 45 Ch 45 INS
7:06 PM
11/29/2023



---- Stored Procedure 3 ----

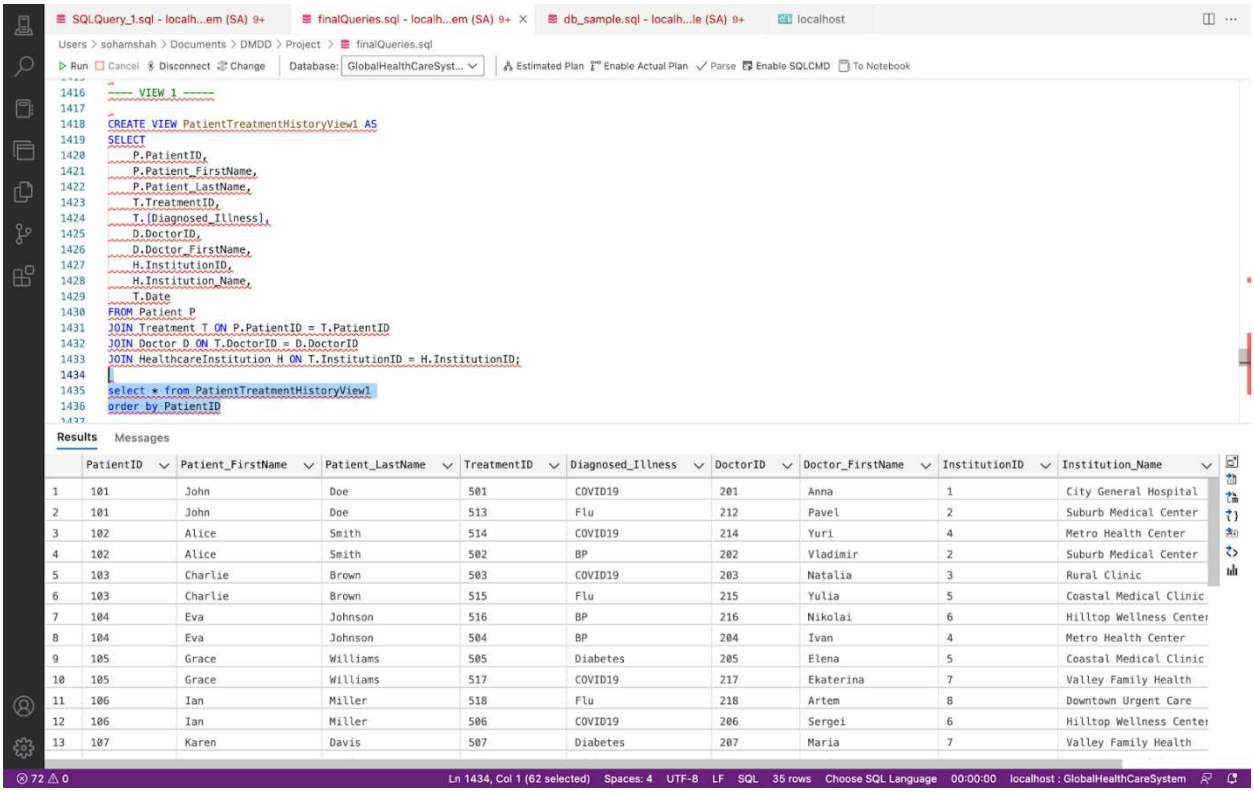
```
CREATE PROCEDURE GetIllnessPrevalence
    @Country VARCHAR(50)
AS
BEGIN
    SELECT
        T.[Diagnosed_Illness],
        COUNT(P.PatientID) AS PatientCount
    FROM
        Treatment T
    INNER JOIN
        HealthcareInstitution H ON T.InstitutionID = H.InstitutionID
    INNER JOIN
```

```
    Patient P ON T.PatientID = P.PatientID
WHERE
    P.Country = @Country
GROUP BY
    T.[Diagnosed_Illness]
ORDER BY
    PatientCount DESC;
END;

EXEC GetIllnessPrevalence @Country = 'USA';
EXEC GetIllnessPrevalence @Country = 'India';
```



---- VIEW 1 -----

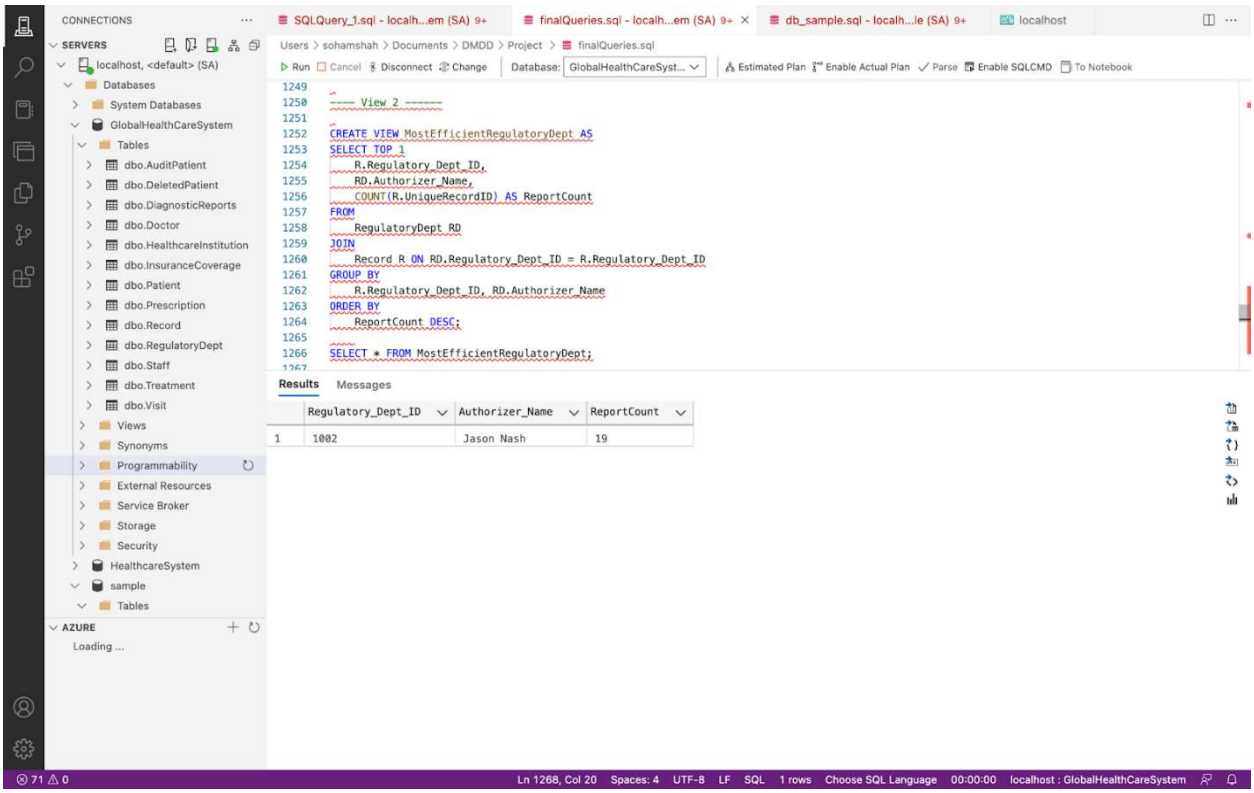
```
CREATE VIEW PatientTreatmentHistoryView1 AS
SELECT
    P.PatientID,
    P.Patient_FirstName,
    P.Patient_LastName,
    T.TreatmentID,
    T.[Diagnosed_Illness],
    D.DoctorID,
    D.Doctor_FirstName,
    H.InstitutionID,
    H.Institution_Name,
    T.Date
FROM Patient P
JOIN Treatment T ON P.PatientID = T.PatientID
JOIN Doctor D ON T.DoctorID = D.DoctorID
JOIN HealthcareInstitution H ON T.InstitutionID = H.InstitutionID;

select * from PatientTreatmentHistoryView1
order by PatientID
```



---- View 2 ------

```
CREATE VIEW MostEfficientRegulatoryDept AS
SELECT TOP 1
    R.Regulatory_Dept_ID,
    RD.Authorizer_Name,
    COUNT(R.UniqueRecordID) AS ReportCount
FROM
    RegulatoryDept RD
JOIN
    Record R ON RD.Regulatory_Dept_ID = R.Regulatory_Dept_ID
GROUP BY
    R.Regulatory_Dept_ID, RD.Authorizer_Name
ORDER BY
    ReportCount DESC;
```

SELECT * FROM MostEfficientRegulatoryDept;



