Pharmaceutical Database Analysis: Understanding Medication Prescriptions in Bolton

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INTRODUCTION

This task involves analyzing a dataset of prescription data from the NHS in England, with a focus on the Bolton region. The dataset includes three related tables: Medical Practice, Drugs, and Prescriptions. This task requires creating a database called Prescriptions DB with these three tables and adding primary and foreign key constraints and providing a brief explanation of the results.

QUERY 1

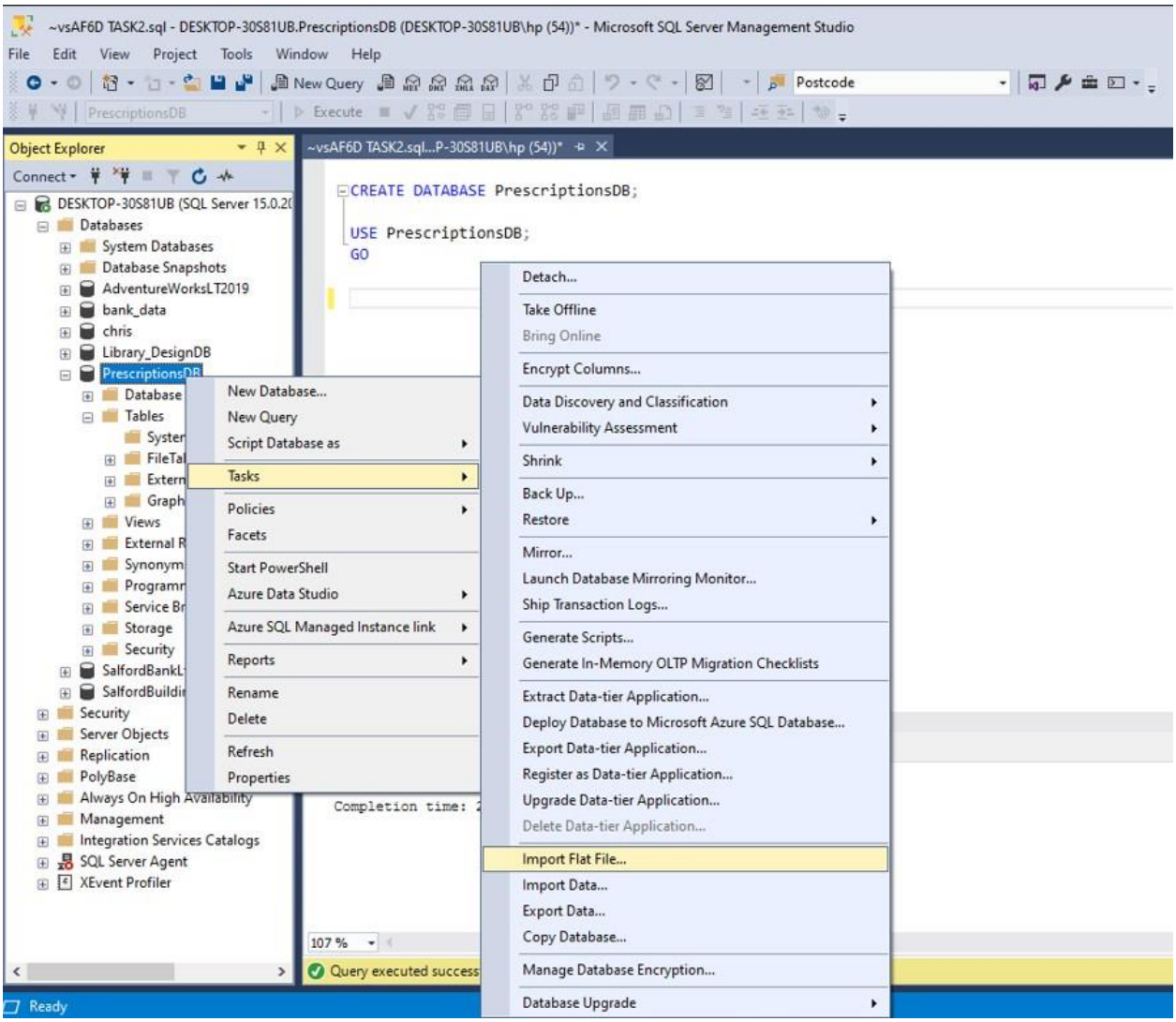
To tackle this task, I created the database with the name PrescriptionsDB

```
CREATE DATABASE PrescriptionsDB;
```

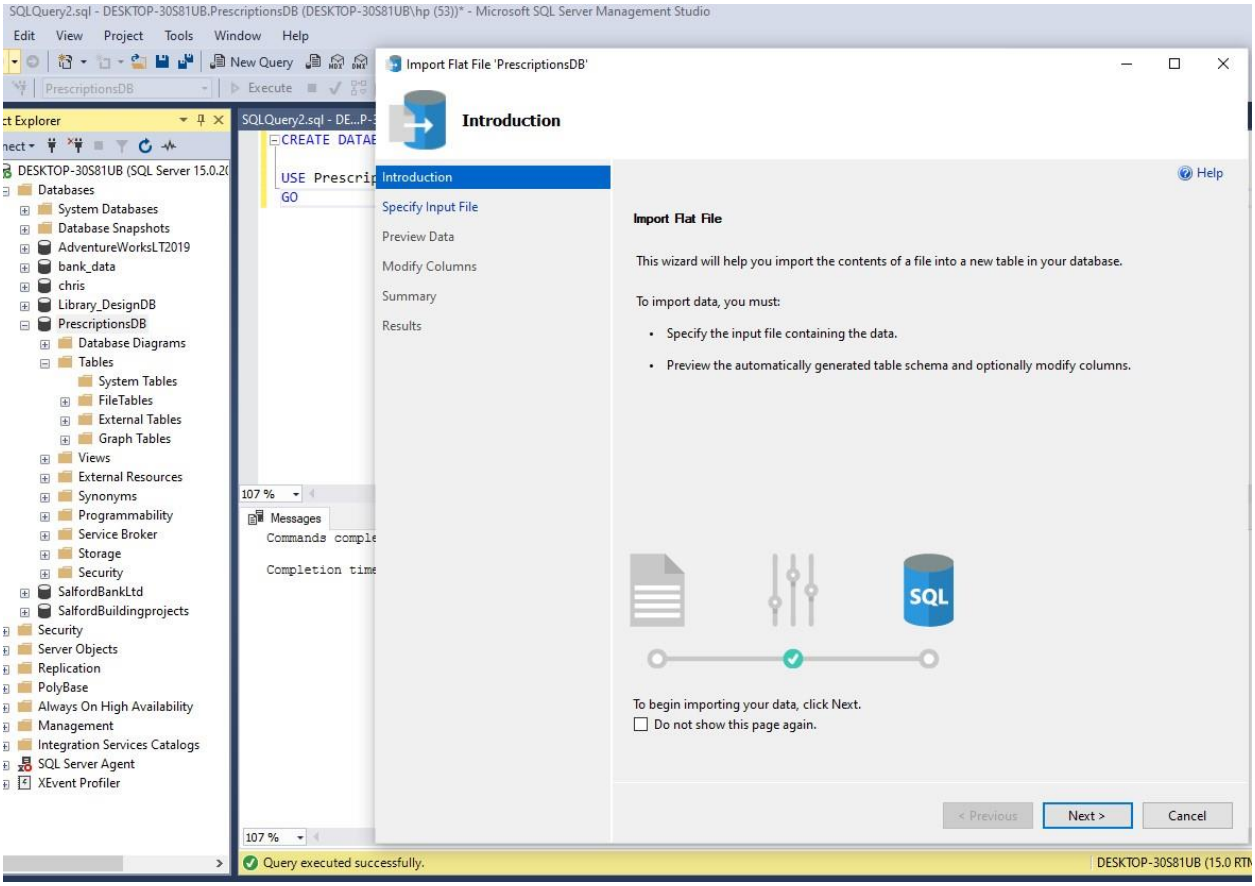
DATA IMPORTATION STEPS

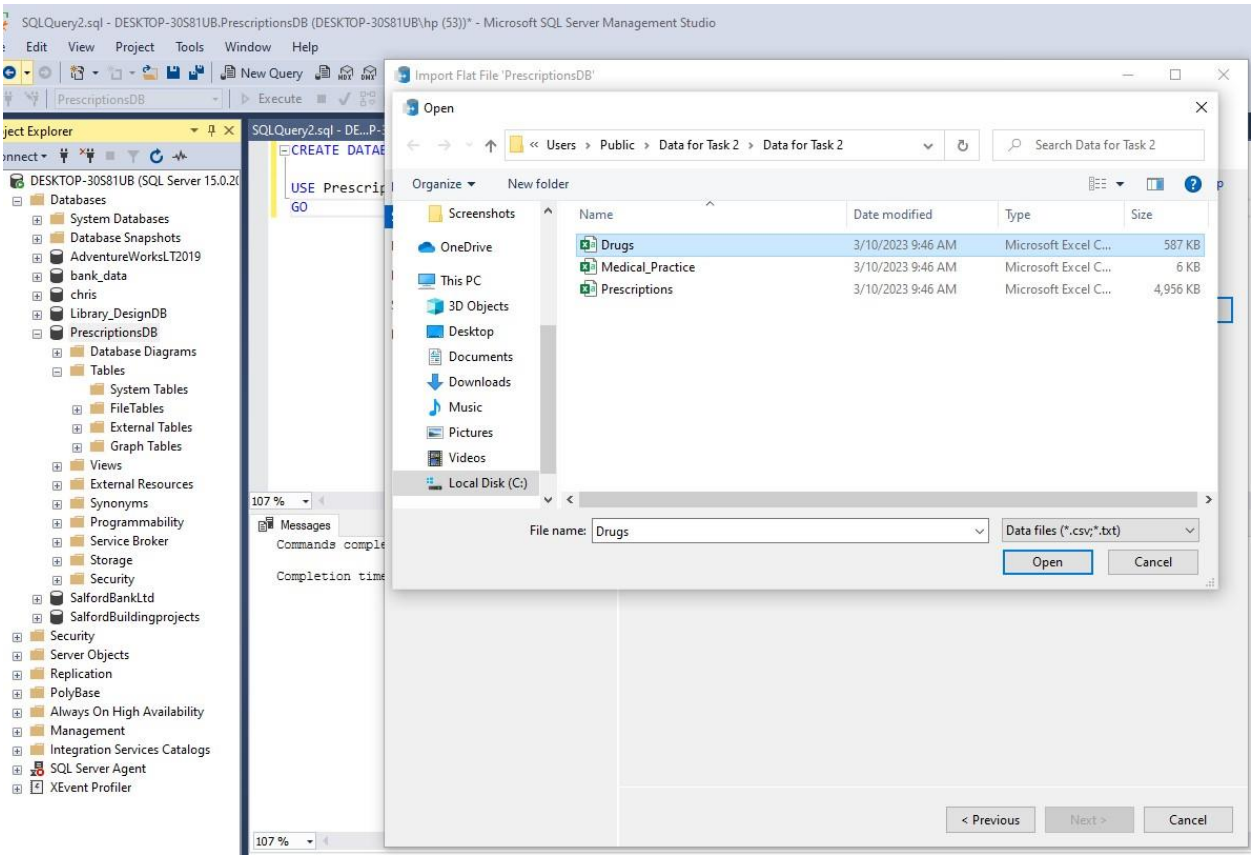
I imported the CSV files into SQL Server Management Studio using the Import data wizard with the following steps as seen on the screenshots.

