Project 2

State MD Urgent Center Database

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Abstract

The following document will describe procedure about how to design, implement and test State MD Urgent Care database. I will create tables for several parts. I use Vetabelo to draw the E-R diagram and 3F forms. After I create the tables, I will test them by feeding data, create view and several complicated operations like function, stored procedures and scripts.

I. Design

Introduction:

This project is about making a database for an Urgent Health Center due to COVID-19. The important parts of this database are Centers , Patients and Tests. Sine the relationship between Centers and patients are many-to-many and the Test is the bridge to connect them. Inside the database, I use 12 tables to build the business structure and relationship in the Description They are Center, Tests, Patients, Doctors, Payment, Invoice, HealthHistory, Report, MedicalEquipment DrugStorage, ProcedureCapcity, Insurance.

Here are my three main steps to design the table:

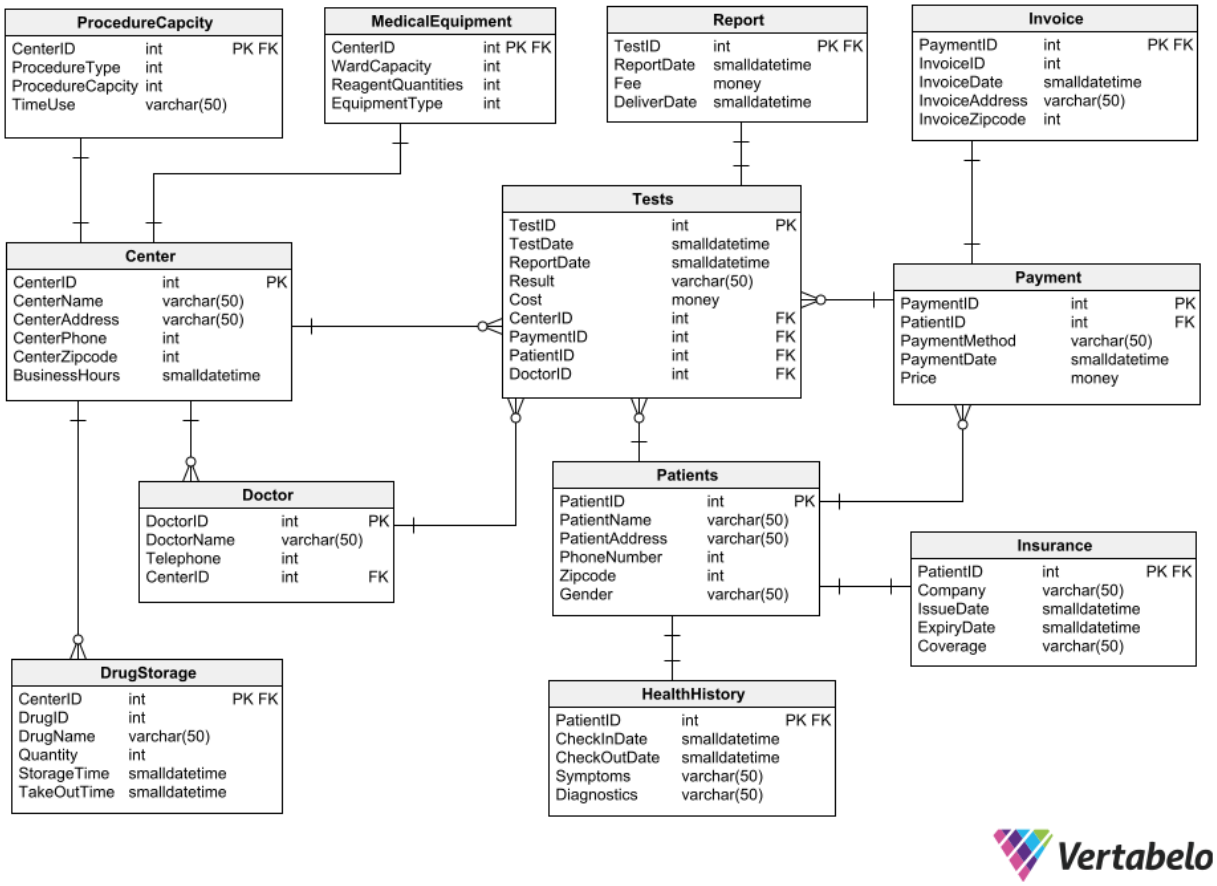
First, I make a Patients Table with 6 columns . There are PatientID, PatientName, PatientAddress, PhoneNumber, Zipcode and Gender inside this table. After that, The PatientID is primary key. It is an identity for each patients. And then I recognized the relationships between tables. Patients to Tests is one-to-many, Patients to Payment is one-to-many, Patients to Insurance and HealthHistory are one to one. Since I supposed one patient only buy one kind of healthy insurance.

And then, I make a Center Table to save the Center information. Here are also 6 columns in this table: CenterID, CenterName, CenterAddress, CenterZipcode, CenterPhone, BusinsessHour. Since CenterID is identity to each center, the primary key should be CenterID. And Center to, MedicalEquipment,

ProdcedureStorage are one-to-one. Center to Doctors and DrugStorage are one to many, Center to Tests is one-to-many, since each center could test several times for patients. All the default values are not null.

Last but not the least, I create Tests table ti connect table Center and table Patients with 9 columnes. The primary key is TestID and foreign keys are PatientID, PaymentID, CenterID and DoctorID.And Tests to the table Report is one to one.

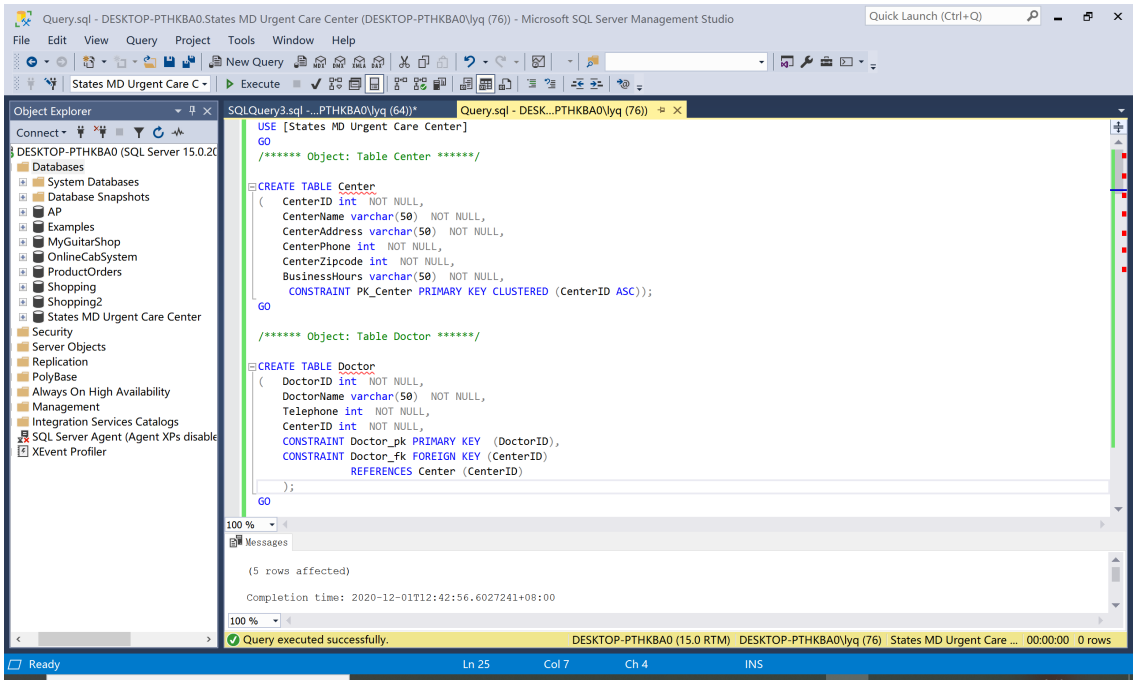
Design Diagram:

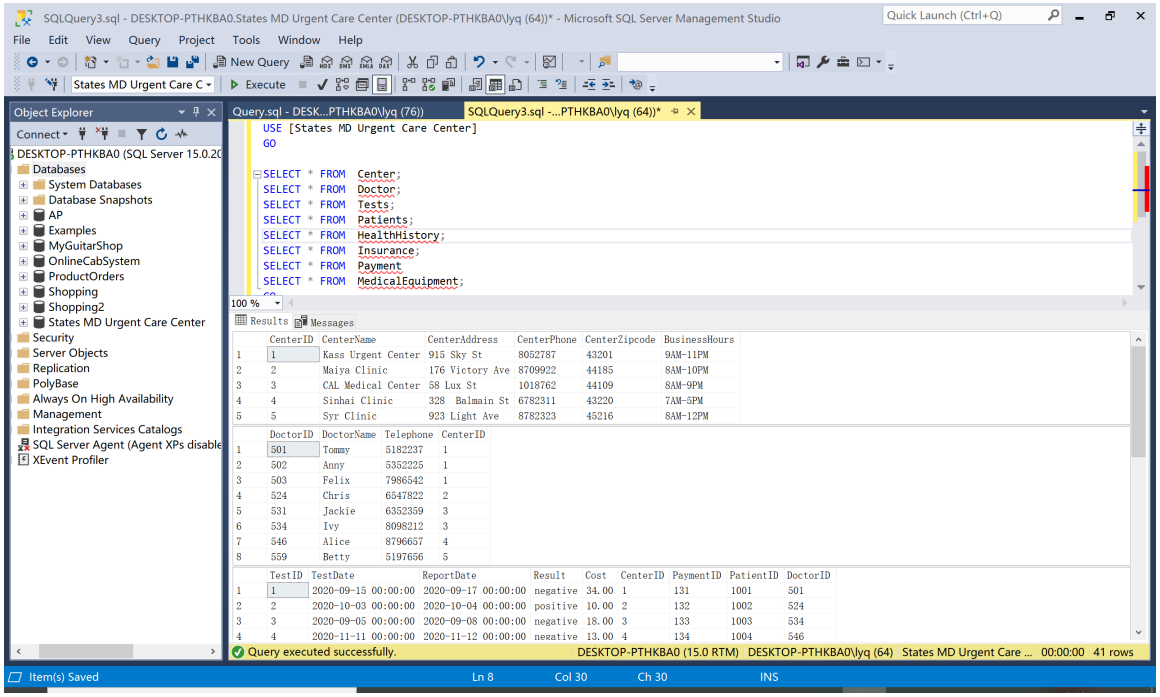


II. Implementation

Screenshots:

The entire code implementation could be seen as sql file

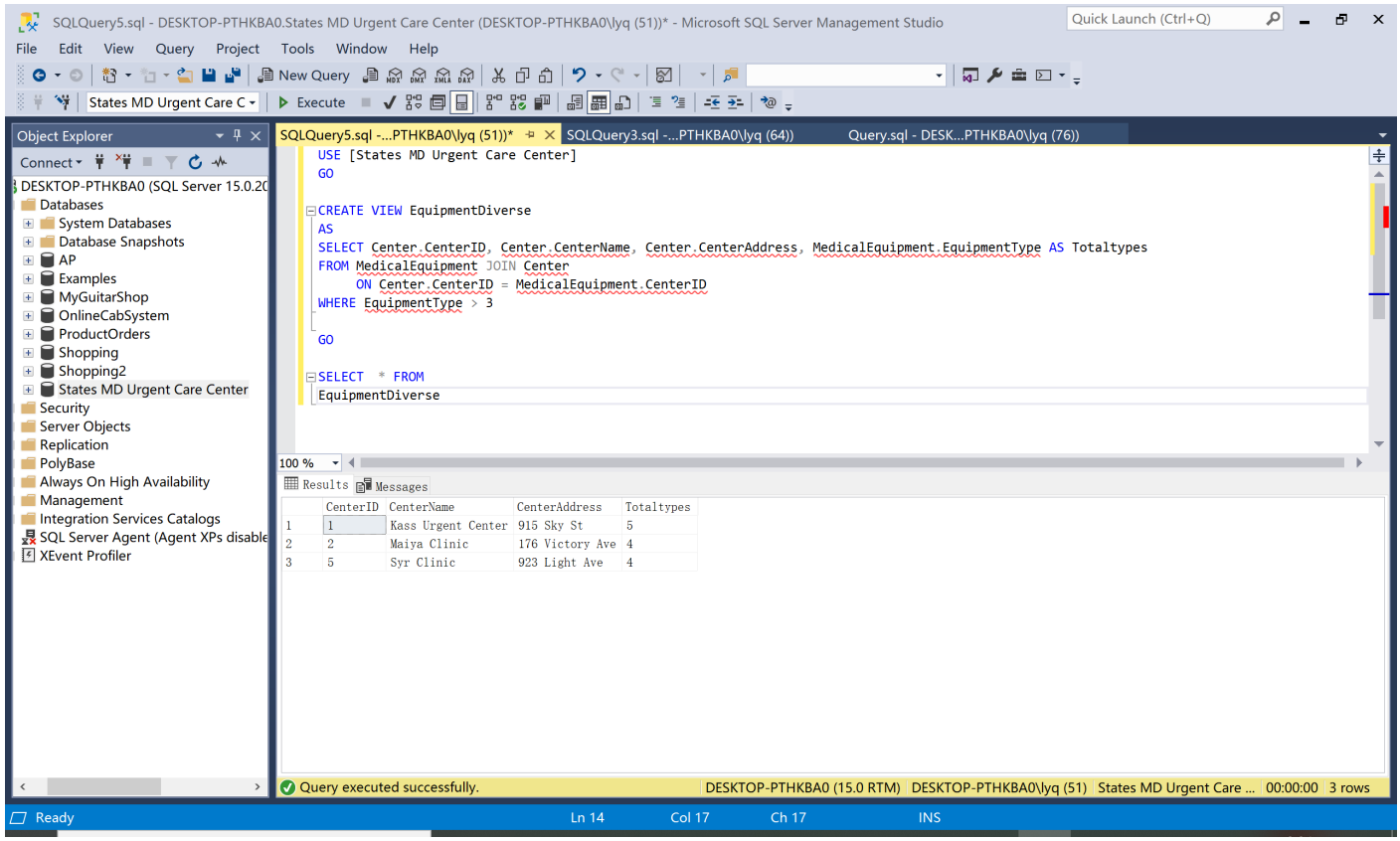




III. Testing

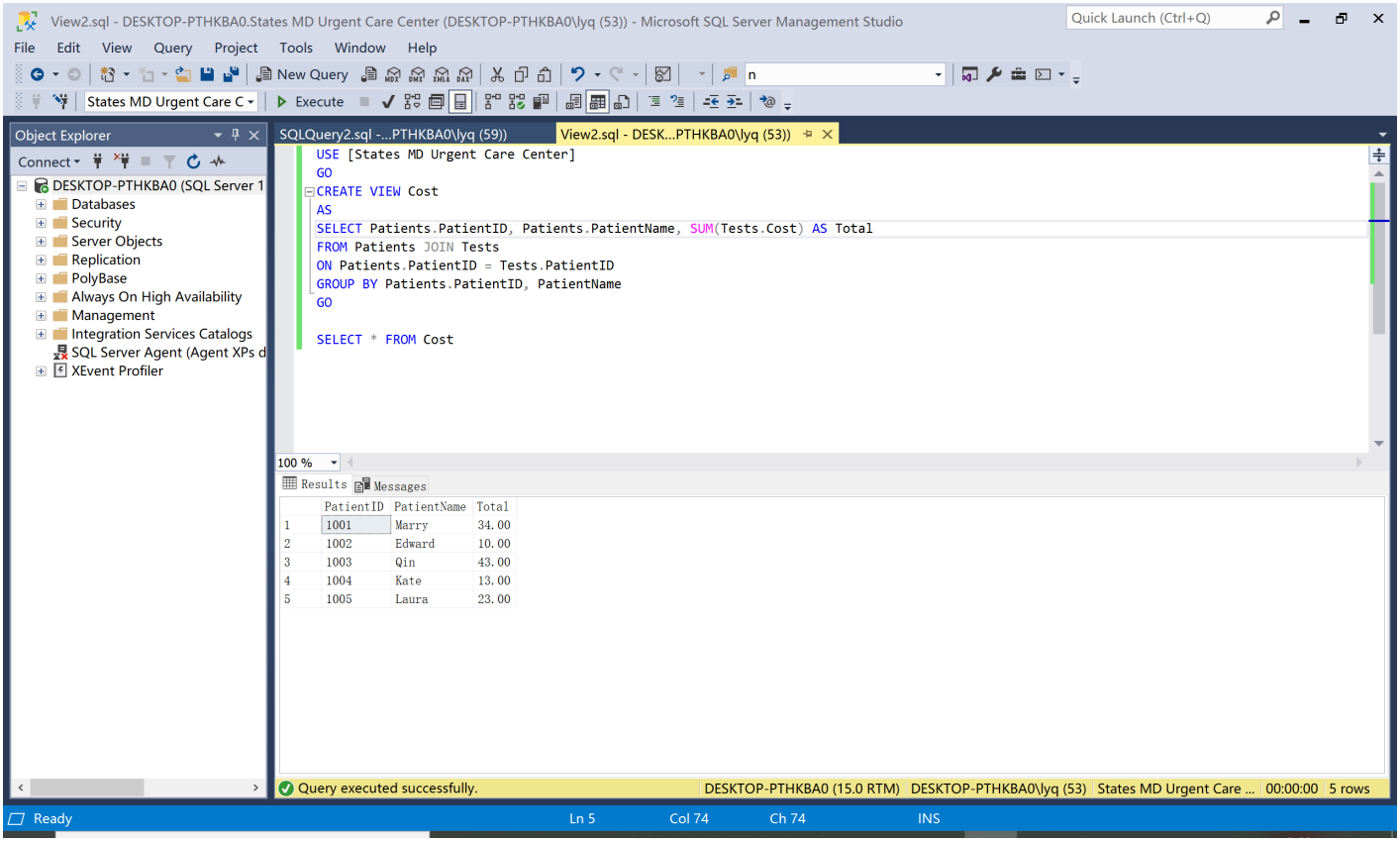
View-1

This view returns Centers with more than 3 equipment types which offers people have opportunity to choose health center with better equipments.