---- VIew 3 -----

CREATE VIEW TreatmentPatientTurnover AS

SELECT

T.TreatmentID,

COUNT(P.PatientID) AS PatientCount,

COUNT(P.PatientID) * T.Cost AS TreatmentTurnover

FROM

Patient P

JOIN

TREATMENT T ON P.PatientID = T.PatientID

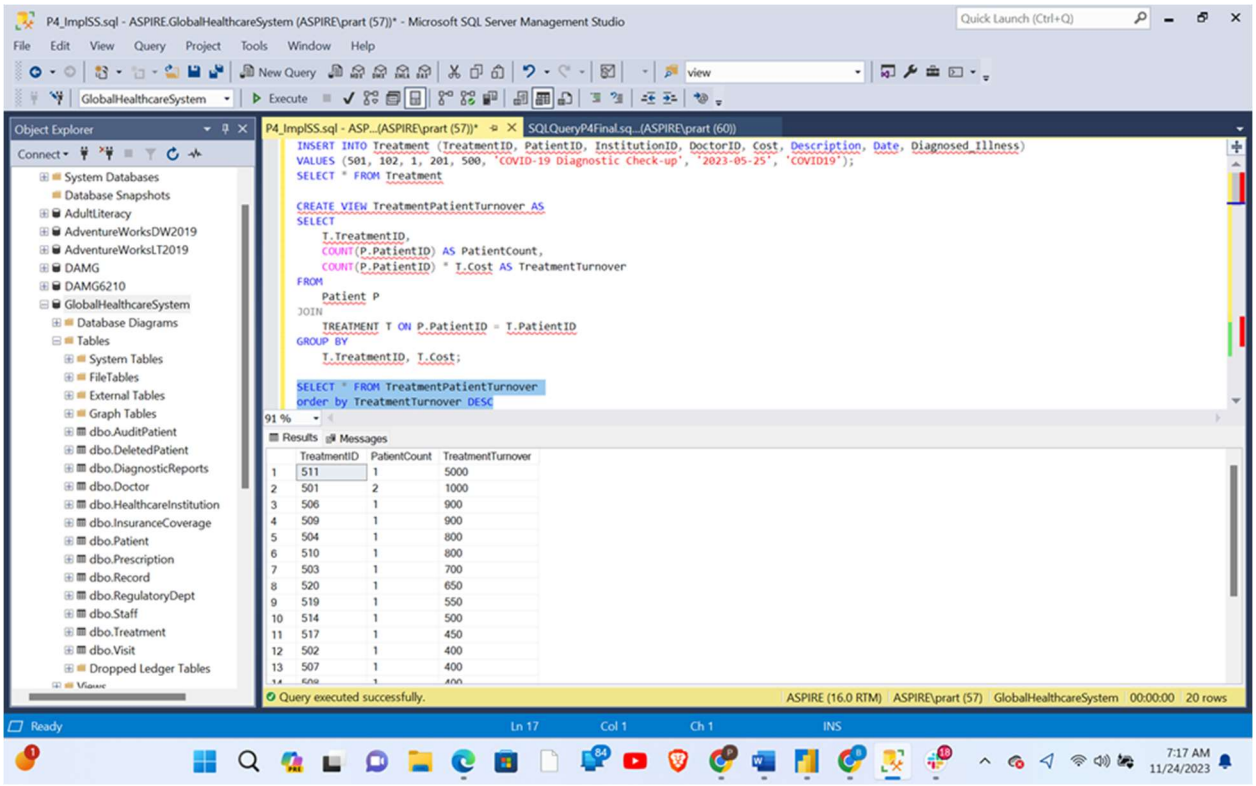
GROUP BY

T.TreatmentID, T.Cost;

(--Inserting a dummy value in treatment 501 to check

```
INSERT INTO Treatment (TreatmentID, PatientID, InstitutionID, DoctorID, Cost, Description, Date, Diagnosed_Illness)

VALUES (501, 102, 1, 201, 500, 'COVID-19 Diagnostic Check-up', '2023-05-25', 'COVID19');

SELECT * FROM Treatment)
```

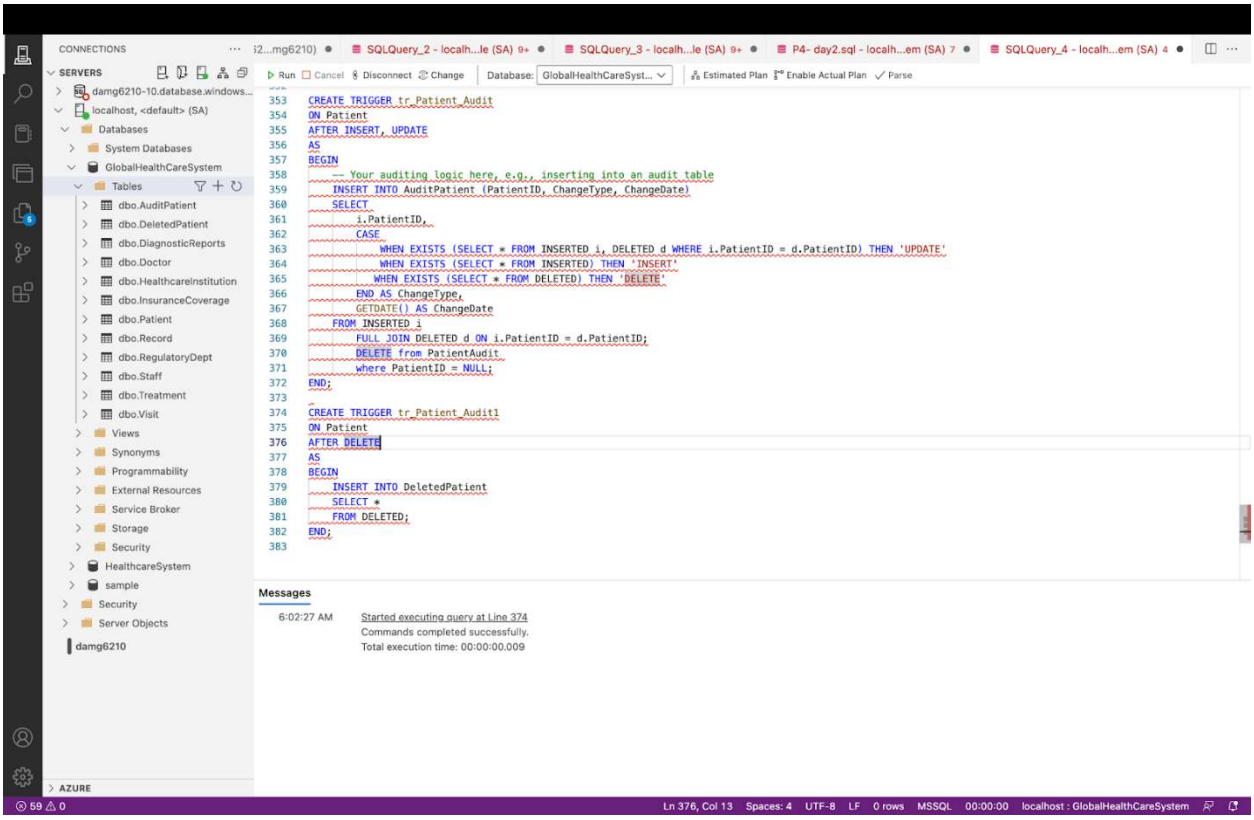
```
SELECT * FROM TreatmentPatientTurnover

order by TreatmentTurnover DESC
```



---- Trigger 1 ----

```
CREATE TRIGGER tr_Patient_Audit

ON Patient

AFTER INSERT, UPDATE

AS

BEGIN
```

```
  INSERT INTO AuditPatient (PatientID, ChangeType, ChangeDate)
  SELECT
      i.PatientID,
      CASE
          WHEN EXISTS (SELECT * FROM INSERTED i, DELETED d WHERE i.PatientID = d.PatientID) THEN
'UPDATE'
          WHEN EXISTS (SELECT * FROM INSERTED) THEN 'INSERT'
         WHEN EXISTS (SELECT * FROM DELETED) THEN 'DELETE'
      END AS ChangeType,
      GETDATE() AS ChangeDate
  FROM INSERTED i
      FULL JOIN DELETED d ON i.PatientID = d.PatientID;
      DELETE from AuditPatient
      where PatientID = NULL;
END;
```



```
END;
```

INSERT INTO Patient (PatientID, Patient_FirstName, Patient_MiddleName, Patient_LastName, Patient_Phone_Num,

Patient_Date_of_Birth, Sex, Height, Weight, Blood_Group, Address, Country,

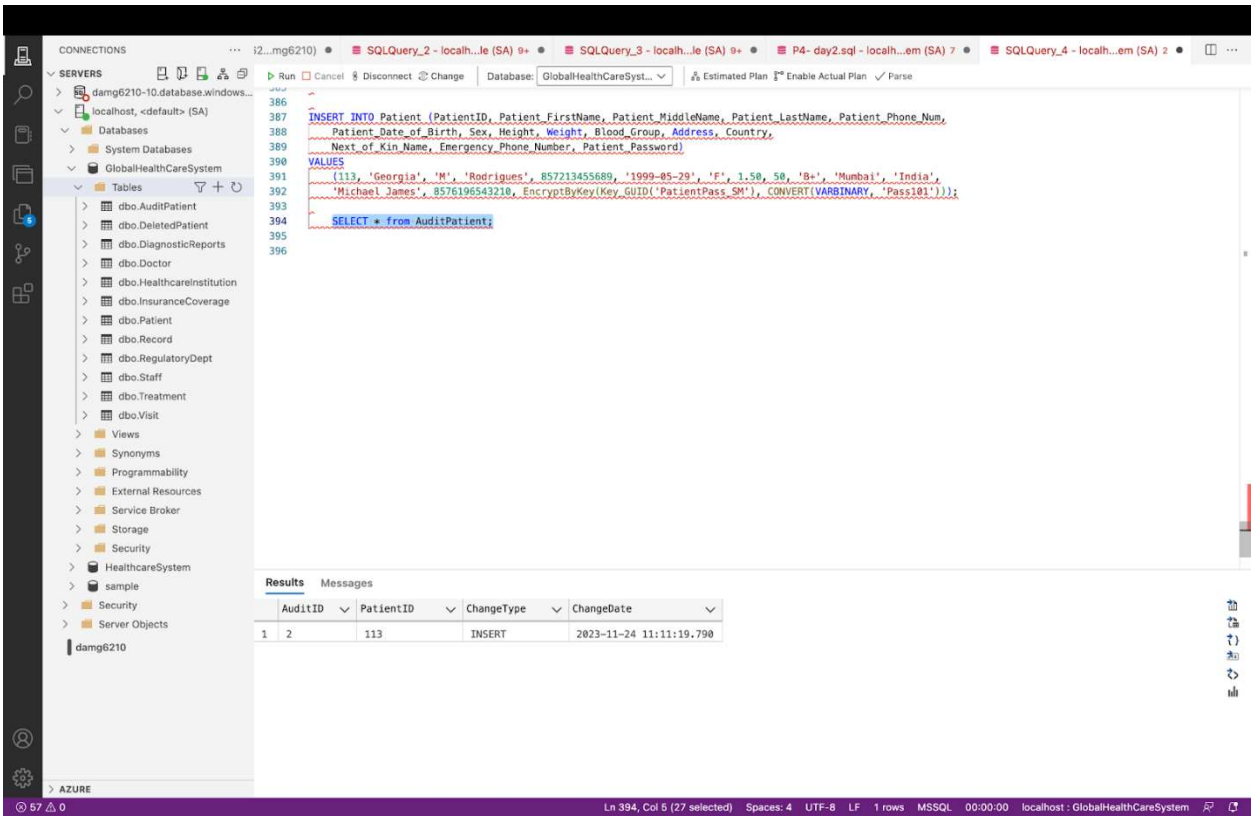
Next_of_Kin_Name, Emergency_Phone_Number, Patient_Password)