I right clicked on the database PrescriptionsDB and selected tasks.

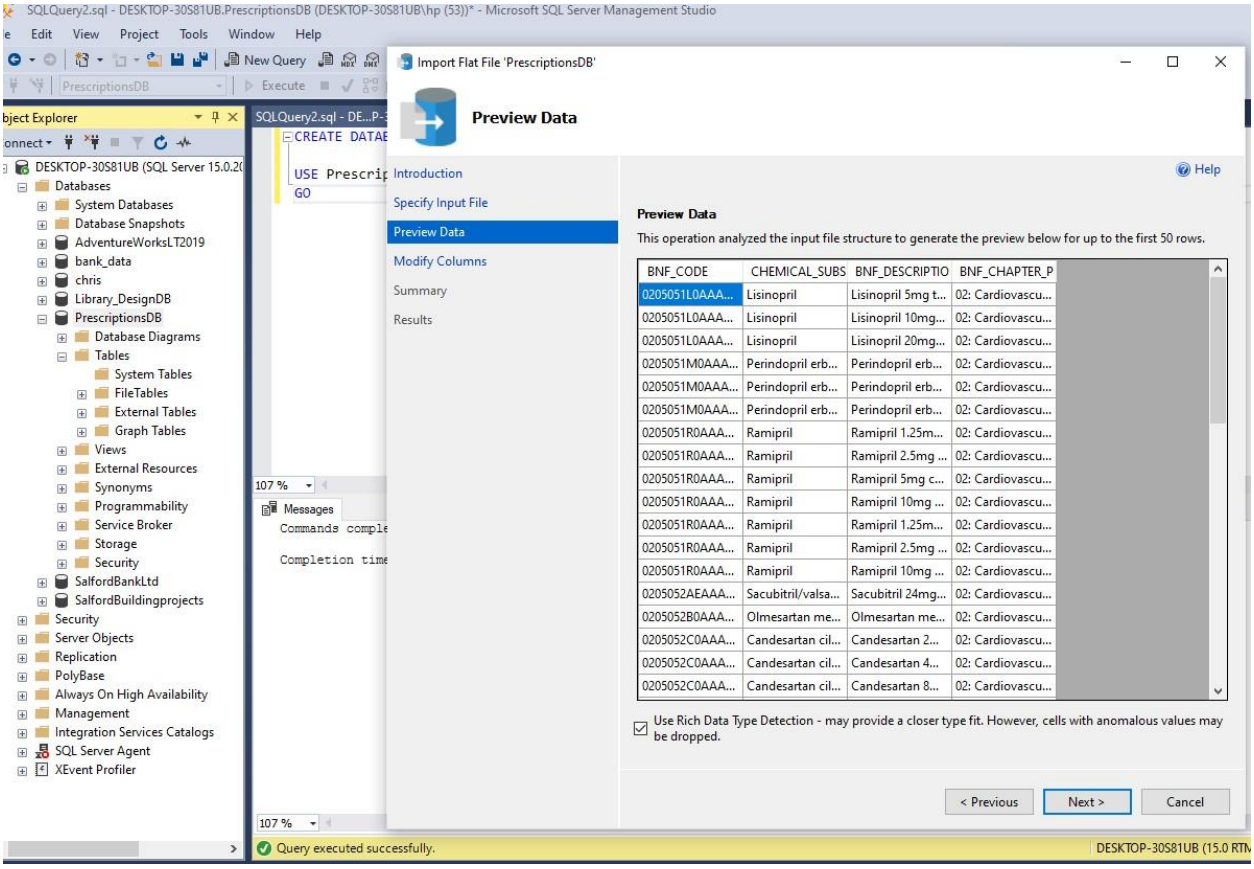


In the import flat file window, I clicked on next to proceed to the choose a data source page

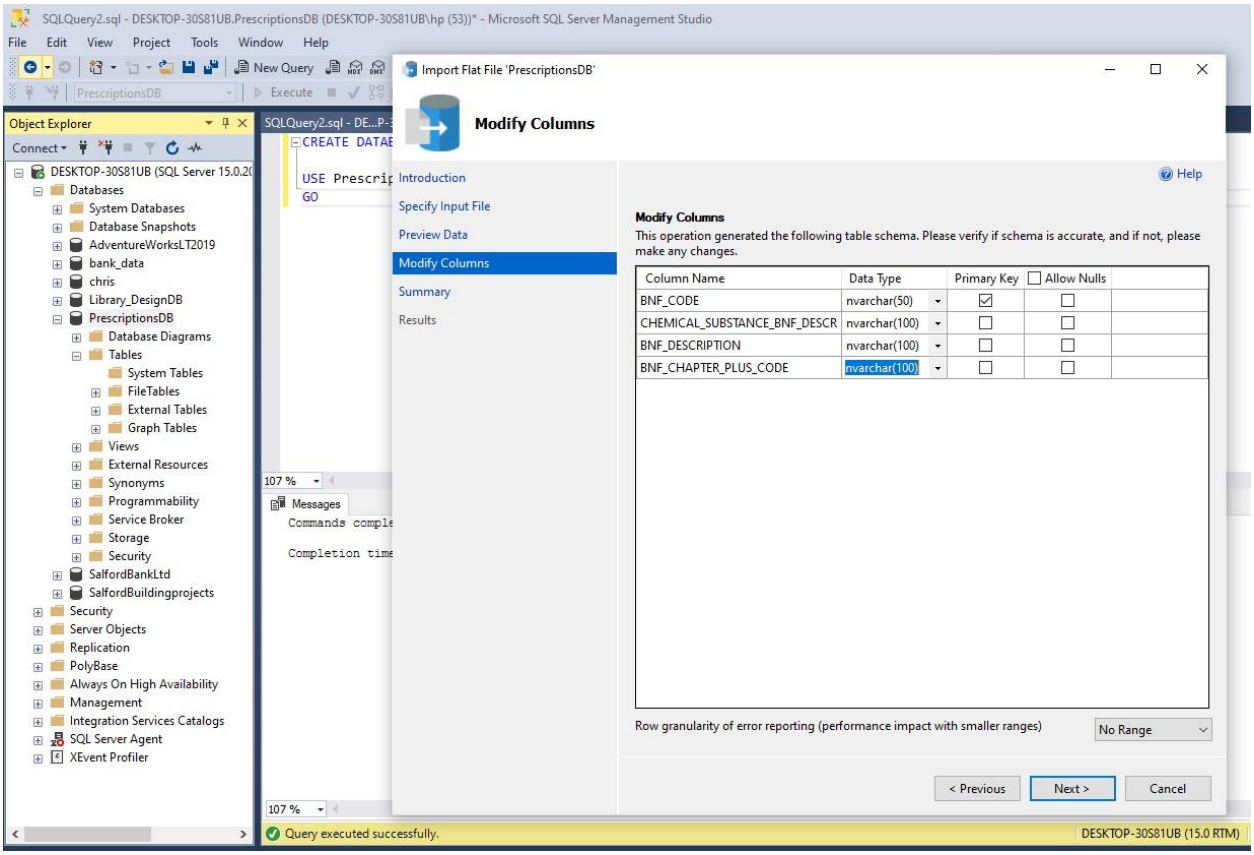

SQLQuery2.sql - DESKTOP-30S81UB.PrescriptionsDB (DESKTOP-30S81UB\hp (53))* - Microsoft SQL Server Management Studio
Edit View Project Tools Window Help
New Query
Execute
Import Flat File 'PrescriptionsDB'
Introduction
Introduction
Specify Input File
Preview Data
Modify Columns
Summary
Results
Help
Import Flat File
This wizard will help you import the contents of a file into a new table in your database.
To import data, you must:
Specify the input file containing the data.
Preview the automatically generated table schema and optionally modify columns.
SQL
To begin importing your data, click Next.
Do not show this page again.
< Previous
Next >
Cancel
Messages
Query executed successfully.
DESKTOP-30S81UB (15.0 RTM
Databases
System Databases
Database Snapshots
AdventureWorksLT2019
bank_data
chris
Library_DesignDB
PrescriptionsDB
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
SalfordBankLtd
SalfordBuildingprojects
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler



