😊 Transact SQL

Transact-SQL (T-SQL) is Microsoft's extension of the SQL (Structured Query Language) standard. It is a procedural programming language that enhances SQL with additional programming constructs, control-of-flow operators, local variables, and error handling capabilities.

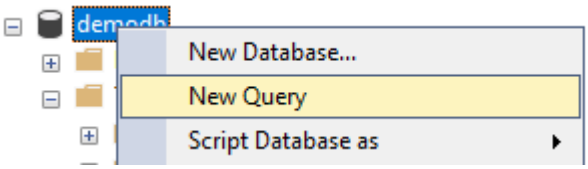
Here's an overview of Transact-SQL:

1. **Data Manipulation:** T-SQL allows for querying, inserting, updating, and deleting data in relational databases. It supports standard SQL operations like SELECT, INSERT, UPDATE, and DELETE.
2. **Data Definition:** T-SQL enables the definition of database objects such as tables, views, stored procedures, functions, indexes, and triggers using commands like CREATE, ALTER, and DROP.
3. **Procedural Programming:** T-SQL includes procedural programming features such as variables, control-of-flow statements (IF...ELSE, WHILE, BEGIN...END), loops, and exception handling with TRY...CATCH blocks.
4. **Transaction Control:** T-SQL supports transactions, allowing developers to ensure data integrity by grouping SQL operations into atomic units of work. Commands like BEGIN TRANSACTION, COMMIT, and ROLLBACK are used to manage transactions.
5. **Error Handling:** T-SQL provides mechanisms for handling errors and exceptions that may occur during the execution of SQL statements or stored procedures. This includes TRY...CATCH blocks for structured error handling.
6. **Dynamic SQL:** T-SQL allows for the dynamic generation and execution of SQL statements within stored procedures or application code, enabling flexibility in query construction based on runtime conditions.
7. **System Functions and Stored Procedures:** T-SQL includes a wide range of built-in functions and system-stored procedures for tasks such as string manipulation, date and time operations, mathematical calculations, and system administration.
8. **Security:** T-SQL supports security features such as permissions, roles, and encryption, allowing developers to control access to database objects and sensitive data.

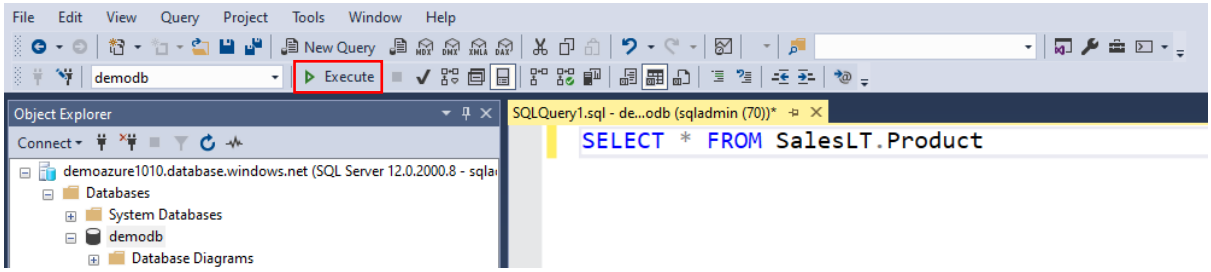
T-SQL is primarily used with Microsoft SQL Server and Azure SQL Database but can also be found in other Microsoft database-related products and services. It provides a powerful and flexible platform for developing database applications, stored procedures, and scripts for managing and manipulating data in SQL Server environments.

😄 SELECT Clause

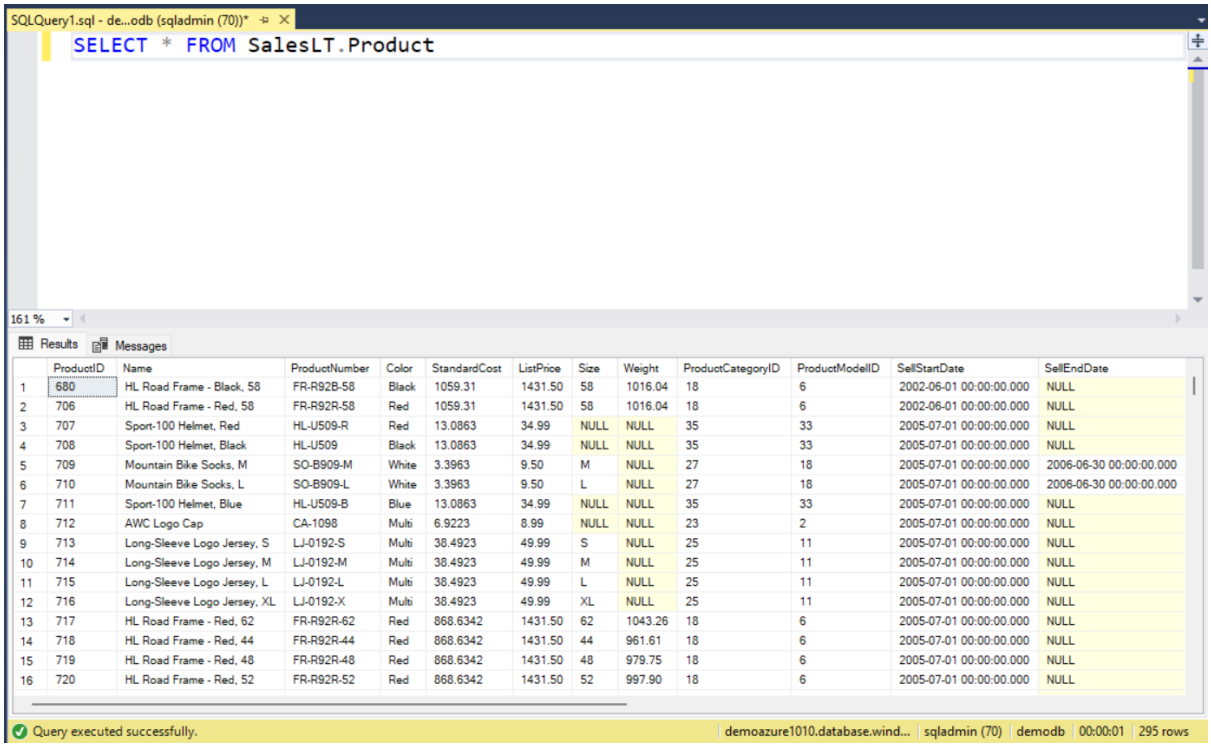
1. First select your database then right-click on it, after that, you have to choose New Query.