VALUES

(113, 'Georgia', 'M', 'Rodrigues', 857213455689, '1999-05-29', 'F', 1.50, 50, 'B+', 'Mumbai', 'India',

'Michael James', 8576196543210, EncryptByKey(Key_GUID('PatientPass_SM'), CONVERT(VARBINARY, 'Pass101')));

SELECT * from AuditPatient;

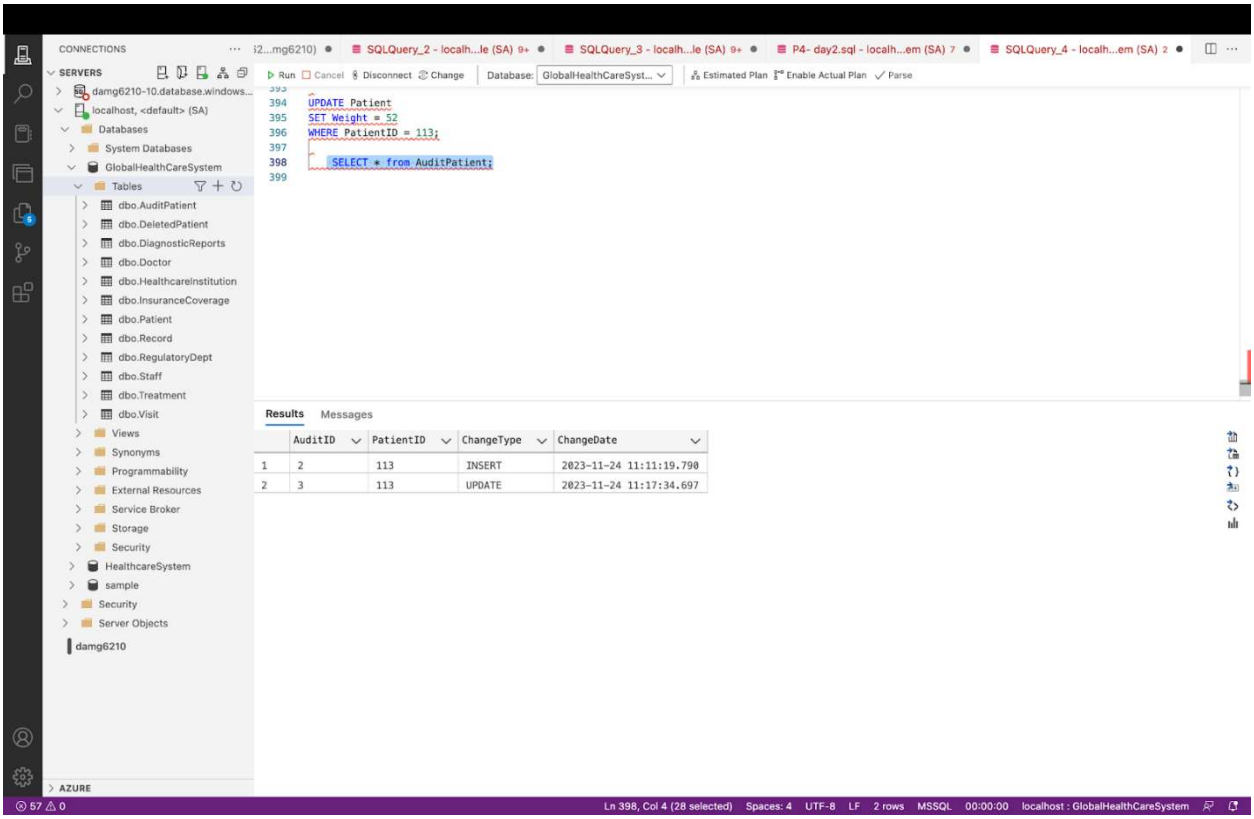


UPDATE Patient

SET Weight = 52

WHERE PatientID = 113;

SELECT * from AuditPatient;

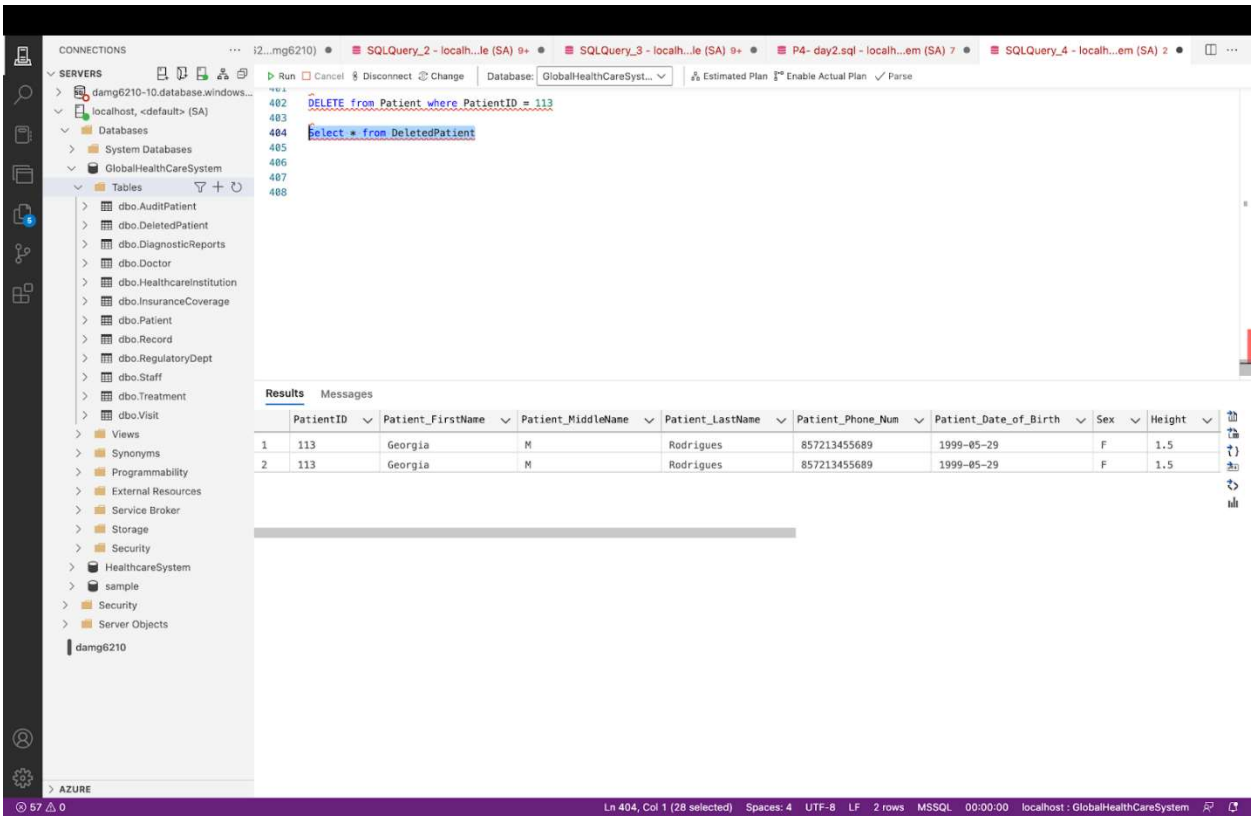


---- Trigger 2 ----

```
CREATE TRIGGER tr_Patient_Audit1
ON Patient
AFTER DELETE
AS
BEGIN
  INSERT INTO DeletedPatient
  SELECT *
  FROM DELETED;
END;
```

