



Case Study

on

DW Concept, SQL, Advance SQL

Case study by,

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1. Understandings of Case Study

Btech-Chai-Wala is a start-up company by Vinit and his friends. Now-a-days in the advancement of the Internet and technologies and by considering the peoples locations they decided to start online streaming services instead of the Television. So, they have created the new streaming service which will allows only the beverage related contents.

They started subscriptions like weekly, monthly and Annual. Vinit has played roles in IT sectors like Data Analyst, Enterprise Data Architect, Principal Architect etc.

This case study questions and analysis will help the start-up to investment decisions and new features to improve Btech-Chai-Wala business.



2. Database and Tables Creation and Insertion:

2.1 & 2.2 Queries:

```
-- Creating the database
CREATE DATABASE [btech-chai-wala];

-- Using the btech-chai-wala database
USE [btech-chai-wala];

-- Creating tables plans, subscriptions and customer

-- Creating plans table
CREATE TABLE [dbo].[plans]
(
    plan_id INT NOT NULL PRIMARY KEY IDENTITY(1,1),
    plan_name VARCHAR(100),
    plan_price DECIMAL
);

-- Creating subscriptions table
CREATE TABLE [dbo].[subscriptions]
(
    subscrip_id INT NOT NULL PRIMARY KEY IDENTITY(1,1),
    cust_id INT,
    plan_id INT,
    start_date DATE,
    is_active VARCHAR(1)
);

-- Creating customer table
CREATE TABLE [dbo].[customer]
(
    cust_id INT NOT NULL PRIMARY KEY IDENTITY(1,1),
    cust_name VARCHAR(100),
    cust_city VARCHAR(100),
    cust_dob DATE
);

-- Inserting the values into the plans, subscriptions and customer tables

--plans values
SET IDENTITY_INSERT [dbo].[plans] ON;
```



```
INSERT INTO [dbo].[plans](plan_id,plan_name,plan_price) VALUES(1,'Trail',0.00);
INSERT INTO [dbo].[plans](plan_id,plan_name,plan_price)
VALUES(2,'Basic_Monthly',499.00);
INSERT INTO [dbo].[plans](plan_id,plan_name,plan_price)
VALUES(3,'Pro_Monthly',999.00);
INSERT INTO [dbo].[plans](plan_id,plan_name,plan_price)
VALUES(4,'Pro_Annual',11998.00);
INSERT INTO [dbo].[plans](plan_id,plan_name,plan_price) VALUES(5,'Chrun',NULL);
SET IDENTITY_INSERT [dbo].[plans] OFF;
-- subscriptions values
SET IDENTITY_INSERT [dbo].[subscriptions] ON;
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(1,1,2,'2019-08-01',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(2,1,3,'2019-08-08',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(3,5,1,'2020-01-17',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(4,5,1,'2020-03-17',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(5,5,3,'2021-03-24',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(6,5,3,'2021-03-24',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(7,5,5,'2021-04-29',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(8,5,5,'2022-04-30',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(9,6,1,'2020-05-31',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(10,6,2,'2020-06-07',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(11,9,1,'2020-06-22',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(12,9,3,'2020-06-29',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(13,8,1,'2020-07-06',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(14,8,3,'2020-07-13',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(15,7,1,'2020-08-01',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(16,1,1,'2020-08-07',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(17,7,2,'2020-08-08',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(18,9,4,'2020-08-29',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(19,2,1,'2020-09-20',0);
```



```
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(20,2,1,'2020-09-20',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(21,2,4,'2020-09-27',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(22,2,4,'2020-09-27',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(23,6,4,'2020-10-21',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(24,2,1,'2020-11-19',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(25,10,1,'2020-11-19',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(26,2,5,'2020-11-26',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(27,10,5,'2021-11-26',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(28,3,1,'2020-12-15',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(29,3,1,'2020-12-15',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(30,3,2,'2020-12-22',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(31,4,2,'2020-12-22',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(32,4,3,'2021-03-29',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(33,3,3,'2021-03-29',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(34,6,1,'2021-05-31',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(35,6,2,'2021-06-07',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(36,9,1,'2021-06-22',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(37,9,3,'2021-06-29',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(38,8,1,'2021-07-06',0);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(39,8,3,'2021-07-13',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(40,7,1,'2021-08-01',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(41,9,4,'2022-08-29',1);
INSERT INTO [dbo].[subscriptions](subscrip_id, cust_id, plan_id, start_date,
is_active) VALUES(42,6,4,'2021-10-21',1);
SET IDENTITY_INSERT [dbo].[subscriptions] OFF;
-- customer values
SET IDENTITY_INSERT [dbo].[customer] ON;
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(1,'Chaitanya','Bangalore','2021-02-02');
```



```
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(2, 'Harini', 'Mumbai', '2021-07-19');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(3, 'Indu', 'Chennai', '2021-01-21');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(4, 'Jameela', 'Hyderabad', '2022-05-01');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(5, 'Neeha', 'Bangalore', '2020-03-15');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(6, 'Reshma', 'Mumbai', '2021-02-02');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(7, 'Sahithi', 'Chennai', '2020-11-02');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(8, 'Sharmila', 'Hyderabad', '2021-04-22');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(9, 'Sreelakshmi', 'Bangalore', '2020-06-17');
INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob)
VALUES(10, 'Subasri', 'Mumbai', '2022-01-30');
SET IDENTITY_INSERT [dbo].[customer] OFF;
-- Verifying the values inserted properly
SELECT * FROM [dbo].[plans];
SELECT * FROM [dbo].[subscriptions];
SELECT * FROM [dbo].[customer];
```

