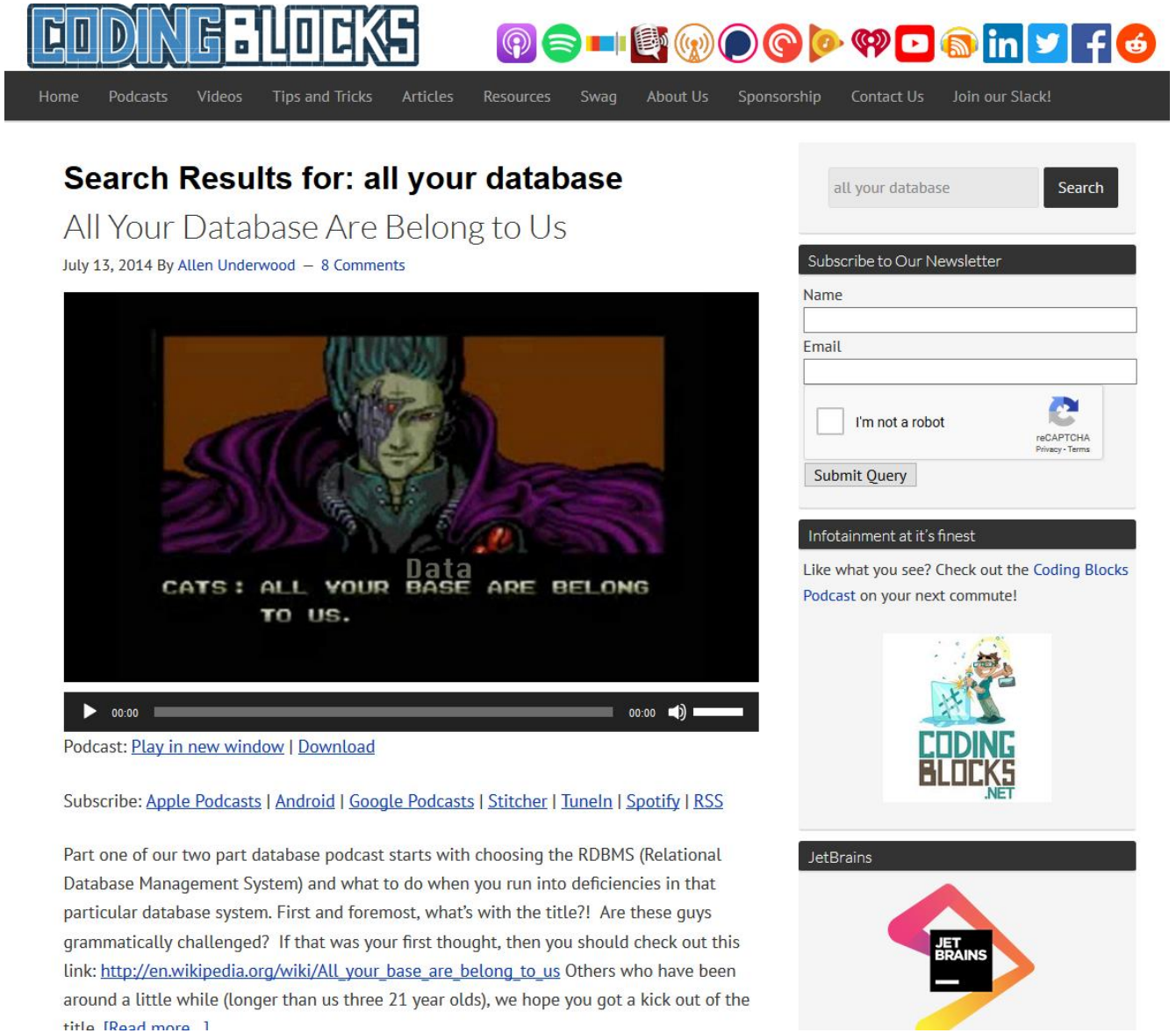

Allen Underwood

https://www.codingblocks.net/
Twitter: @theallenu
https://www.linkedin.com/in/allenunderwood/
https://github.com/codingblocks/

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Boost Your MSSQL Productivity

Docker – If You Don't Have It

Go download it!!!

https://www.docker.com/products/docker-desktop

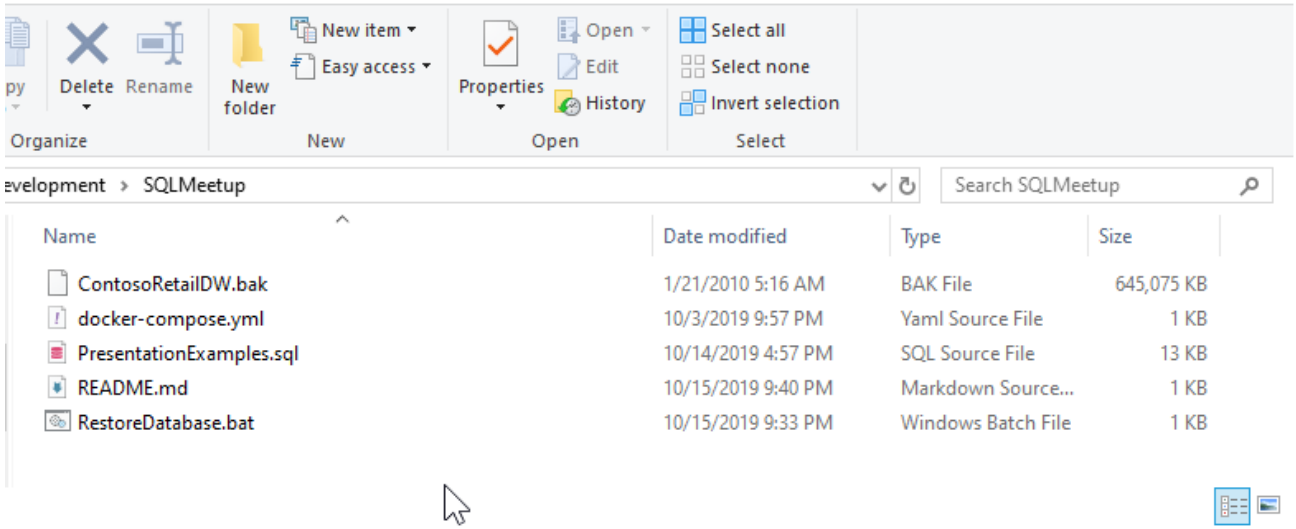
For the best experience to play along with the examples in this slide-deck, you'll want to be on Windows 10 Professional