DELETE from Patient WHERE PatientID = 113

Select * from DeletedPatient



---- Trigger 3 ----

CREATE TRIGGER tr_Patient_ValidateEmergencyPhoneNumber

ON Patient

AFTER INSERT, UPDATE

AS

BEGIN

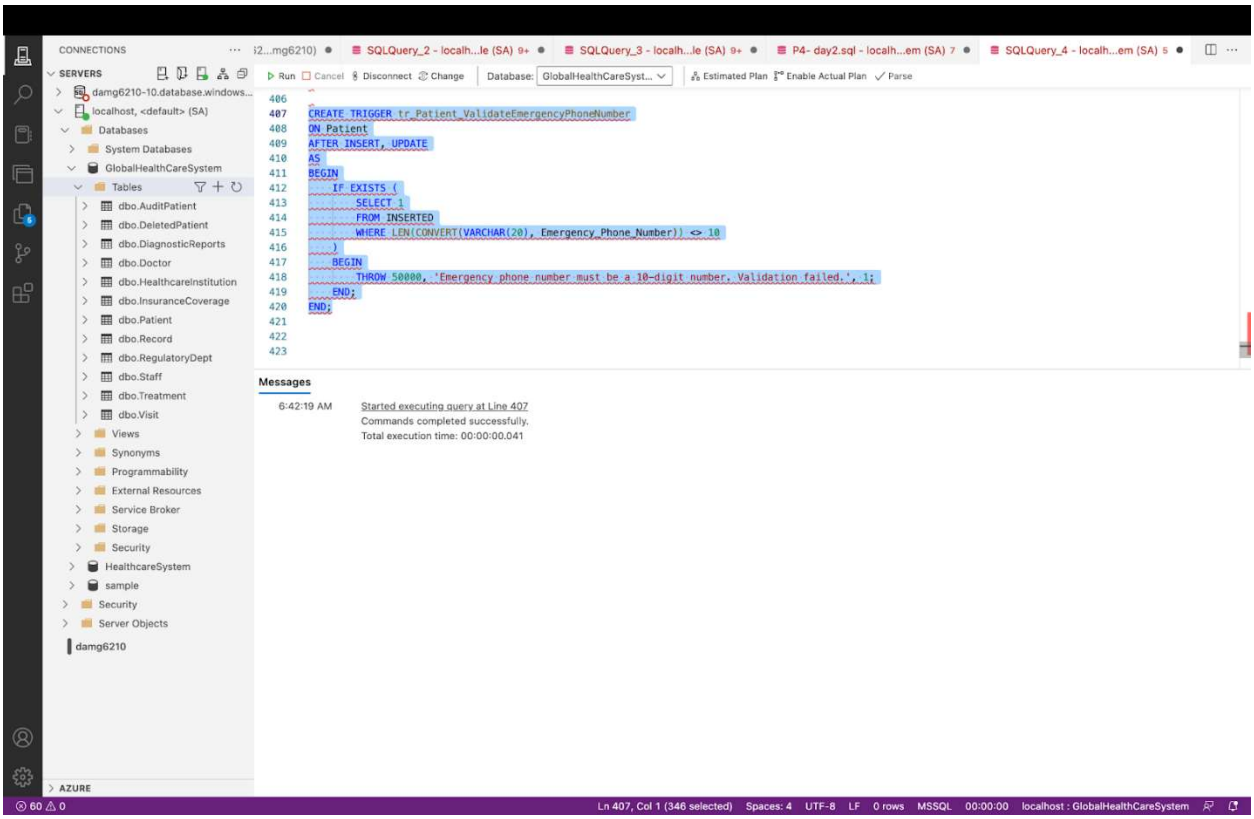
  IF EXISTS (

    SELECT 1

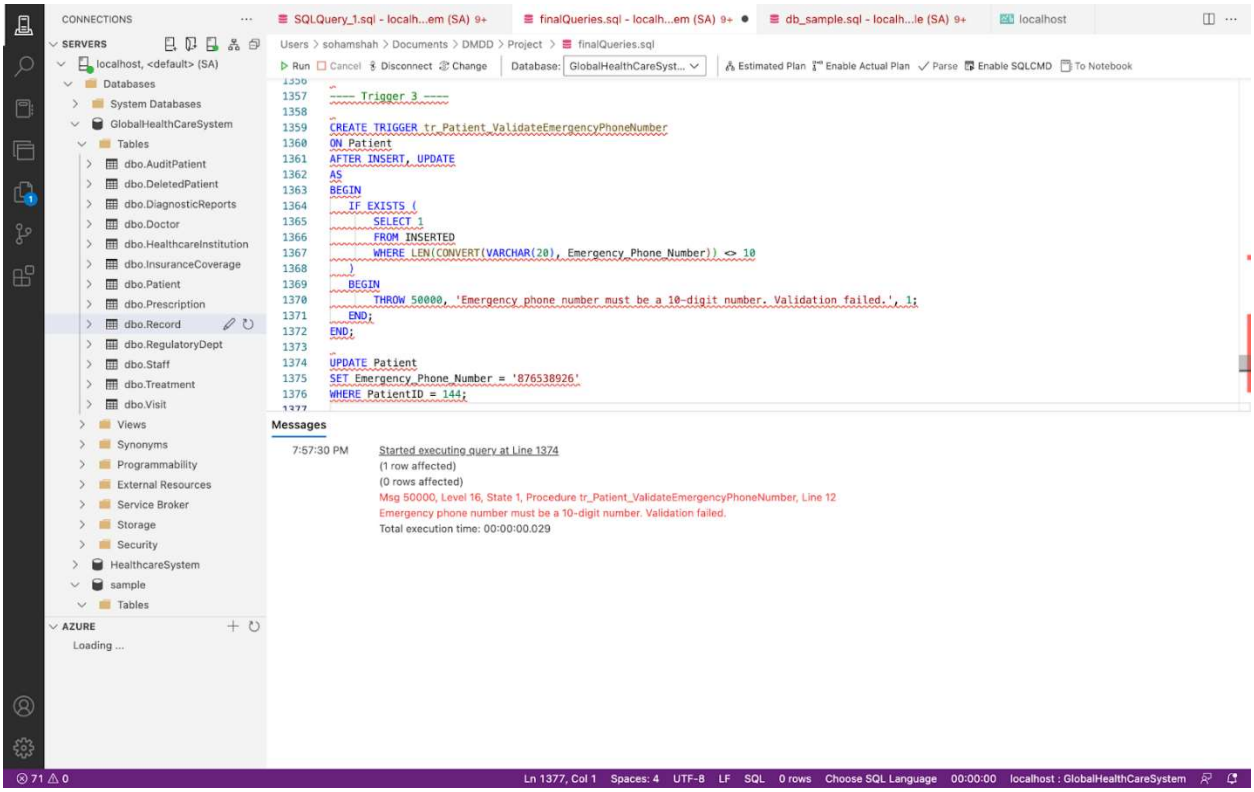
    FROM INSERTED

    WHERE LEN(CONVERT(VARCHAR(20), Emergency_Phone_Number)) <> 10

```
  )
  BEGIN
      THROW 50000, 'Emergency phone number must be a 10-digit number. Validation failed.', 1;
  END;
END;
```

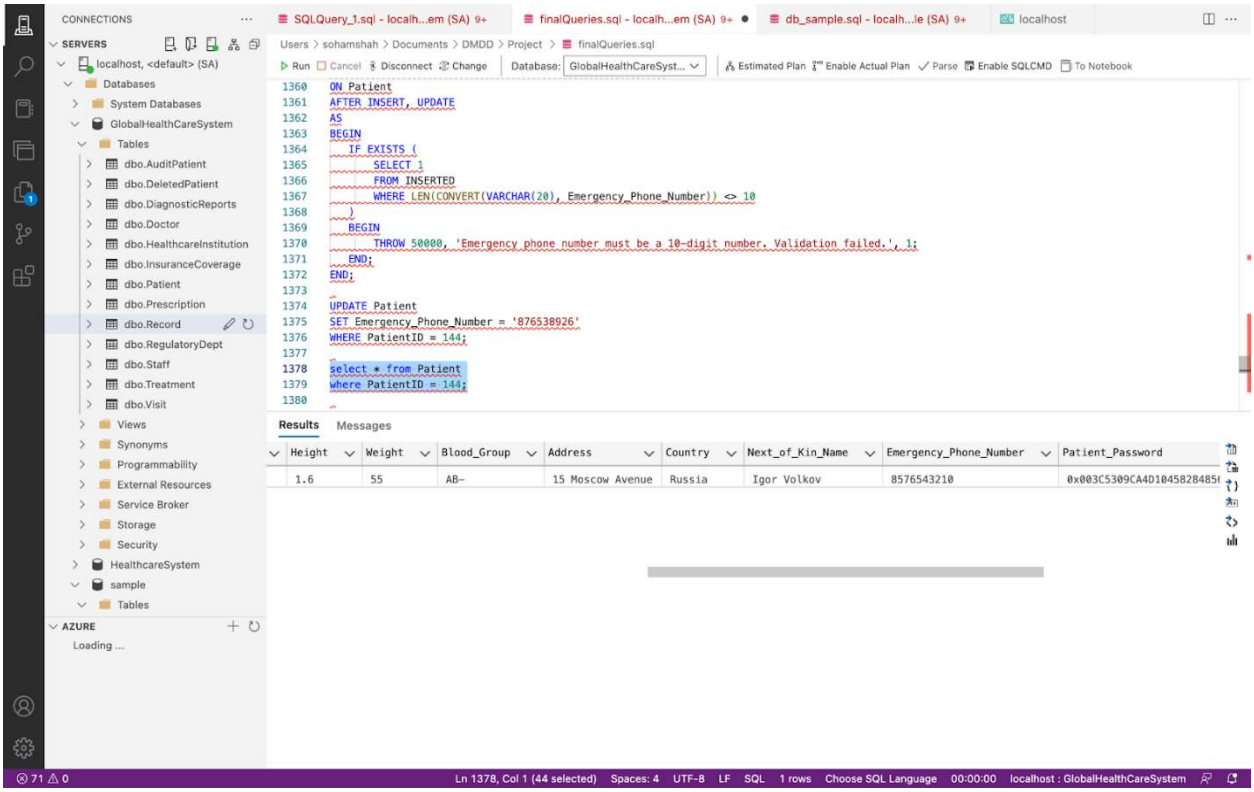



```
UPDATE Patient
SET Emergency_Phone_Number = '876538926'
WHERE PatientID = 144;
```



