OBESITY MANAGEMENT SYSTEM

Submitted on May 7, 2023.

Executive summary:

The obesity management project is designed to help individuals address and manage their weight issues through various strategies. The project includes the involvement of both patients and dietitians who work together to develop and implement an effective management plan. We assess the patient's current weight status using a Body measurement table. Based on the Body Measurements, the patient and dietitian work together to develop a personalized weight loss plan that includes a diet and exercise planner. The diet plan provides a framework for patients to make healthy food choices, and they are designed to be sustainable and flexible to meet the individual's choice. The project also includes regular check-ins with the dietitian to monitor progress and make any necessary adjustments to the management plan. Overall, the obesity management project is designed to help patients achieve and maintain a healthy weight through a combination of diet and exercise. By working closely with a dietitian and following a personalized plan, patients can improve their overall health outcomes and reduce their risk of chronic diseases associated with obesity.

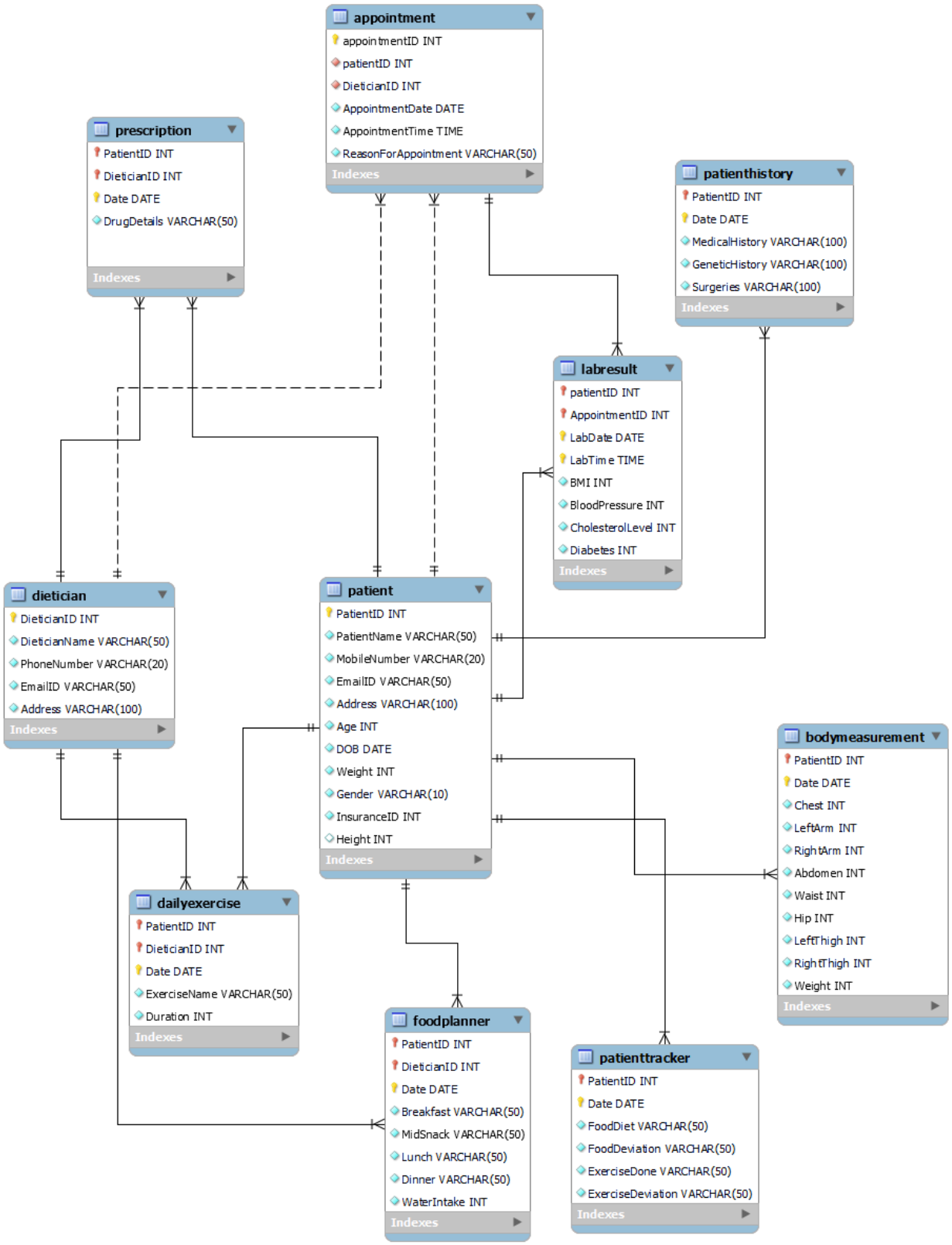
Project motivation/background/context:

Obesity is a leading preventable cause of death worldwide, with rising prevalence in both adults and children. It also raises the chance of acquiring metabolic illnesses, cardiovascular disease, osteoarthritis, Alzheimer's disease, depression, and certain types of cancer. Obesity can be aided by a healthier diet, and more physical activity, and medications can be used in conjunction with a healthy diet to suppress appetite or fat absorption. So, we need a system that can manage and track all activities of the patient in the weight-loss journey. we designed the project Obesity Management System to satisfy the following objectives:

- **Understanding calorie consumption:** Keeping track of calorie intake is essential for achieving weight loss goals and monitoring progress.
- **Provides a Food Planner:** A complete food plan allows patients to schedule meals ahead depending on their calorie and nutrient requirements.
- **Factors influencing a patient's weight loss:** Understanding the elements that influence a patient's weight loss, such as lifestyle and health issues, aids in tailoring a plan for the patient.
- **A patient's pre-medical history**: Knowing the patient's pre-medical history, including any allergies or existing health concerns, aids in designing a dietary plan that is both safe and effective for the patient.

- **Dietician checkups:** Regular checkups with dieticians assist in evaluating the patient's progress and detect any concerns.

Entity Relationship Diagram:



List of tables created:

1. **Patient:** The patient table stores the information about all patients with their personal information including insurance details.

- PatientID
- PatientName
- MobileNumber
- EmailID
- Address
- Age
- DOB
- Weight
- Height
- Gender
- InsuranceID

The primary key in the table is patientid.

2. **Dietician:** The dietician table stores details of the personal details of the dietician who is working in the hospital.

- DieticianID
- DieticianName
- PhoneNumber
- EmailID
- Address

The primary key in the table is dieticianid.

3. **Appointment:** The appointment table stores information about the patient's appointment with the dietician and the time of the appointment.

- AppointmentID
- PatientID
- DieticianID
- AppointmentDate
- AppointmentTime
- ReasonForAppointment

The primary key in the table is appointmentID, PatientID, and DieticianID.
The Foreign key in the table are patientid, dietician id which references patientid from patient table and dietician id from the dietician table.

4. **PatientHistory:**The patient history table is designed to store records related to patients. It typically includes various details and events associated with a patient's medical, treatment, or health-related history.

- PatientID
- Date
- MedicalHistory
- GeneticHistory
- Surgeries

The primary key in the table is PatientID, Date.
The Foreign key in the table is patientid which references patientid from the patient table.

5. **LabResult:** The lab result table is designed to store the results of laboratory tests conducted for patients. It typically includes various parameters, measurements, and values obtained from diagnostic tests or analyses.

- PatientID
- AppointmentID
- LabDate
- LabTime
- BMI
- BloodPressure
- CholesterolLevel
- Diabetes

The primary key in the table is patientID, AppointmentID, LabDate,LabTime.
The Foreign key in the table are patientid, AppointmentID which references patientid from patient table and AppointmentID from Appointment table.

6. **Prescription**: The prescription table is designed to store information related to prescribed medications for patients. It typically includes details about the prescribed medication.

- PatientID
- DieticianID
- Date
- DrugDetails

The primary key in the table are PatientID, DieticianID, Date.
The Foreign key in the table are patientid, DieticianID which references patientid from patient table and DieticianID from the Dietician table.

7. **FoodPlanner:** The food planner table is designed to store information related to planned meals or dietary plans for patients. It typically includes details about the patient, the date of the food plan, specific meals, and any additional instructions or recommendations provided by dieticians.

- PatientID
- DieticianID
- Date
- Breakfast
- MidSnack
- Lunch
- Dinner
- WaterIntake

The primary key in the table are PatientID, DieticianID, Date.
The Foreign key in the table are patientid, DieticianID which references patientid from patient table and DieticianID from the Dietician table.

8. **DailyExercise:** The daily exercise table is designed to store information about the exercises performed by individuals on a daily basis. It can include details such as the exercise type, duration, and intensity.

- PatientID
- DieticianID
- Date
- ExerciseName
- Duration

The primary key in the table are PatientID, DieticianID, Date.
The Foreign key in the table are patientid, DieticianID which references patientid from patient table and DieticianID from the Dietician table.

9. **PatientTracker:** A patient tracker table is designed to keep track of various parameters like deviations done during the diet period

- PatientID
- Date
- FoodDiet
- FoodDeviation
- ExerciseDone
- ExerciseDeviation

The primary key in the table is PatientID, Date.
The Foreign key in the table are patientid which references patientid from the patient table.

10. **BodyMeasurement:** The body measurement table stores information about various measurements related to a patient's body composition and physical characteristics from time to time.

- PatientID
- Date
- Chest
- LeftArm
- RightArm
- Abdomen
- Waist
- Hip
- LeftThigh
- RightThigh
- Weight

The primary key in the table is PatientID, Date.
The Foreign key in the table are patientid which references patientid from the patient table.