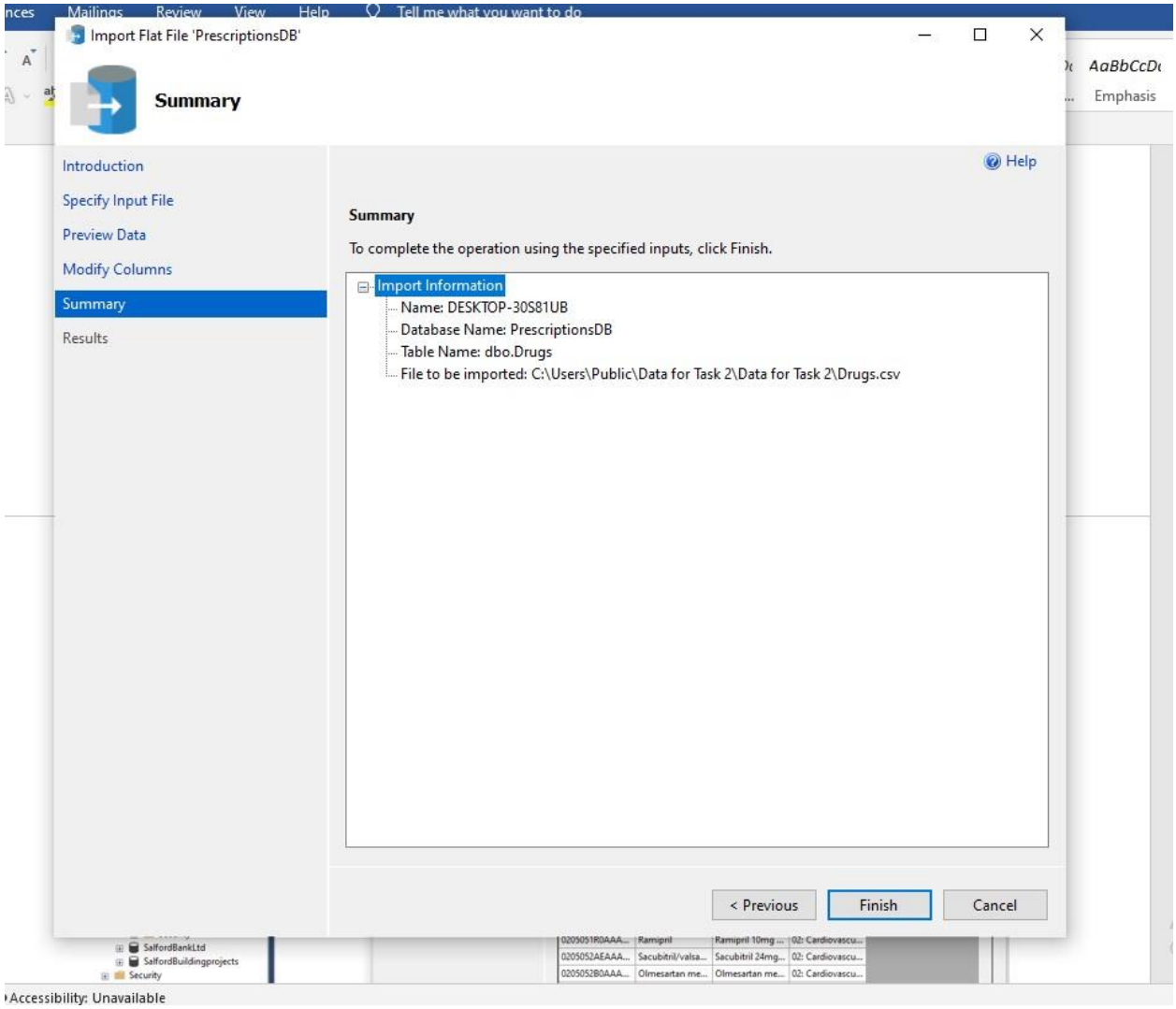
I selected my file “Drugs” and used my files name as the table name and previewed the data

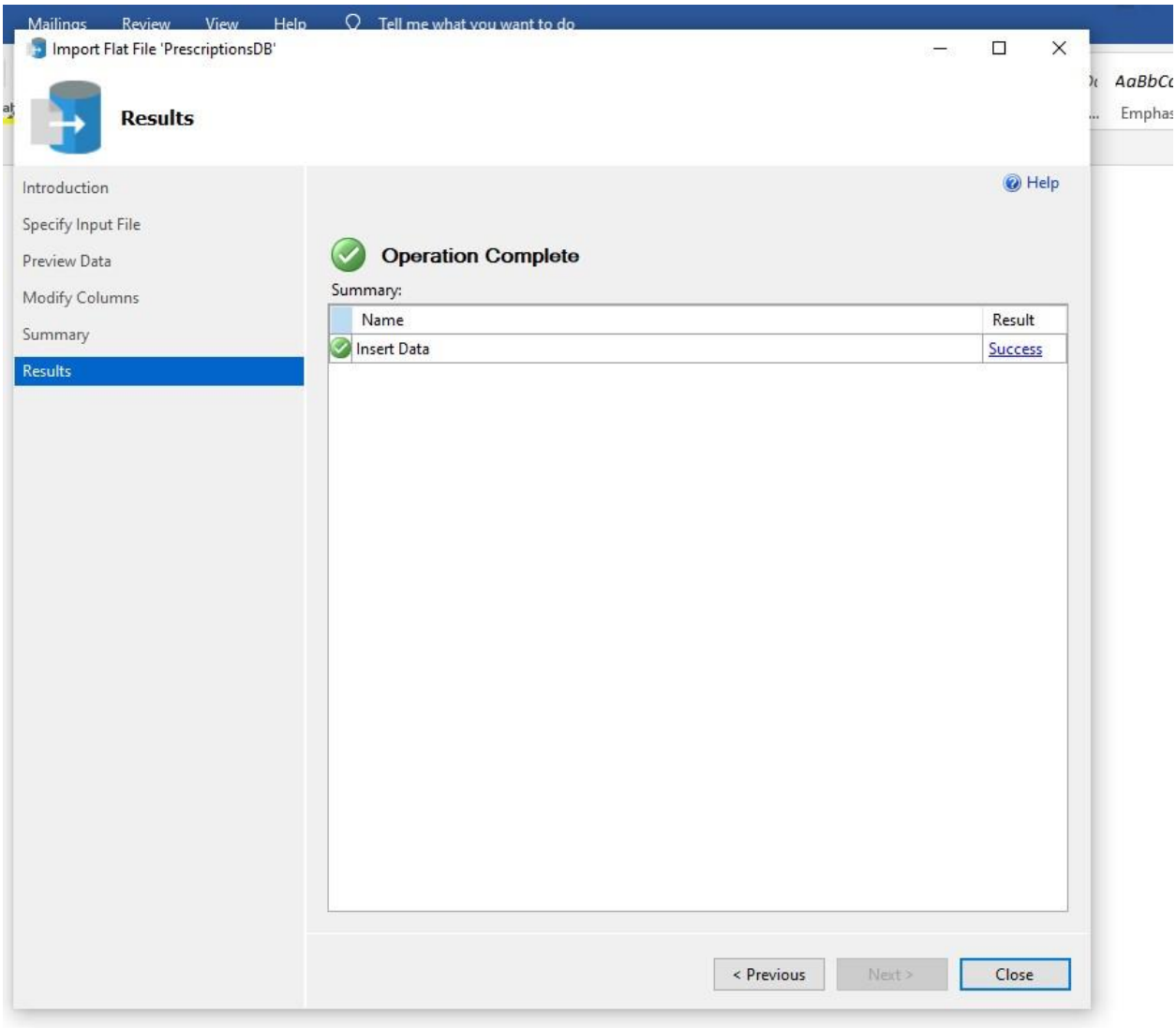


Next, I modified the columns by selecting the accurate schema



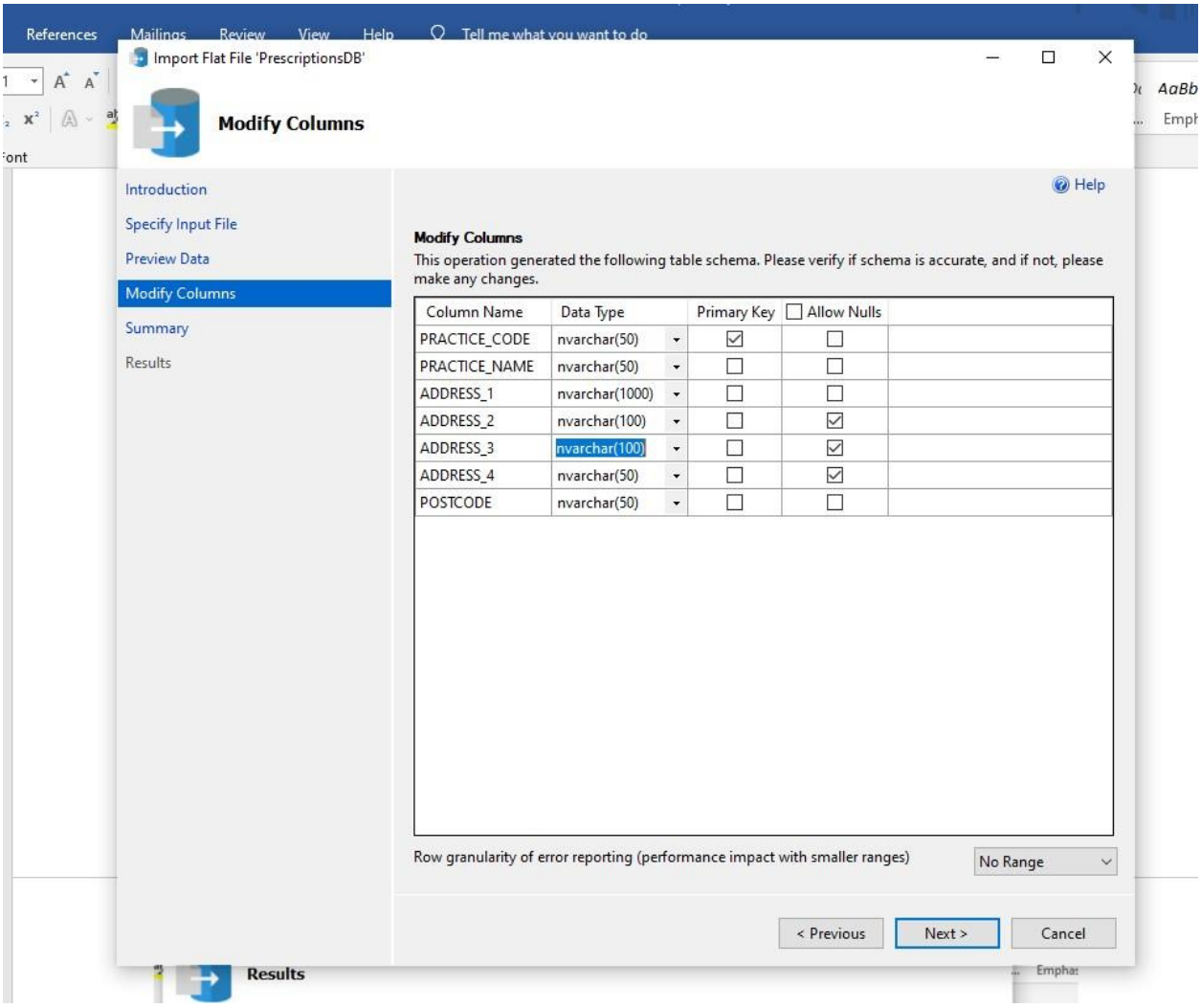
Lastly, I reviewed the summary information and clicked on finish to import the data