2. Now the first statement we are going to issue is the Select statement.
3. If you want to see the data within a table in your database, you can go ahead and issue the SELECT statement. If you want to return all the columns of information from within a table, we can do a star FROM.
4. Then choose the schema name that is SalesLT, the default schema that's part of this sample database.
5. After that we give the table name which happens to be Product. Once all it is written then click on Execute.

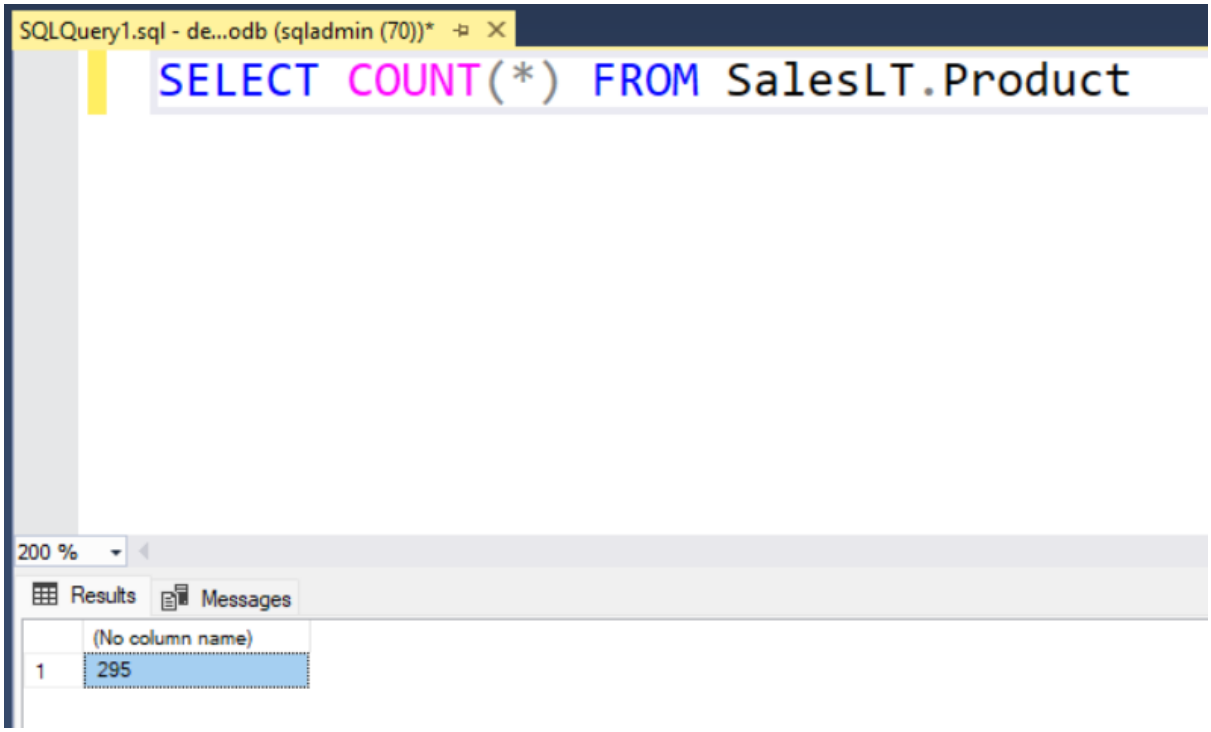


6. Here below you can see the data after execution of the command.

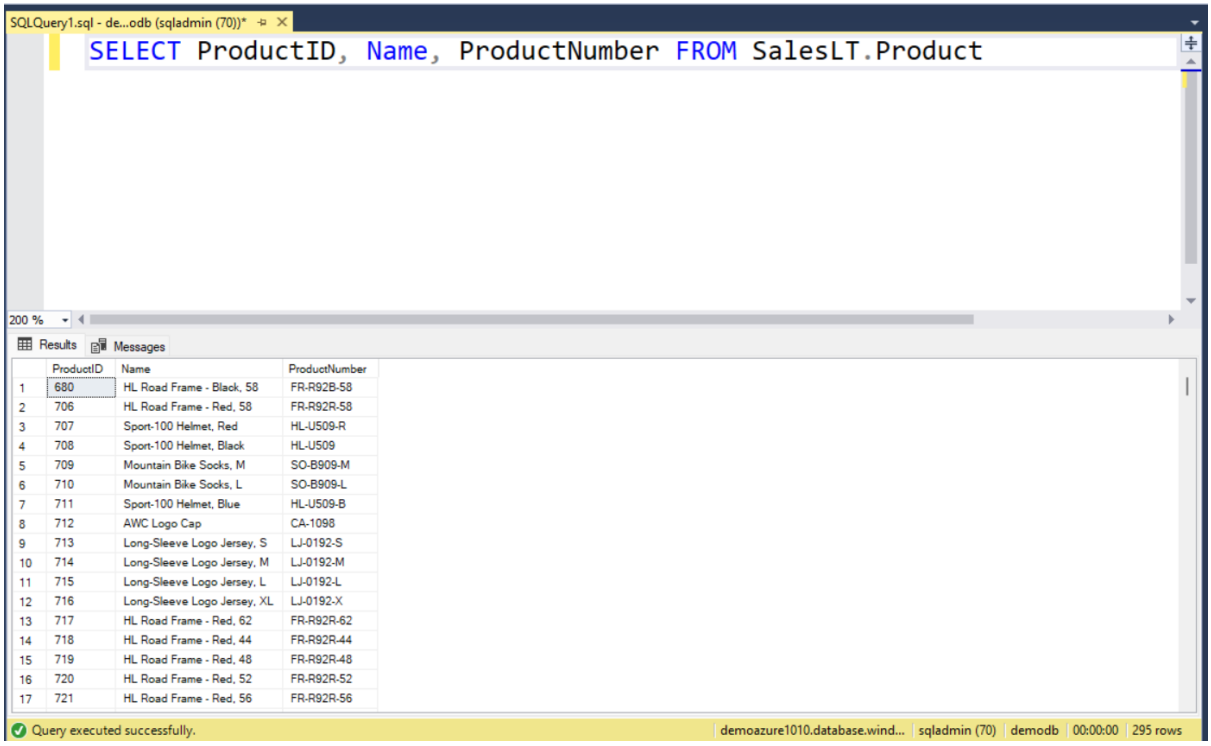


	ProductID	Name	ProductNumber	Color	StandardCost	ListPrice	Size	Weight	ProductCategoryID	ProductModelID	SellStartDate	SellEndDate
1	680	HL Road Frame - Black, 58	FR-R92B-58	Black	1059.31	1431.50	58	1016.04	18	6	2002-06-01 00:00:00.000	NULL
2	706	HL Road Frame - Red, 58	FR-R92R-58	Red	1059.31	1431.50	58	1016.04	18	6	2002-06-01 00:00:00.000	NULL
3	707	Sport-100 Helmet, Red	HL-U509-R	Red	13.0863	34.99	NULL	NULL	35	33	2005-07-01 00:00:00.000	NULL
4	708	Sport-100 Helmet, Black	HL-U509	Black	13.0863	34.99	NULL	NULL	35	33	2005-07-01 00:00:00.000	NULL
5	709	Mountain Bike Socks, M	SO-B909-M	White	3.3963	9.50	M	NULL	27	18	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000
6	710	Mountain Bike Socks, L	SO-B909-L	White	3.3963	9.50	L	NULL	27	18	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000
7	711	Sport-100 Helmet, Blue	HL-U509-B	Blue	13.0863	34.99	NULL	NULL	35	33	2005-07-01 00:00:00.000	NULL
8	712	AWC Logo Cap	CA-1098	Multi	6.9223	8.99	NULL	NULL	23	2	2005-07-01 00:00:00.000	NULL
9	713	Long-Sleeve Logo Jersey, S	LJ-0192-S	Multi	38.4923	49.99	S	NULL	25	11	2005-07-01 00:00:00.000	NULL
10	714	Long-Sleeve Logo Jersey, M	LJ-0192-M	Multi	38.4923	49.99	M	NULL	25	11	2005-07-01 00:00:00.000	NULL
11	715	Long-Sleeve Logo Jersey, L	LJ-0192-L	Multi	38.4923	49.99	L	NULL	25	11	2005-07-01 00:00:00.000	NULL
12	716	Long-Sleeve Logo Jersey, XL	LJ-0192-X	Multi	38.4923	49.99	XL	NULL	25	11	2005-07-01 00:00:00.000	NULL
13	717	HL Road Frame - Red, 62	FR-R92R-62	Red	868.6342	1431.50	62	1043.26	18	6	2005-07-01 00:00:00.000	NULL
14	718	HL Road Frame - Red, 44	FR-R92R-44	Red	868.6342	1431.50	44	961.61	18	6	2005-07-01 00:00:00.000	NULL
15	719	HL Road Frame - Red, 48	FR-R92R-48	Red	868.6342	1431.50	48	979.75	18	6	2005-07-01 00:00:00.000	NULL
16	720	HL Road Frame - Red, 52	FR-R92R-52	Red	868.6342	1431.50	52	997.90	18	6	2005-07-01 00:00:00.000	NULL