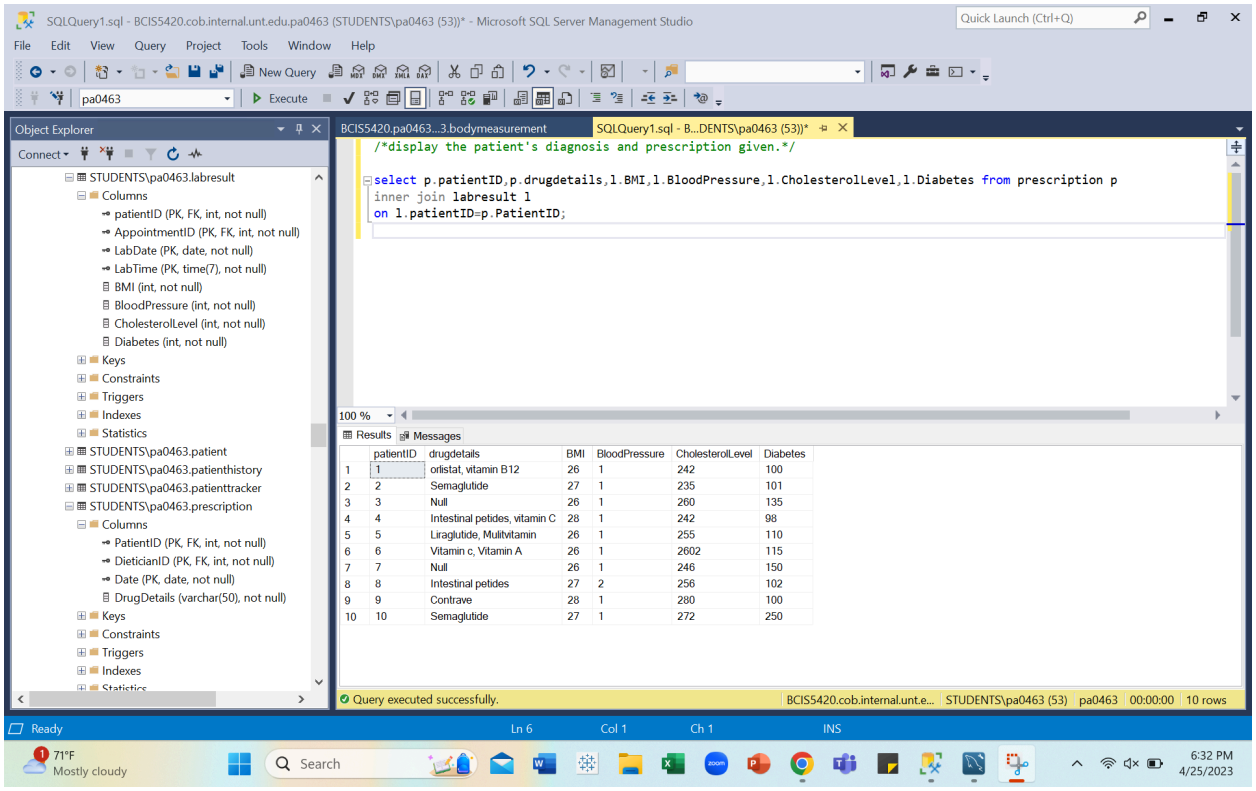
Set of 20 complex queries:

Query 1: Query to display the patient's lab result and the prescription for that diagnosis.

Query:

```
Select p.patientID,p.drugdetails,l.BMI,l.BloodPressure,l.CholesterolLevel,l.Diabetes
from prescription p
inner join labresult l
on l.patientID=p.PatientID;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of patients lab results and prescriptions of the patients given by the dietician using an inner join.

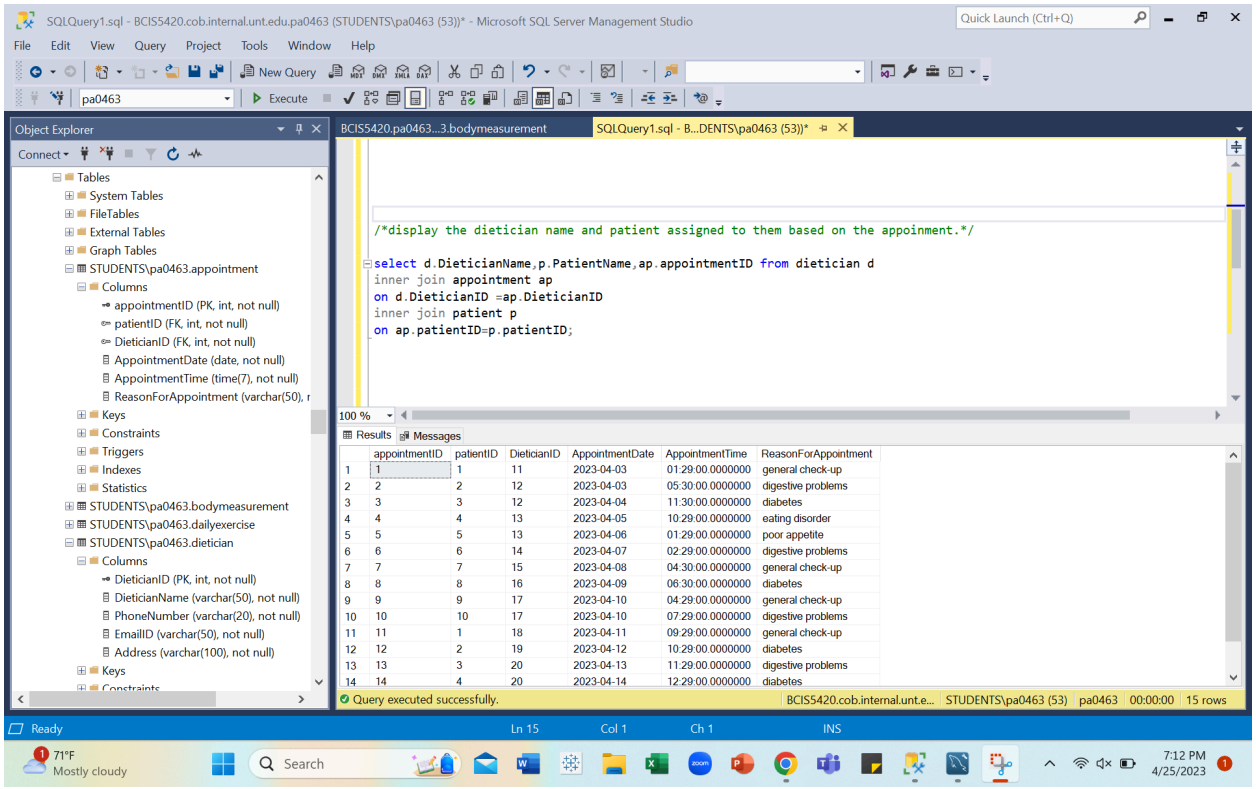
The above query helps to identify what the patient is diagnosed with from the lab result table and the prescription that was given by the dietician from the prescription table. The query helps to easily identify the health status of the patient and what medication they are taking.

Query 2: Query to display the dietician's name and the patient assigned to them based on the appointment.

Query:

```
select d.DieticianName,p.PatientName, ap.appointmentID from dietician d
inner join appointment ap
on d.DieticianID =ap.DieticianID
inner join patient p
on ap.patientID=p.patientID;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of the dietician and patients assigned to a particular dietician using an inner join.

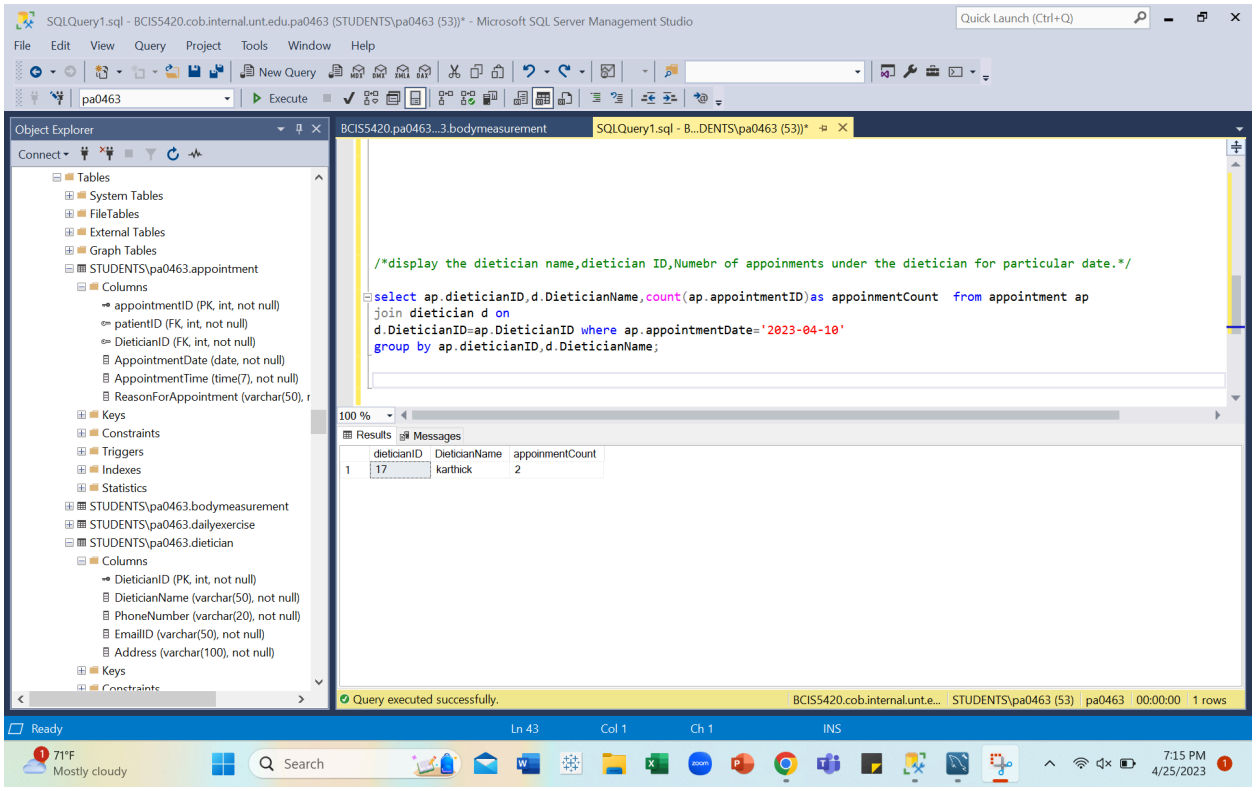
These query helps to identify the patient who has been allocated to which dietician to receive their medical care and nutrition advice.

Query 3: Query to display the dietician's name, dietician ID, and Number of appointments under the dietician for a particular date.