Screenshots:

The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the Object Explorer with the 'MOULI-SANKAR' server selected. The right pane shows the 'Messages' window with the following SQL queries executed:

```
110 INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob) VALUES(3, 'Indu', 'Chennai', '2021-01-21');
111 INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob) VALUES(4, 'Jameela', 'Hyderabad', '2022-05-01');
112 INSERT INTO [dbo].[customer](cust_id, cust_name, cust_city, cust_dob) VALUES(5, 'Neeha', 'Bangalore', '2020-03-15');
```

Below the queries, the 'Results' window shows the data for the [customer] table. The table has columns: cust_id, cust_name, cust_city, cust_dob. The data is as follows:

cust_id	cust_name	cust_city	cust_dob
1	Chaitanya	Bangalore	2021-02-02
2	Harini	Mumbai	2021-07-19
3	Indu	Chennai	2021-01-21
4	Jameela	Hyderabad	2022-05-01
5	Neeha	Bangalore	2020-03-15
6	Reshma	Mumbai	2021-02-02
7	Sahithi	Chennai	2020-11-02
8	Sharmila	Hyderabad	2021-04-22
9	Sreelakshmi	Bangalore	2020-06-17
10	Subasri	Mumbai	2022-01-30



3. Case Study Questions

3.1 Question 1

Summarize your understanding of Section 01 of this document is less than 60 words.

Btech-Chai-Wala is a start-up company which will allow only the beverage related contents. In the advancement of the Internet and technologies and by considering the people's locations they decided to start streaming services instead of the Television. So, started streaming service.

They started weekly, monthly and Annual subscriptions. Vinit has played roles in IT sectors need to help him to improve business.



3.2 Question 2

Based on the 10 customers provided in the section 2.4 of this document refer subscriptions & customer table, customers having age 21 as of date get their onboarding dates.