7. Now if you want to see the number of rows with in the table then you can issue this command.

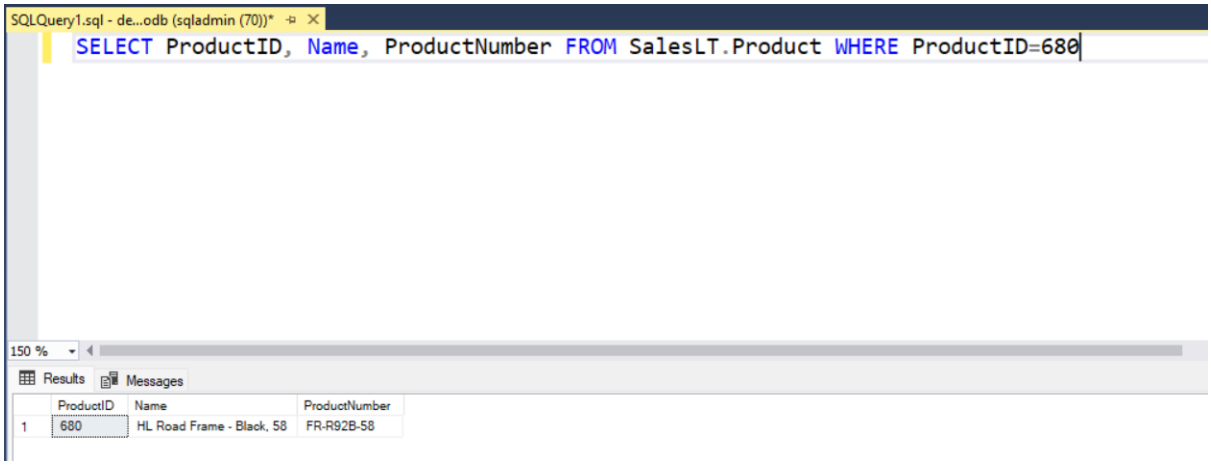


8. If you want to see the details for certain columns, then you can issue this command.

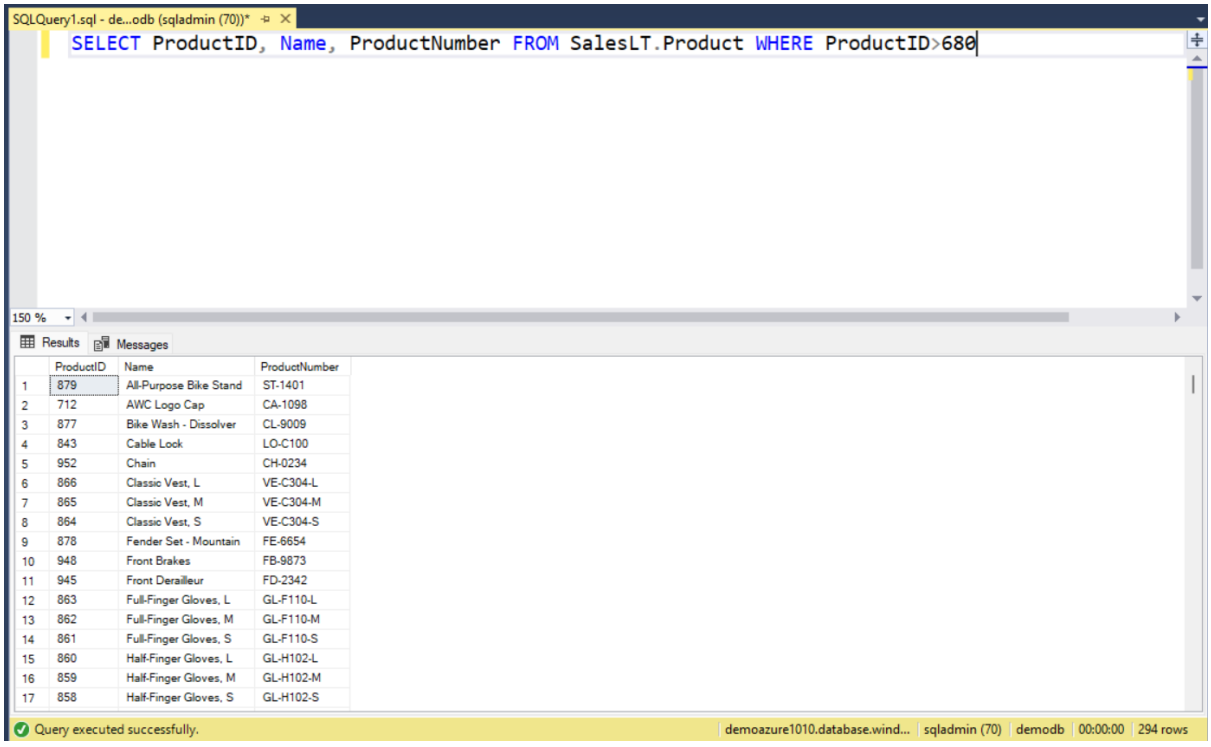


😄 WHERE Clause

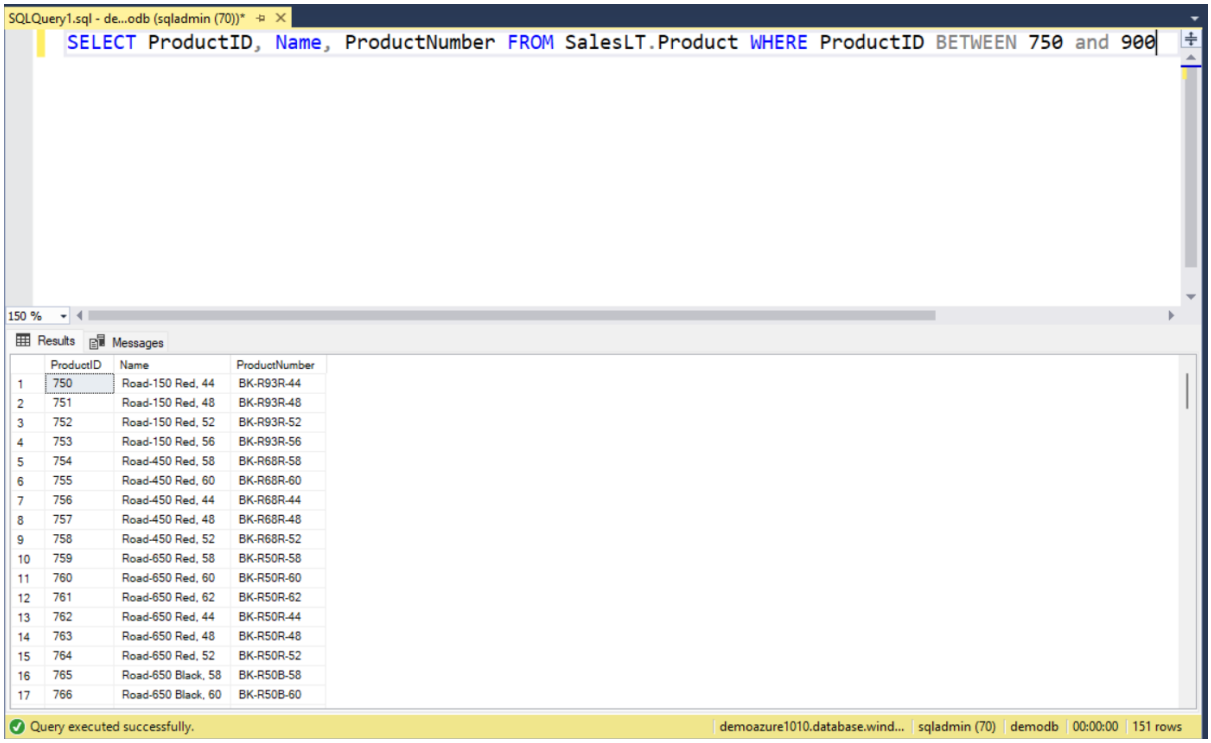
1. Now we are going to learn about Where condition. The WHERE clause can be used to extract only those records from within a table that fulfill a specified condition.
2. Below you can see that we add where clause to the statement to find a specific product ID and we got the result accordingly.