Docker – BEFORE You Get Started

If you want to play around in the SQL file that's included in this repository, you'll need to download the ContosoRetailDW file into the SAME directory as the docker-compose.yml (included in the root folder of this repository)

https://www.microsoft.com/en-us/download/details.aspx?id=18279

If you cloned the repo, that folder should look like this (after you download the file above)



Docker – Getting Started

Take a look at the docker-compose.yml file in this repository

- You'll see three services in there – all three SQL Server instances

From the command line, in the same directory where the docker-compose.yml file exists, run the following (make sure you're using in Linux container mode for Docker)

```
docker-compose up -d
```

You should see something similar to this…

```
D:\Development\SQLMeetup
λ docker-compose up -d
Creating network "sqlmeetup_default" with the default driver
Creating sql-server ... done
Creating sql-stage  ... done
Creating sql-prod   ... done

D:\Development\SQLMeetup
λ
```

Restoring the ContosoRetailDW

You will need to run the RestoreDatabase.bat file – it will restore the ContosoRetailDW into the "dev" environment → Port 1500 on the next slide

- This could take a few minutes – be patient – it's restoring a 1.3GB database ☺
  `RestoreDatabase.bat`

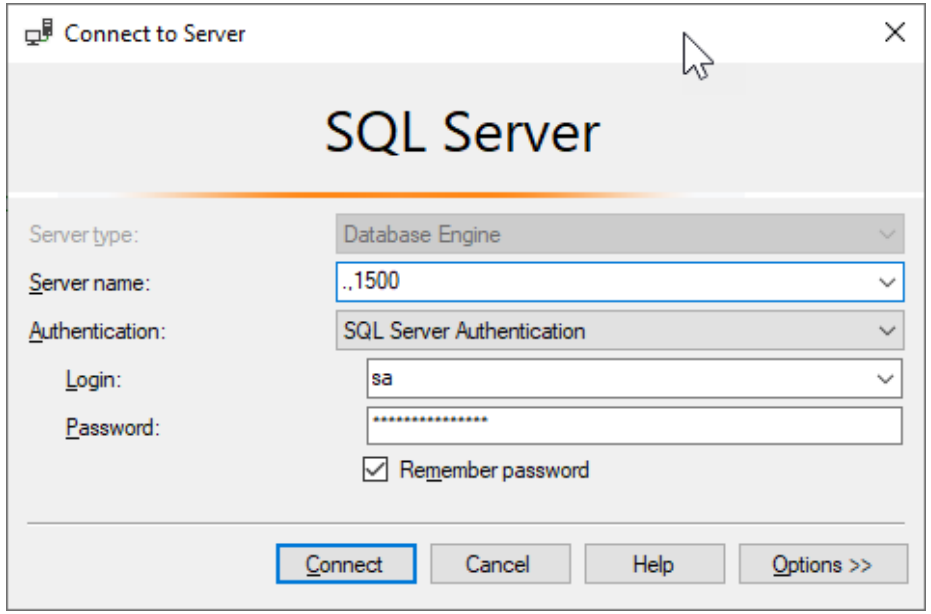
```
D:\Development\SQLMeetup
λ RestoreDatabase.bat

docker-compose exec sql-dev /opt/mssql-tools/bin/sqlcmd -U sa -P c0dingbl0cks! -H localhost -q "RESTORE DATABASE [ContosoRetai
lDW] FROM  DISK = N'/var/opt/mssql/data/ContosoRetailDW.bak' WITH  FILE = 1,  MOVE N'ContosoRetailDW2.0' TO N'/var/opt/mssql/d
ata/ContosoRetailDW.mdf',  MOVE N'ContosoRetailDW2.0_log' TO N'/var/opt/mssql/data/ContosoRetailDW.ldf',  NOUNLOAD,  STATS = 5
"
5 percent processed.
10 percent processed.
15 percent processed.
20 percent processed.
Database 'ContosoRetailDW' running the upgrade step from version 863 to version 864.
Database 'ContosoRetailDW' running the upgrade step from version 864 to version 865.
Database 'ContosoRetailDW' running the upgrade step from version 865 to version 866.
Database 'ContosoRetailDW' running the upgrade step from version 866 to version 867.
Database 'ContosoRetailDW' running the upgrade step from version 867 to version 868.
Database 'ContosoRetailDW' running the upgrade step from version 868 to version 869.
RESTORE DATABASE successfully processed 157986 pages in 32.330 seconds (38.176 MB/sec).
```

Now that SQL Server is Started with Data

Open up SSMS and try to connect

- If you didn't change anything in the docker-compose.yml file, enter the following – notice that server name is period comma (period is an alias for localhost) – note that changing the port in the Server Name field represents one of the three services from the docker-compose.yml file
- 1500 → Development (ContosoRetailDW)
- 1501 → Staging (Empty)
- 1502 → Production (Empty)
  - `Server Name: .,1500`
  - `Authentication: Sql Server`
  - `Login: sa`
  - `Password: c0dingbl0cks!`



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Open Up PresentationExamples.sql

Now it’s time to follow along – PresentationExamples.sql is in the root folder of this project

Most of the slides in this presentation have an accompanying query or set of queries in the sql file. Open that thing up and play along.