Import Flat File 'PrescriptionsDB'
Summary
Introduction
Specify Input File
Preview Data
Modify Columns
Summary
Results
Help
Summary
To complete the operation using the specified inputs, click Finish.
Import Information
Name: DESKTOP-30S81UB
Database Name: PrescriptionsDB
Table Name: dbo.Drugs
File to be imported: C:\Users\Public\Data for Task 2\Data for Task 2\Drugs.csv
< Previous
Finish
Cancel
Accessibility: Unavailable

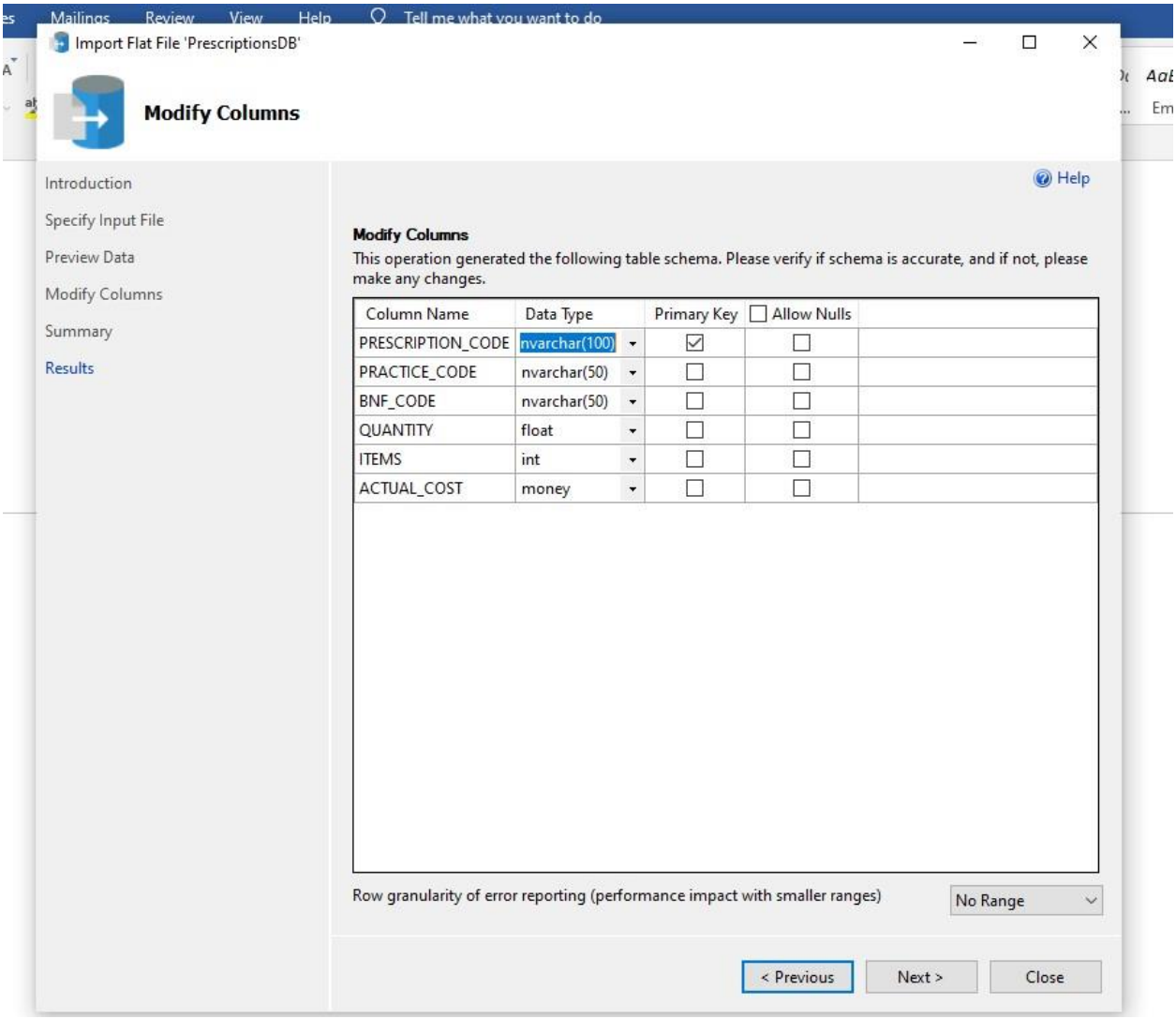


I repeated the above steps for medical_practice and Prescriptions and used the accurate schemas for each

Medical_practice



Prescription



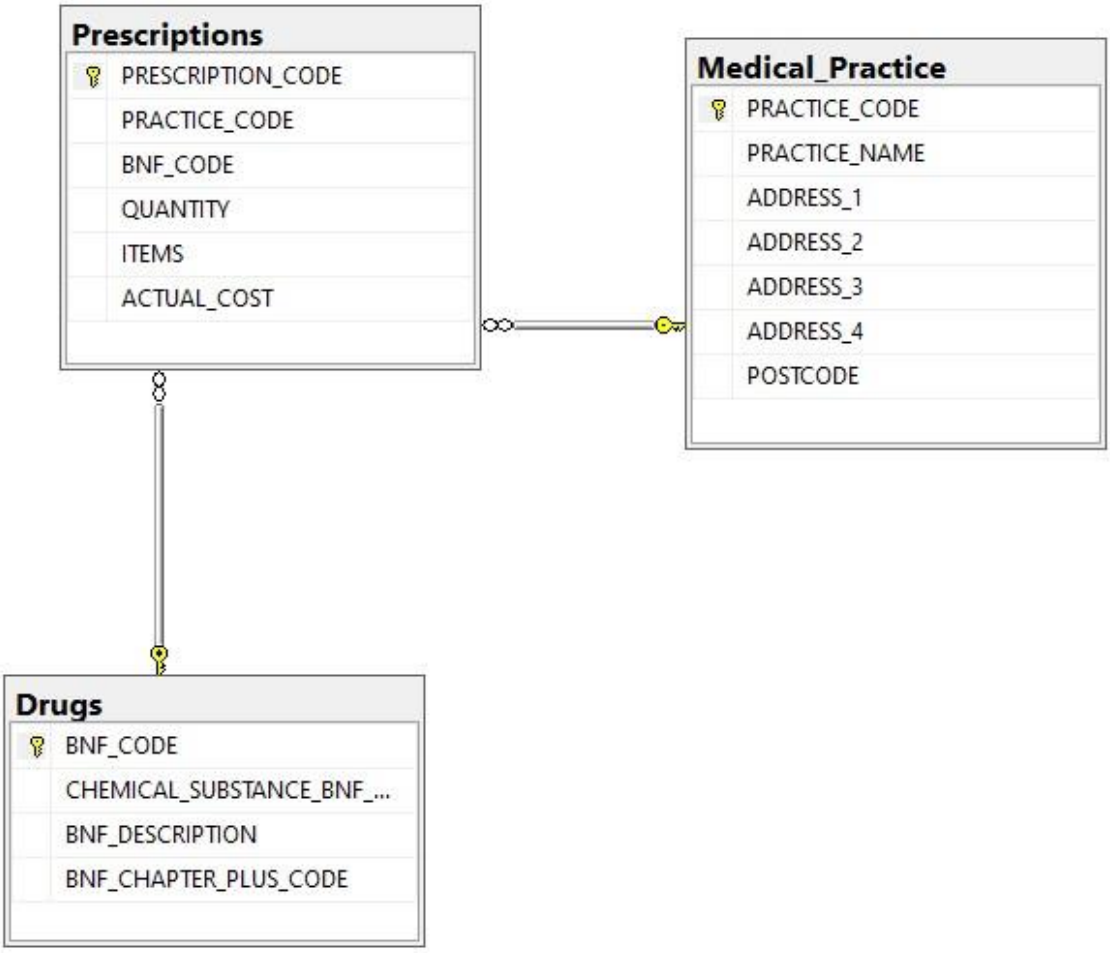
I ensured that the column names remained the same as they were in the CSV files. Then, I selected data types for the tables and added the necessary primary keys.

Next, I wrote the following queries to add the foreign keys to tables

```
ALTER TABLE Prescriptions
ADD FOREIGN KEY (PRACTICE_CODE) REFERENCES Medical_Practice
(PRACTICE_CODE);


ALTER TABLE Prescriptions
ADD FOREIGN KEY (BNF_CODE) REFERENCES Drugs
(BNF_CODE);
```

An ER database diagram.to show the relationships between the tables



The diagram shows that the Medical_Practice table and the Drugs table are related to the Prescriptions table through their respective primary keys. The Medical_Practice table has a oneto-many relationship with the Prescriptions table, and the Drugs table also has a one-to-many relationship with the Prescriptions table through the BNF_CODE column.