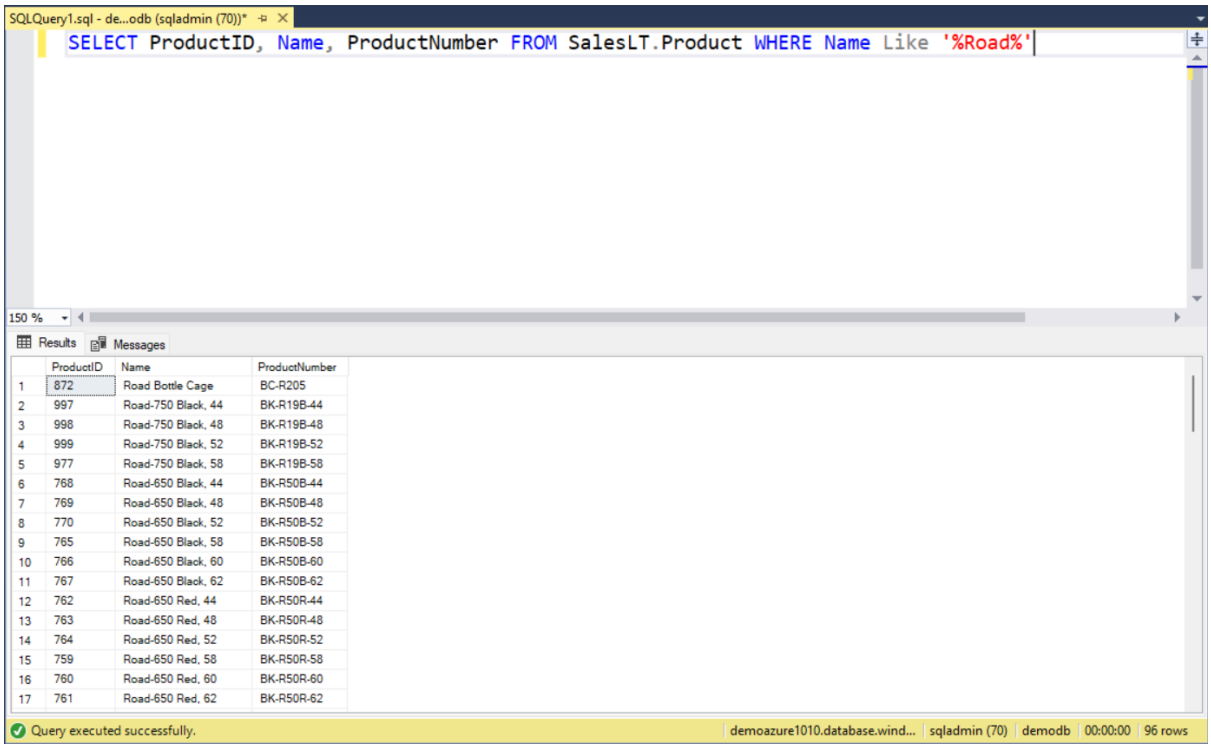
3. Now if you want to get a list of products where Product ID is greater than that specific number.



4. Now you can also find the data between the set of values.



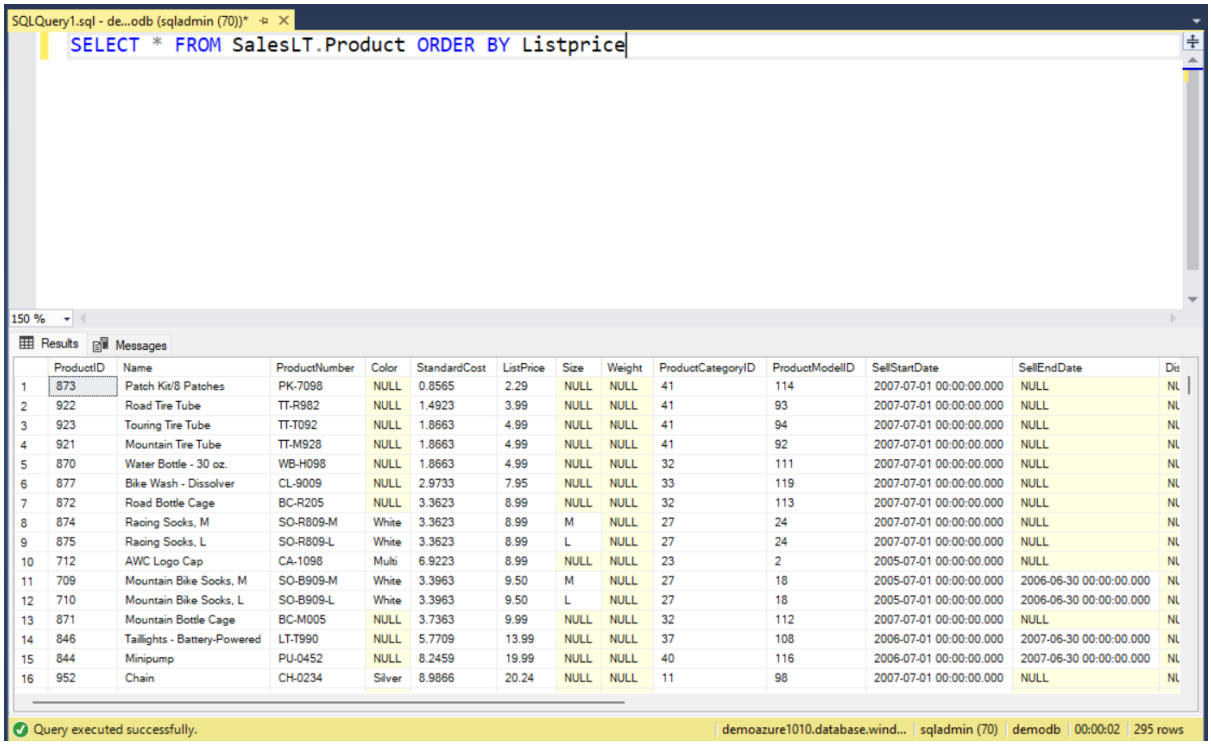