Setting the Bar…

INNER JOIN → JOIN

LEFT OUTER JOIN → LEFT JOIN

~~RIGHT OUTER JOIN → RIGHT JOIN~~

FULL OUTER JOIN → OUTER JOIN

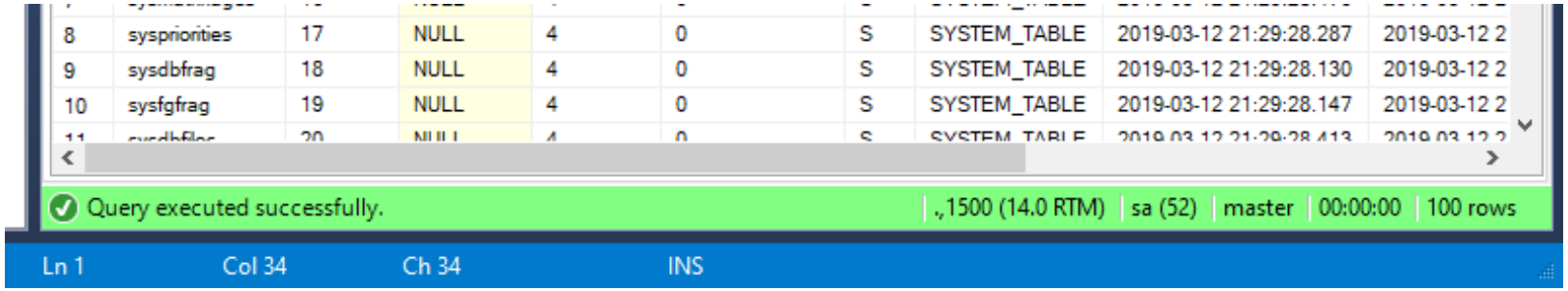
CROSS JOIN

CROSS APPLY

OUTER APPLY

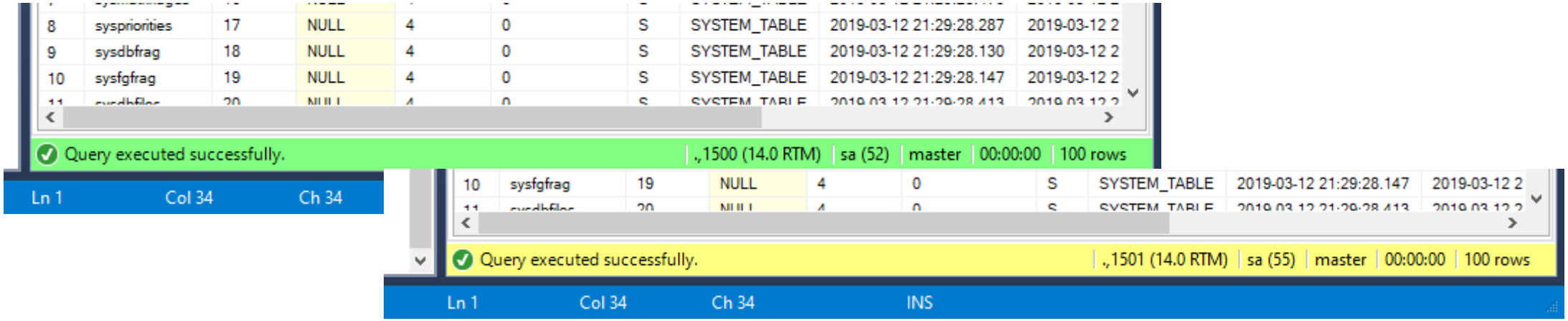
SSMS Tips & Tricks

Color code your query windows by connection



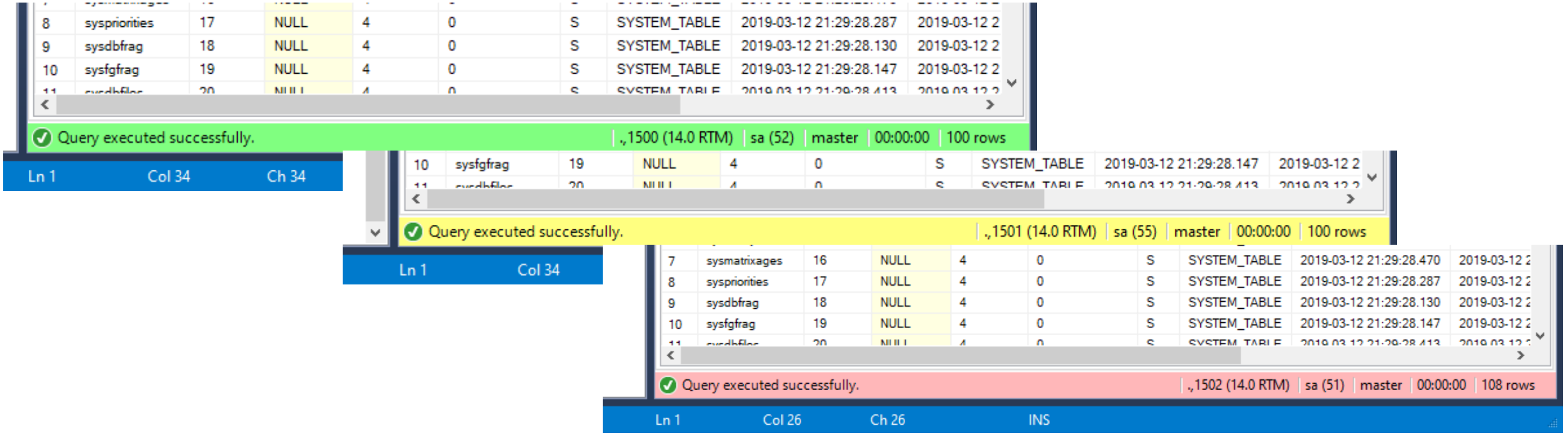
SSMS Tips & Tricks

Color code your query windows by connection



SSMS Tips & Tricks

Color code your query windows by connection



Highlight Object Name, then Alt + F1

Find out about database objects with this quick shortcut

- Tables
- Stored Procedures
- Functions

Dry Run Your Queries

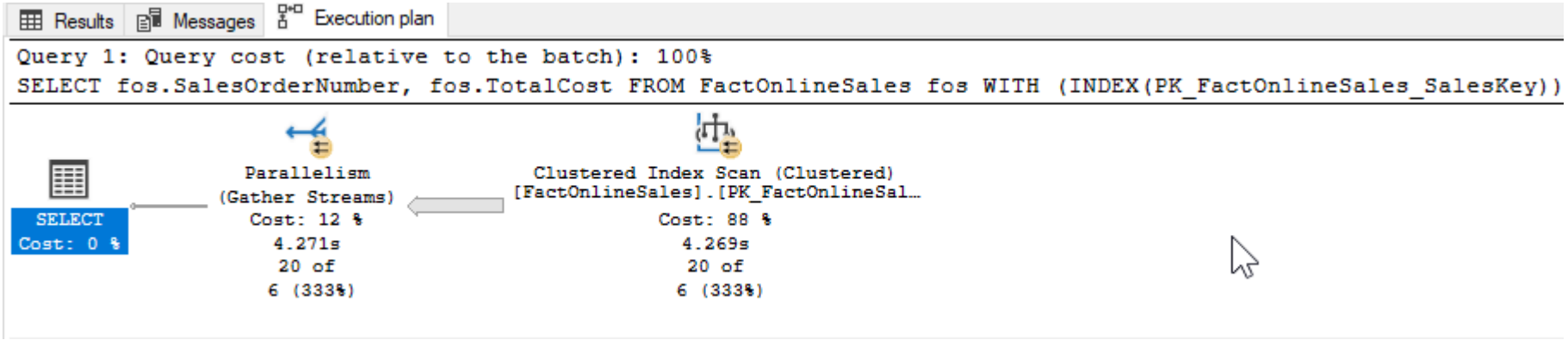
```
UPDATE c SET
    FirstName = 'Elisabeth’
FROM DimCustomer c


 -- UPDATE c SET
 SELECT c.*,
     FirstName = 'Elisabeth’
 FROM DimCustomer c
```