Query:

```
select ap.dieticianID,d.DieticianName,count(ap.appointmentID)as appoinmentCount
from appointment ap
join dietician d on
d.DieticianID=ap.DieticianID where ap.appointmentDate='2023-04-10'
group by ap.dieticianID,d.DieticianName;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of the dietician and the number of appointments for a particular date using the where clause and group by the operator.

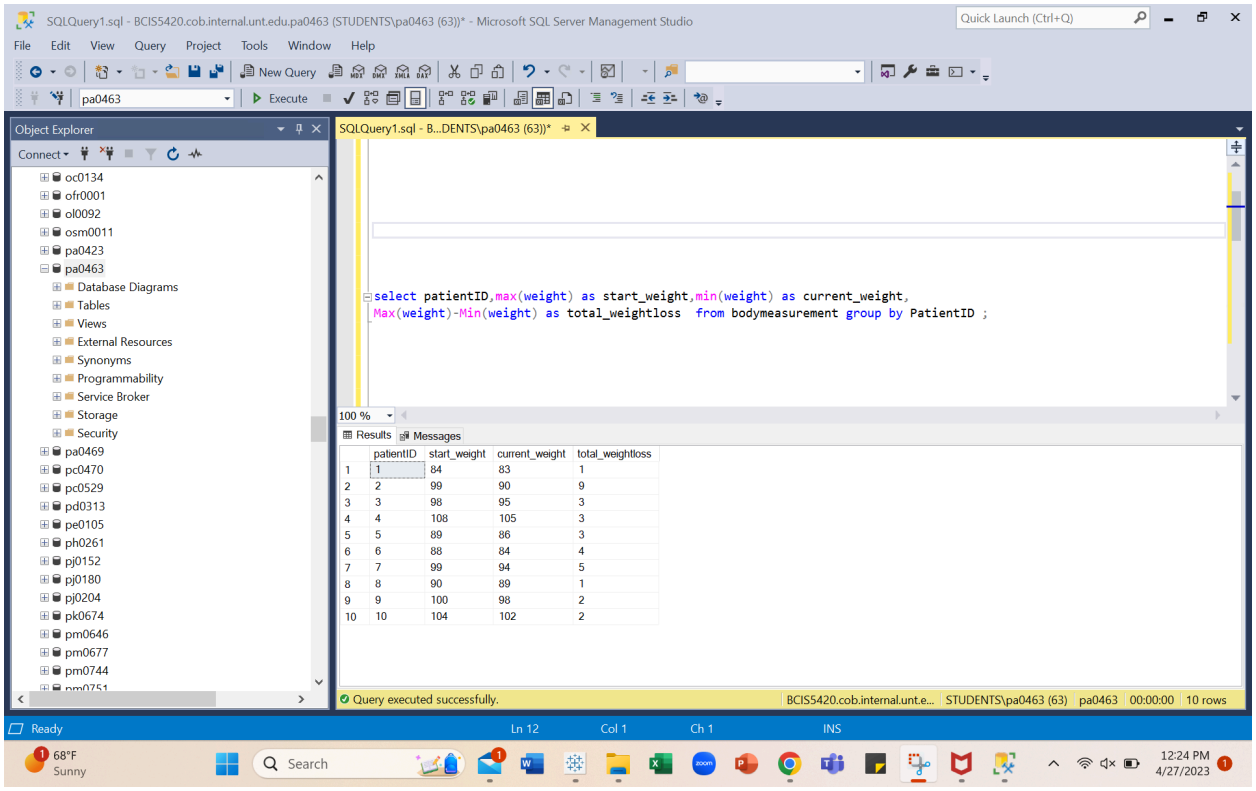
This query helps the dietician to identify the number of appointments allocated under them for a particular day.

Query 4: Query to display how much weight does the patient have lost comparing to starting of the journey?

Query:

```
select patientID,
max(weight) as start_weight,
min(weight) as current_weight,
Max(weight)-Min(weight) as total_weightloss
 from bodymeasurement group by PatientID ;
```

Screenshot:



Description and business need of the query:

In these query, we display the details of the patient weight when compared with beginning of diet plan using max, min operators and we grouped by patient id

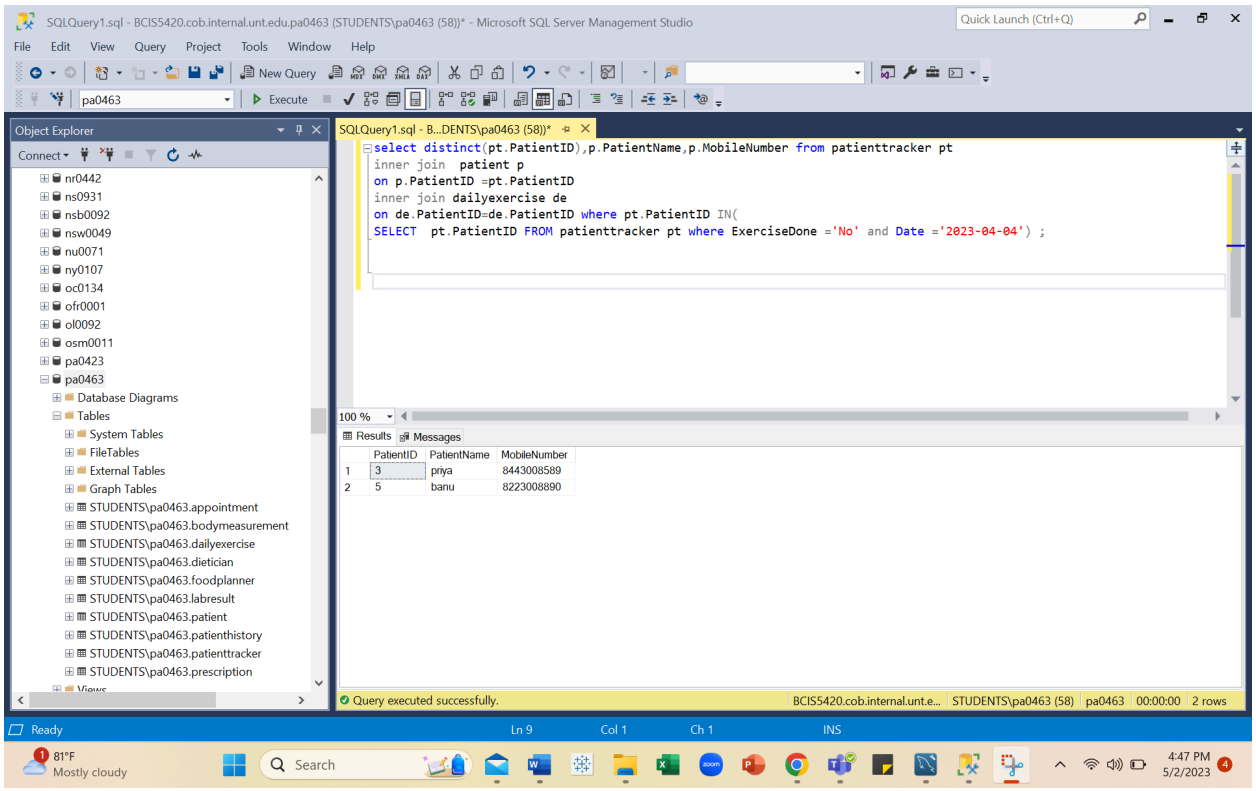
These query helps us to identify how much weight has been reduced by the patient throughout their weight-loss journey and the dietician will be able to determine if the diet and exercise plan is helping the patient to achieve their goals.

Query 5: Query to display details of the patient who has skipped the exercise with their Contact Number for a connection.

Query:

```
select distinct(pt.PatientID),p.PatientName,p.MobileNumber from patienttracker pt
inner join  patient p
on p.PatientID =pt.PatientID
inner join dailyexercise de
on de.PatientID=de.PatientID where pt.PatientID IN(
SELECT pt.PatientID FROM patienttracker pt where ExerciseDone ='No' and Date ='2023-04-04');
```

Screenshot:



Description and business need of the query:

In this query, we display the details of patients who skipped the exercise by using an inner join.

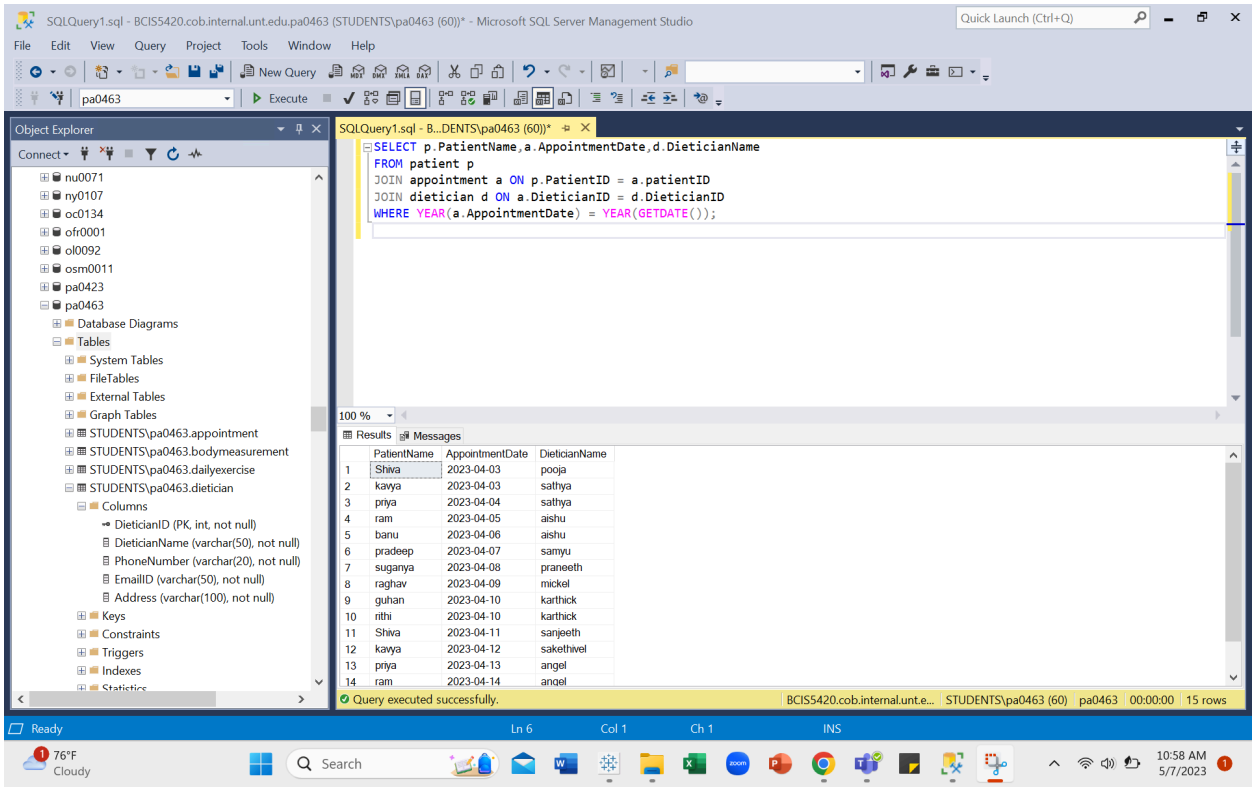
This query helps the dietician to keep track of the patient who has missed their exercise plan based on the date and their contact details to notify and keep them on track.

Query 6: Query to display Appointment details of the patient for the current year and the dietician who was assigned to them.

Query:

```
SELECT p.PatientName, a.AppointmentDate,d.DieticianName
FROM patient p
JOIN appointment a ON p.PatientID = a.patientID
JOIN dietician d ON a.DieticianID = d.DieticianID
WHERE YEAR(a.AppointmentDate) = YEAR(GETDATE());
```

Screenshot:



Description and business need of the query:

In this query, we retrieve the data of patients and their dieticians in the current year. Using the JOIN keyword is to combine the "appointment" table with the "dietician" table based on the DieticianID column.

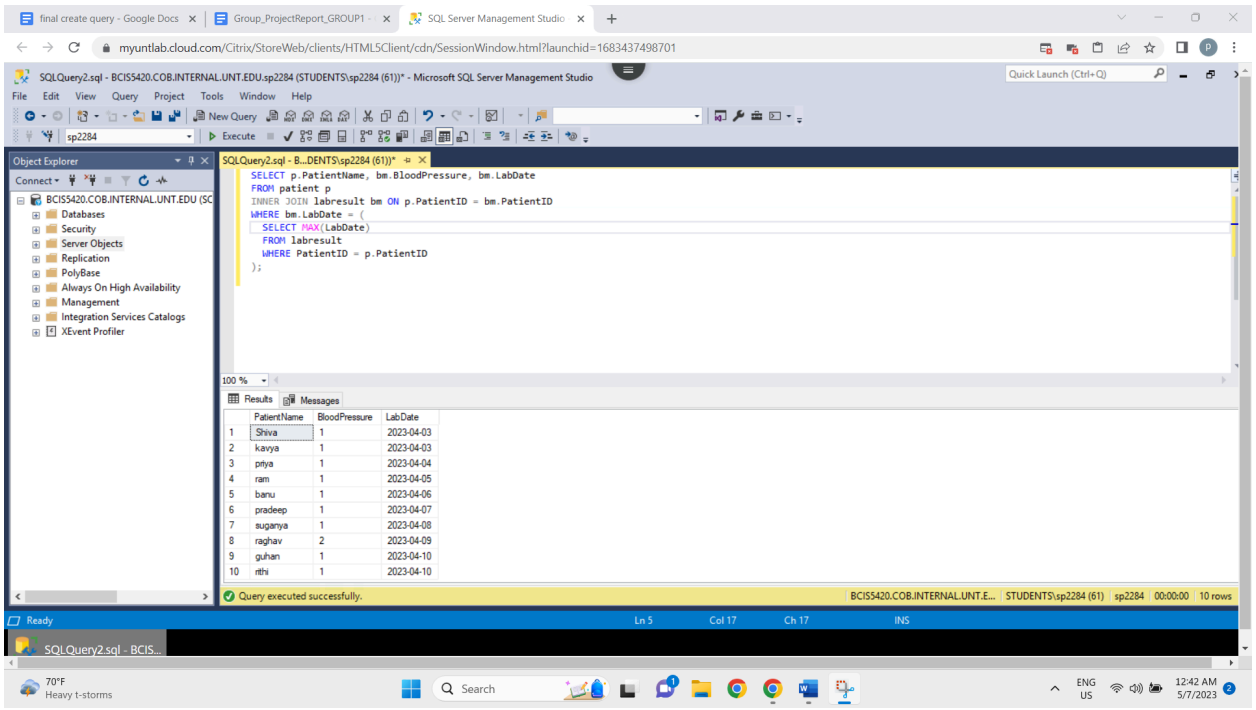
The query helps in managing appointments by providing a list of patients who have appointments in the current year. It enables scheduling, rescheduling, and tracking appointments efficiently.

Query 7: Query to display the patient name and their latest blood pressure details:

Query:

```
SELECT p.PatientName, bm.BloodPressure, bm.LabDate
FROM patient p INNER JOIN labresult bm ON p.PatientID = bm.PatientID
WHERE bm.LabDate = (   SELECT MAX(LabDate)   FROM labresult
WHERE PatientID = p.PatientID );
```

Screenshot:



Description and business need of the query:

The query retrieves the patient's name, blood pressure, and lab date from the "patient" and "labresult" tables. It uses a subquery to filter the lab results for each patient to only the maximum lab date.

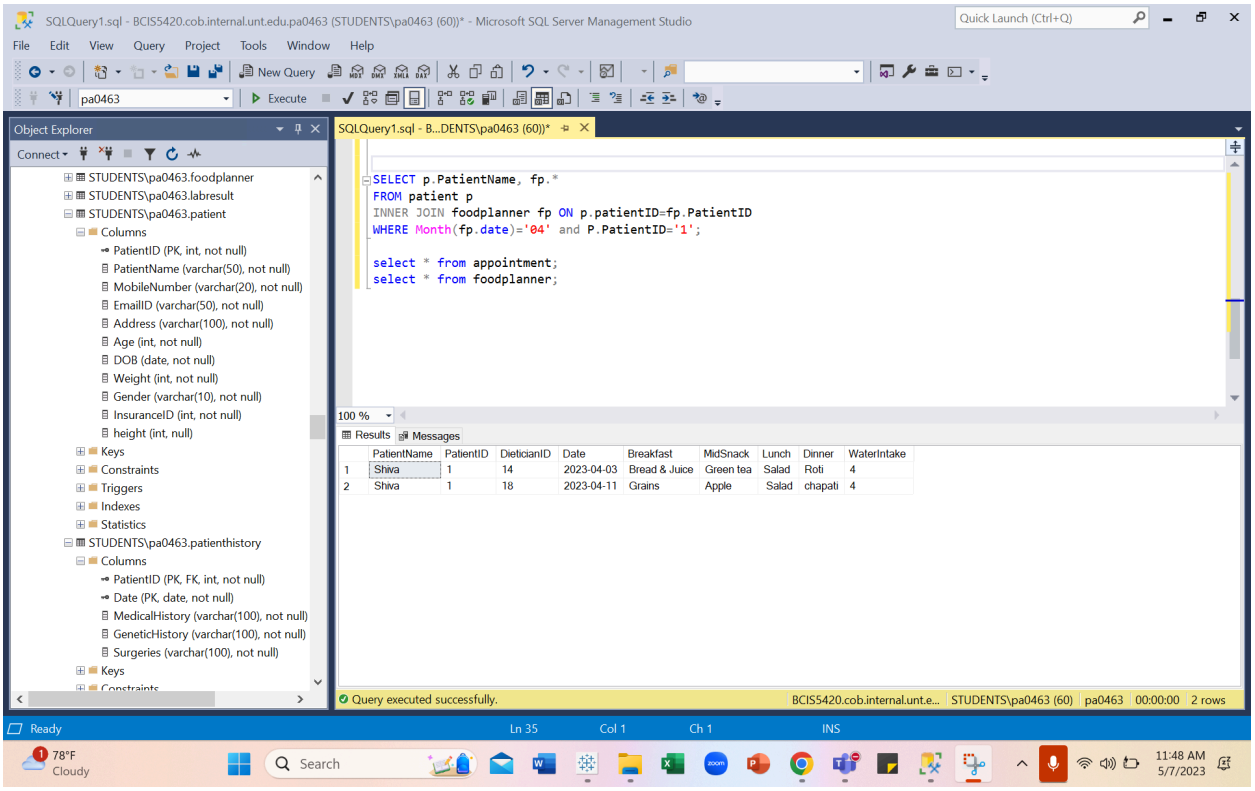
This query helps the dieticians to make decisions regarding the type of care and therapy required to assist manage any existing conditions by having access to the most recent blood pressure data. This query helps the patient to consult with the corresponding dietician to make their exercise plan alterations.

Query 8: Retrieve the patient's food planner for a particular month and for a particular patient.

Query:

```
SELECT p.PatientName, fp.*
FROM patient p
INNER JOIN foodplanner fp ON p.patientID=fp.PatientID
WHERE Month(fp.date)='04' and P.PatientID='1';
```

Screenshot:



Description and business need of the query:

In these query retrieves the data of patients from the patient table and by using the join keyword it retrieves the data of the food the patient has taken for the particular month

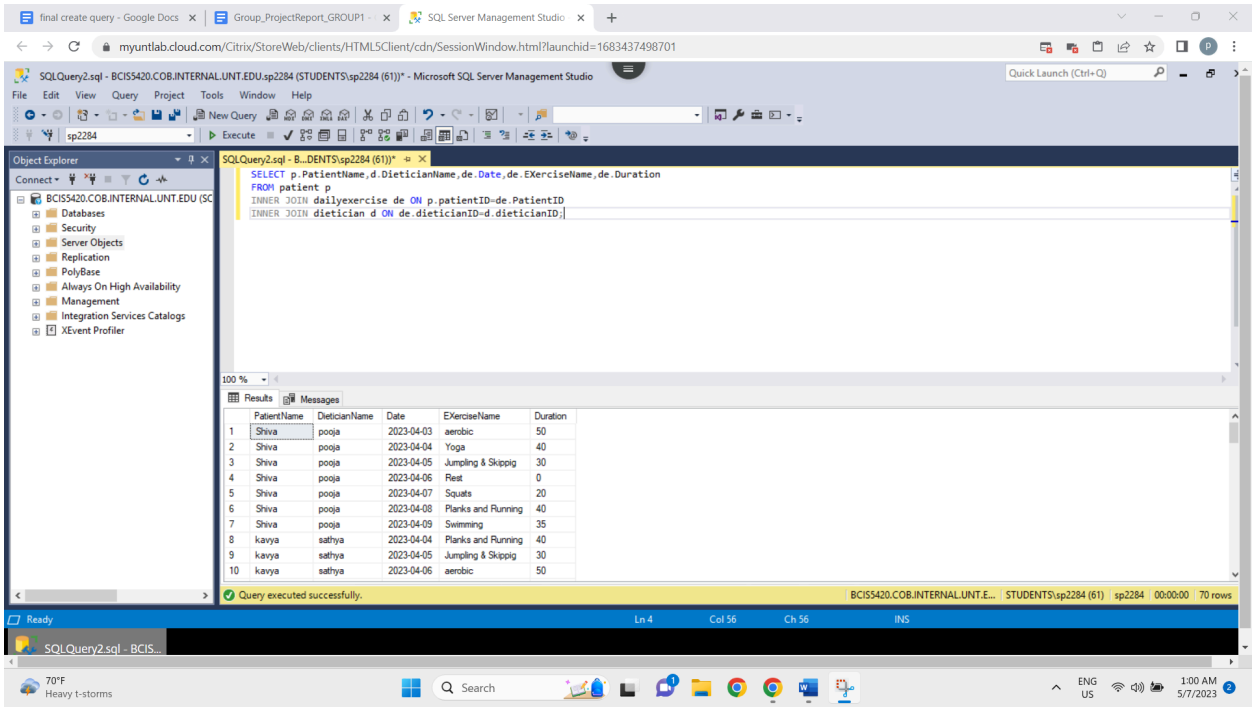
This query helps the dietician to get the food planner of the patient to design a food planner for the upcoming months.

Query 9: Query to display about patients' daily exercises and the corresponding dietician

Query:

```
SELECT p.PatientName,d.DieticianName,de.Date,de.ExerciseName,de.Duration
FROM patient p
INNER JOIN dailyexercise de ON p.patientID=de.PatientID
INNER JOIN dietician d ON de.dieticianID=d.dieticianID;
```

Screenshot:



Description and business need of the query:

This query retrieves the data of patients and their daily exercises done from the exercise table and their dietitian respectively.

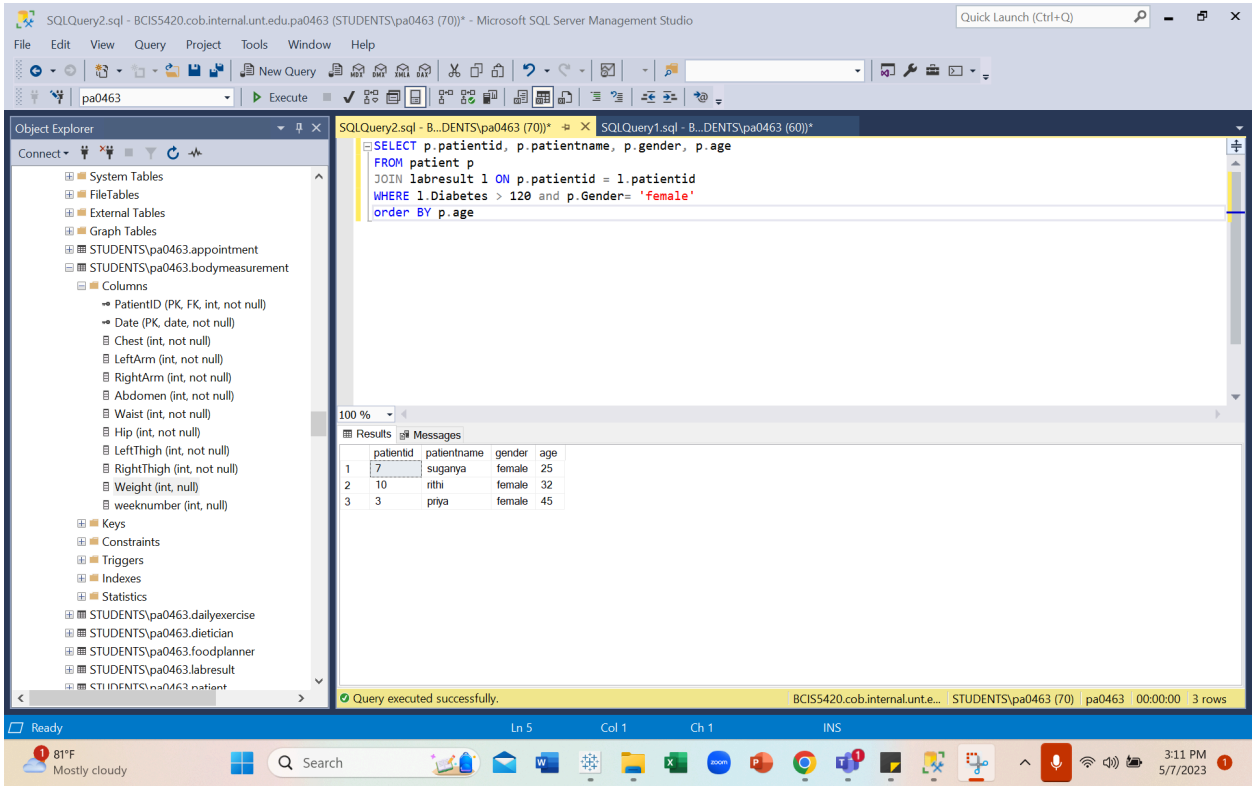
By executing this query, you can obtain a result set that displays the patients' daily exercises along with the corresponding dietician assigned to each patient. This information can be useful for business purposes, such as monitoring patient progress and ensuring coordination between exercise and dietary plans.

Query 10: Display details of the patient who is female having a high level of diabetes.

Query:

```
SELECT p.patientid, p.patientname, p.gender, p.age
FROM patient p
JOIN labresult l ON
p.patientid = l.patientid
WHERE l.Diabetes > 120 and p.Gender= 'female'
order BY p.age
```

Screenshot:



Description and business need of the query:

In this query, we retrieve the data of patients whose gender is women and have high diabetes value by using the join keyword and where clause.

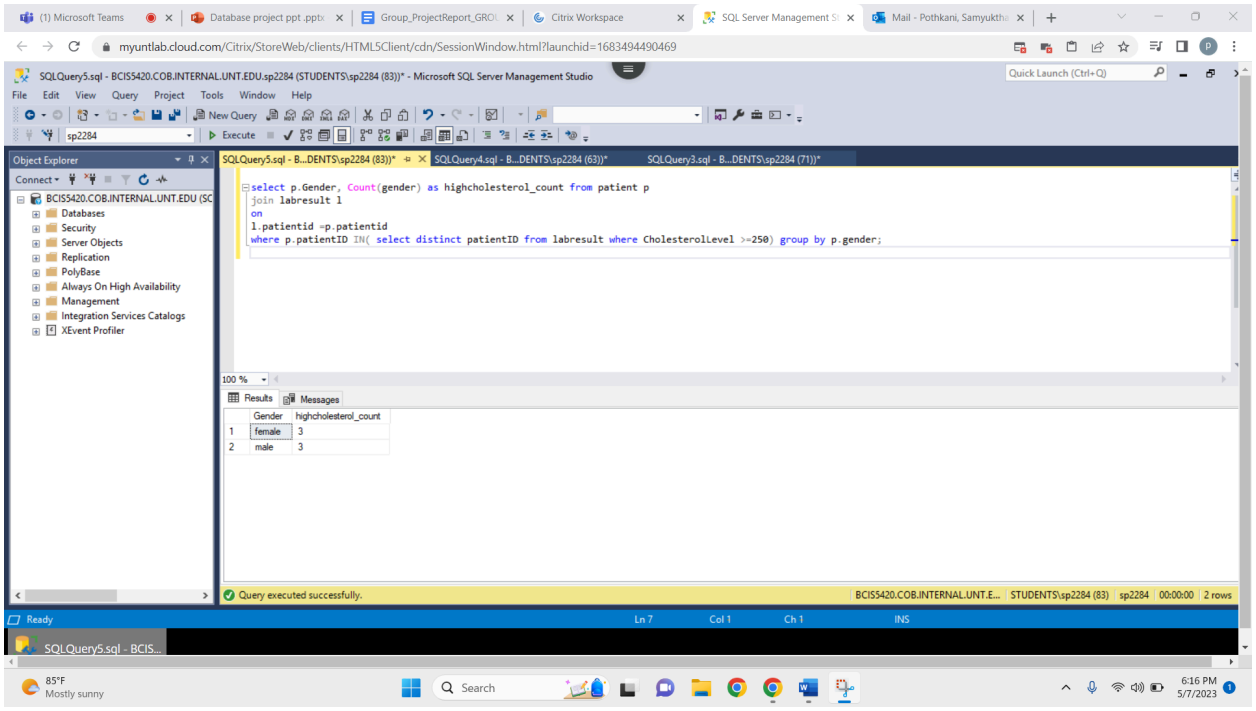
This information can be valuable for business purposes, such as targeted medical interventions, personalized treatment plans, or monitoring the effectiveness of interventions for high-risk patients.

Query 11: Write a query to display the gender of the patients who have high cholesterol count.

Query:

```
select p.Gender, Count(gender) as highcholesterol_count from patient p
join labresult l
on
l.patientid =p.patientid
where p.patientID IN( select distinct patientID from labresult where CholesterolLevel >=250)
group by p.gender;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of patients who have high cholesterol count and we are also displaying the gender of the patient by using where clause and join keyword to join the tables and group by gender using group by operator.

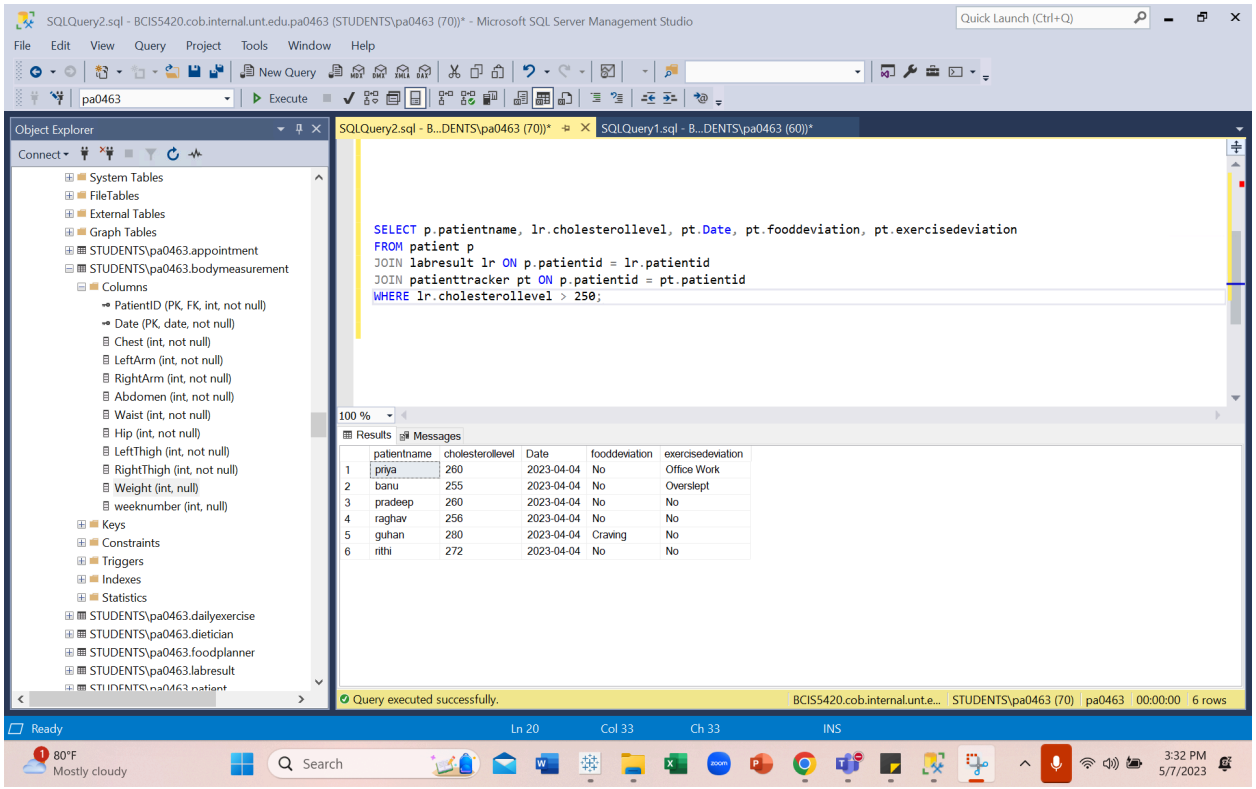
The business use of displaying the gender of patients who have a high cholesterol count can provide insights for various purposes like risk analysis, treatment planning, and educational initiatives

Query 12: Displays the exercise and food deviation for patients whose cholesterol level is greater than 250.