5. Now if you want to get the records from the table based on the string keyword within the name.



😄 ORDER BY Clause

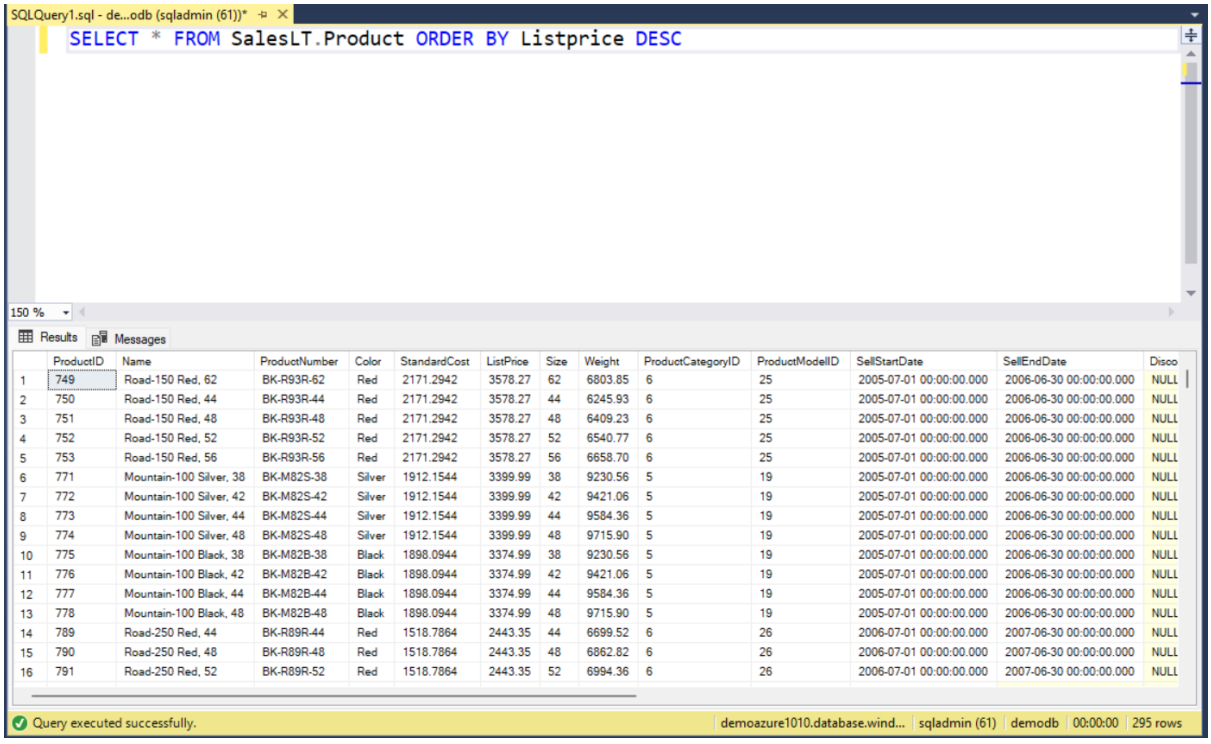
1. This clause can be used to sort the results set, the data that's coming in from the table, based on your selected statement in ascending or descending order.