Get Familiar with Execution Plans

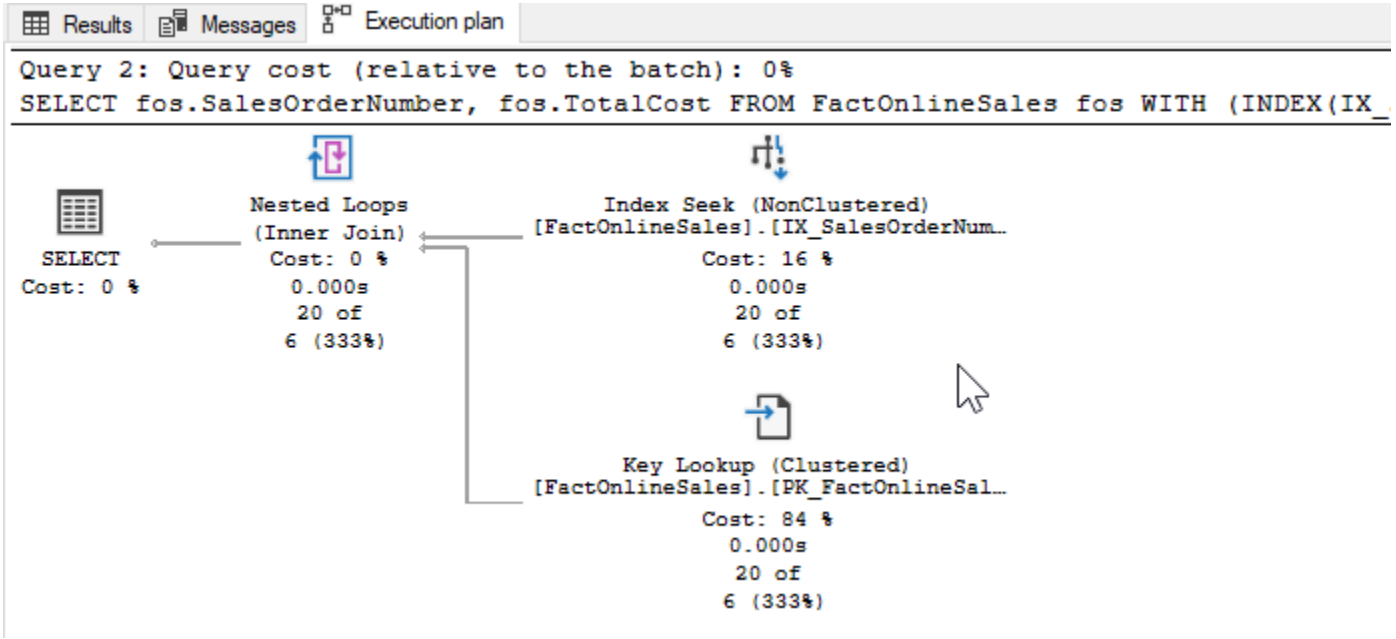
```
SELECT
    fos.SalesOrderNumber,
    fos.TotalCost
FROM FactOnlineSales fos WITH (INDEX(PK_FactOnlineSales_SalesKey))
WHERE SalesOrderNumber IN ('20070101311332','20070101711340’)
```

Clustered Index Scan → NOT what you want to see most of the time



Key Lookup – What's That?

```
SELECT
    fos.SalesOrderNumber,
    fos.TotalCost
FROM FactOnlineSales fos WITH (INDEX(IX_SalesOrderNumber))
WHERE SalesOrderNumber IN ('20070101311332','20070101711340')
```




```
CREATE INDEX IX_SalesOrderNumber ON
dbo.FactOnlineSales(
    SalesOrderNumber
)
GO
```

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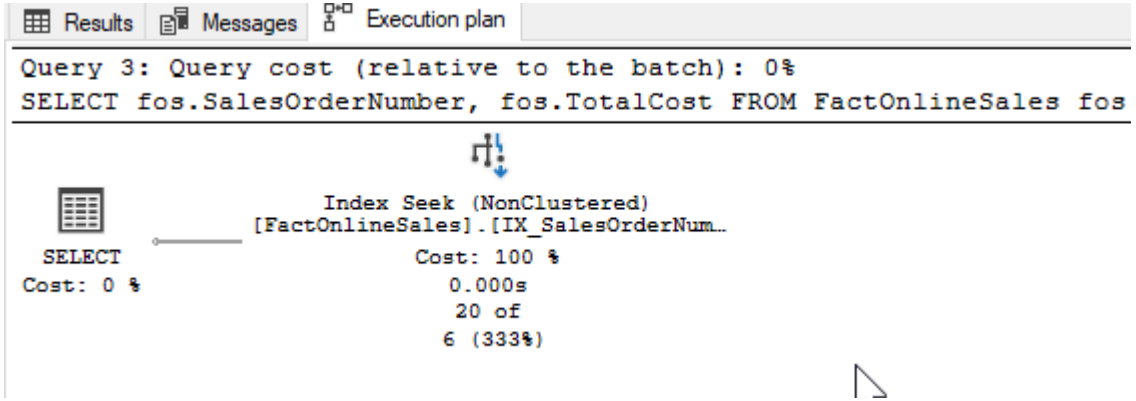
Index Seek → Pay Dirt!