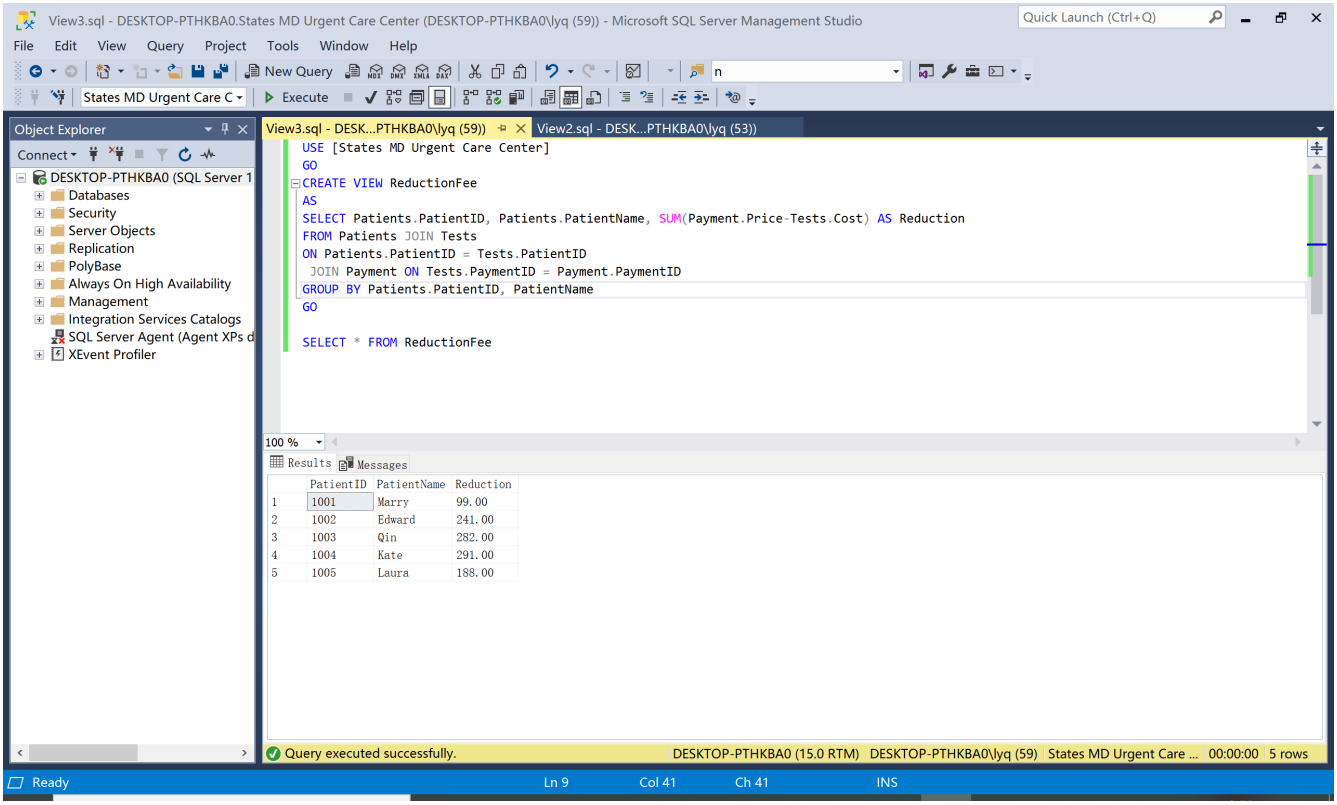
View-2

This view could be able to figure out the relationship between Patients and Tests, since some patients might test more than one time and the view displays the total cost for each patient.



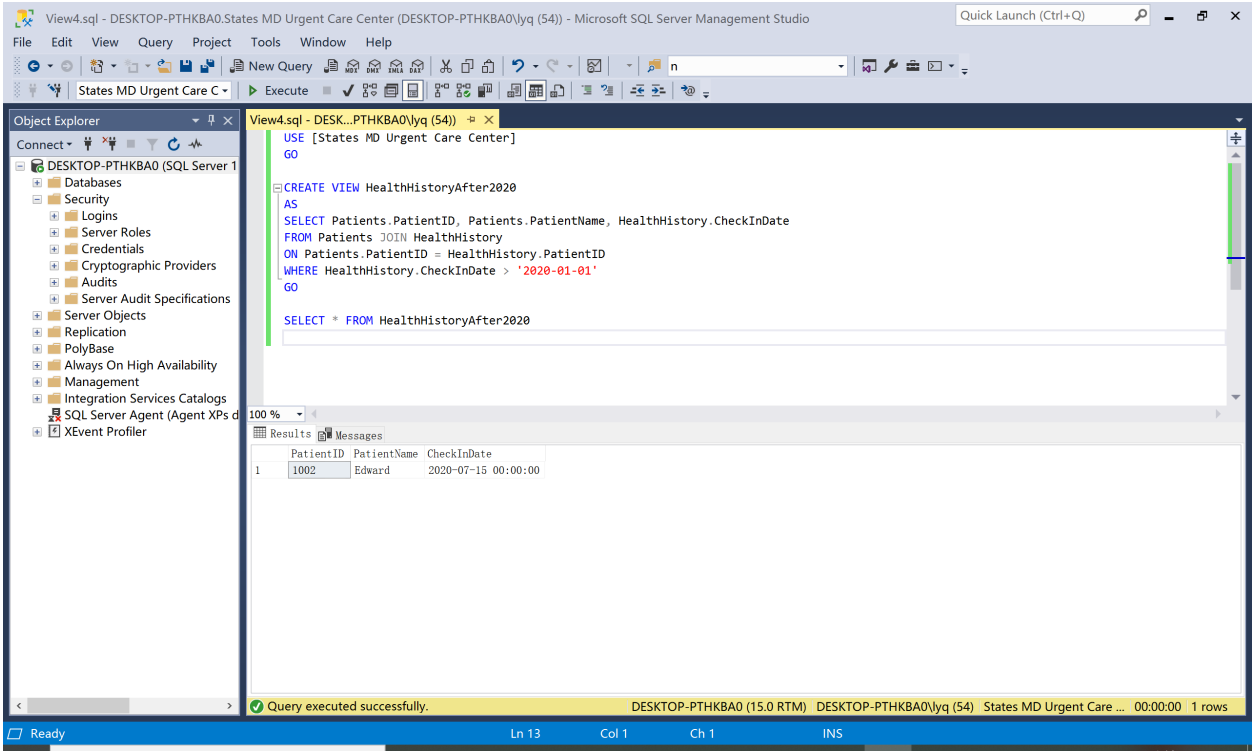
View-3

This view could be able to figure out the reduction fee of insurance for each patient. It could display the welfare of each patient with different insurance coverage and price to some content.