I will write T-SQL statements to perform each of the six required queries and additional queries I. I will include explanations for each query and the full result set where possible. Finally, I will structure my report to clearly identify which part of the report relates to each of the numbered steps listed in the task description

QUERIES AND RESULTS

To verify that the tables were created correctly and the data was imported successfully, I ran the following queries for each table:

```
SELECT * FROM  Prescriptions

SELECT * FROM Drugs

SELECT * FROM Medical_Practice;
```

QUERY 2

```
SELECT *
FROM Drugs
WHERE BNF_DESCRIPTION LIKE '%tablets%' or BNF_DESCRIPTION LIKE '%capsules%';
```

This query retrieves data from the Drugs table where the BNF_DESCRIPTION column contains the words "tablets" or "capsules". The "LIKE" operator is used with wildcard characters (%) to match any string that contains "tablets" or "capsules"

This information can help inform decisions on drug formulations, packaging, and other related factors

Results | Messages

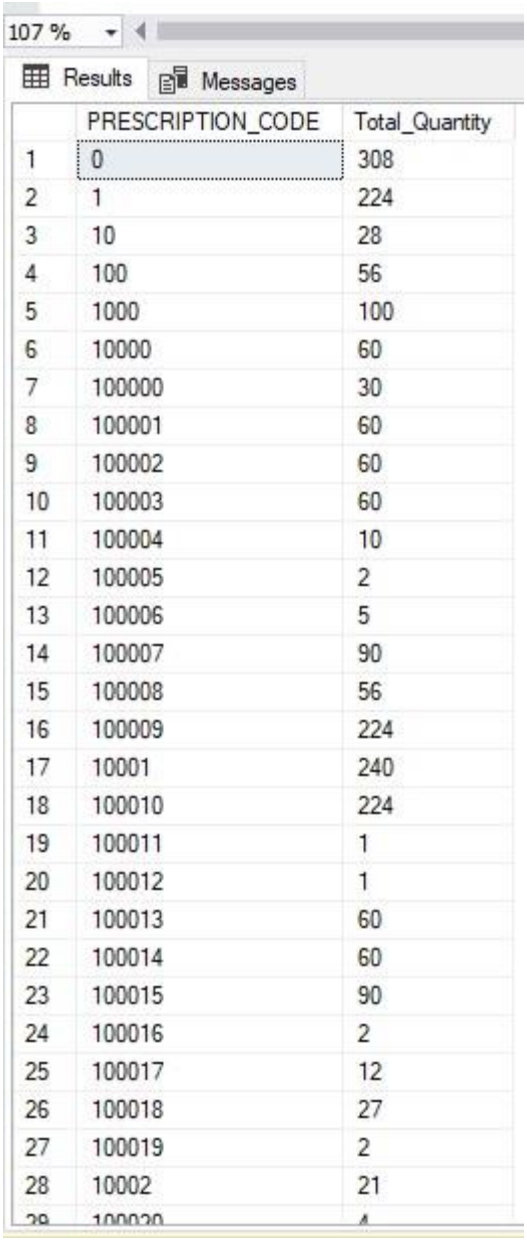
	BNF_CODE	CHEMICAL_SUBSTANCE_BNF_DESCR	BNF_DESCRIPTION	BNF_CHAPTER_PLUS_CODE
1	0101010I0AAAEAE	Magnesium oxide	Magnesium oxide 100mg tablets	01: Gastro-Intestinal System
2	0101010I0BEAAAC	Magnesium oxide	Oromag 160 capsules	01: Gastro-Intestinal System
3	0101010R0AAAA...	Simeticone	Simeticone 100mg capsules	01: Gastro-Intestinal System
4	0101010R0AAAH...	Simeticone	Simeticone 125mg capsules	01: Gastro-Intestinal System
5	0101010R0BHAA...	Simeticone	WindSetlers 100mg capsules	01: Gastro-Intestinal System
6	010102100BBAQ...	Compound alginates and proprietary ind...	Rennie Peppermint chewable ...	01: Gastro-Intestinal System
7	010102100BBAR...	Compound alginates and proprietary ind...	Rennie Spearmint chewable t...	01: Gastro-Intestinal System
8	0101021B0BEAQ...	Alginic acid compound preparations	Gaviscon Advance Mint chew...	01: Gastro-Intestinal System
9	0101021B0BEAR...	Alginic acid compound preparations	Gaviscon Double Action che...	01: Gastro-Intestinal System
10	0101021B0BEAU...	Alginic acid compound preparations	Gaviscon Peppermint chewab...	01: Gastro-Intestinal System
11	0101021B0BEA...	Alginic acid compound preparations	Gaviscon Strawberry chewabl...	01: Gastro-Intestinal System
12	0101021C0AAAFAF	Calcium carbonate	Calcium carbonate 500mg ch...	01: Gastro-Intestinal System
13	0101021C0BIABAF	Calcium carbonate	Rennie Orange 500mg chewa...	01: Gastro-Intestinal System
14	0102000A0AAAA...	Alverine citrate	Alverine 60mg capsules	01: Gastro-Intestinal System
15	0102000A0AAAB...	Alverine citrate	Alverine 120mg capsules	01: Gastro-Intestinal System
16	0102000A0BBAA...	Alverine citrate	Spasmonal 60mg capsules	01: Gastro-Intestinal System
17	0102000A0BBAB...	Alverine citrate	Spasmonal Forte 120mg caps...	01: Gastro-Intestinal System
18	0102000AJAAAA...	Alverine citrate/simeticone	Alverine 60mg / Simeticone 3...	01: Gastro-Intestinal System
19	0102000AJBBAA...	Alverine citrate/simeticone	SimAlvia 60mg/300mg capsules	01: Gastro-Intestinal System
20	0102000J0AAABAB	Dicycloverine hydrochloride	Dicycloverine 10mg tablets	01: Gastro-Intestinal System
21	0102000J0AAACAC	Dicycloverine hydrochloride	Dicycloverine 20mg tablets	01: Gastro-Intestinal System
22	0102000L0AAAC...	Glycopyrronium bromide	Glycopyrronium bromide 1mg t...	01: Gastro-Intestinal System
23	0102000N0AAAB...	Hyoscine butylbromide	Hyoscine butylbromide 10mg t...	01: Gastro-Intestinal System
24	0102000N0AAAU...	Hyoscine butylbromide	Hyoscine butylbromide 20mg t...	01: Gastro-Intestinal System
25	0102000N0BBAA...	Hyoscine butylbromide	Buscopan 10mg tablets	01: Gastro-Intestinal System
26	0102000N0BBAC...	Hyoscine butylbromide	Buscopan IBS Relief 10mg ta...	01: Gastro-Intestinal System
27	0102000N0BBAD...	Hyoscine butylbromide	Buscopan Cramps 10mg tablets	01: Gastro-Intestinal System
28	0102000P0AAAB...	Mebeverine hydrochloride	Mebeverine 135mg tablets	01: Gastro-Intestinal System
29	0102000P0AAAD...	Mebeverine hydrochloride	Mebeverine 200mg modified-r...	01: Gastro-Intestinal System
30	0102000P0BCAB...	Mebeverine hydrochloride	Colofac 135mg tablets	01: Gastro-Intestinal System
31	0102000P0BCAE...	Mebeverine hydrochloride	Colofac MR 200mg capsules	01: Gastro-Intestinal System
32	0102000T0AAAA...	Peppermint oil	Peppermint oil 0.2ml gastro-res...	01: Gastro-Intestinal System

Query executed successfully.

QUERY 3

```
SELECT PRESCRIPTION_CODE, ROUND(SUM (items * quantity),0) AS Total_Quantity
FROM Prescriptions
GROUP BY PRESCRIPTION_CODE;
```

I created this query to return the total quantity for each prescription in the Prescriptions table. The SUM function calculates the total quantity for each prescription by multiplying the items and quantity columns. The ROUND function is then used to round the result to the nearest integer value, as requested by the client. The result is grouped by PRESCRIPTION_CODE.



107 %

Results | Messages

	PRESCRIPTION_CODE	Total_Quantity
1	0	308
2	1	224
3	10	28
4	100	56
5	1000	100
6	10000	60
7	100000	30
8	100001	60
9	100002	60
10	100003	60
11	100004	10
12	100005	2
13	100006	5
14	100007	90
15	100008	56
16	100009	224
17	10001	240
18	100010	224
19	100011	1
20	100012	1
21	100013	60
22	100014	60
23	100015	90
24	100016	2
25	100017	12
26	100018	27
27	100019	2
28	10002	21

the first row shows that the prescription with code 0 has a total quantity of 308 items, which is the sum of the product of the items and quantity columns for all the rows with prescription code 0. This can be useful in analyzing the usage patterns of different prescriptions. By knowing the total quantity of items for each prescription

QUERY 4

```
SELECT DISTINCT CHEMICAL_SUBSTANCE_BNF_DESCR
FROM Drugs;
```

This query selects the CHEMICAL_SUBSTANCE_BNF_DESCR column from the Drugs table and uses the DISTINCT keyword to return only unique values in the result set. The DISTINCT

keyword, removes any duplicate values in the column, so the result set will only contain distinct chemical substances that appear in the Drugs table.

	CHEMICAL_SUBSTANCE_BNF_DESCR
1	Sulpiride
2	Almotriptan
3	Hydrocortisone sodium phosphate
4	Loprazolam mesilate
5	Trimethoprim
6	Potassium permanganate
7	Discharge Solidifying Agents
8	Phased formulations of ethinylestradiol
9	Hydrocortisone acetate
10	Beclometasone dipropionate (Systemic)
11	Terbutaline sulphate
12	Antazoline
13	Ivermectin
14	Co-tenidone (Atenolol/chlortalidone)
15	Formoterol/glycopyrronium/budesonide
16	Amisulpride
17	Hyoscine hydrobromide
18	Mometasone furoate
19	Chlortalidone
20	Labetalol hydrochloride
21	Nefopam hydrochloride
22	Vigabatrin
23	Methyldopa
24	Colesevelam hydrochloride
25	Bempedoic acid/Ezetimibe
26	Simvastatin
27	Lithium citrate
28	Pivmecillinam hydrochloride

This query could be useful for identifying the unique chemical substances that are included in the drugs prescribed by medical practices.

QUERY 5

```
SELECT dr.BNF_CHAPTER_PLUS_CODE,
COUNT(*) AS Number_of_prescriptions,
AVG(pr.ACTUAL_COST) AS Average_cost,
MIN(pr.ACTUAL_COST) AS Minimum_cost,
MAX(pr.ACTUAL_COST) AS Maximum_cost
FROM Drugs dr
INNER JOIN Prescriptions pr ON pr.BNF_CODE = dr.BNF_CODE
GROUP BY BNF_CHAPTER_PLUS_CODE;
```

This query joins the Drugs and Prescriptions tables on the BNF_CODE column, groups the result by CHEMICAL_SUBSTANCE_BNF_DESCR, and calculates prescription statistics like count, average, minimum and maximum cost for each chemical substance. The INNER JOIN combines data from two or more tables based on a condition. Here, it joins Drugs and Prescriptions tables on the BNF_CODE column.