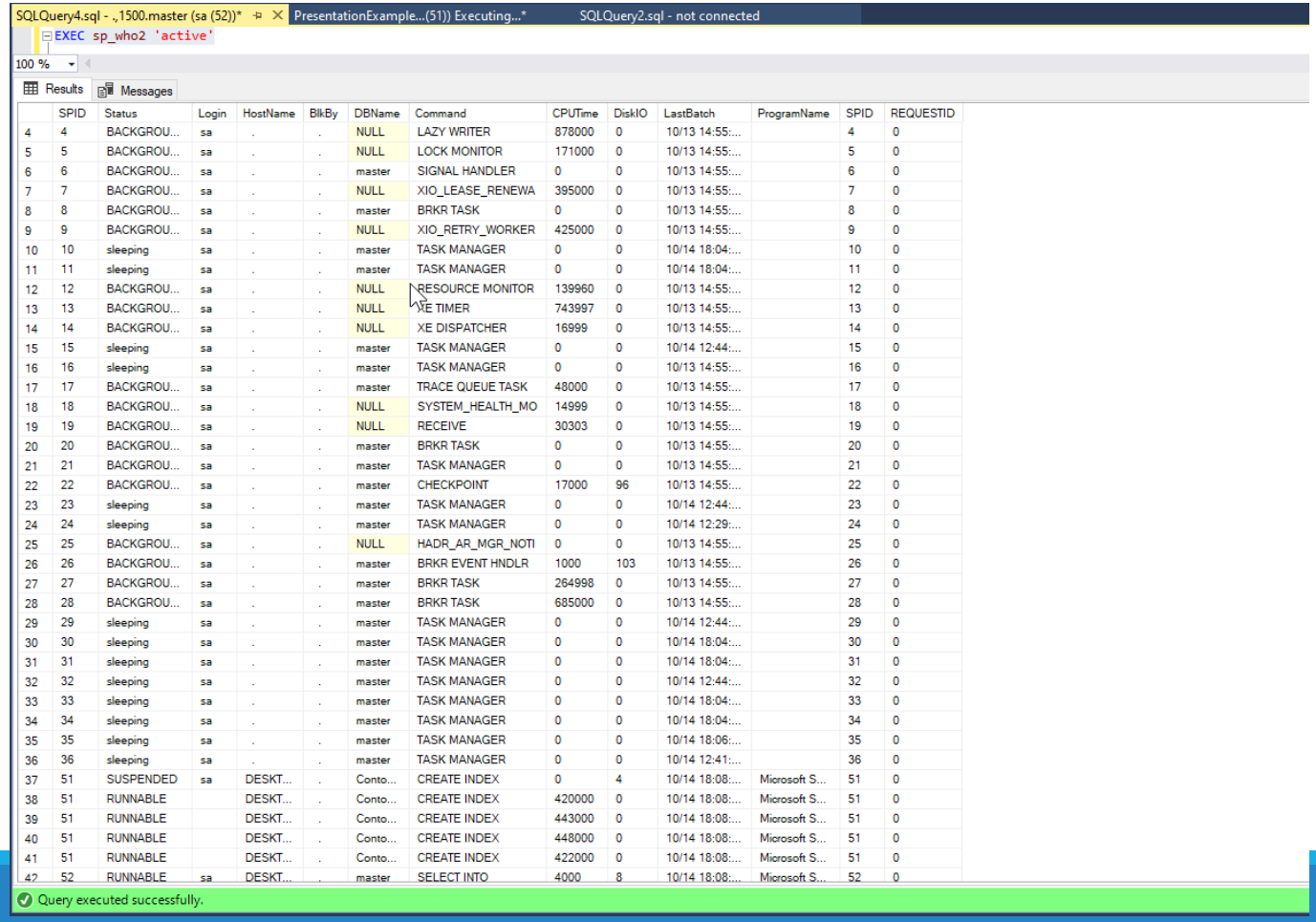
```
SELECT
    fos.SalesOrderNumber,
    fos.TotalCost
FROM FactOnlineSales fos WITH (INDEX(IX_SalesOrderNumberWithCost))
WHERE SalesOrderNumber IN ('20070101311332','20070101711340')
```




```
CREATE INDEX IX_SalesOrderNumberWithCost ON
dbo.FactOnlineSales(
    SalesOrderNumber
)
INCLUDE(
    TotalCost
)
GO
```

sp_who2 Hidden Proc

```
EXEC sp_who2 'active'
```


SQLQuery4.sql - .,1500.master (sa (52))* | PresentationExample...(51)) Executing...* | SQLQuery2.sql - not connected

```
EXEC sp_who2 'active'
```