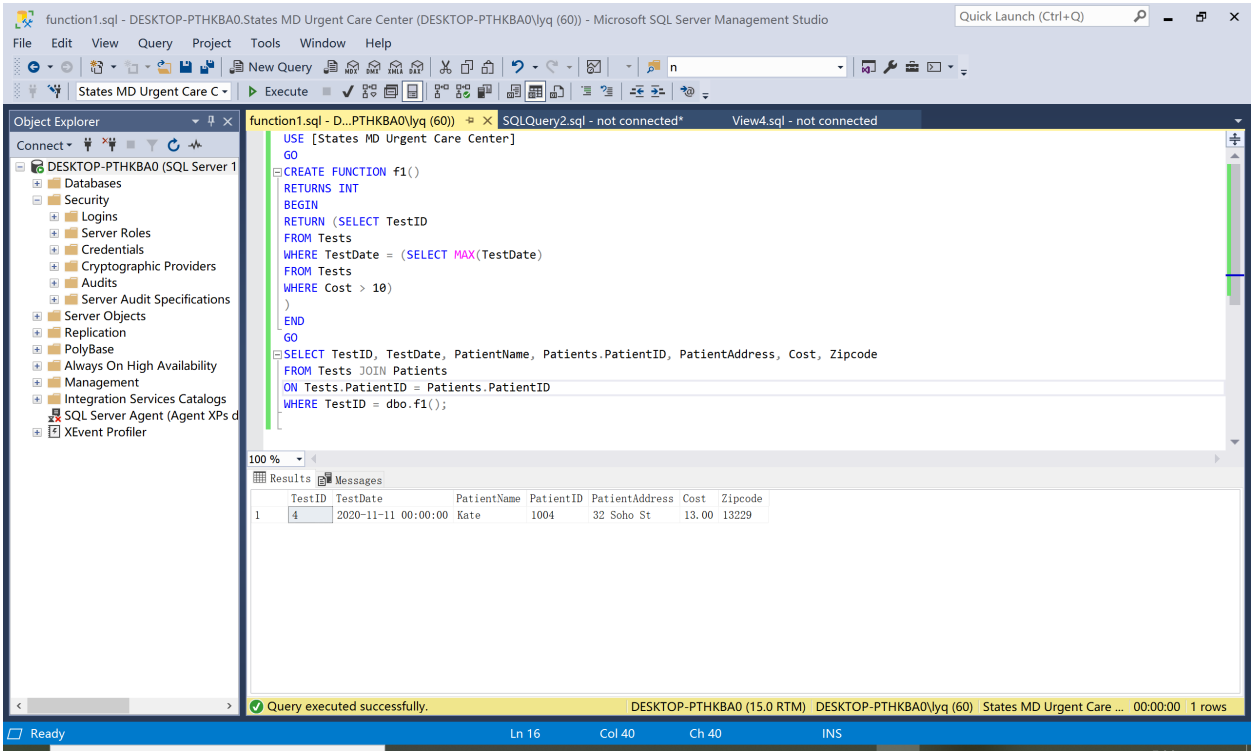
View-4

This view could be able to figure out the patient who had past medical history after 2020. It could help the urgent center to analyze the risk of re-infection after treatment.



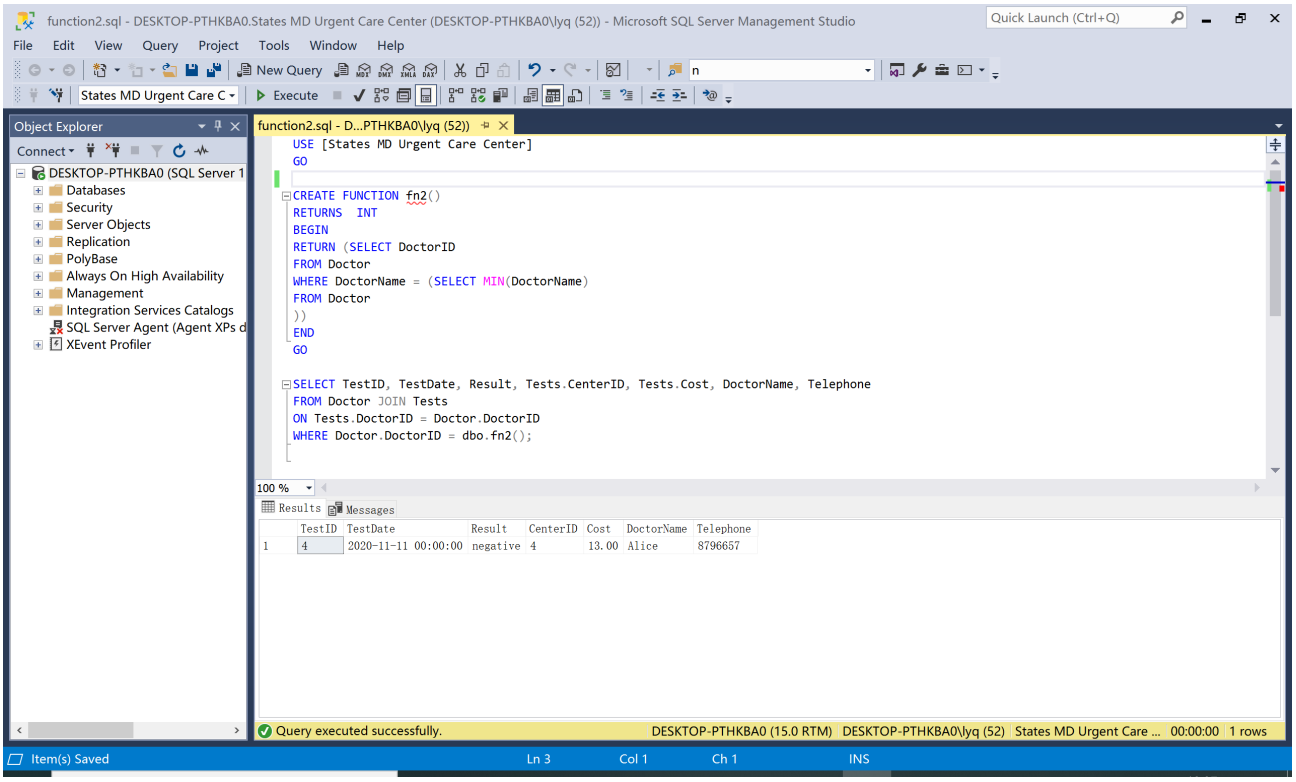
Function-1

1. In this function, it will return the Test information with patient information that in the most recent day. And the Cost of this test should bigger than 10 dollars .