select * from Patient

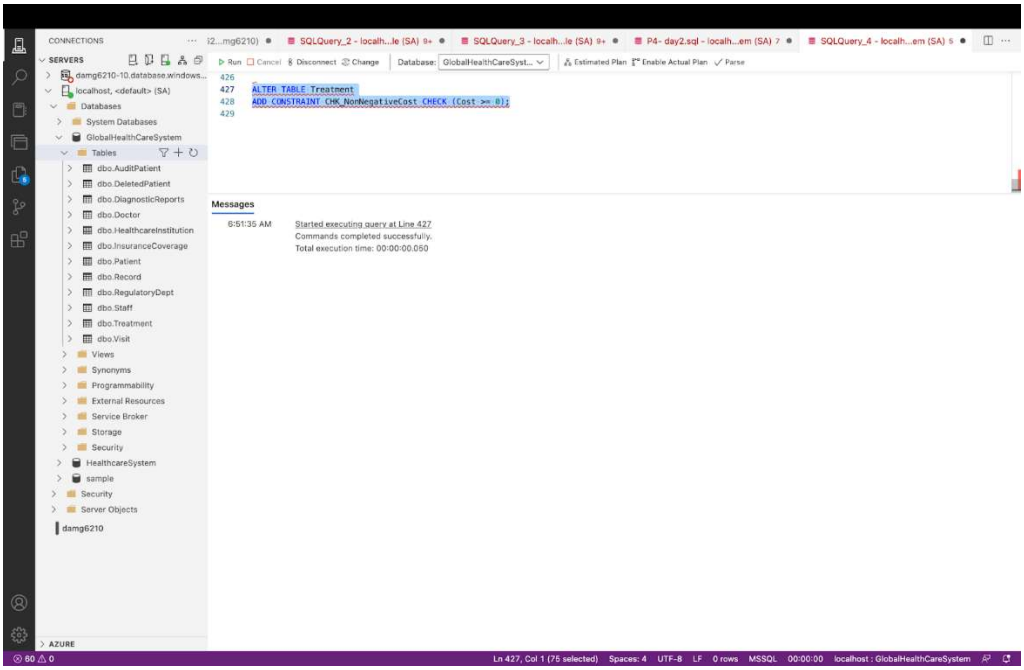
where PatientID = 144;



---- Check Constraint on Cost using Table Treatment ----

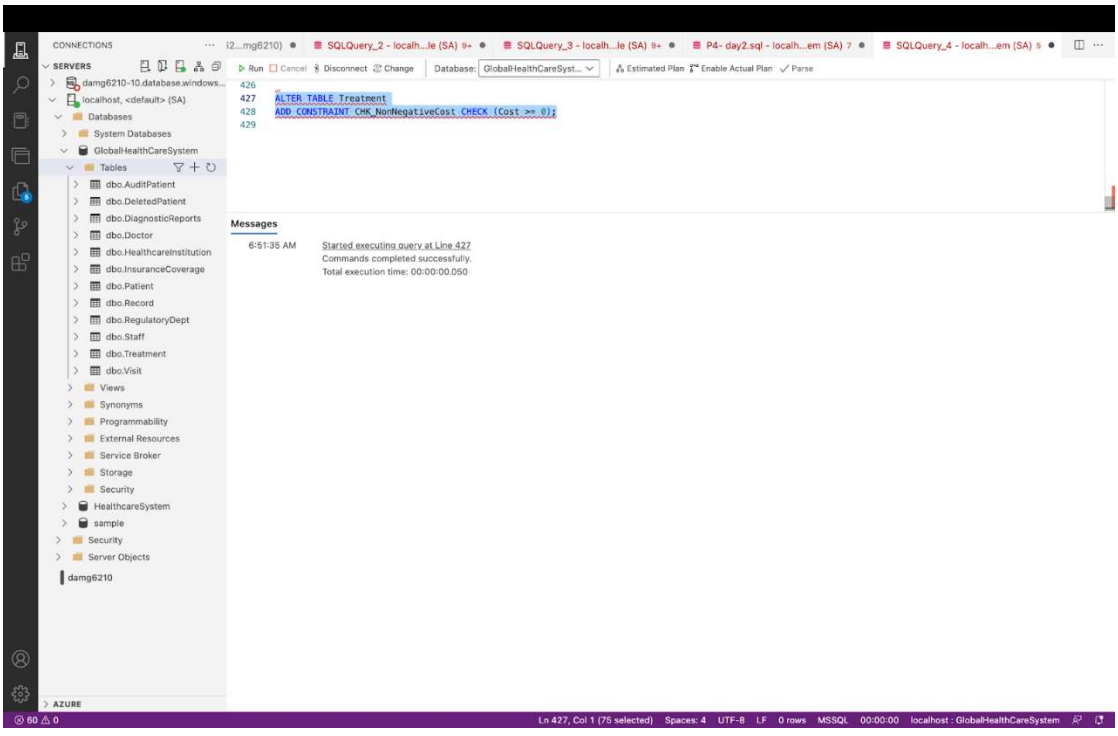
ALTER TABLE Treatment

ADD CONSTRAINT CHK_NonNegativeCost CHECK (Cost >= 0);

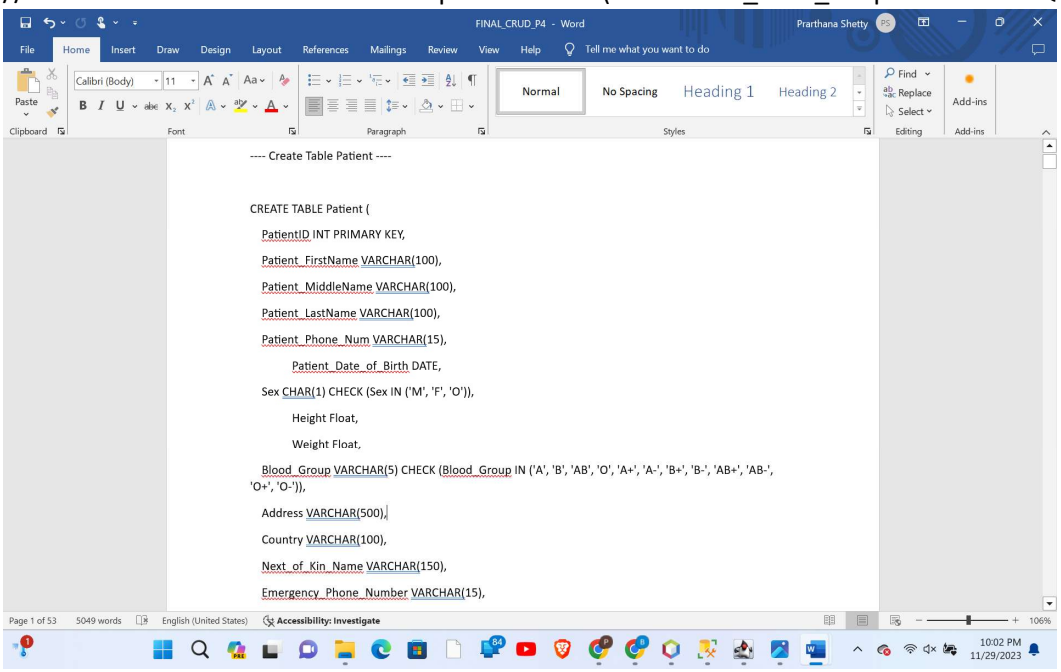


Update Treatment set Cost = -1000

where TreatmentID = 520

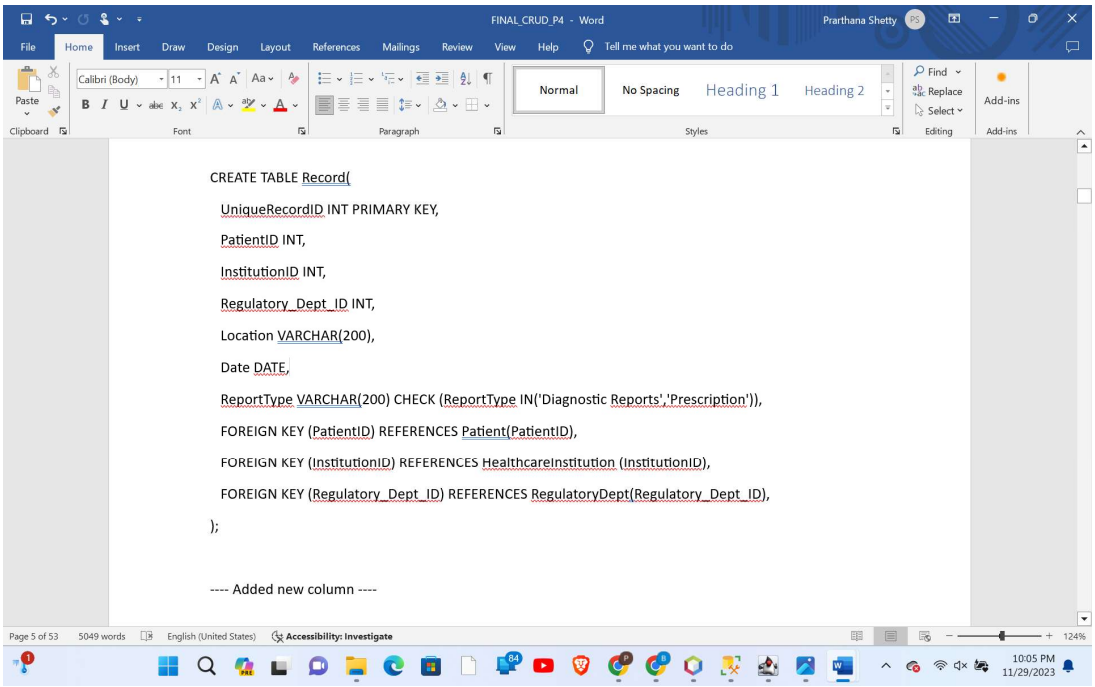


//Patient sex and Patient Blood Group Constraints (Refer ‘Final_Crud_P4’ pdf file and ‘SQL_CRUD’ file)



```
---- Create Table Patient ----

CREATE TABLE Patient (
  PatientID INT PRIMARY KEY,
  Patient_FirstName VARCHAR(100),
  Patient_MiddleName VARCHAR(100),
  Patient_LastName VARCHAR(100),
  Patient_Phone_Num VARCHAR(15),
      Patient_Date_of_Birth DATE,
  Sex CHAR(1) CHECK (Sex IN ('M', 'F', 'O')),
      Height Float,
      Weight Float,
  Blood_Group VARCHAR(5) CHECK (Blood_Group IN ('A', 'B', 'AB', 'O', 'A+', 'A-', 'B+', 'B-', 'AB+', 'AB-',
'O+', 'O-')),
  Address VARCHAR(500),
  Country VARCHAR(100),
  Next_of_Kin_Name VARCHAR(150),
  Emergency_Phone_Number VARCHAR(15),
```