100 %

Results | Messages

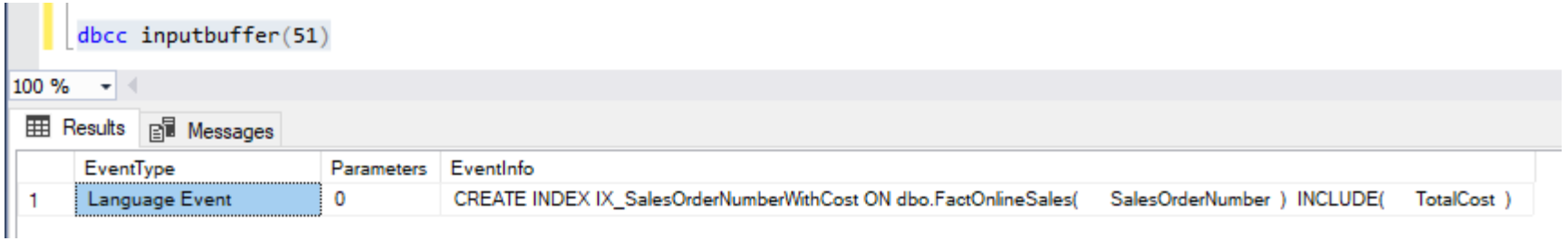
	SPID	Status	Login	HostName	BlkBy	DBName	Command	CPUTime	DiskIO	LastBatch	ProgramName	SPID	REQUESTID
4	4	BACKGROU...	sa	.	.	NULL	LAZY WRITER	878000	0	10/13 14:55:...		4	0
5	5	BACKGROU...	sa	.	.	NULL	LOCK MONITOR	171000	0	10/13 14:55:...		5	0
6	6	BACKGROU...	sa	.	.	master	SIGNAL HANDLER	0	0	10/13 14:55:...		6	0
7	7	BACKGROU...	sa	.	.	NULL	XIO_LEASE_RENEWA	395000	0	10/13 14:55:...		7	0
8	8	BACKGROU...	sa	.	.	master	BRKR TASK	0	0	10/13 14:55:...		8	0
9	9	BACKGROU...	sa	.	.	NULL	XIO_RETRY_WORKER	425000	0	10/13 14:55:...		9	0
10	10	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		10	0
11	11	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		11	0
12	12	BACKGROU...	sa	.	.	NULL	RESOURCE MONITOR	139960	0	10/13 14:55:...		12	0
13	13	BACKGROU...	sa	.	.	NULL	XE TIMER	743997	0	10/13 14:55:...		13	0
14	14	BACKGROU...	sa	.	.	NULL	XE DISPATCHER	16999	0	10/13 14:55:...		14	0
15	15	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:44:...		15	0
16	16	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/13 14:55:...		16	0
17	17	BACKGROU...	sa	.	.	master	TRACE QUEUE TASK	48000	0	10/13 14:55:...		17	0
18	18	BACKGROU...	sa	.	.	NULL	SYSTEM_HEALTH_MO	14999	0	10/13 14:55:...		18	0
19	19	BACKGROU...	sa	.	.	NULL	RECEIVE	30303	0	10/13 14:55:...		19	0
20	20	BACKGROU...	sa	.	.	master	BRKR TASK	0	0	10/13 14:55:...		20	0
21	21	BACKGROU...	sa	.	.	master	TASK MANAGER	0	0	10/13 14:55:...		21	0
22	22	BACKGROU...	sa	.	.	master	CHECKPOINT	17000	96	10/13 14:55:...		22	0
23	23	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:44:...		23	0
24	24	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:29:...		24	0
25	25	BACKGROU...	sa	.	.	NULL	HADR_AR_MGR_NOTI	0	0	10/13 14:55:...		25	0
26	26	BACKGROU...	sa	.	.	master	BRKR EVENT HNDLR	1000	103	10/13 14:55:...		26	0
27	27	BACKGROU...	sa	.	.	master	BRKR TASK	264998	0	10/13 14:55:...		27	0
28	28	BACKGROU...	sa	.	.	master	BRKR TASK	685000	0	10/13 14:55:...		28	0
29	29	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:44:...		29	0
30	30	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		30	0
31	31	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		31	0
32	32	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:44:...		32	0
33	33	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		33	0
34	34	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:04:...		34	0
35	35	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 18:06:...		35	0
36	36	sleeping	sa	.	.	master	TASK MANAGER	0	0	10/14 12:41:...		36	0
37	51	SUSPENDED	sa	DESKT...	.	Conto...	CREATE INDEX	0	4	10/14 18:08:...	Microsoft S...	51	0
38	51	RUNNABLE		DESKT...	.	Conto...	CREATE INDEX	420000	0	10/14 18:08:...	Microsoft S...	51	0
39	51	RUNNABLE		DESKT...	.	Conto...	CREATE INDEX	443000	0	10/14 18:08:...	Microsoft S...	51	0
40	51	RUNNABLE		DESKT...	.	Conto...	CREATE INDEX	448000	0	10/14 18:08:...	Microsoft S...	51	0
41	51	RUNNABLE		DESKT...	.	Conto...	CREATE INDEX	422000	0	10/14 18:08:...	Microsoft S...	51	0
42	52	RUNNABLE	sa	DESKT...	.	master	SELECT INTO	4000	8	10/14 18:08:...	Microsoft S...	52	0

Query executed successfully.

Now...DBCC INPUTBUFFER(spid)

Use the SPID from the previous slide, EXEC sp_who2 results to find information about anything that looks like it needs to be investigated…

```
dbcc inputbuffer(51)
```



Dark Theme Anyone?

SSMS 2016

C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\ManagementStudio

SSMS 17

C:\Program Files (x86)\Microsoft SQL Server\140\Tools\Binn\ManagementStudio

SSMS 18

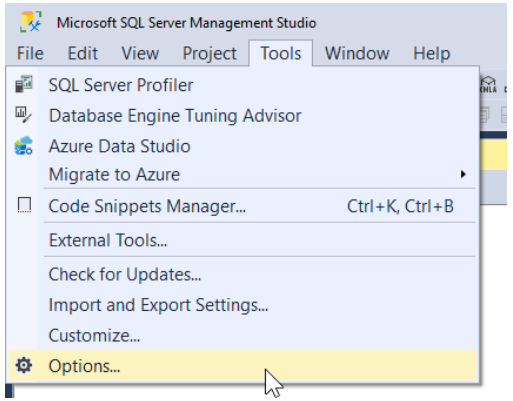
C:\Program Files (x86)\Microsoft SQL Server Management Studio 18\Common7\IDE

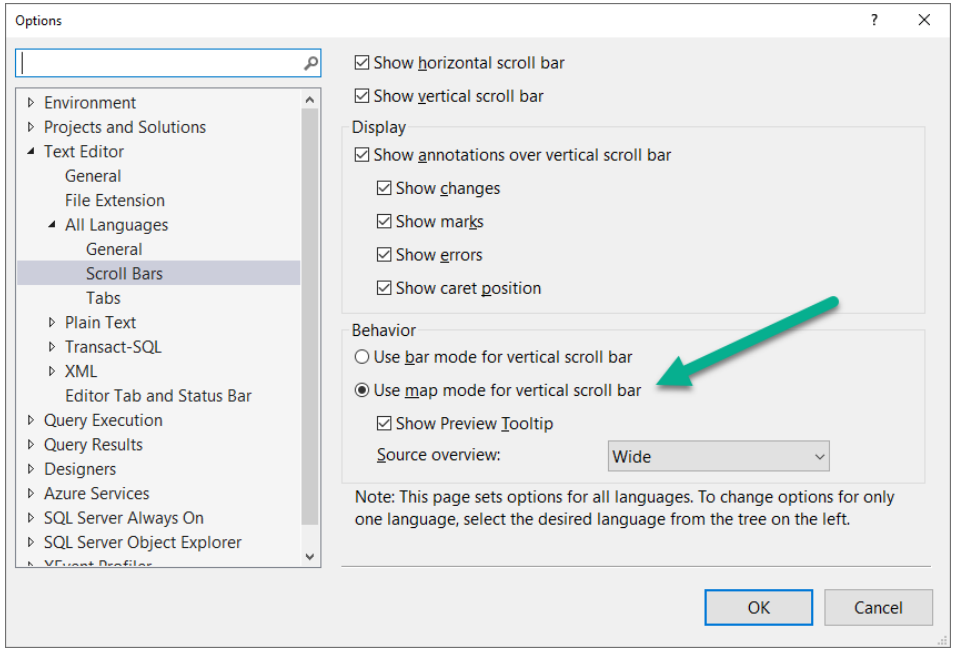
Comment out Dark Theme in ssms.pkgundef file