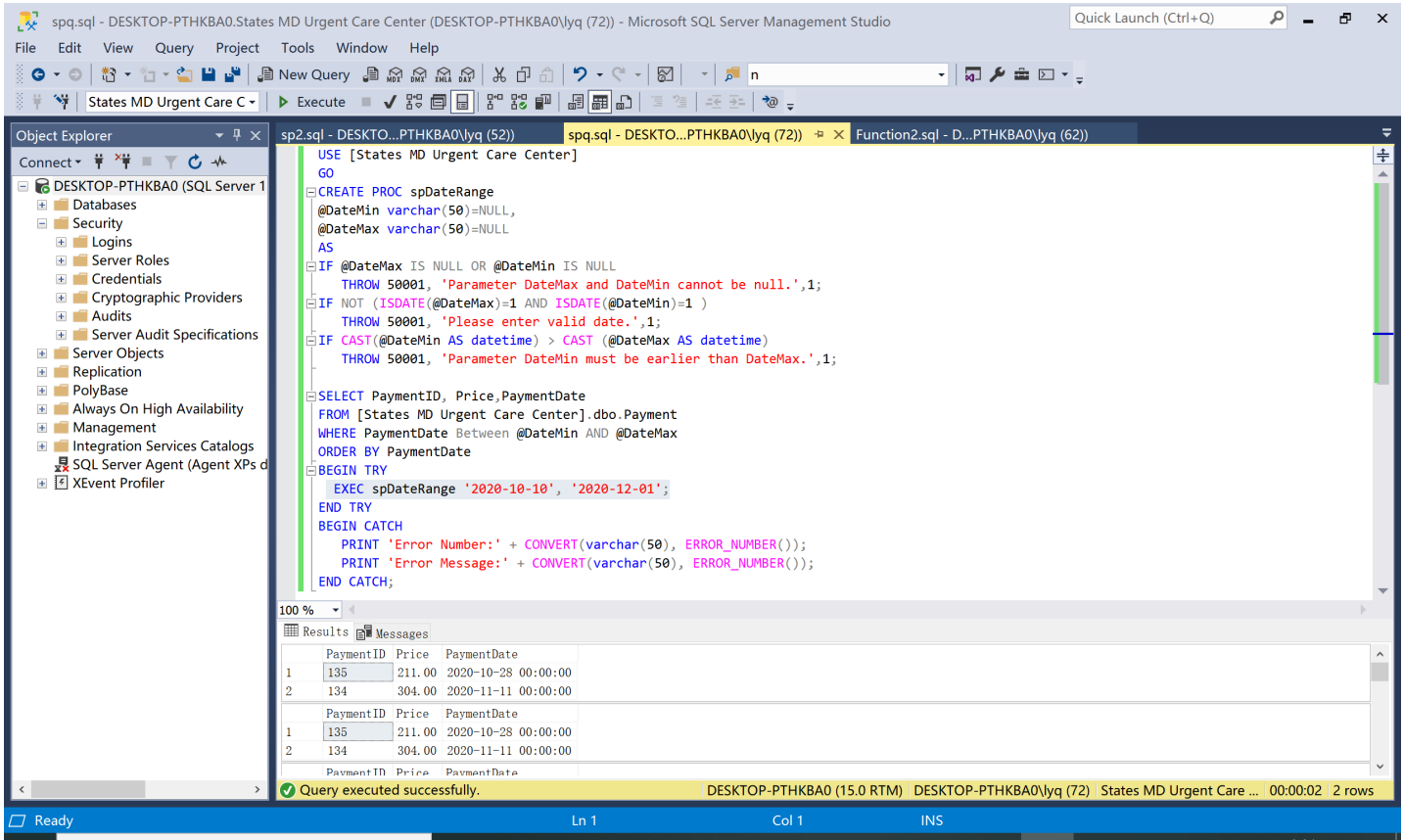
Function-2

In this function, it returns the Doctor with the most small doctor name ‘Alice’ with the information of Center and Test.



Stored Procedures-1

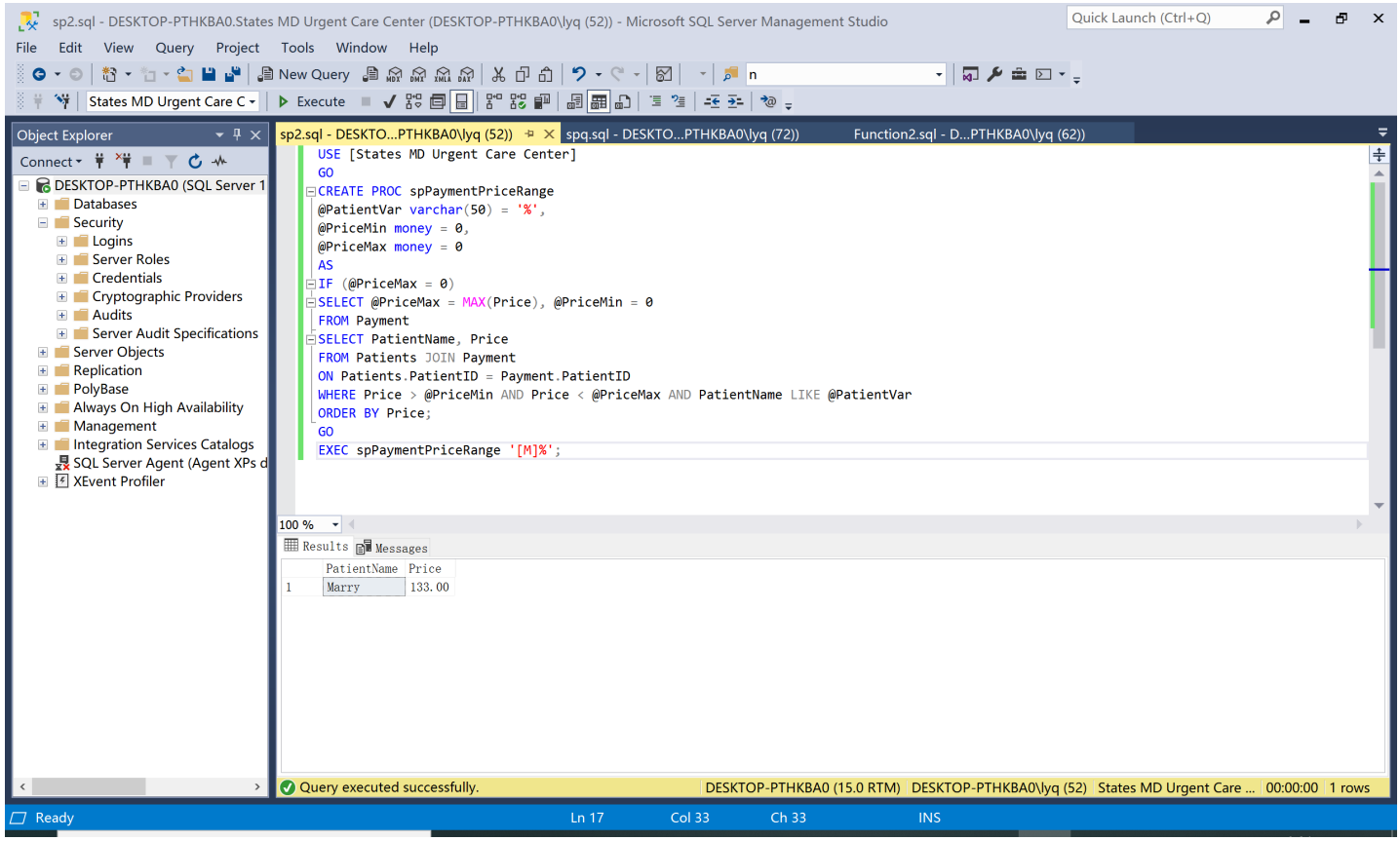
This stored procedure will output the Payment of tests between 2020-10-10 and 1010-12-01. Before it output the



table, it will validate the parameter. If everything goes fine, it will return the value we want to the console.