2. Now run this query and you will see that you are getting the information in ascending order.



	ProductID	Name	ProductNumber	Color	StandardCost	ListPrice	Size	Weight	ProductCategoryID	ProductModelID	SellStartDate	SellEndDate	Dis
1	873	Patch Kit/8 Patches	PK-7098	NULL	0.8565	2.29	NULL	NULL	41	114	2007-07-01 00:00:00.000	NULL	NU
2	922	Road Tire Tube	TT-R982	NULL	1.4923	3.99	NULL	NULL	41	93	2007-07-01 00:00:00.000	NULL	NU
3	923	Touring Tire Tube	TT-T092	NULL	1.8663	4.99	NULL	NULL	41	94	2007-07-01 00:00:00.000	NULL	NU
4	921	Mountain Tire Tube	TT-M928	NULL	1.8663	4.99	NULL	NULL	41	92	2007-07-01 00:00:00.000	NULL	NU
5	870	Water Bottle - 30 oz.	WB-H098	NULL	1.8663	4.99	NULL	NULL	32	111	2007-07-01 00:00:00.000	NULL	NU
6	877	Bike Wash - Dissolver	CL-9009	NULL	2.9733	7.95	NULL	NULL	33	119	2007-07-01 00:00:00.000	NULL	NU
7	872	Road Bottle Cage	BC-R205	NULL	3.3623	8.99	NULL	NULL	32	113	2007-07-01 00:00:00.000	NULL	NU
8	874	Racing Socks, M	SO-R809-M	White	3.3623	8.99	M	NULL	27	24	2007-07-01 00:00:00.000	NULL	NU
9	875	Racing Socks, L	SO-R809-L	White	3.3623	8.99	L	NULL	27	24	2007-07-01 00:00:00.000	NULL	NU
10	712	AWC Logo Cap	CA-1098	Multi	6.9223	8.99	NULL	NULL	23	2	2005-07-01 00:00:00.000	NULL	NU
11	709	Mountain Bike Socks, M	SO-B909-M	White	3.3963	9.50	M	NULL	27	18	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NU
12	710	Mountain Bike Socks, L	SO-B909-L	White	3.3963	9.50	L	NULL	27	18	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NU
13	871	Mountain Bottle Cage	BC-M005	NULL	3.7363	9.99	NULL	NULL	32	112	2007-07-01 00:00:00.000	NULL	NU
14	846	Taillights - Battery-Powered	LT-T990	NULL	5.7709	13.99	NULL	NULL	37	108	2006-07-01 00:00:00.000	2007-06-30 00:00:00.000	NU
15	844	Minipump	PU-0452	NULL	8.2459	19.99	NULL	NULL	40	116	2006-07-01 00:00:00.000	2007-06-30 00:00:00.000	NU
16	952	Chain	CH-0234	Silver	8.9866	20.24	NULL	NULL	11	98	2007-07-01 00:00:00.000	NULL	NU