Query:

```
SELECT c.cust_id,  
c.cust_name,  
c.cust_city,  
p.plan_name,  
p.plan_price,  
s.start_date,  
s.is_active  
FROM [dbo].[customer] c  
INNER JOIN [dbo].[subscriptions] s ON c.cust_id = s.cust_id  
INNER JOIN [dbo].[plans] p ON s.plan_id = p.plan_id  
WHERE DATEDIFF(YEAR, c.cust_dob, GETDATE()) = 21 AND s.is_active = 1  
GROUP BY c.cust_id, c.cust_name, c.cust_city, p.plan_name, p.plan_price,  
s.start_date, s.is_active;
```

Screenshot:

The screenshot displays the Microsoft SQL Server Management Studio interface. The left pane shows the Object Explorer with the database structure. The central pane shows the SQL query being executed. The bottom pane shows the results of the query, which is a table with 7 columns: cust_id, cust_name, cust_city, plan_name, plan_price, start_date, and is_active. The results show two rows of data.

cust_id	cust_name	cust_city	plan_name	plan_price	start_date	is_active
4	Janeels	Hyderabad	Pro_Monthly	999	2021-03-29	1
10	Subash	Mumbai	Chun	NULL	2021-11-26	1



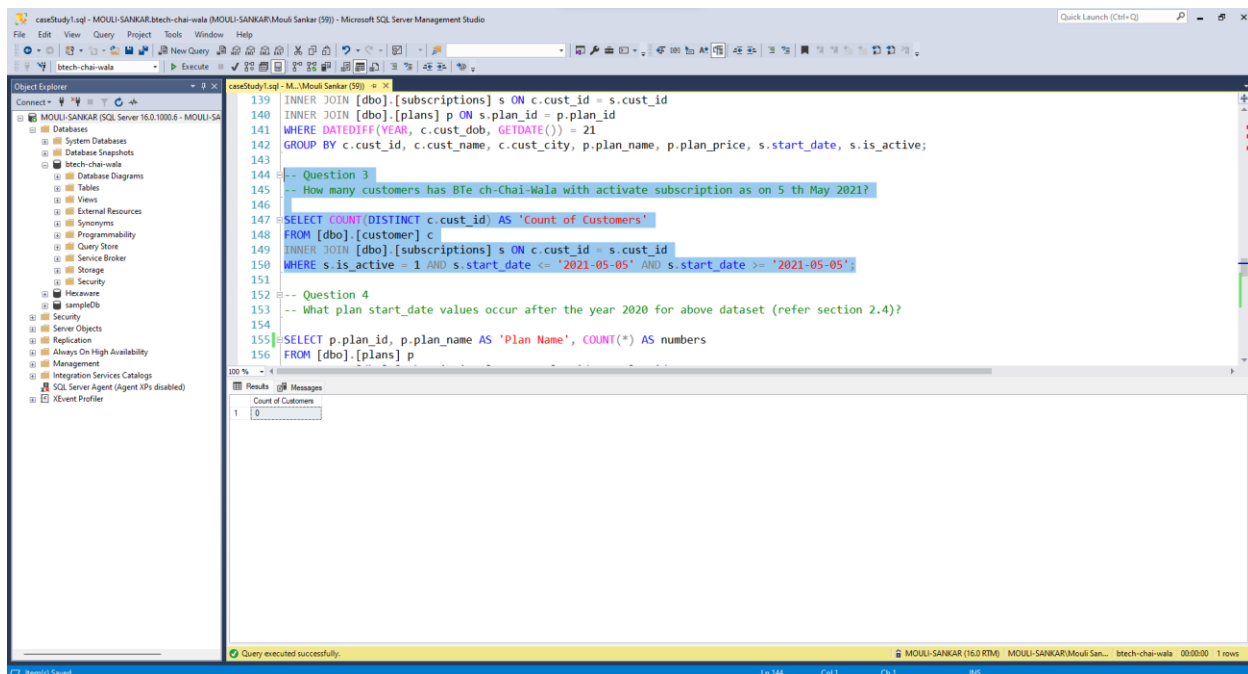
3.3 Question 3

How many customers has BTe ch-Chai-Wala with activate subscription as on 5 th May 2021?