Query:

```
SELECT p.patientname, lr.cholesterollevel, pt.Date, pt.fooddeviation, pt.exercisedeviation
FROM patient p
JOIN labresult lr ON p.patientid = lr.patientid
JOIN patienttracker pt ON p.patientid = pt.patientid
WHERE lr.cholesterollevel > 250;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of exercise and food deviation for patients whose cholesterol level is greater than 250. By using the Join keyword and where clause from the patient table.

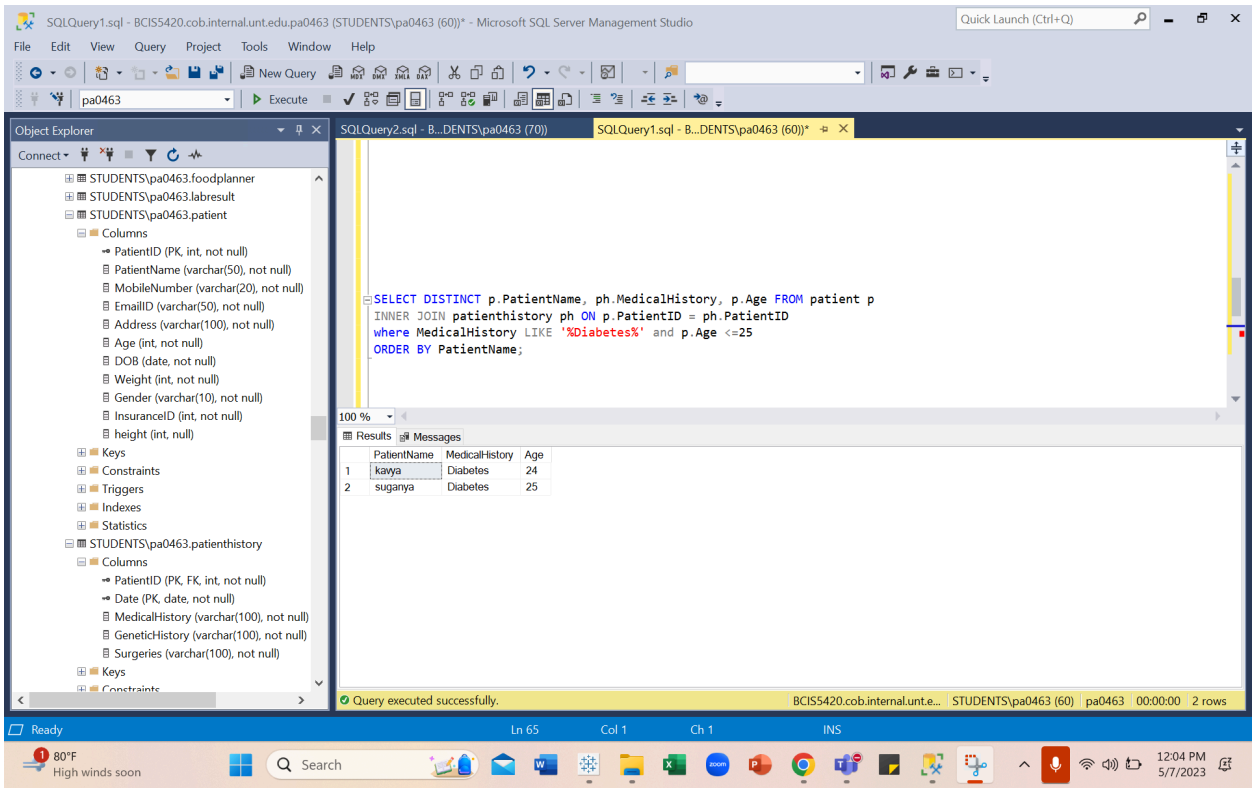
This information can be useful for business purposes, such as identifying patients who need targeted interventions for managing their cholesterol levels and providing personalized exercise and dietary recommendations to address their specific needs.

Query 13: Query to display PatientName, Age, and MedicalHistory columns from the patient and patienthistory tables, where the patient's age is less the equal to 25 and has Diabetes

Query:

```
SELECT DISTINCT p.PatientName, ph.MedicalHistory, p.Age FROM patient p
INNER JOIN patienthistory ph ON p.PatientID = ph.PatientID
where MedicalHistory LIKE '%Diabetes%' and p.Age <=25
ORDER BY PatientName;
```

Screenshot:



Description and business need of the query:

In this query, we display PatientName, Age, and MedicalHistory columns from the patient and patienthistory tables, where the patient's age is less the equal to 25 and has Diabetes using Innerjoin and where clause ordering by patientname.

This information can be useful for business purposes, such as targeted healthcare interventions or research focusing on diabetes management in young patients.

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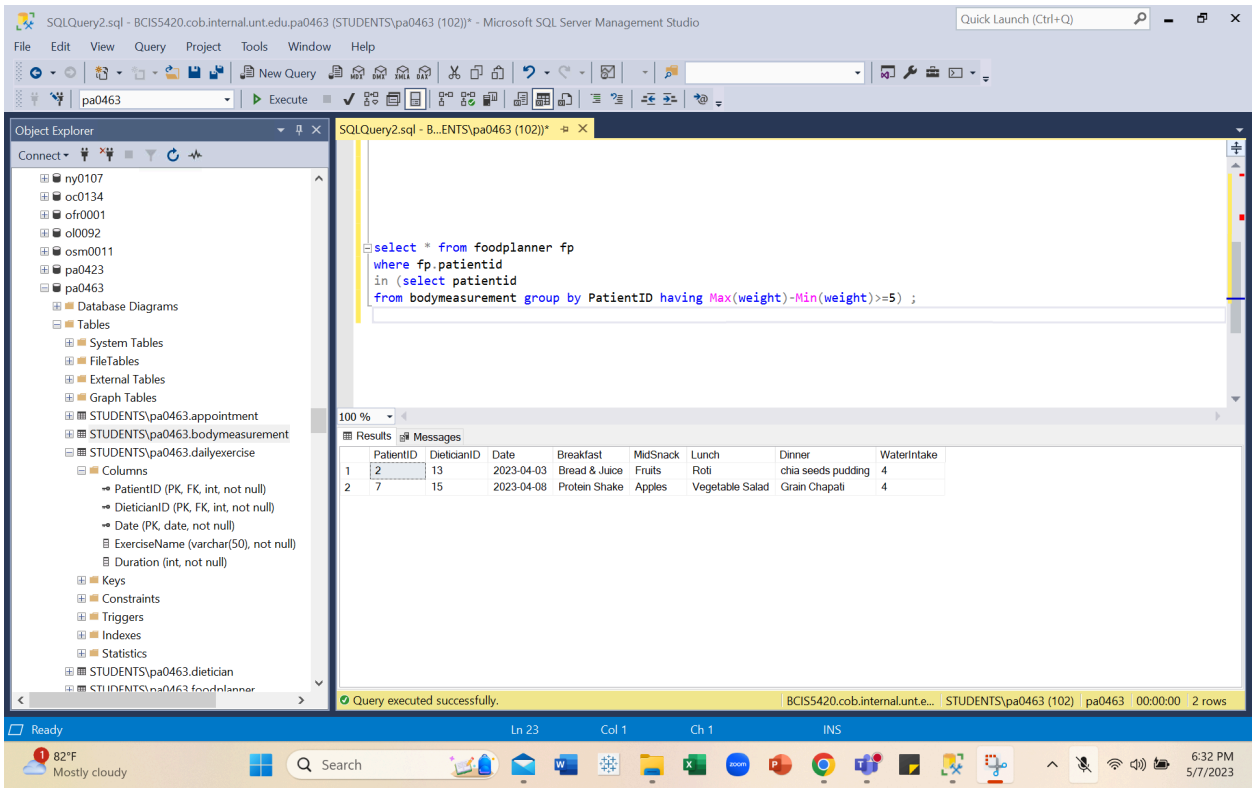
Query 14: The query display the diet details of the patient who has lost more than five kgs.

Query:

```
select * from foodplanner fp
where fp.patientid
in (select patientid
from bodymeasurement group by PatientID
having Max(weight)-Min(weight)>=5) ;
```

Screenshot:



Description and business need of the query:

In this query, we display the details of the patient who has lost more than five kgs using the where clause and max, min operators to filter the weight less than 5 kgs.

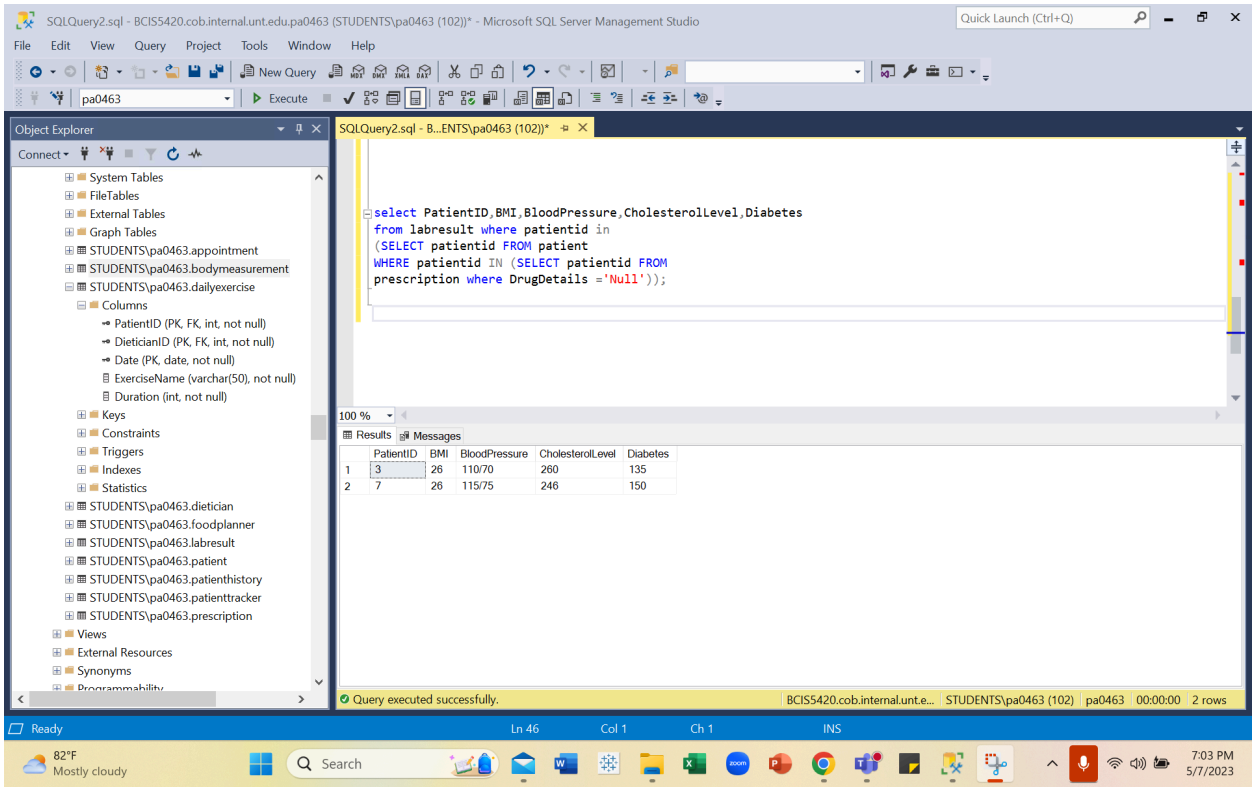
This helps the dietician to understand the food plan which is effective to continue suggesting patients to follow.

Query 15: Lab details of the patient who are not under medication

Query:

```
select PatientID, BMI, BloodPressure, CholesterolLevel, Diabetes
from labresult where patientid in
(SELECT patientid FROM patient
WHERE patientid IN (SELECT patientid FROM
prescription where DrugDetails ='Null'));
```

Screenshot:



Description and business need of the query:

In this query, we display the details of the patients who are not under any medication by using select clause and from the patient table and filtering by IN operator.

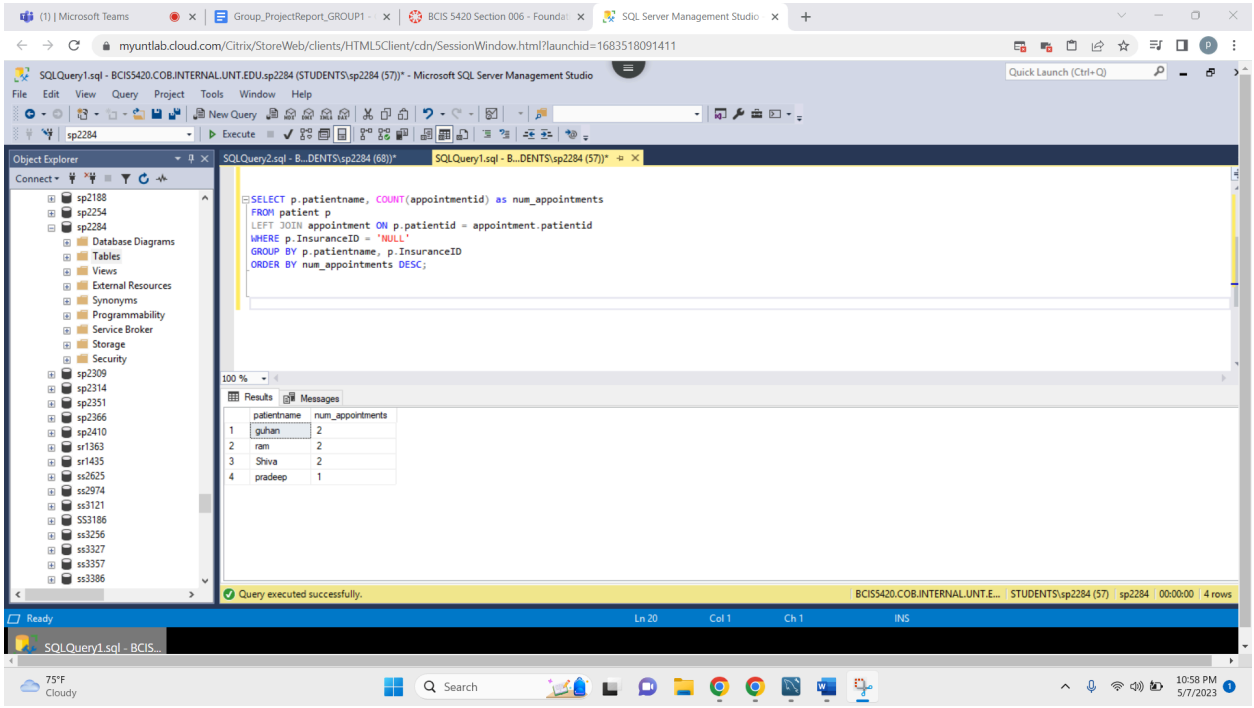
In a business context, this query could be used to identify patients who are not currently taking any medication and analyze their lab results. It may help in identifying any underlying health conditions or monitoring the progress of patients who are not on medication.

Query 16: Query to display patients who don't have insurance and display the number of appointments the patient .

Query:

```
SELECT p.patientname, COUNT(appointmentid) as num_appointments
FROM patient p
LEFT JOIN appointment ON p.patientid = appointment.patientid
WHERE p.InsuranceID = 'NULL'
GROUP BY p.patientname, p.InsuranceID
ORDER BY num_appointments DESC;
```

Screenshot:



Description and business need of the query:

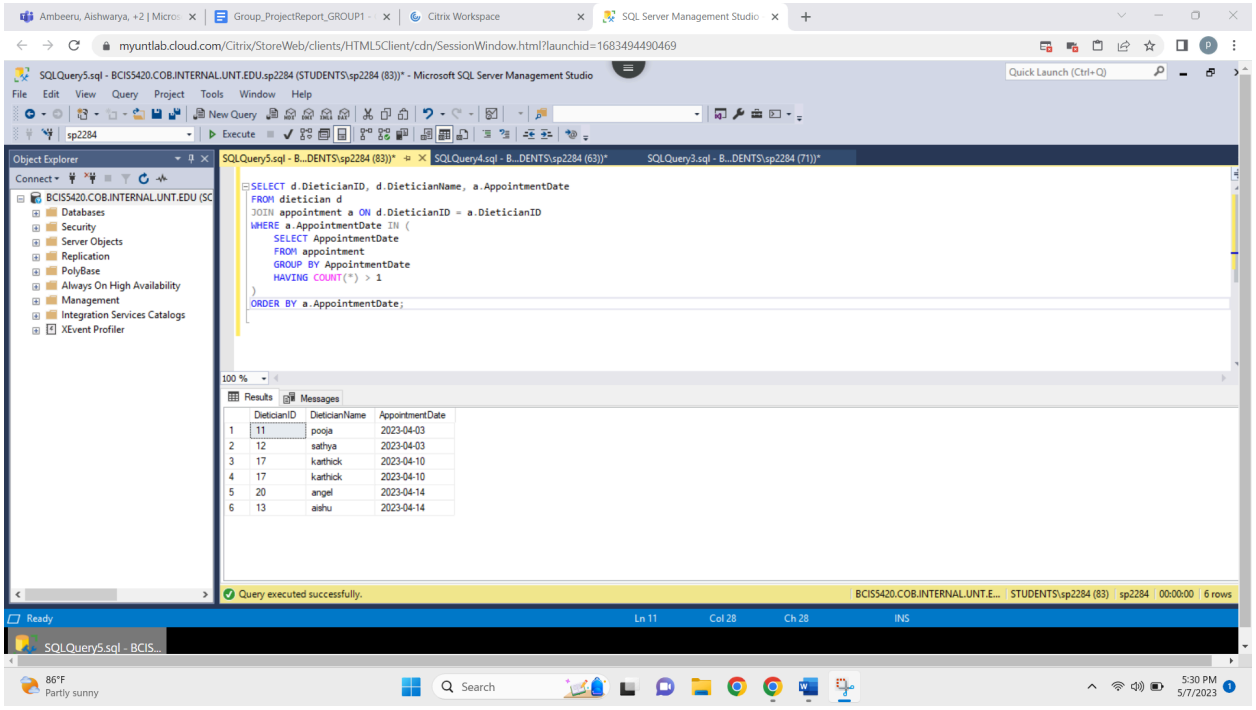
The query allows dietician to monitor patients progress in terms of their waist measurements over time. It provides a consolidated view of all patients and their corresponding waist measurements recorded on different dates.

Query 17: Query to display dieticians who have more appointments on the same day

Query:

```
SELECT d.DieticianID, d.DieticianName, a.AppointmentDate
FROM dietician d
JOIN appointment a ON d.DieticianID = a.DieticianID
WHERE a.AppointmentDate IN (
    SELECT AppointmentDate
    FROM appointment
    GROUP BY AppointmentDate
    HAVING COUNT(*) > 1
)
ORDER BY a.AppointmentDate;
```

Screenshot:



Description and business need of the query:

In these we display the details of the dietitian who has more than one appointment on the same day by using where clause by describing conditions and filtering it by using groupby operator .

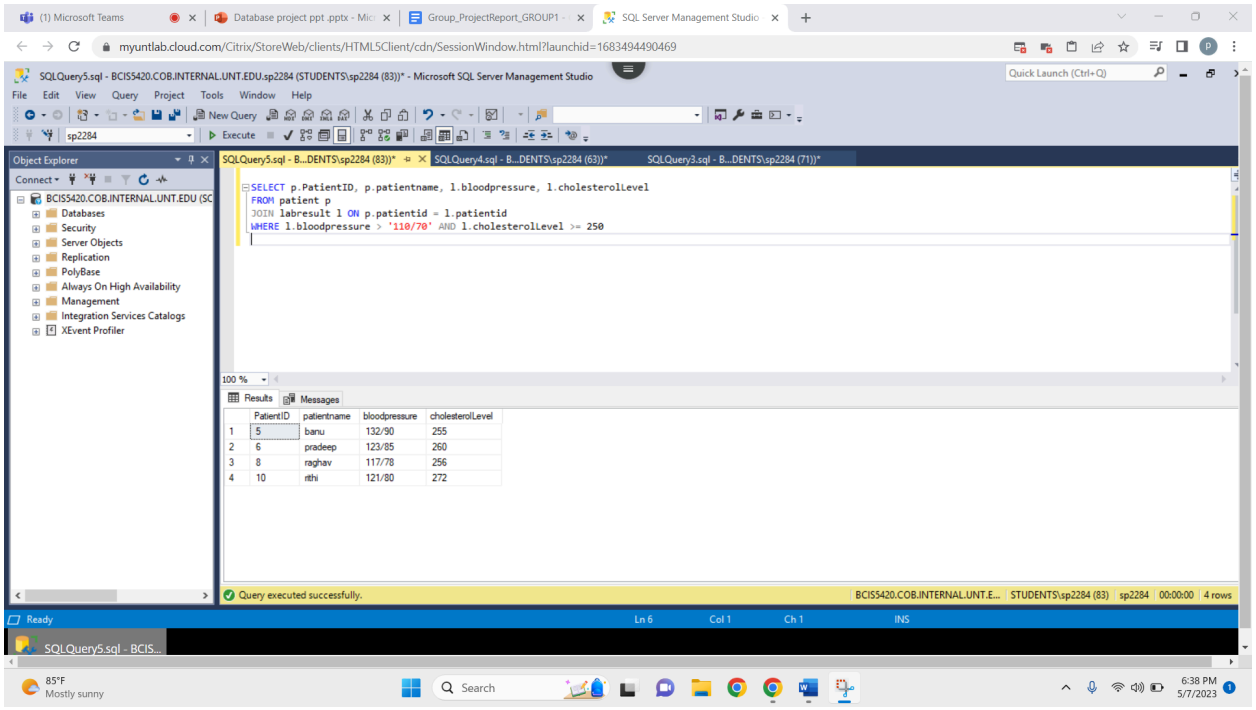
This query can be valuable in managing the scheduling and workload of dieticians in a healthcare or wellness facility.

Query 18: Query to display patientname, bloodpressure, and cholestralLevel greater than or equal to 250 and blood pressure greater than 110/70.

Query:

```
SELECT p.PatientID, p.patientname, l.bloodpressure, l.cholesterolLevel
FROM patient p
JOIN labresult l ON p.patientid = l.patientid
WHERE l.bloodpressure > '110/70' AND l.cholesterolLevel >= 250
```

Screenshot:



Description and business need of the query:

In these query we display the details of the patients patient name, blood pressure and cholesterol Level greater than or equal to 250 and blood pressure greater than 110/70.By using the Join keyword and joining two tables by taking patientid as common.

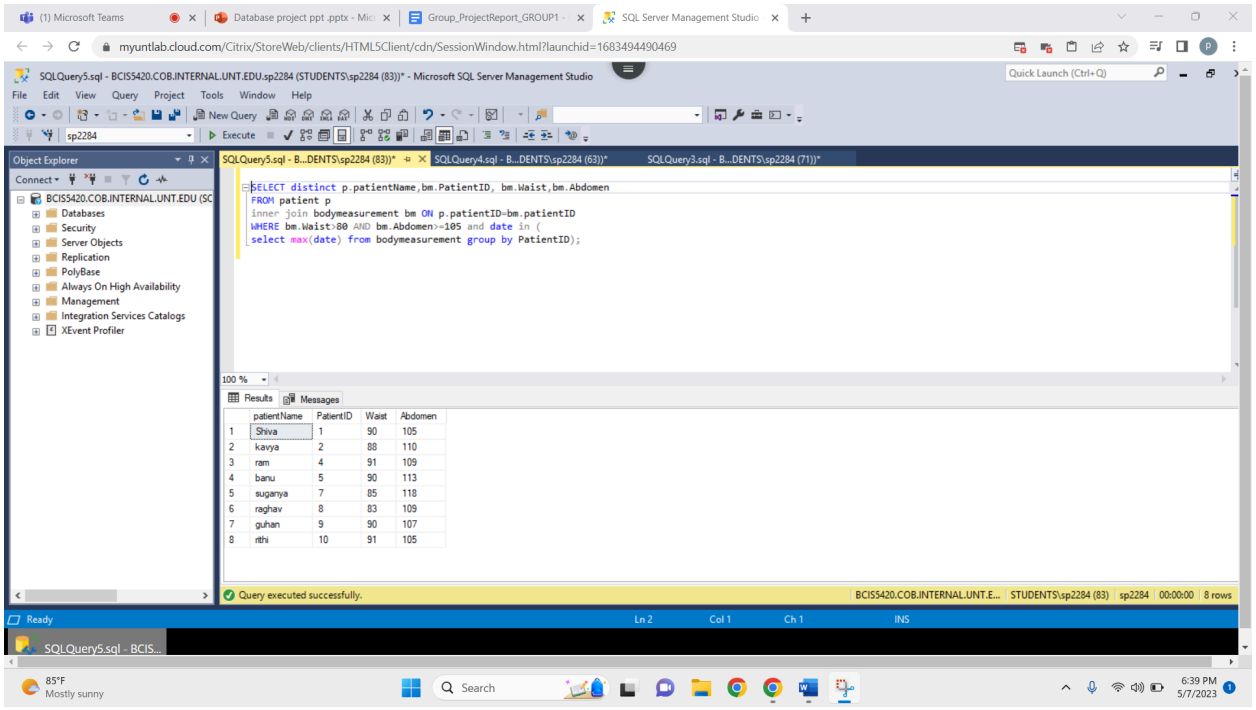
This query can be used in a healthcare setting to identify patients who have elevated cholesterol levels and high blood pressure. By retrieving the patient name, blood pressure, and cholesterol level for these individuals, healthcare professionals can monitor the risk of certain diseases.

Query 19: Display the latest body measurement details taken for each patient who has Waist size > = 80 and Abdomen size >=105 to check whether they have a high-risk of fatty liver.

Query:

```
SELECT distinct p.patientName,bm.PatientID, bm.Waist,bm.Abdomen
FROM patient p
inner join bodymeasurement bm ON p.patientID=bm.patientID
WHERE bm.Waist>80 AND bm.Abdomen>=105 and date in (
select max(date) from bodymeasurement group by PatientID);
```

Screenshot:



Description and business need of the query:

In this query, we display the details of the latest body measurement details taken for each patient who has Waist size > = 80 and Abdomen size >=105 to check whether they have a high risk of fatty liver. By using the Inner join and where clause.

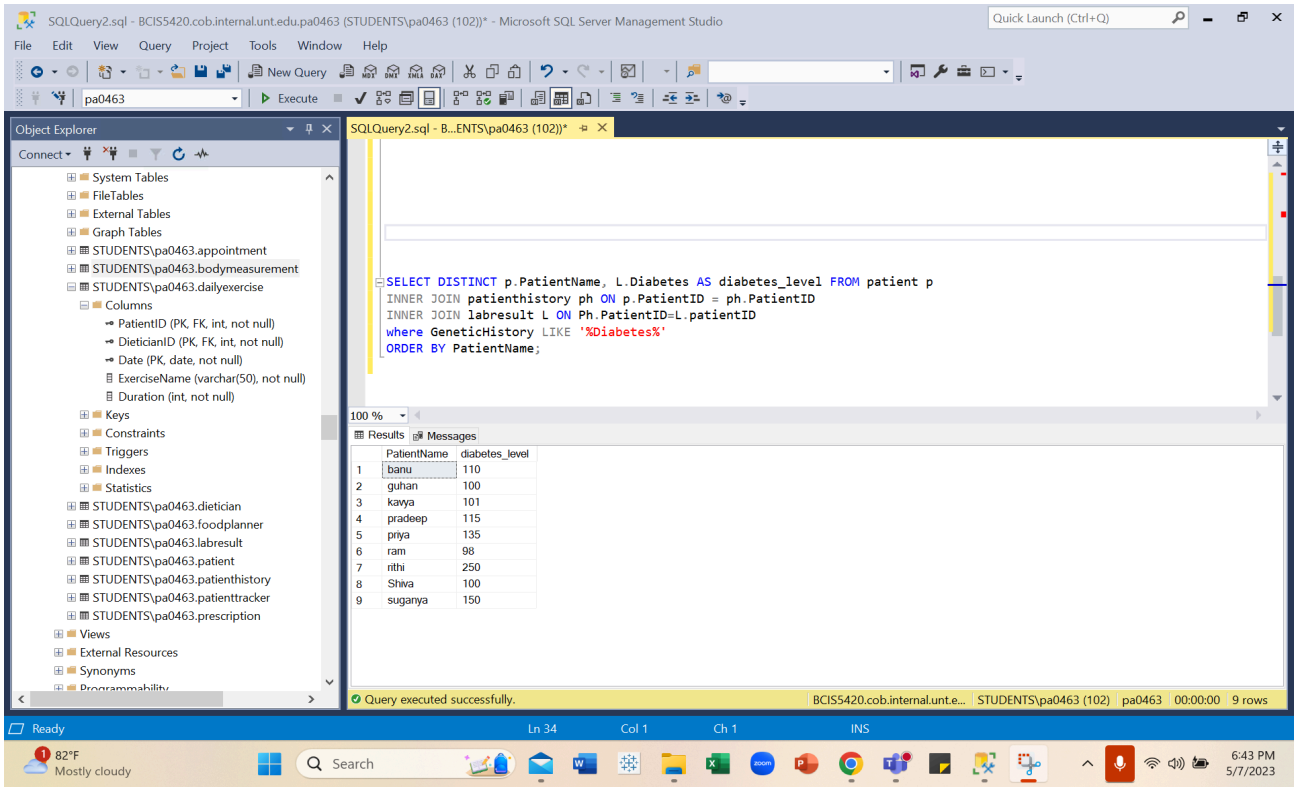
The query helps dietitians identify patients who have a higher risk of obesity-related complications based on their waist and abdomen measurements. Waist measurements of 80 or above and abdomen measurements above 105 can indicate a higher risk for conditions like abdominal obesity, metabolic syndrome, or cardiovascular issues.

Query 20: Retrieve details of the patient whose parental medical history is diagnosed with diabetes.

Query:

```
SELECT DISTINCT p.PatientName, L.Diabetes AS diabetes_level FROM patient p
INNER JOIN patienthistory ph ON p.PatientID = ph.PatientID
INNER JOIN labresult L ON Ph.PatientID=L.patientID
where GeneticHistory LIKE '%Diabetes%'
ORDER BY PatientName;
```

Screenshot:



Description and business need of the query:

In this query, we Retrieve details of the patient whose parental medical history is diagnosed with diabetes.By using inner join and order by operator.

The query helps the dietician to understand the root of diabetes for the patients if they are having higher diabetes levels.

Conclusion:

- Obesity management system has the potential to enhance patient outcomes and contribute to the overall goal of lowering obesity incidence and related health hazards.
- A successful obesity management system should concentrate on promoting a healthy lifestyle that includes a balanced diet and frequent exercise as well as treating any underlying medical or psychological issues that may be related to obesity.
- obesity management can be a valuable tool in assisting healthcare professionals in the management and treatment of obesity.

References:

https://www.wellnessquotient.community