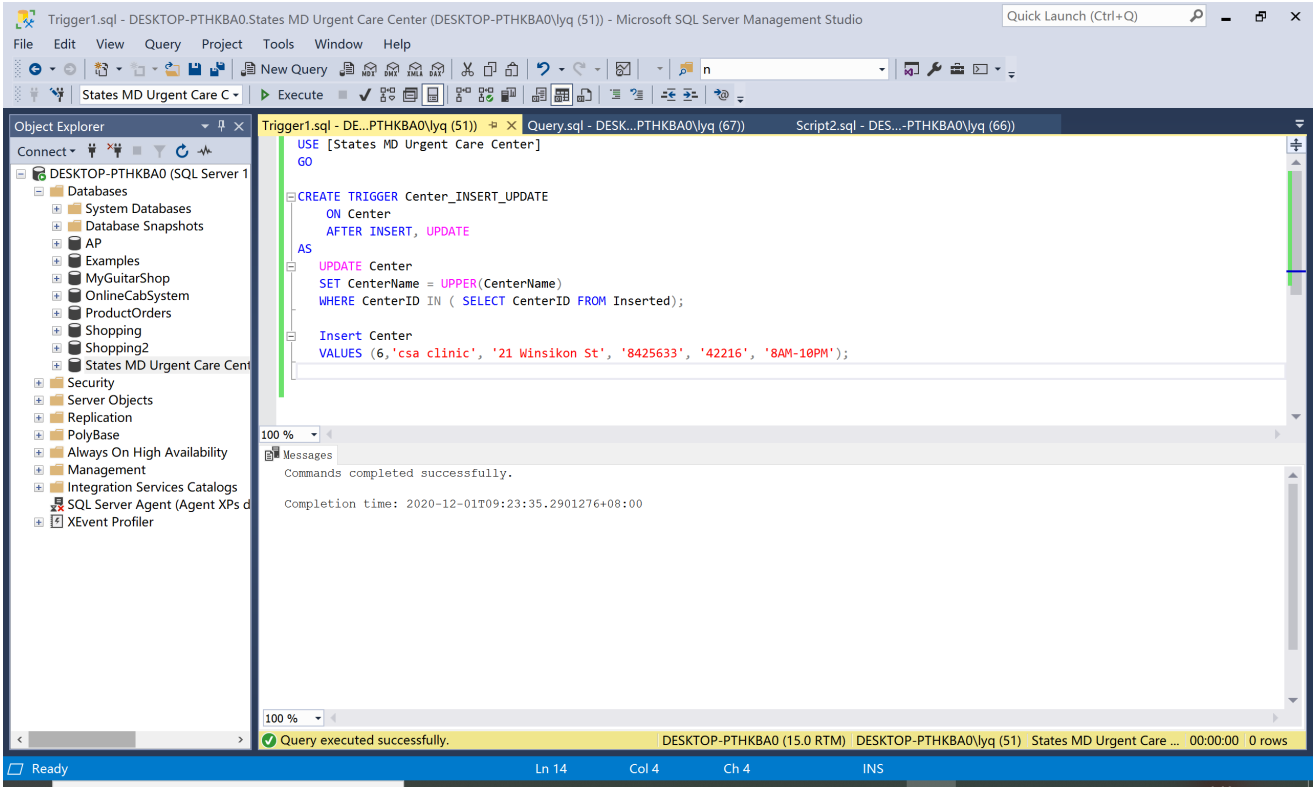
Stored Procedures-2

In this problem, the SP will calculate the Price range for some patients with specific PatientName. It will return the DriverName, PaymentPrice to show that the price range of patients that their name includes some substring.



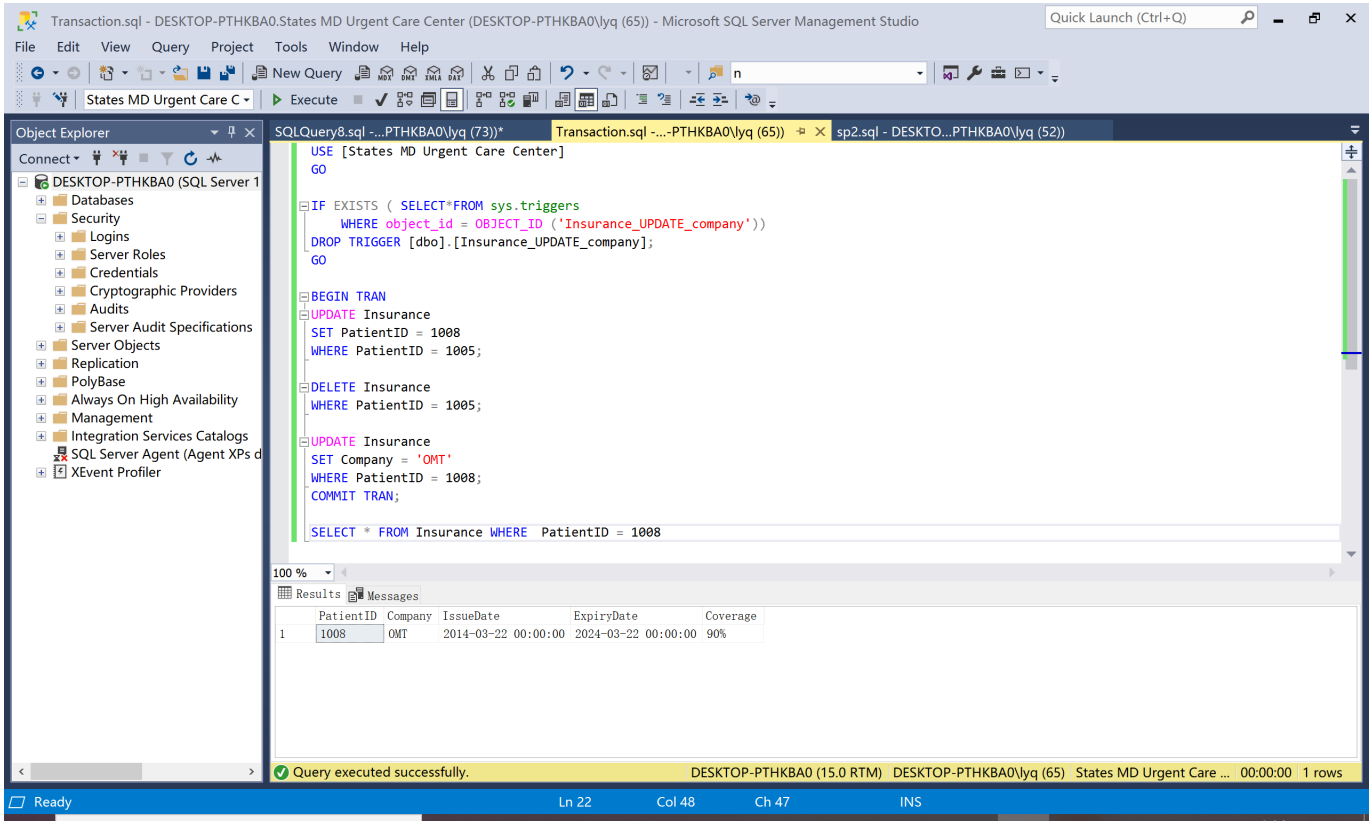
Triggers

This trigger could be able to corrects Center name to Upper after insert or update the table which help people to modify information of database.