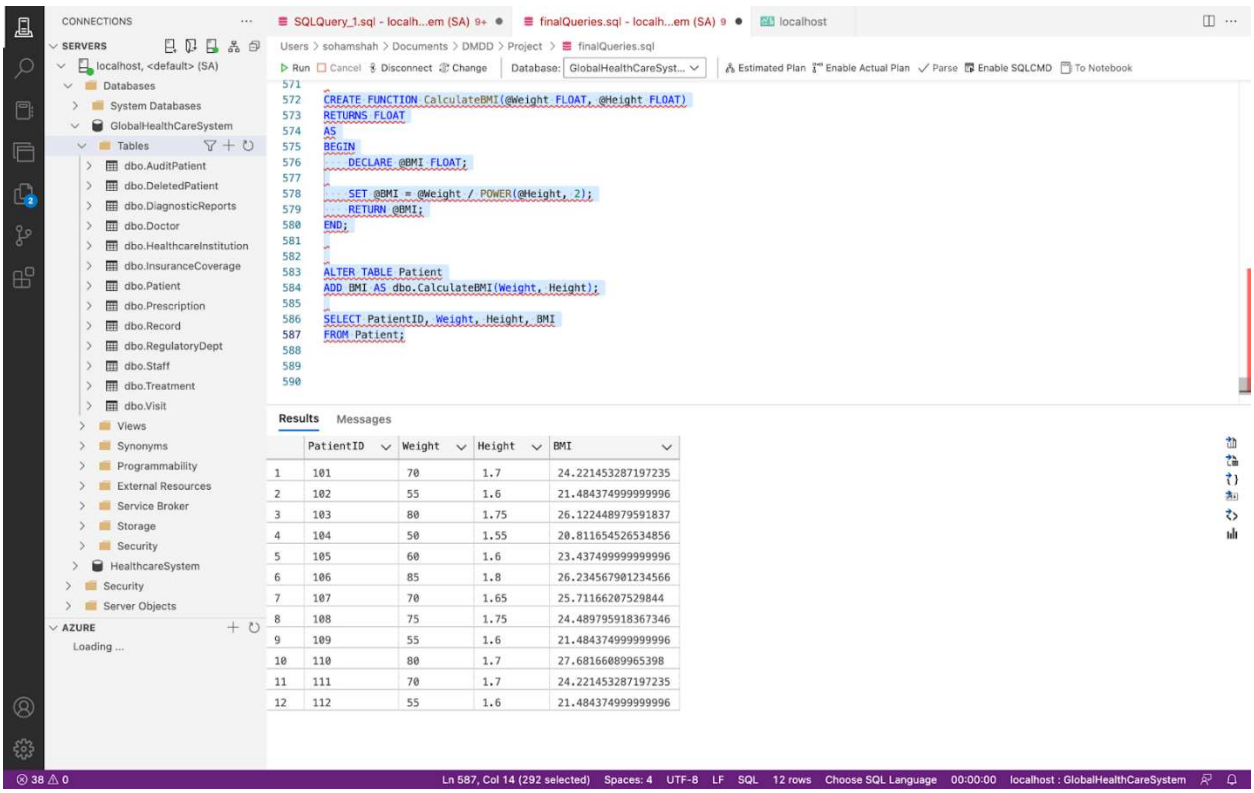
//Record Constraint for ‘ReportType’ which acts as a Discriminator for ‘Record’ table Subtypes ‘Diagnostic Reports’ and ‘Prescription’ (Refer ‘Final_Crud_P4’ pdf file and ‘SQL_CRUD’ file)



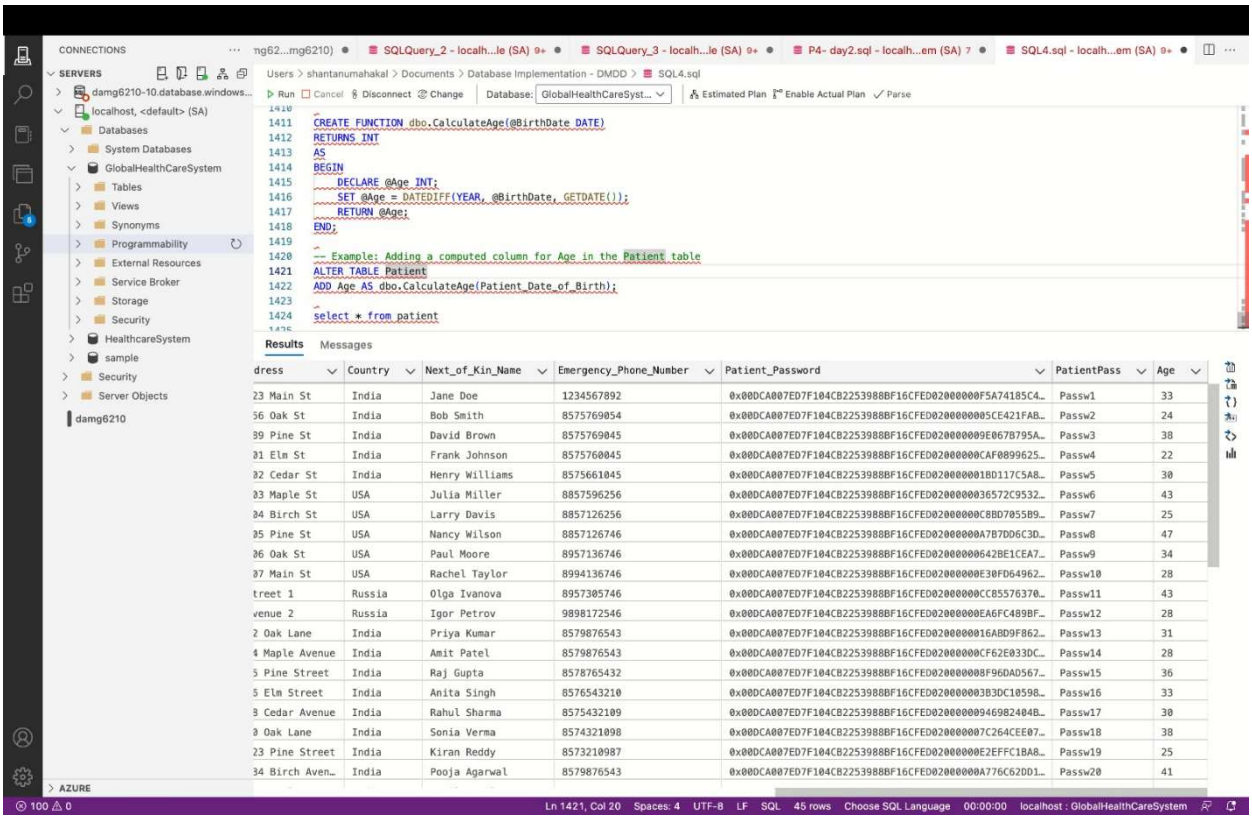
```
CREATE TABLE Record(
  UniqueRecordID INT PRIMARY KEY,
  PatientID INT,
  InstitutionID INT,
  Regulatory_Dept_ID INT,
  Location VARCHAR(200),
  Date DATE,
  ReportType VARCHAR(200) CHECK (ReportType IN('Diagnostic Reports','Prescription')),
  FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),
  FOREIGN KEY (InstitutionID) REFERENCES HealthcareInstitution (InstitutionID),
  FOREIGN KEY (Regulatory_Dept_ID) REFERENCES RegulatoryDept(Regulatory_Dept_ID),
);

---- Added new column ----
```

---- UDF (User Defined Function)

```
CREATE FUNCTION CalculateBMI(@Weight FLOAT, @Height FLOAT)
RETURNS FLOAT
AS
BEGIN
    DECLARE @BMI FLOAT;

    SET @BMI = @Weight / POWER(@Height, 2);
    RETURN @BMI;
END;

ALTER TABLE Patient
ADD BMI AS dbo.CalculateBMI(Weight, Height);

SELECT PatientID, Weight, Height, BMI
FROM Patient;
```



```
CREATE FUNCTION dbo.CalculateAge(@BirthDate DATE)
RETURNS INT
AS
BEGIN
    DECLARE @Age INT;
    SET @Age = DATEDIFF(YEAR, @BirthDate, GETDATE());
    RETURN @Age;
END;

ALTER TABLE Patient
ADD Age AS dbo.CalculateAge(Patient_Date_Of_Birth);

select * from Patient
```