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Results | Messages

	BNF_CHAPTER_PLUS_CODE	Number_of_prescriptions	Average_cost	Minimum_cost	Maximum_cost
1	11: Eye	2676	21.4403	1.34	434.7997
2	13: Skin	5692	22.2507	0.4864	1402.4766
3	21: Appliances	5856	38.3528	0.2057	2552.9234
4	20: Dressings	1014	40.2214	0.2181	2599.1877
5	19: Other Drugs and Preparations	338	32.2498	0.4331	1193.3481
6	02: Cardiovascular System	19186	35.9956	0.1311	11094.7521
7	05: Infections	4657	21.2474	0.1966	1262.2079
8	23: Stoma Appliances	1697	82.2616	1.5894	882.5271
9	08: Malignant Disease and Immunosuppression	754	54.9382	0.29	2197.1551
10	22: Incontinence Appliances	535	42.8654	2.8703	538.8857
11	01: Gastro-Intestinal System	8777	35.1252	0.1405	2777.6906
12	10: Musculoskeletal and Joint Diseases	3634	16.2459	0.2713	1476.6376
13	09: Nutrition and Blood	7944	41.8156	0.1405	4250.4384
14	12: Ear, Nose and Oropharynx	1274	23.6805	1.6766	315.7777
15	07: Obstetrics, Gynaecology and Urinary-Trac...	3999	25.4563	0.1498	803.4917
16	03: Respiratory System	7057	75.873	0.1498	4161.8103
17	04: Central Nervous System	28866	28.3994	0.1311	2765.623
18	14: Immunological Products and Vaccines	126	1049.5574	7.2927	21570.9208
19	15: Anaesthesia	271	35.6672	0.2805	345.2493
20	06: Endocrine System	12462	61.1661	0.1685	3490.7024

The first row shows that there were 2676 prescriptions for drugs in the "Eye" BNF chapter plus code category, with an average cost of 21.4403, a minimum cost of 1.34, and a maximum cost of 434.7997.

This result set could be useful for identifying trends in prescription drug usage and costs across different medical conditions and treatment categories

QUERY 6

```
SELECT m.PRACTICE_NAME, MAX(pr.ACTUAL_COST) AS MOST_EXPENSIVE_PRESCRIPTION
FROM Medical_Practice m
INNER JOIN Prescriptions pr ON m.PRACTICE_CODE = pr.PRACTICE_CODE
GROUP BY m.PRACTICE_NAME
HAVING
MAX(ACTUAL_COST) > 4000

ORDER BY MOST_EXPENSIVE_PRESCRIPTION DESC ;
```

This query returns a result set of medical practices and their most expensive prescription, but only includes practices whose most expensive prescription is over 4000 using the HAVING clause. The result set is sorted in descending order based on the cost of the most expensive prescription. This could be useful for identifying trends or outliers in prescription costs across different medical practices.

Results | Messages

	PRACTICE_NAME	MOST_EXPENSIVE_PRESCRIPTION
1	UNSWORTH GROUP PRACTICE	21570.9208
2	BROMLEY MEADOWS SURGERY	11031.5885
3	KILDONAN HOUSE	8659.596
4	KEARSLEY MEDICAL CENTRE	7313.581
5	BOLTON COMMUNITY PRACTICE	6069.7747
6	HARWOOD MEDICAL CENTRE	4626.9594
7	MANDALAY MEDICAL CENTRE	4377.6525
8	CROMPTON VIEW SURGERY	4250.4384
9	DALEFIELD SURGERY	4031.9573

QUERY 7i

Let's assume I want to find the names, addresses and postcode of all the medical practices in Bolton that have not issued any prescriptions for the drug spasmonal 60mg capsules using nested query including use of exists or in

This SQL query retrieves information about medical practices, including their postcode, name, and address, but only for those that have not prescribed "spasmonal 60mg capsules".

```sql
SELECT PRACTICE_CODE, PRACTICE_NAME, POSTCODE, CONCAT (ADDRESS_1,' ',ADDRESS_2, ' ', ADDRESS_3, ' ',ADDRESS_4)  AS ADDRESS
FROM Medical_Practice m
WHERE NOT EXISTS (
    SELECT *
    FROM Prescriptions pr
    INNER JOIN  Drugs dr ON  pr.BNF_CODE =dr.BNF_CODE
    WHERE m.PRACTICE_CODE = pr.PRACTICE_CODE
    AND dr.BNF_DESCRIPTION = 'Spasmonal 60mg capsules');
```

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Results | Messages

	PRACTICE_CODE	PRACTICE_NAME	POSTCODE	ADDRESS
1	00T998	UNIDENTIFIED DOCTORS	BL1 1PP	ST PETERS HOUSE SILVERWELL STREET BOLTON LANCASHIRE
2	P82001	THE DUNSTAN PARTNERSHIP	BL2 6NT	BREIGHTMET HEALTH CENTRE BREIGHTMET FOLD LANE BRIG...
3	P82002	PIKES LANE 1	BL3 5HP	THE PIKES LANE CENTRE DEANE ROAD BOLTON LANCASHIRE
4	P82004	SWAN LANE MEDICAL CENTRE	BL3 6TL	SWAN LANE MEDICAL CENTRE SWAN LANE BOLTON LANCASHI...
5	P82005	STABLE FOLD SURGERY	BL5 3SF	STABLE FOLD SURGERY 119 CHURCH STREET WESTHOUGHTO...
6	P82006	DR MALHOTRA & PARTNERS	BL6 7AS	PIKE VIEW MEDICAL CENTRE ALBERT STREET, HORWICH BOLT...
7	P82008	STONEHILL MEDICAL CENTRE	BL4 9QZ	STONEHILL MEDICAL CENTRE PIGGOTT ST,FARNWORTH BOLT...
8	P82009	ST HELENS ROAD PRACTICE	BL3 3RR	GARNET FOLD PRACTICE 374-376 ST HELENS ROAD BOLTON LA...
9	P82010	DALEFIELD SURGERY	BL1 4JP	AVONDALE HEALTH CENTRE AVONDALE STREET BOLTON LAN...
10	P82011	TONGE FOLD HEALTH CENTRE	BL2 6DY	TONGE FOLD HEALTH CENTRE HILTON ST, TONGE FOLD BOLT...
11	P82012	DR EARNSHAW AND PARTNERS	BL1 1SQ	LEVER CHAMBERS ASHBURNER STREET BOLTON
12	P82013	LEVER CHAMBERS 2	BL3 6RN	GREAT LEVER HEALTH CENTRE RUPERT STREET,GREAT LEVE...
13	P82014	SPRING HOUSE SURGERY	BL1 6AF	555 CHORLEY OLD ROAD BOLTON GREATER MANCHESTER
14	P82015	UNSWORTH GROUP PRACTICE	BL5 3UB	UNSWORTH GROUP PRACTICE PETER HOUSE SURGERY CAPT...
15	P82016	HARWOOD MEDICAL CENTRE	BL2 3HQ	HARWOOD MEDICAL CENTRE HOUGH FOLD WAY, HARWOOD B...
16	P82018	THE ALASTAIR ROSS MEDICAL...	BL2 6NT	BREIGHTMET HEALTH CENTRE BREIGHTMET FOLD LANE BRIG...
17	P82021	THE OAKS FAMILY PRACTICE	BL1 8UP	CROMPTON HEALTH CENTRE 501 CROMPTON WAY BOLTON
18	P82022	HALLIWELL SURGERY 1	BL1 3RG	THE HALLIWELL SURGERY LINDFIELD DRIVE HALLIWELL BOLT...
19	P82023	MANDALAY MEDICAL CENTRE	BL1 7LR	MANDALAY MEDICAL CENTRE 933 BLACKBURN RD,SHARPLES B...
20	P82025	BURNSIDE SURGERY	BL1 8TU	BURNSIDE SURGERY WATERS MEETING HC NAVIGATION PARK...
21	P82029	HALLIWELL SURGERY 2	BL1 3RG	THE HALLIWELL SURGERY LINDFIELD DRIVE,HALLIWELL BOLT...
22	P82030	DEANE MEDICAL CENTRE	BL3 5AH	155-157 DEANE ROAD BOLTON
23	P82031	HEATON MEDICAL CENTRE	BL1 5PU	HEATON MEDICAL CENTRE 2 LUCY STREET HEATON, BOLTON
24	P82033	BRADFORD STREET SURGERY	BL2 1HT	65 BRADFORD STREET HAULGH BOLTON
25	P82034	EDGWORTH MEDICAL CENTRE	BL7 9RG	EGERTON/DUNSCAR HLTH CTRE DARWEN ROAD BROMLEY CR...
26	P82036	LITTLE LEVER HEALTH CENTR...	BL3 1JF	LITTLE LEVER HEALTH CTR MYTHAM RD,LITTLE LEVER BOLTO...
27	P82607	CROMPTON VIEW SURGERY	BL1 8UP	CROMPTON HEALTH CENTRE 501 CROMPTON WAY BOLTON
28	P82609	SHANTI MEDICAL CENTRE	BL3 3PH	SHANTI MEDICAL CENTRE 160 ST.HELENS ROAD BOLTON LANC...
29	P82613	SPRING VIEW MEDICAL CENTRE	BL3 1HQ	SPRING VIEW MEDICAL CTR MYTHAM ROAD LITTLE LEVER BOL...
30	P82616	BEEHIVE SURGERY	BL3 2JR	108 CRESCENT ROAD GREAT LEVER BOLTON
31	P82624	ORIENT HOUSE MEDICAL CEN...	BL3 5QE	216 WIGAN ROAD BOLTON

Query executed successfully.