3. Now to get the information in descending order you can run this command.

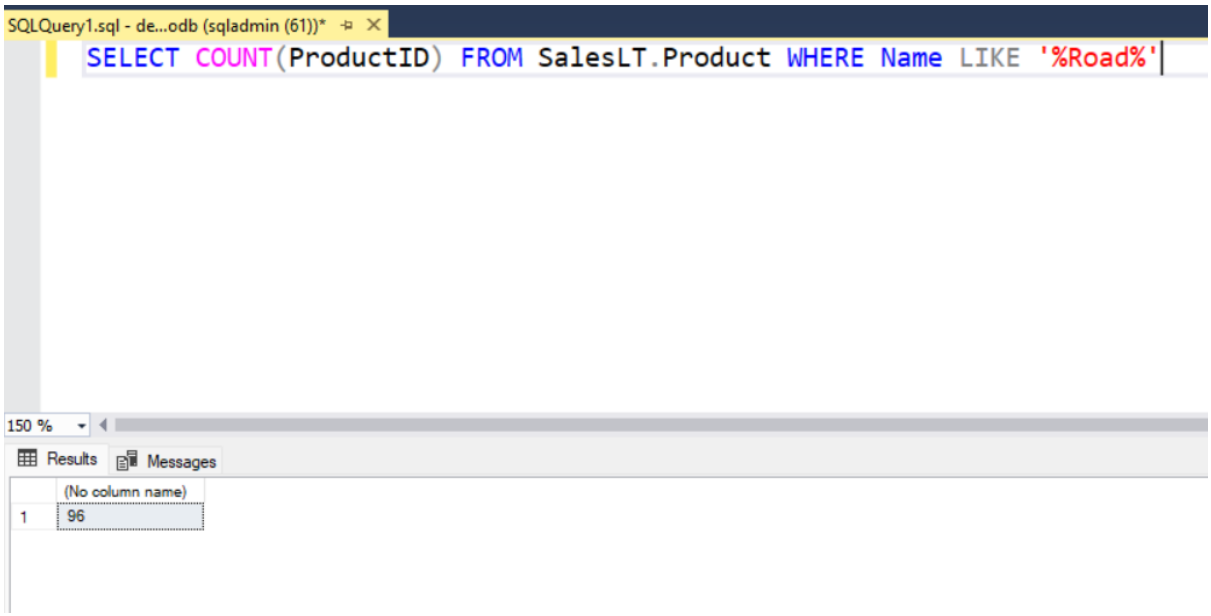


	ProductID	Name	ProductNumber	Color	StandardCost	ListPrice	Size	Weight	ProductCategoryID	ProductModelID	SellStartDate	SellEndDate	Disco
1	749	Road-150 Red, 62	BK-R93R-62	Red	2171.2942	3578.27	62	6803.85	6	25	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
2	750	Road-150 Red, 44	BK-R93R-44	Red	2171.2942	3578.27	44	6245.93	6	25	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
3	751	Road-150 Red, 48	BK-R93R-48	Red	2171.2942	3578.27	48	6409.23	6	25	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
4	752	Road-150 Red, 52	BK-R93R-52	Red	2171.2942	3578.27	52	6540.77	6	25	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
5	753	Road-150 Red, 56	BK-R93R-56	Red	2171.2942	3578.27	56	6658.70	6	25	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
6	771	Mountain-100 Silver, 38	BK-M82S-38	Silver	1912.1544	3399.99	38	9230.56	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
7	772	Mountain-100 Silver, 42	BK-M82S-42	Silver	1912.1544	3399.99	42	9421.06	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
8	773	Mountain-100 Silver, 44	BK-M82S-44	Silver	1912.1544	3399.99	44	9584.36	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
9	774	Mountain-100 Silver, 48	BK-M82S-48	Silver	1912.1544	3399.99	48	9715.90	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
10	775	Mountain-100 Black, 38	BK-M82B-38	Black	1898.0944	3374.99	38	9230.56	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
11	776	Mountain-100 Black, 42	BK-M82B-42	Black	1898.0944	3374.99	42	9421.06	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
12	777	Mountain-100 Black, 44	BK-M82B-44	Black	1898.0944	3374.99	44	9584.36	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
13	778	Mountain-100 Black, 48	BK-M82B-48	Black	1898.0944	3374.99	48	9715.90	5	19	2005-07-01 00:00:00.000	2006-06-30 00:00:00.000	NULL
14	789	Road-250 Red, 44	BK-R89R-44	Red	1518.7864	2443.35	44	6699.52	6	26	2006-07-01 00:00:00.000	2007-06-30 00:00:00.000	NULL
15	790	Road-250 Red, 48	BK-R89R-48	Red	1518.7864	2443.35	48	6862.82	6	26	2006-07-01 00:00:00.000	2007-06-30 00:00:00.000	NULL
16	791	Road-250 Red, 52	BK-R89R-52	Red	1518.7864	2443.35	52	6994.36	6	26	2006-07-01 00:00:00.000	2007-06-30 00:00:00.000	NULL

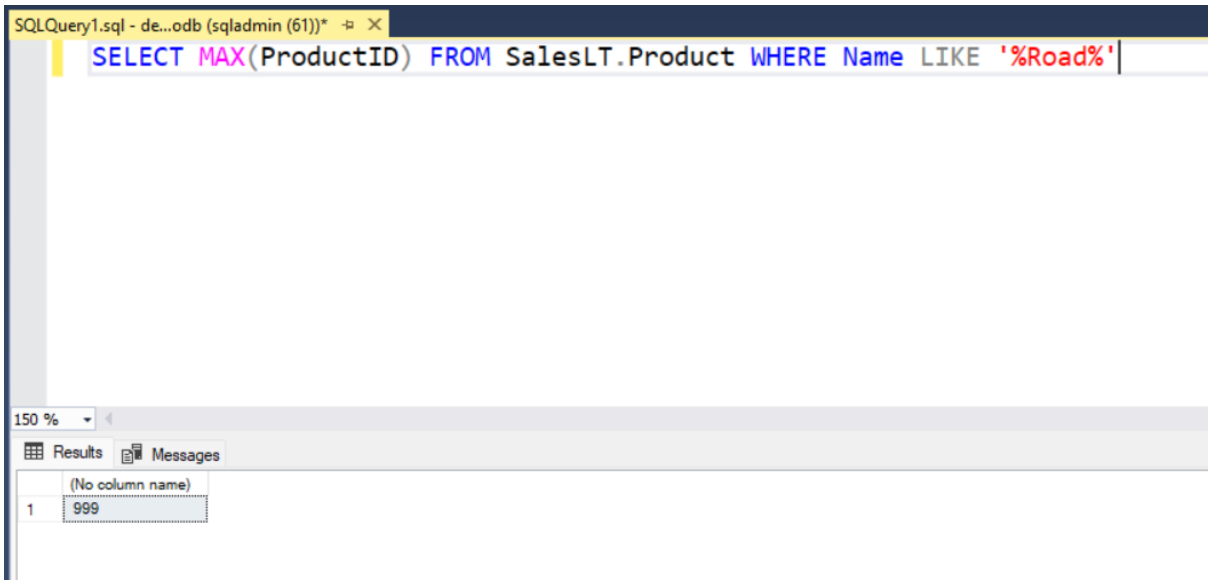
😄 Aggregate Functions

1. In this part we will learn how to use aggregate functions.

2. If you want to aggregate your data, there are functions available within the structure query language. We have already seen one function before and that is the count function. If you want to look at the number of records that are being returned by a particular statement, a select statement, we can go ahead and use the count function.