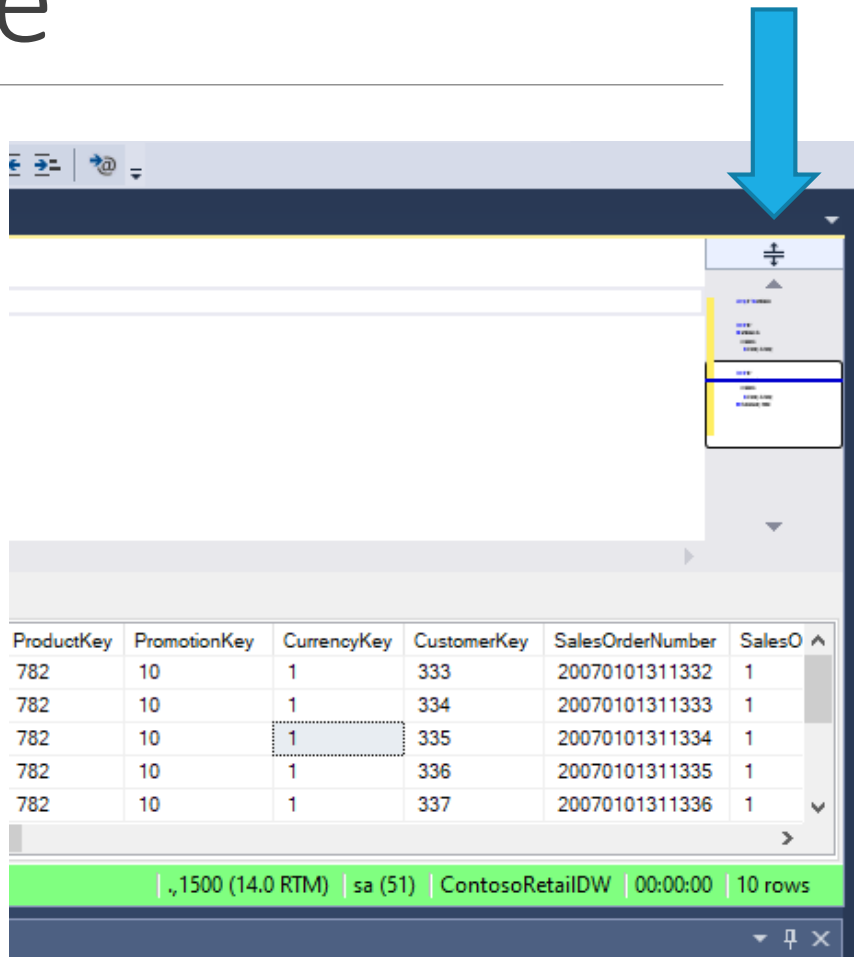
// Remove Dark theme

//[$RootKey$\Themes\{1ded0138-47ce-435e-84ef-9ec1f439b749}]

Vertical Scrollbar Map Mode







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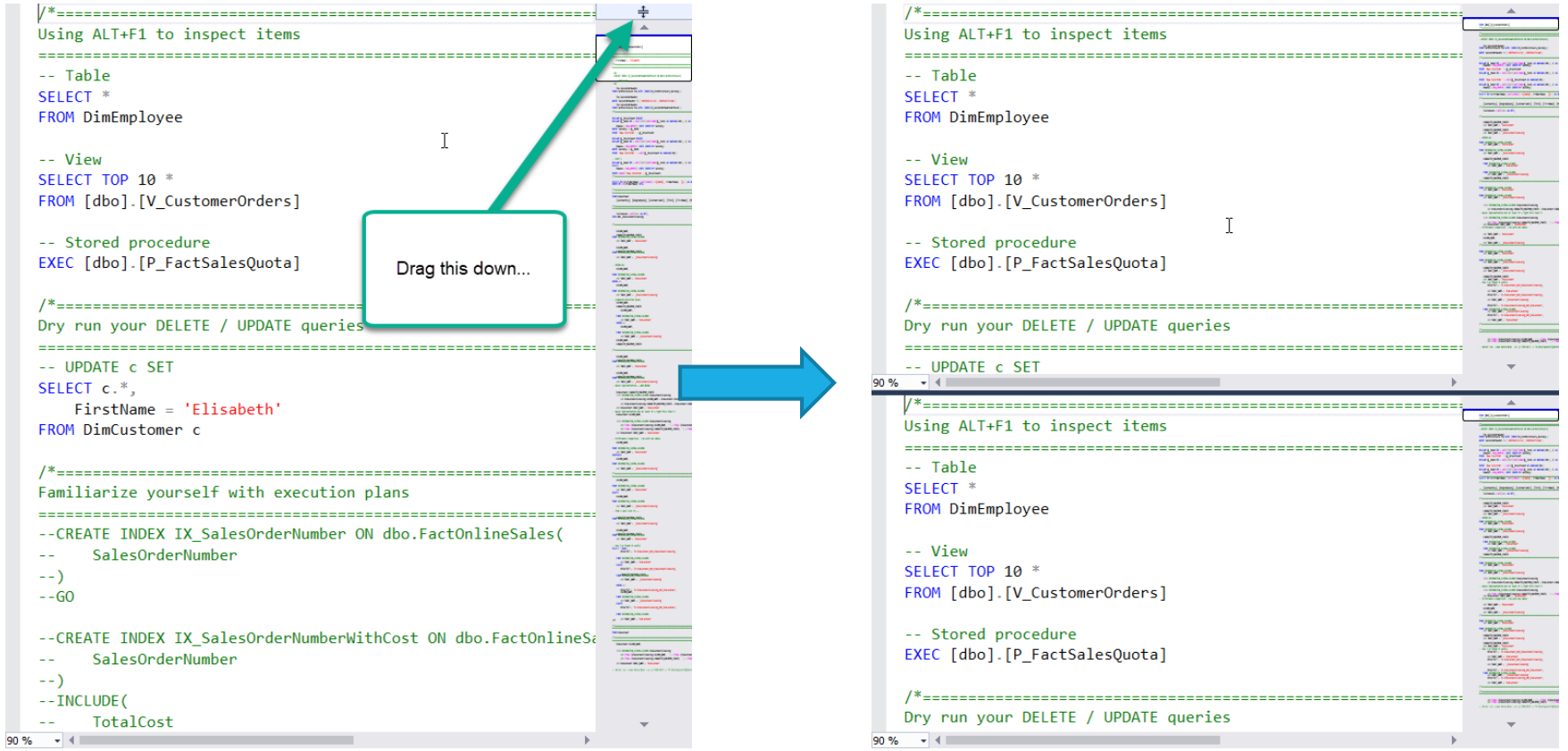
Quick Vertical Split