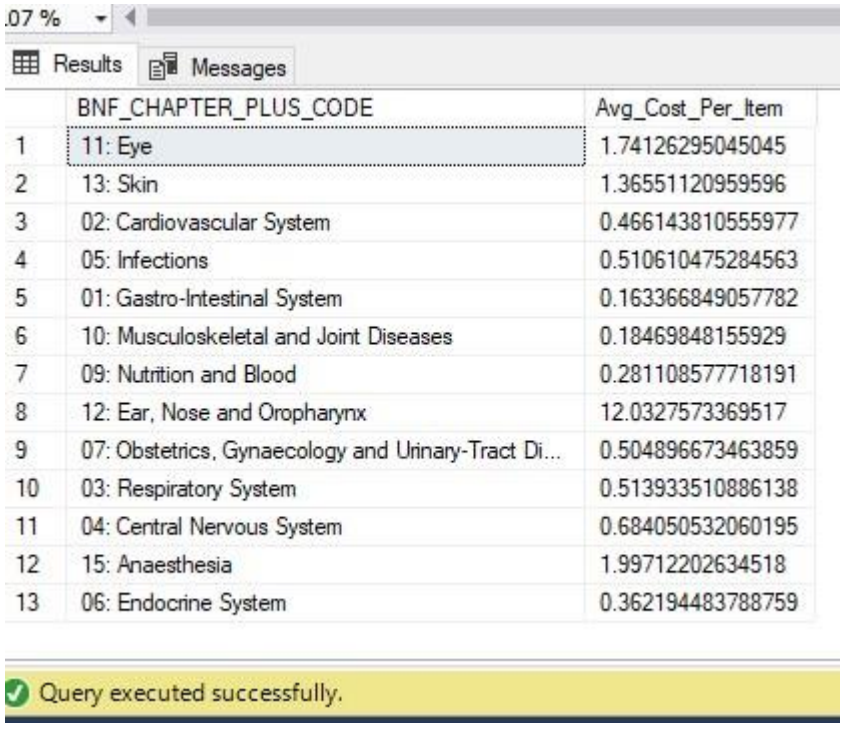
The result set shows the details of medical practices that do not have any prescriptions for the drug "spasmonal 60mg capsules". This query can be used to identify medical practices that may not be prescribing a particular drug, which could be due to several reasons such as lack of awareness about the drug or its effectiveness, availability of alternative treatments, or patient preference.

QUERY 7ii

For each BNF chapter, what is the average actual cost per item for prescriptions that contain a drug with a chemical substance that includes "hydrochloride" in the name?

```
SELECT dr.BNF_CHAPTER_PLUS_CODE, AVG(pr.ACTUAL_COST/pr.QUANTITY) AS Avg_Cost_Per_Item
FROM Drugs dr
JOIN Prescriptions pr ON pr.BNF_CODE = dr.BNF_CODE
WHERE dr.CHEMICAL_SUBSTANCE_BNF_DESCR LIKE '%hydrochloride%'
GROUP BY dr.BNF_CHAPTER_PLUS_CODE;
```

This query calculates the average cost per item for drugs with "hydrochloride" in their chemical substance description, grouped by BNF chapter plus code. The SELECT statement retrieves the BNF chapter plus code and average cost per item. The query joins the Drugs and Prescriptions tables on BNF code, filters the Drugs table for "hydrochloride" by using the wild cards and then groups the result by BNF chapter plus code. The AVG() function calculates the average cost per item.



.07 %

Results | Messages

	BNF_CHAPTER_PLUS_CODE	Avg_Cost_Per_Item
1	11: Eye	1.74126295045045
2	13: Skin	1.36551120959596
3	02: Cardiovascular System	0.466143810555977
4	05: Infections	0.510610475284563
5	01: Gastro-Intestinal System	0.163366849057782
6	10: Musculoskeletal and Joint Diseases	0.18469848155929
7	09: Nutrition and Blood	0.281108577718191
8	12: Ear, Nose and Oropharynx	12.0327573369517
9	07: Obstetrics, Gynaecology and Urinary-Tract Di...	0.504896673463859
10	03: Respiratory System	0.513933510886138
11	04: Central Nervous System	0.684050532060195
12	15: Anaesthesia	1.99712202634518
13	06: Endocrine System	0.362194483788759

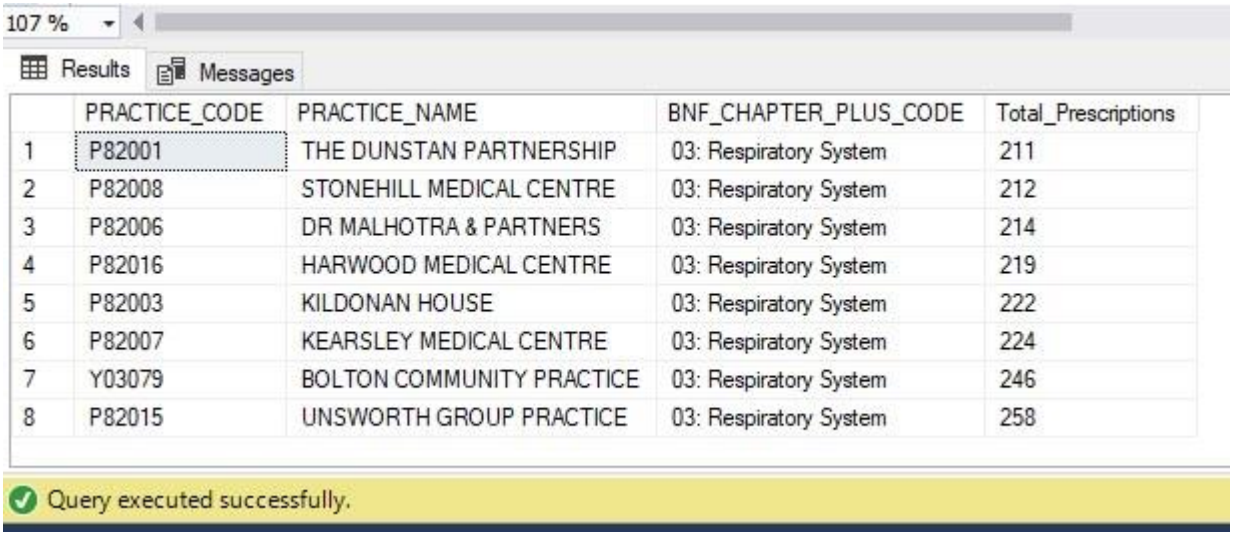
Query executed successfully.

QUERY 7iii

I want to Write a query that returns the list of medical practices, their practice codes, and the total number of prescriptions issued by each medical practice in Bolton for drugs in the BNF_CHAPTER_PLUS_CODE 03: Respiratory System and it will only include practices that have issued more than 200 prescriptions

```sql
SELECT m.PRACTICE_CODE, m.PRACTICE_NAME, dr.BNF_CHAPTER_PLUS_CODE, COUNT (*) AS Total_Prescriptions
FROM Prescriptions pr
INNER JOIN Drugs dr ON pr.BNF_CODE = dr.BNF_CODE
INNER JOIN Medical_Practice m ON pr.PRACTICE_CODE = m.PRACTICE_CODE
WHERE dr.BNF_CHAPTER_PLUS_CODE ='03: Respiratory System'
GROUP BY m.PRACTICE_CODE, m.PRACTICE_NAME, dr.BNF_CHAPTER_PLUS_CODE
HAVING COUNT(*)>200
ORDER BY Total_Prescriptions, m.PRACTICE_NAME  ASC;
```

This query retrieves data from three tables, combines the data using inner joins based on keys, and filters the results to only include rows where the drug's BNF_CHAPTER_PLUS_CODE is '03: Respiratory System'. The result is grouped by PRACTICE_CODE, PRACTICE_NAME, and BNF_CHAPTER_PLUS_CODE, and only rows with a count greater than 200 are included. The output is sorted in ascending order by Total_Prescriptions and PRACTICE_NAME.



107 %

Results | Messages

	PRACTICE_CODE	PRACTICE_NAME	BNF_CHAPTER_PLUS_CODE	Total_Prescriptions
1	P82001	THE DUNSTAN PARTNERSHIP	03: Respiratory System	211
2	P82008	STONEHILL MEDICAL CENTRE	03: Respiratory System	212
3	P82006	DR MALHOTRA & PARTNERS	03: Respiratory System	214
4	P82016	HARWOOD MEDICAL CENTRE	03: Respiratory System	219
5	P82003	KILDONAN HOUSE	03: Respiratory System	222
6	P82007	KEARSLEY MEDICAL CENTRE	03: Respiratory System	224
7	Y03079	BOLTON COMMUNITY PRACTICE	03: Respiratory System	246
8	P82015	UNSWORTH GROUP PRACTICE	03: Respiratory System	258

Query executed successfully.

This information can be used to identify medical practices that prescribed a high volume of medications related to the respiratory system which could be an indicator of higher incidence of respiratory conditions in the population served by those practices