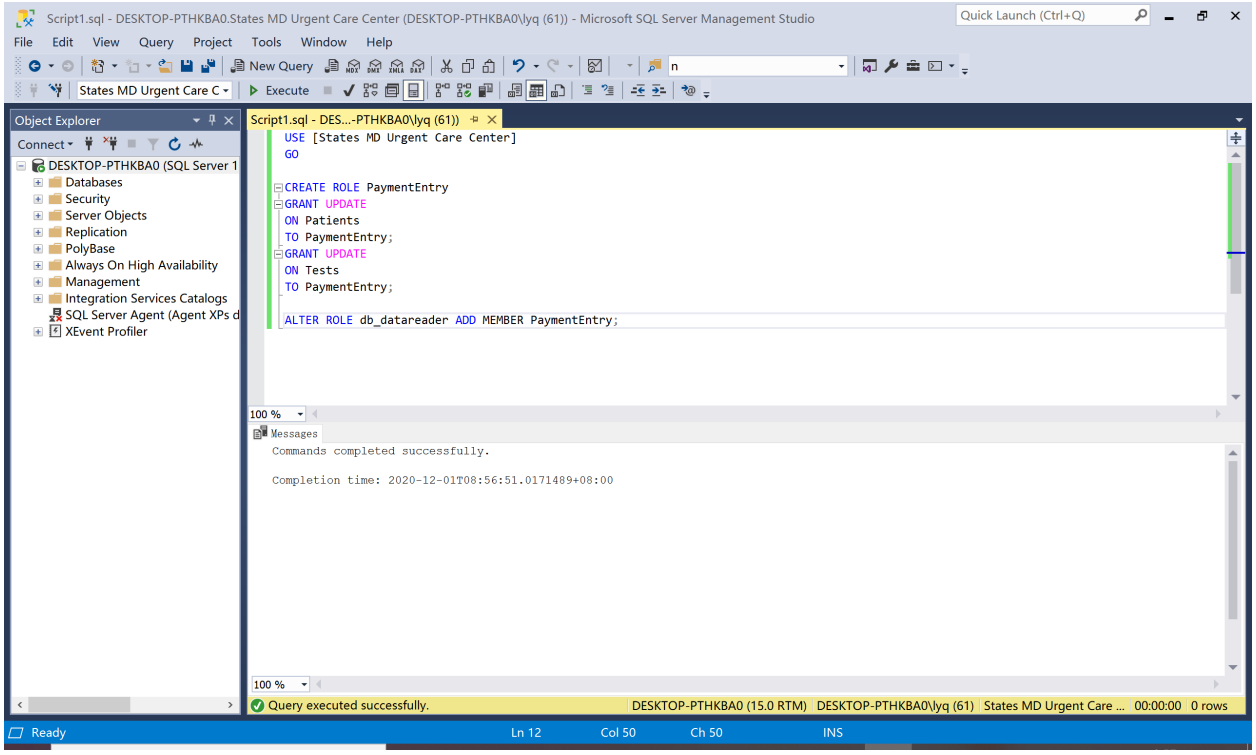
Transaction

This transaction reflect a change of insurance company and PatientID for a patient whose ID number was used to be 1005 and now is 1008 with a new insurance company named OMT.



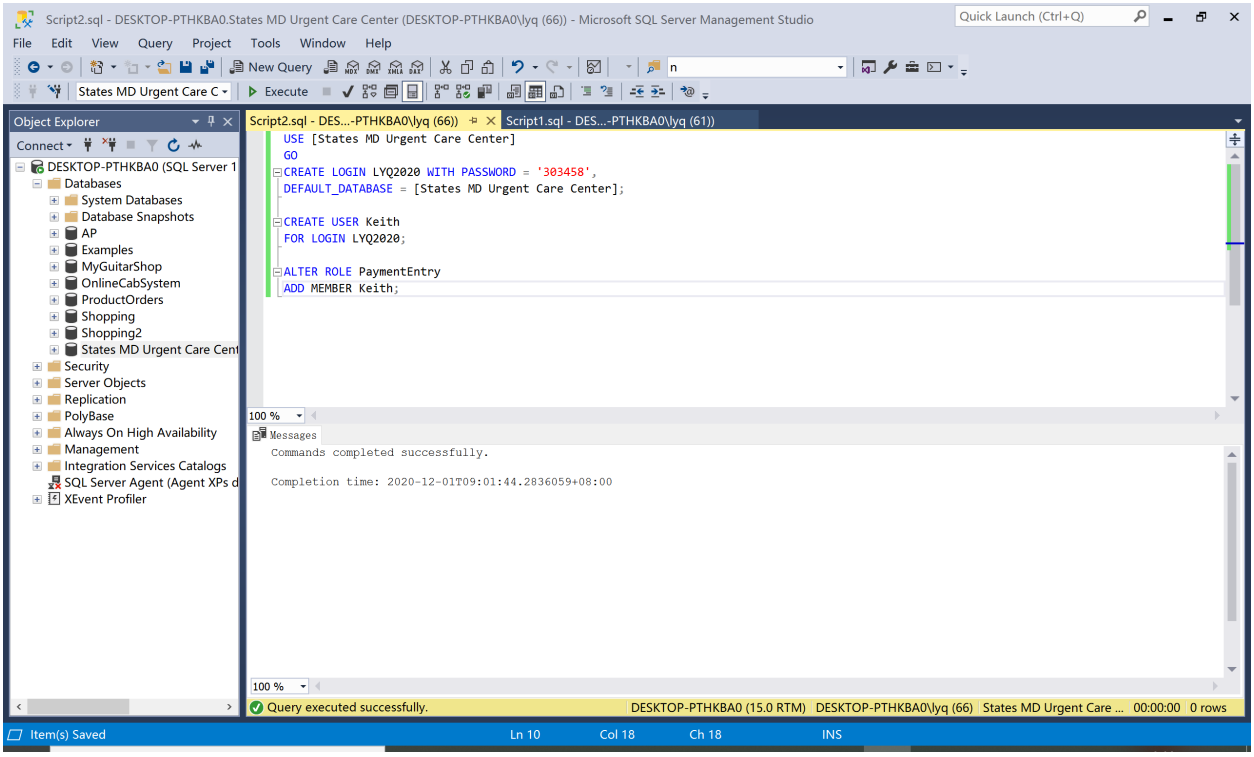
Scripts-1

In this script, I create a user-defined database role named Paymententry in the State MD Urgent Care Center database and give permissions of UPDATE to both the table Patients and the table Tests.



Scripts-2

In this script, I create a login ID named ‘LYQ2020’ with the password ‘303458’ and assign a user named Keith for login to the PaymentEntry role.



IIII. Conclusions

Project Analysis:

During finish this project, This project gave me a better comprehension of database logic, and gave me inspiration of designing a database. Although I meet a lot of problems from database design to implementation, from data insert to data testing. I could be able to solve them in the end. And one of the important thing is to identify data elements, tables and assign them into logic relationship. I think the ER diagram is very useful for database design since it clearly displayed tables relationships and contribute to the construction of database structure. The other thing I think is essential too is to implement database with sql language without errors, It takes long time to analysis the project requirements and the data flow and structure , but it is most important for any project. If you do something wrong in the beginning. It will become so hard to change something in the middle of the project since I wrote wrong syntax and it did took time to correct it. Throughout this time I could write syntax and test them by several view, function, stored procedure or scripts more similarly.

Remarks:

After I finish this project, I learned a lot about how to analysis statistics and implement a database. I think establishing the right relationship between tables is as same important as creating right syntax for designing a database.