---- Encryption -----

```
create MASTER KEY
ENCRYPTION BY PASSWORD = 'ShreeRam@765';

SELECT NAME KeyName,
symmetric_key_id KeyID,
key_length KeyLength,
algorithm_desc KeyAlgorithm
FROM sys.symmetric_keys;
go

CREATE CERTIFICATE PatientPass
WITH SUBJECT = 'Patient Password';
GO

CREATE SYMMETRIC KEY PatientPass_SM
WITH ALGORITHM = AES_256
ENCRYPTION BY CERTIFICATE PatientPass;
GO

OPEN SYMMETRIC KEY PatientPass_SM
DECRYPTION BY CERTIFICATE PatientPass;

INSERT INTO Patient (PatientID, Patient_FirstName, Patient_MiddleName, Patient_LastName,
Patient_Phone_Num,
   Patient_Date_of_Birth, Sex, Height, Weight, Blood_Group, Address, Country,
```

Next_of_Kin_Name, Emergency_Phone_Number, Patient_Password)

VALUES

(146, 'Shantanu', 'R', 'Mahakal', 8575769054, '1998-10-30', 'M', 1.68, 60, 'B+', '15 Pond St', 'USA',

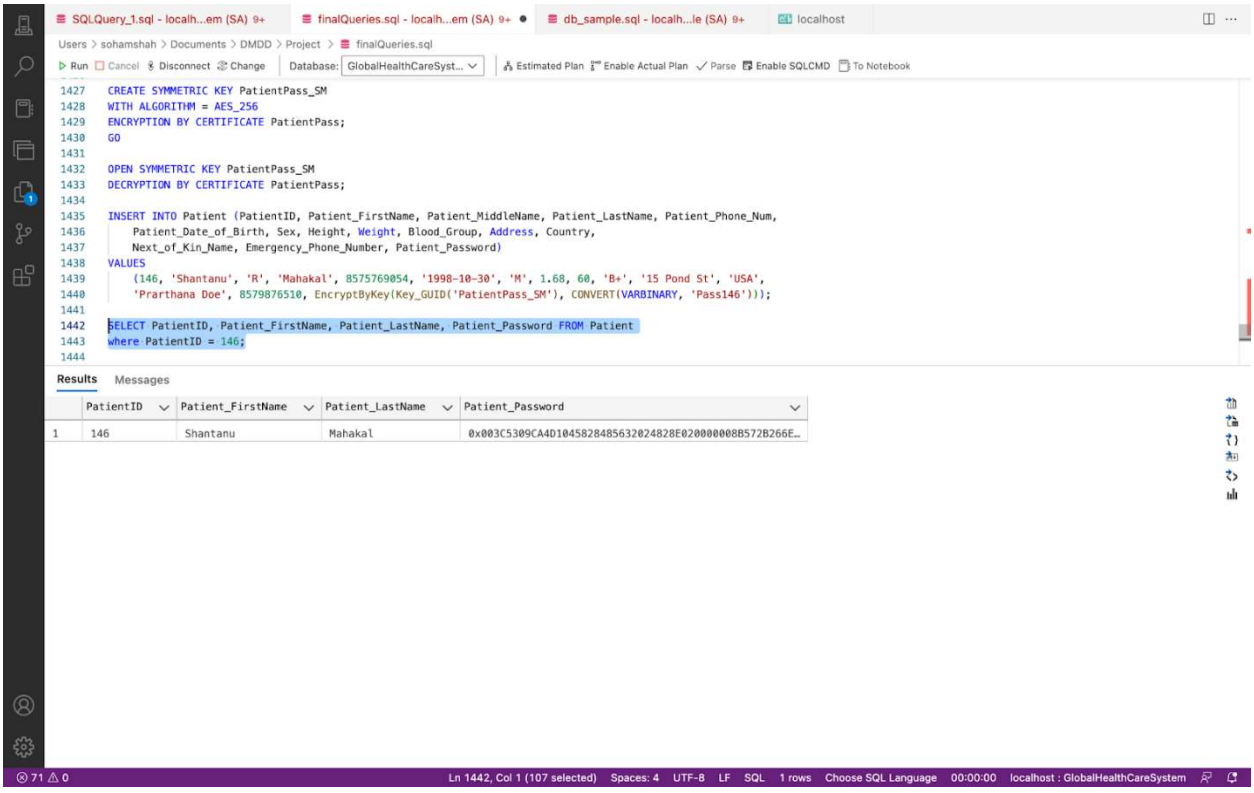
'Prarthana Doe', 8579876510, EncryptByKey(Key_GUID('PatientPass_SM'), CONVERT(VARBINARY, 'Pass146')));

SELECT PatientID, Patient_FirstName, Patient_LastName, Patient_Password FROM Patient

where PatientID = 146;

UPDATE Patient set patientpass = 'Pass146' where PatientID= 146

SELECT * FROM Patient



--- to decrypt ---

OPEN SYMMETRIC KEY PatientPass_SM

DECRYPTION BY CERTIFICATE PatientPass;

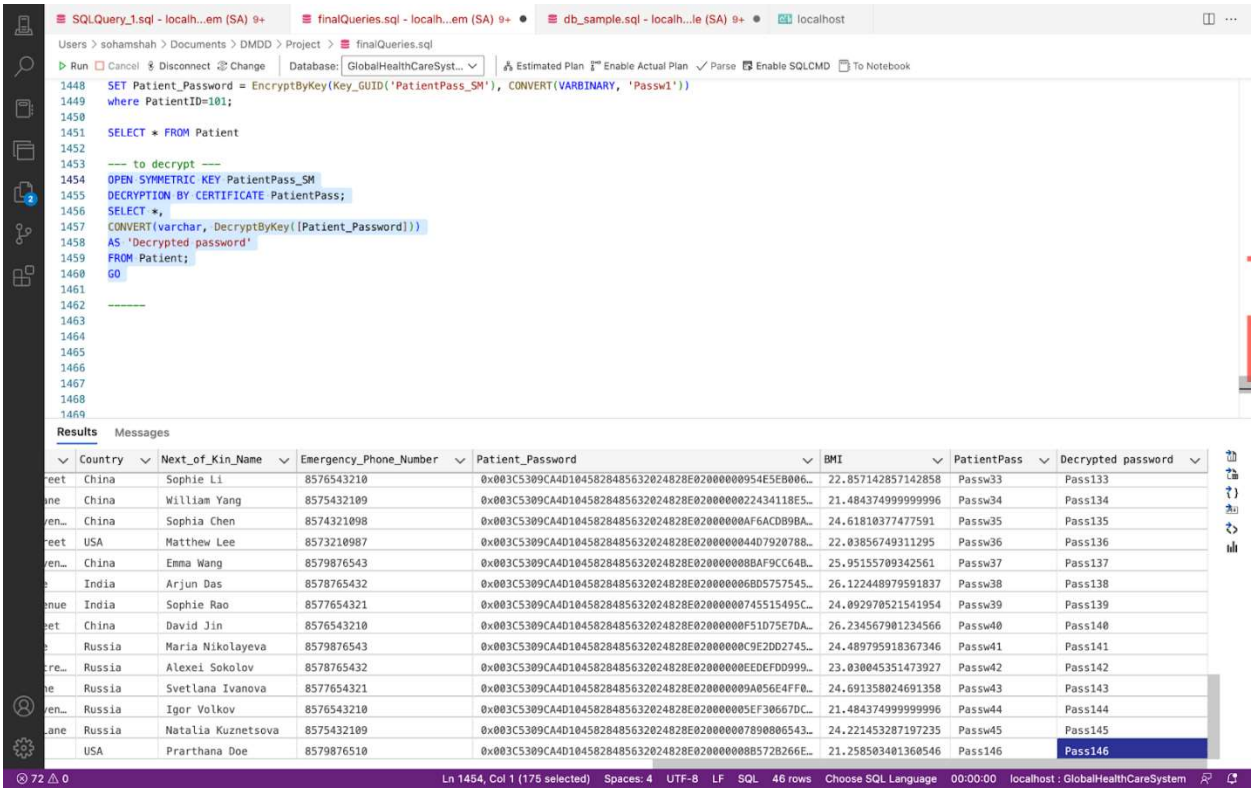
SELECT *,

CONVERT(varchar, DecryptByKey([Patient_Password]))

AS 'Decrypted password'

FROM Patient;