QUERY 7IV

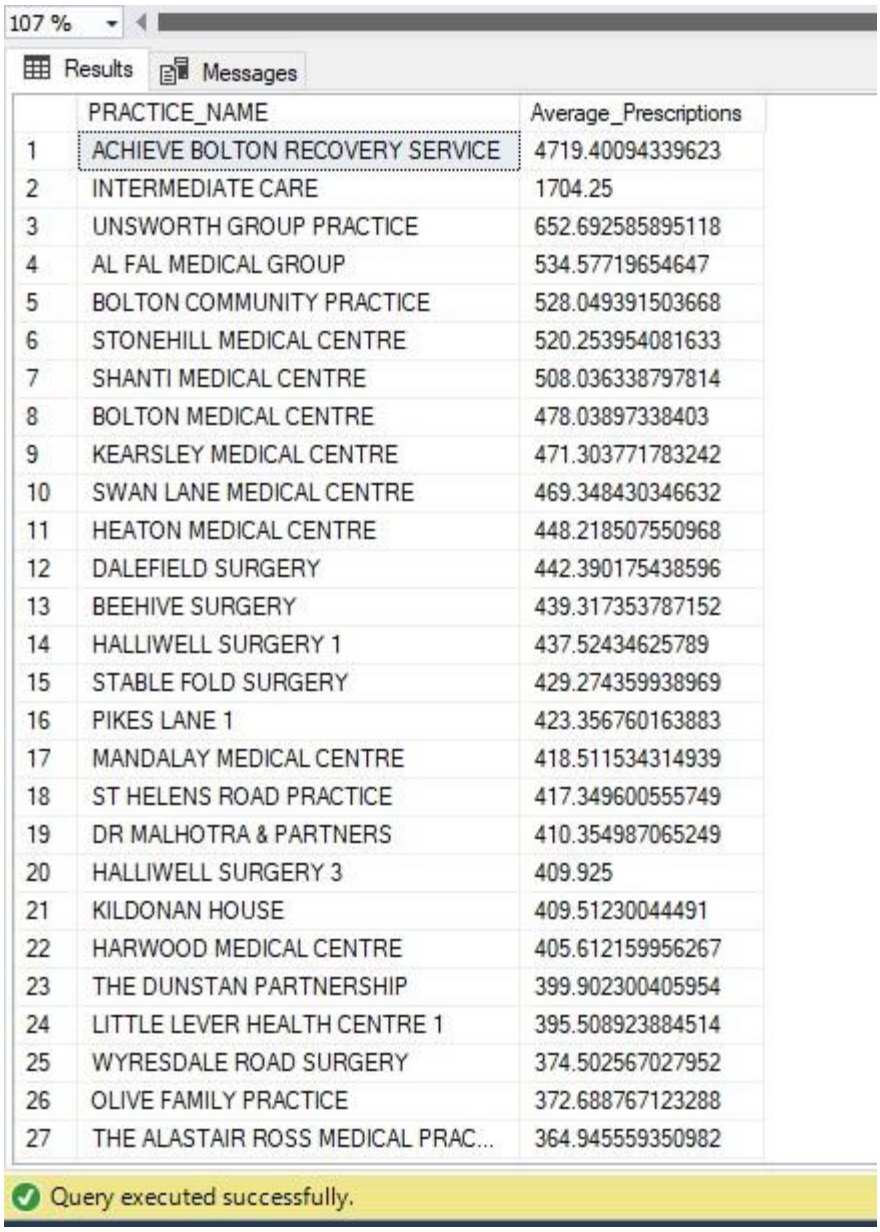
USING System Functions

A query that returns the PRACTICE_NAME and average number of

items of each prescriptions issued by each medical practice in Bolton

```sql
SELECT m.PRACTICE_NAME, SUM( pr.ITEMS * pr.QUANTITY) / COUNT(*) AS Average_Prescriptions
FROM Medical_Practice m
JOIN Prescriptions pr ON m.PRACTICE_CODE = pr.PRACTICE_CODE
GROUP BY m.PRACTICE_NAME
ORDER BY Average_Prescriptions DESC;
```

This code uses the JOIN keyword to combine the Medical_Practice table and the Prescriptions table based on their PRACTICE_CODE column and calculates the total number of prescriptions for each practice by multiplying the number of items by the quantity for each prescription and then summing up these values. The COUNT() counts the total number of prescriptions made by each practice and The AVG() function is used to calculate the average number of prescriptions for each practice.



107 %

Results | Messages

	PRACTICE_NAME	Average_Prescriptions
1	ACHIEVE BOLTON RECOVERY SERVICE	4719.40094339623
2	INTERMEDIATE CARE	1704.25
3	UNSWORTH GROUP PRACTICE	652.692585895118
4	AL FAL MEDICAL GROUP	534.57719654647
5	BOLTON COMMUNITY PRACTICE	528.049391503668
6	STONEHILL MEDICAL CENTRE	520.253954081633
7	SHANTI MEDICAL CENTRE	508.036338797814
8	BOLTON MEDICAL CENTRE	478.03897338403
9	KEARSLEY MEDICAL CENTRE	471.303771783242
10	SWAN LANE MEDICAL CENTRE	469.348430346632
11	HEATON MEDICAL CENTRE	448.218507550968
12	DALEFIELD SURGERY	442.390175438596
13	BEEHIVE SURGERY	439.317353787152
14	HALLIWELL SURGERY 1	437.52434625789
15	STABLE FOLD SURGERY	429.274359938969
16	PIKES LANE 1	423.356760163883
17	MANDALAY MEDICAL CENTRE	418.511534314939
18	ST HELENS ROAD PRACTICE	417.349600555749
19	DR MALHOTRA & PARTNERS	410.354987065249
20	HALLIWELL SURGERY 3	409.925
21	KILDONAN HOUSE	409.51230044491
22	HARWOOD MEDICAL CENTRE	405.612159956267
23	THE DUNSTAN PARTNERSHIP	399.902300405954
24	LITTLE LEVER HEALTH CENTRE 1	395.508923884514
25	WYRESDALE ROAD SURGERY	374.502567027952
26	OLIVE FAMILY PRACTICE	372.688767123288
27	THE ALASTAIR ROSS MEDICAL PRAC...	364.945559350982

Query executed successfully.

The output of this query can be useful for analyzing the prescribing patterns of medical practices and identifying practices that may be prescribing more or less than average.

QUERY 7 V

I wrote a query that returns the top 10 drugs that are most frequently prescribed across all the medical practices based on the total number of items prescribed in Bolton

```
SELECT TOP 10 dr.BNF_DESCRIPTION, SUM( pr.ITEMS) AS Total_Prescriptions
FROM Prescriptions pr
INNER JOIN Drugs dr ON pr.BNF_CODE = dr.BNF_CODE
GROUP BY dr.BNF_DESCRIPTION
ORDER BY Total_Prescriptions DESC;
```

This query extracts the top 10 most prescribed drugs based on the total number of items prescribed. The query selects the drug product description and the sum of the number of items prescribed for each drug. The query joins the Prescriptions table with the Drugs table on the BNF_CODE column. The GROUP BY clause groups the results by the BNF_DESCRIPTION column in the Drugs table. The SUM function adds up the number of items prescribed for each drug.

Finally, it orders the results by the Total_Prescriptions column in descending order and selects the top 10 rows using the TOP keyword.

107 %

Results | Messages

	BNF_DESCRIPTION	Total_Prescriptions
1	Omeprazole 20mg gastro-resistant capsules	16871
2	Atorvastatin 20mg tablets	11449
3	Amlodipine 5mg tablets	7946
4	Paracetamol 500mg tablets	7044
5	Zapain 30mg/500mg tablets	6933
6	Lansoprazole 30mg gastro-resistant caps...	6916
7	Salbutamol 100micrograms/dose inhaler ...	6879
8	Aspirin 75mg dispersible tablets	6352
9	Atorvastatin 40mg tablets	6145
10	Metformin 500mg tablets	5939

Query executed successfully.

The result set displays the name of each practice and its corresponding average number of prescription items, rounded to two decimal places. This information could be useful for medical practice management to compare prescribing patterns between different practices and potentially identify areas where resources could be allocated more efficiently.

VI Additional functionalities

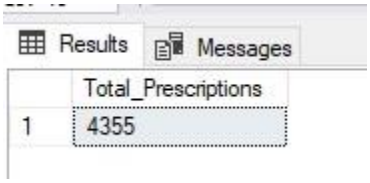
i

I wrote a query to Create a stored procedure that retrieves the total number of prescriptions for a given medical practice

```
CREATE PROCEDURE GetPrescription
AS
BEGIN
    SELECT COUNT(*) AS Total_Prescriptions
    FROM Prescriptions
    WHERE PRACTICE_CODE = 'Y03079'
END;
```

```
EXEC GetPrescription;
```

This query creates a stored procedure named GetPrescription that returns the total number of prescriptions made by a medical practice identified by its PRACTICE_CODE. The procedure contains a single SQL statement that selects the count of all records in the Prescriptions table where the PRACTICE_CODE is equal to 'Y03079'. The result is a single column named Total_Prescriptions and is executed using the EXEC command.



the result set is simply the count of the number of prescriptions issued by the practice with the PRACTICE_CODE value of Y03079, which is 4355. This could be useful information for medical practice management to monitor prescribing activity and ensure that resources are allocated appropriately.

I I

I want to Create a view that joins the prescriptions and medication tables to show the name, Drug, BNF_DESCRIPTION and quantity of medication for each prescription

```
CREATE VIEW PrescriptionDetails AS
SELECT m.PRACTICE_NAME, pr.QUANTITY, dr.BNF_DESCRIPTION,pr.ITEMS
FROM Prescriptions pr
INNER JOIN Drugs dr ON pr.BNF_CODE = dr.BNF_CODE
INNER JOIN Medical_Practice m ON pr.PRACTICE_CODE = m.PRACTICE_CODE;
```

I created a view named PrescriptionDetails that combines data from the Prescriptions, Drugs, and Medical_Practice tables. The view includes the columns PRACTICE_NAME, QUANTITY, BNF_DESCRIPTION, and ITEMS.

I used The INNER JOIN clauses to join the Prescriptions table with the Drugs table and the Medical_Practice table based on matching codes. The result set include rows where there are matching records in all three tables.

After creating the view I queried it as if it were a table to retrieve the combined data from the underlying tables as seen below

```
SELECT * FROM PrescriptionDetails;
```

	PRACTICE_NAME	QUANTITY	BNF_DESCRIPTION	ITEMS
1	EDGWORTH MEDICAL CENTRE	28	Lisinopril 5mg tablets	11
2	EDGWORTH MEDICAL CENTRE	56	Lisinopril 5mg tablets	4
3	EDGWORTH MEDICAL CENTRE	28	Perindopril erbumine 2mg tablets	1
4	FARNWORTH FAMILY PRACTICE	56	Adizem-XL 180mg capsules	1
5	FIG TREE MEDICAL PRACTICE	100	Alverine 60mg capsules	1
6	HALLIWELL SURGERY 3	60	Fexofenadine 180mg tablets	1
7	BOLTON COMMUNITY PRACTICE	30	Tiotropium bromide 10microgram inhalation pdr cap...	1
8	BOLTON COMMUNITY PRACTICE	30	Spiriva 18microgram inhalation pdr caps with Handi...	2
9	BOLTON COMMUNITY PRACTICE	60	Spiriva 18microgram inhalation powder capsules	1
10	BOLTON COMMUNITY PRACTICE	30	Spiriva 18microgram inhalation powder capsules	2
11	BOLTON COMMUNITY PRACTICE	1	Spiriva Respimat 2.5microg/dose inhalation soln	10
12	BOLTON COMMUNITY PRACTICE	2	Spiriva Respimat 2.5microg/dose inhalation soln	1
13	BOLTON COMMUNITY PRACTICE	1	Spiriva Respimat 2.5microg/dose inhalation soln ref...	5
14	BOLTON COMMUNITY PRACTICE	30	Seebri Breezhaler 44microgram inhalation pdr caps ...	3
15	BOLTON COMMUNITY PRACTICE	56	Uniphyllin Continus 400mg tablets	1
16	BOLTON COMMUNITY PRACTICE	224	Uniphyllin Continus 200mg tablets	1
17	HALLIWELL SURGERY 3	30	Fexofenadine 180mg tablets	8
18	BOLTON COMMUNITY PRACTICE	112	Uniphyllin Continus 200mg tablets	2
19	BOLTON COMMUNITY PRACTICE	1	Umeclidinium brom 65microg/Vilanterol 22microg/d...	1

Query executed successfully.

Ln 175

the first row shows that Bolton Community Practice prescribed 30 units of Spiriva 18microgram inhalation powder capsules, which consisted of 2 individual items