Query:

```
SELECT COUNT(DISTINCT c.cust_id) AS 'Count of Customers'
FROM [dbo].[customer] c
INNER JOIN [dbo].[subscriptions] s ON c.cust_id = s.cust_id
WHERE s.is_active = 1 AND s.start_date <= '2021-05-05' AND s.start_date >= '2021-05-05';
```

Screenshot:





3.4 Question 4

What plan start_date values occur after the year 2020 for above dataset (refer section 2.4)?

Query:

```
SELECT p.plan_id, p.plan_name AS 'Plan Name', COUNT(*) AS numbers
FROM [dbo].[plans] p
INNER JOIN [dbo].[subscriptions] s ON p.plan_id = s.plan_id
WHERE YEAR(s.start_date) > '2020'
GROUP BY p.plan_id, p.plan_name;
```

Screenshot:

The screenshot shows the SQL Server Management Studio interface. The query editor displays the following SQL code for Question 4:

```
-- Question 4
-- What plan start_date values occur after the year 2020 for above dataset (refer section 2.4)?
SELECT p.plan_id, p.plan_name AS 'Plan Name', COUNT(*) AS numbers
FROM [dbo].[plans] p
INNER JOIN [dbo].[subscriptions] s ON p.plan_id = s.plan_id
WHERE YEAR(s.start_date) > '2020'
GROUP BY p.plan_id, p.plan_name;
```

The Results pane shows the following data:

plan_id	Plan Name	numbers
1	Trial	4
2	Basic_Monthly	1
3	Pro_Monthly	6
4	Pro_Annual	2
5	Onrun	3



3.5 Question 5

What is the customer count and percentage breakdown of all 5 plan_name values at 2020-12-31?

Query:

```
WITH customers_next_plan AS(
SELECT cust_id, plan_id, start_date,
LEAD(start_date, 1) OVER(PARTITION BY cust_id ORDER BY start_date) as
customers_next_date
FROM [dbo].[subscriptions]
WHERE start_date <= '2020-12-31'),
customer_brkdown AS (
SELECT plan_id, COUNT(DISTINCT cust_id) AS customers
FROM customers_next_plan
WHERE (customers_next_date IS NOT NULL AND (start_date < '2020-12-31' AND
customers_next_date > '2020-12-31'))
OR (customers_next_date IS NULL AND start_date < '2020-12-31')
GROUP BY plan_id)
SELECT plan_id, customers ,
ROUND(100 * CAST(customers AS NUMERIC) / (
SELECT COUNT(DISTINCT cust_id)
FROM [dbo].[subscriptions]),1) AS percentage
FROM customer_brkdown
GROUP BY plan_id, customers
ORDER BY plan_id;
```

Screenshot:

The screenshot shows the SQL Server Management Studio interface. The query window displays the SQL code for Question 5. The Results window shows the output of the query, which is a table with 3 columns: plan_id, customers, and percentage. The data is as follows:

plan_id	customers	percentage
1	3	30.0000000000000000
2	3	30.0000000000000000
3	1	10.0000000000000000
4	2	20.0000000000000000
5	1	10.0000000000000000