GO



----- NON CLUSTERED INDEX 1 -----

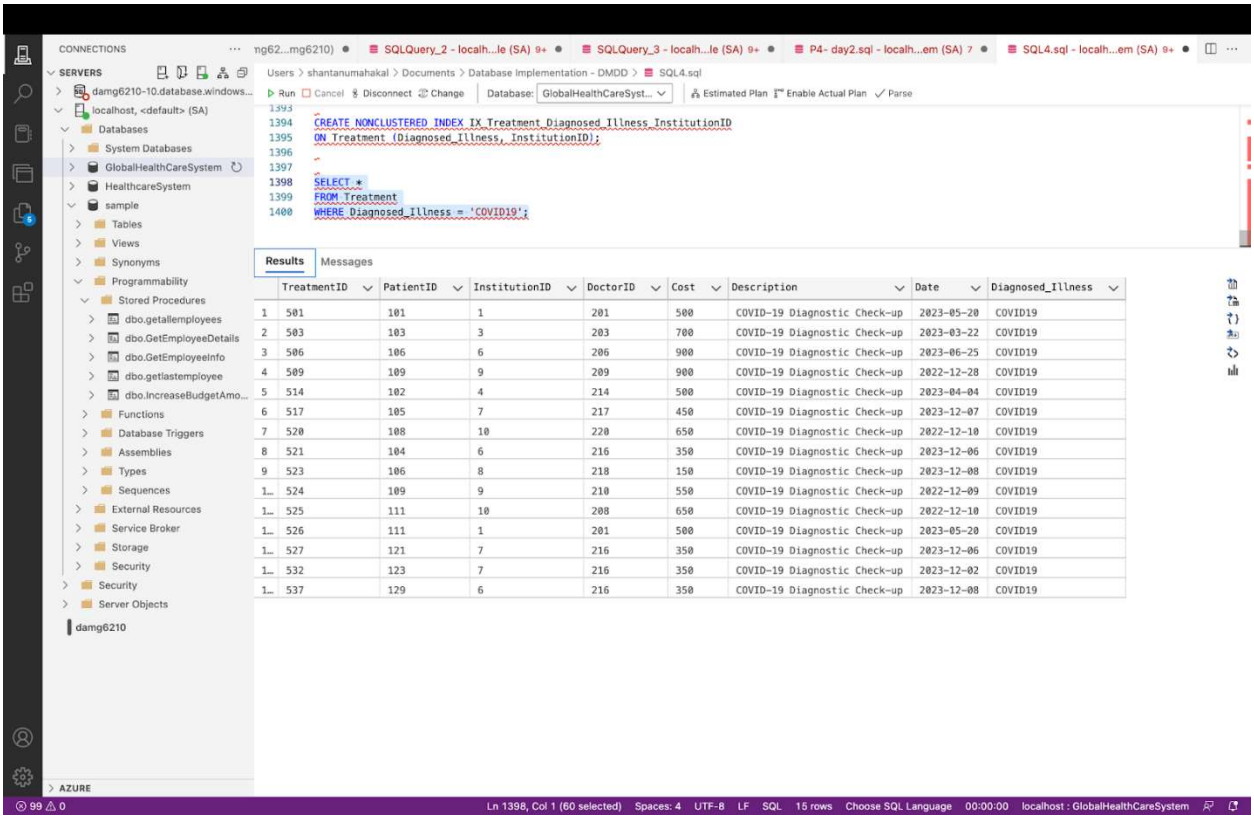
CREATE NONCLUSTERED INDEX IX_Treatment_Diagnosed_Illness_InstitutionID

ON Treatment (Diagnosed_Illness, InstitutionID);

SELECT *

FROM Treatment

WHERE Diagnosed_Illness = 'COVID19';



---- NON CLUSTERED INDEX 2 ----

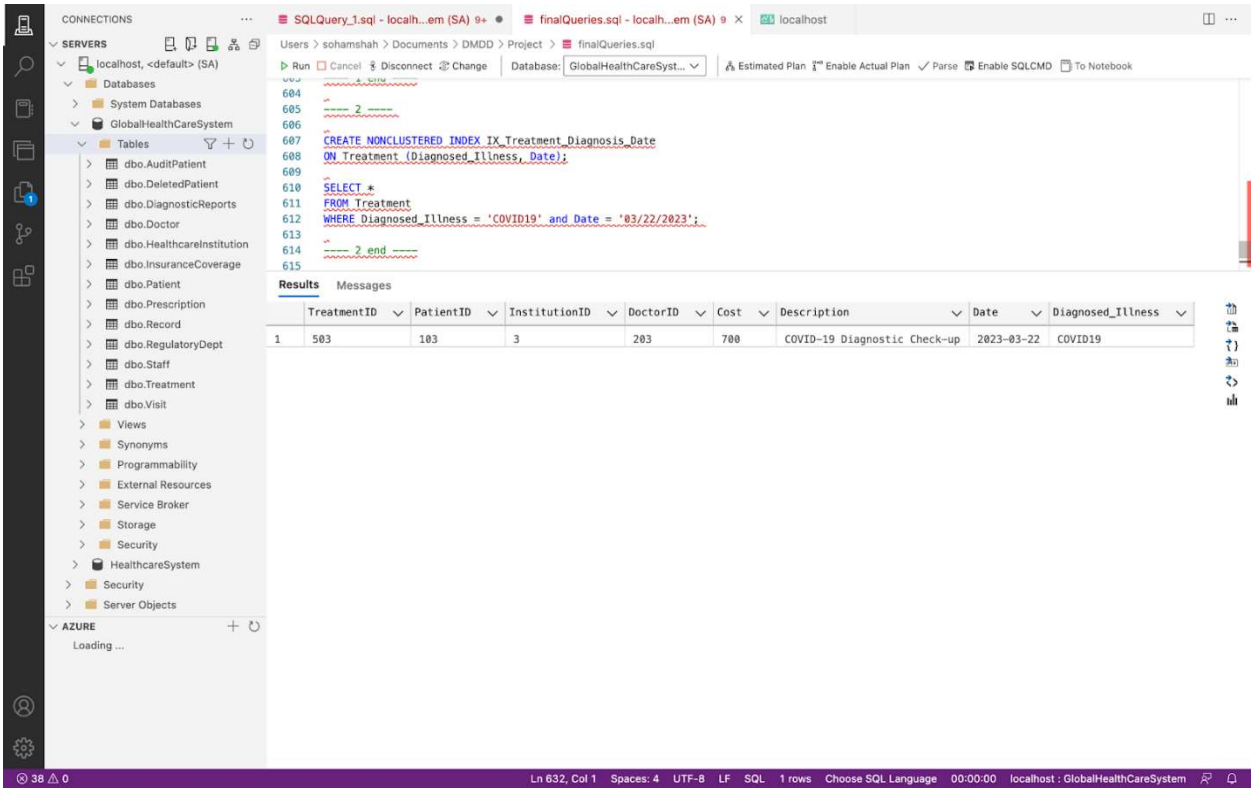
CREATE NONCLUSTERED INDEX IX_Treatment_Diagnosis_Date

ON Treatment (Diagnosed_Illness, Date);

SELECT *

FROM Treatment

WHERE Diagnosed_Illness = 'COVID19' and Date = '03/22/2023';



---- NON CLUSTERED INDEX 3 -----

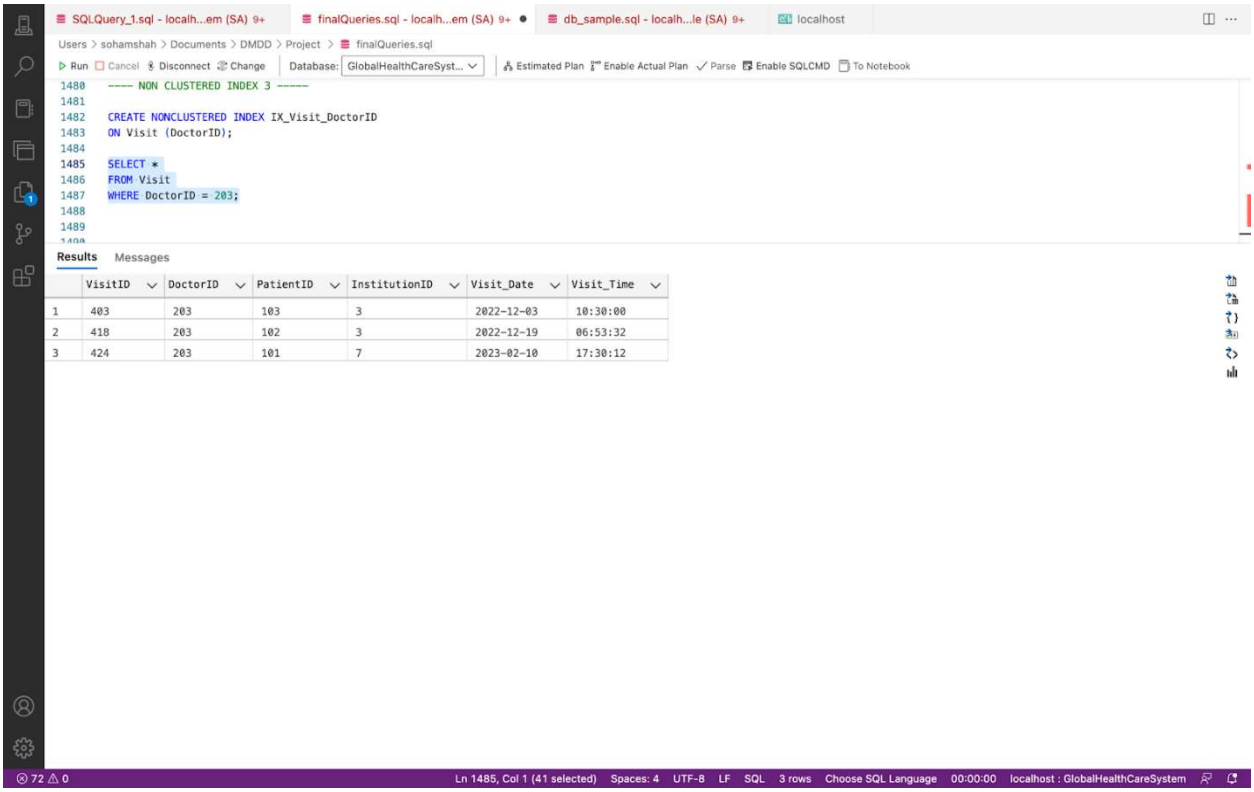
CREATE NONCLUSTERED INDEX IX_Visit_DoctorID

ON Visit (DoctorID);

SELECT *

FROM Visit

WHERE DoctorID = 203;



---- TO VIEW NUMBER OF NON CLUSTERED INDEX ----

```
SELECT
    t.name AS TableName,
    i.name AS IndexName,
    i.type_desc AS IndexType,
    col.name AS ColumnName
FROM
    sys.indexes AS i
INNER JOIN
    sys.index_columns AS ic ON i.object_id = ic.object_id AND i.index_id = ic.index_id
INNER JOIN
    sys.columns AS col ON ic.object_id = col.object_id AND ic.column_id = col.column_id
```

```
INNER JOIN
    sys.tables AS t ON i.object_id = t.object_id
WHERE
    i.type_desc = 'NONCLUSTERED';
```