3. Below are some examples of how you can use Aggregate functions.



SQLQuery1.sql - de...odb (sqladmin (61))*

```
SELECT MIN(ProductID) FROM SalesLT.Product WHERE Name LIKE '%Road%'
```

150 %

Results | Messages

	(No column name)
1	680

SQLQuery1.sql - de...odb (sqladmin (61))*

```
SELECT SUM(ProductID) FROM SalesLT.Product WHERE Name LIKE '%Road%'
```

150 %

Results | Messages

	(No column name)
1	77335

SQLQuery1.sql - de...odb (sqladmin (61))*

```
SELECT AVG(ProductID) FROM SalesLT.Product WHERE Name LIKE '%Road%'
```

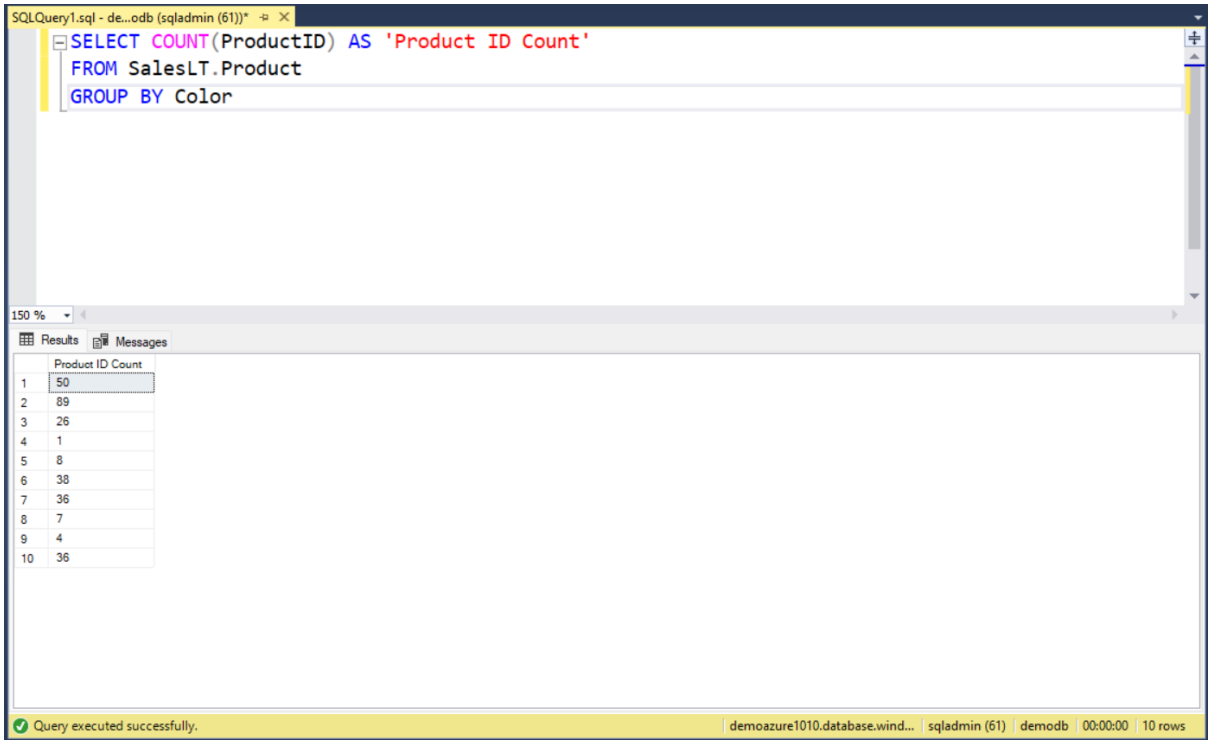
150 %

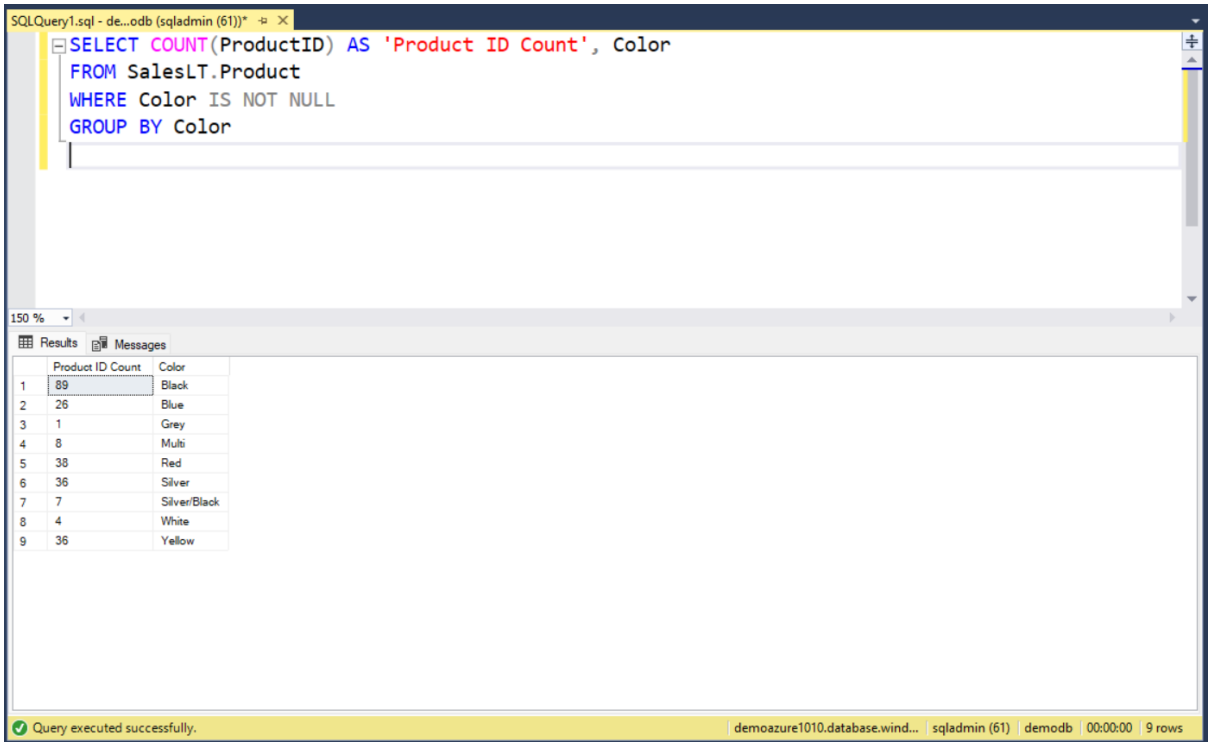
Results | Messages

	(No column name)
1	805

😄 GROUP BY Clause

1. Now the group by clause is used to group rows into summary rows and this can be used along with your aggregate functions.
2. Below are some examples on how you can use this clause.





😄 HAVING Clause

1. When you start using aggregate functions from within your queries, you can use the WHERE clause to filter on the information that's first returned in the results set. But after the GROUP BY clause, you know, once you have the results set in place, after the filter condition has been applied from the WHERE clause, and we use a GROUP BY clause to our group by Color, let's say in this case, you want to filter down further. We can make use of the HAVING clause.