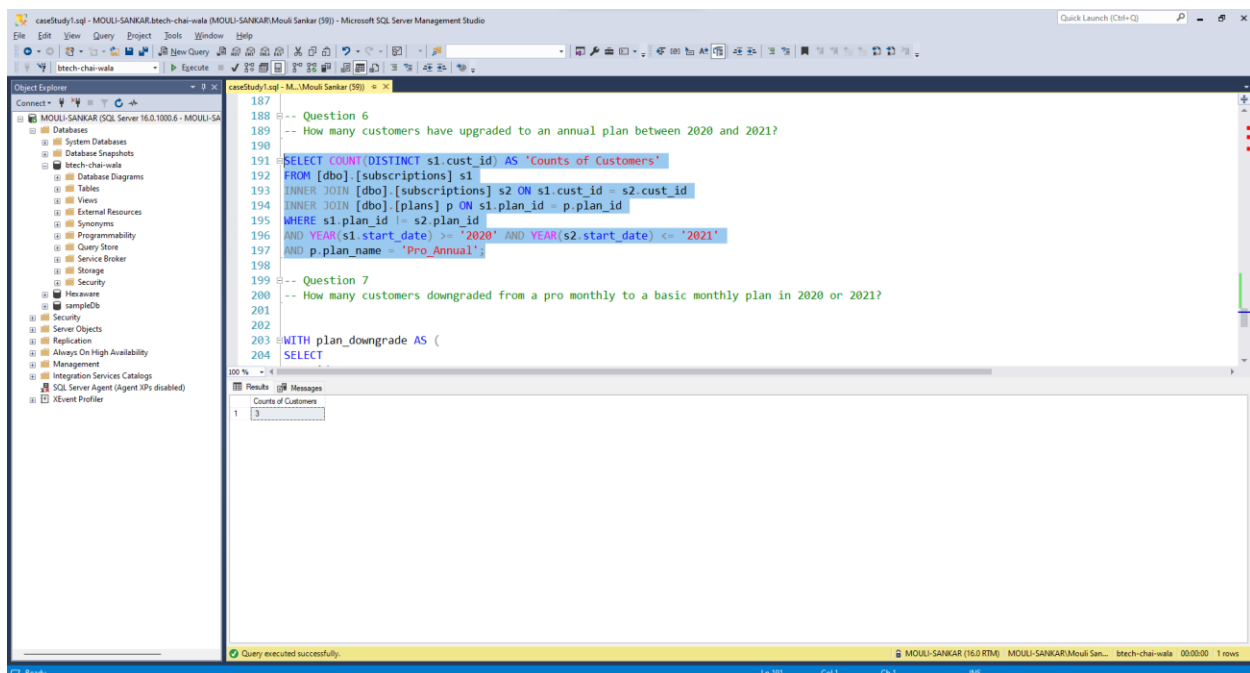
3.6 Question 6

How many customers have upgraded to an annual plan between 2020 and 2021?

Query:

```
SELECT COUNT(DISTINCT s1.cust_id) AS 'Counts of Customers'
FROM [dbo].[subscriptions] s1
INNER JOIN [dbo].[subscriptions] s2 ON s1.cust_id = s2.cust_id
INNER JOIN [dbo].[plans] p ON s1.plan_id = p.plan_id
WHERE s1.plan_id != s2.plan_id
AND YEAR(s1.start_date) >= '2020' AND YEAR(s2.start_date) <= '2021'
AND p.plan_name = 'Pro_Annual';
```

Screenshot:





3.7 Question 7

How many customers downgraded from a pro monthly to a basic monthly plan in 2020 or 2021?

Query:

```
WITH plan_downgrade AS (  
SELECT  
cust_id,  
plan_id,  
start_date,  
LEAD(plan_id, 1) OVER(PARTITION BY cust_id ORDER BY plan_id) AS down_plan  
FROM [dbo].[subscriptions])  
SELECT COUNT(*) AS 'Number of Customers Downgraded'  
FROM plan_downgrade  
WHERE start_date <= '2020-12-31' AND plan_id = 2 AND down_plan = 1;
```

Screenshot:

The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the 'Object Explorer' with the 'MOULI-SANKAR (SQL Server 16.0.1000.6 - MOULI-SANKAR)' server selected. The right pane shows a query window with the following SQL code:

```
-- Question 7  
-- How many customers downgraded from a pro monthly to a basic monthly plan in 2020 or 2021?  
WITH plan_downgrade AS (  
SELECT  
cust_id,  
plan_id,  
start_date,  
LEAD(plan_id, 1) OVER(PARTITION BY cust_id ORDER BY plan_id) AS down_plan  
FROM [dbo].[subscriptions])  
SELECT COUNT(*) AS 'Number of Customers Downgraded'  
FROM plan_downgrade  
WHERE start_date <= '2020-12-31'  
AND plan_id = 2 AND down_plan = 1;
```

Below the query window, the 'Results' pane shows the output of the query:

Number of Customers Downgraded
0

The status bar at the bottom indicates 'Query executed successfully'.