Using CONCAT – Simplify Your Code

```
DECLARE @__ResultCount BIGINT
DECLARE @__Seed BIGINT = DATEDIFF(s, '1970-01-01 00:00:00', SYSDATETIME())
DECLARE @__Rand INT = CAST(RIGHT(CAST(RAND(@__Seed) AS VARCHAR(200)), 2) AS INT)

SELECT
    *,
    Rownum = ROW_NUMBER() OVER (ORDER BY SalesKey)
FROM FactSales
WHERE SalesKey <= @__Rand

SET @__ResultCount = @@ROWCOUNT

PRINT CONCAT('Rows Selected: ', @__ResultCount)
```

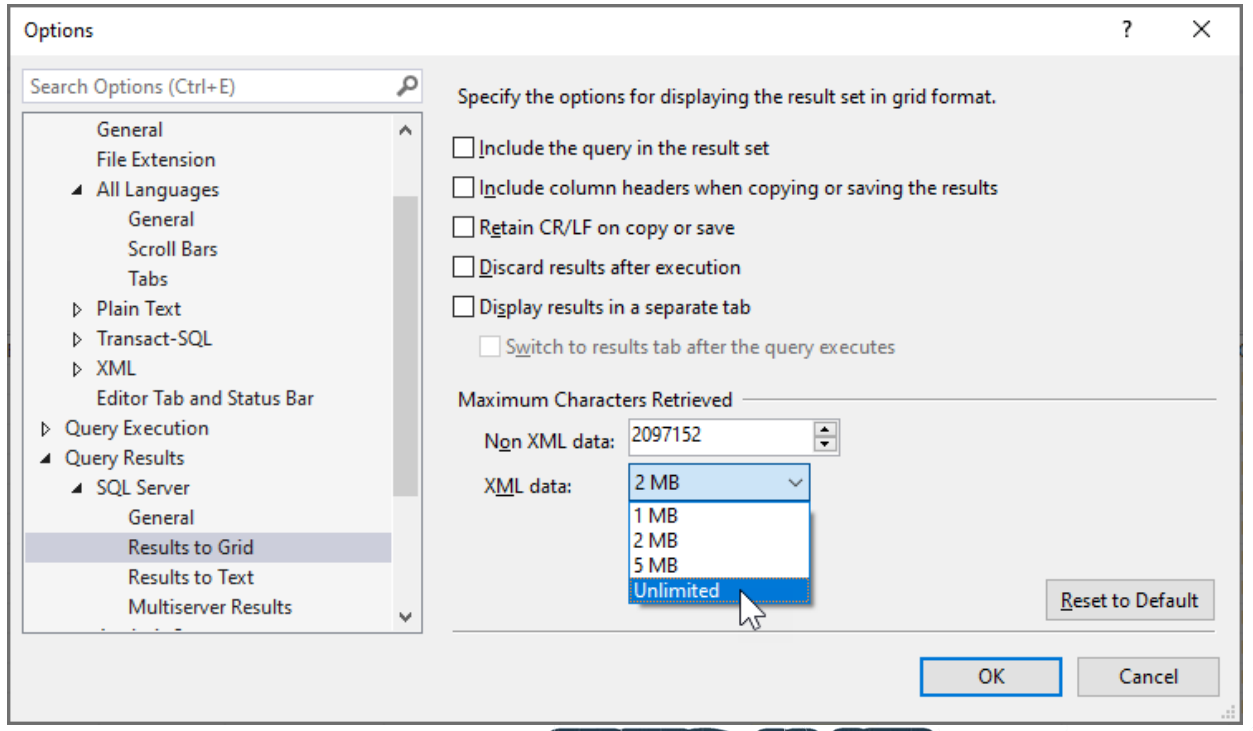
Retrieving Large Text Blocks

```
SELECT TOP 10 ProductName,
CAST(CONCAT('<![CDATA[', ProductName, ']]>') AS
XML) ProductNameAsXML
FROM DimProduct
ORDER BY LEN(ProductName) DESC
```

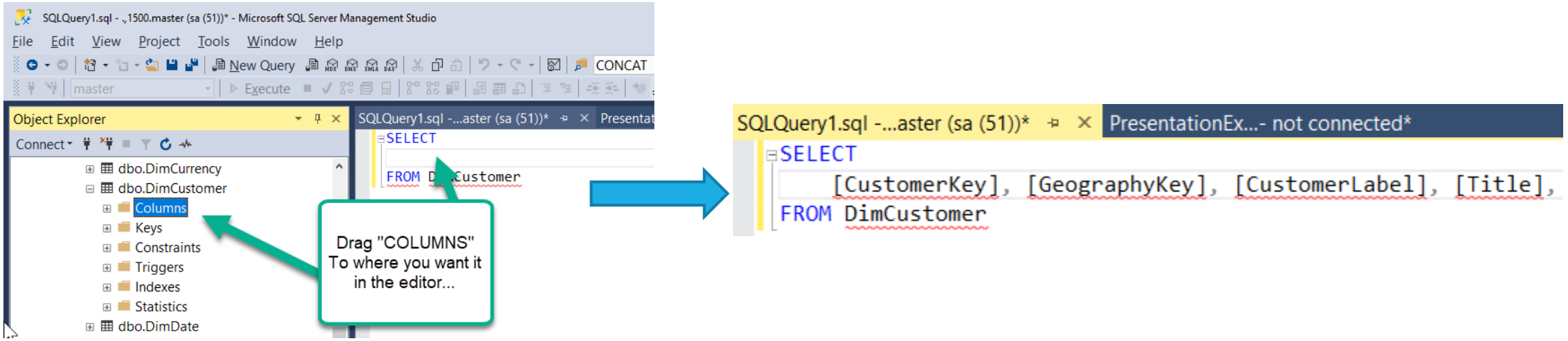
- The beauty is you can set XML output to no size limit
- You need the CDATA so that XML characters don't blow up the CAST

Maximum NON-XML data size

- 2,097,152 characters

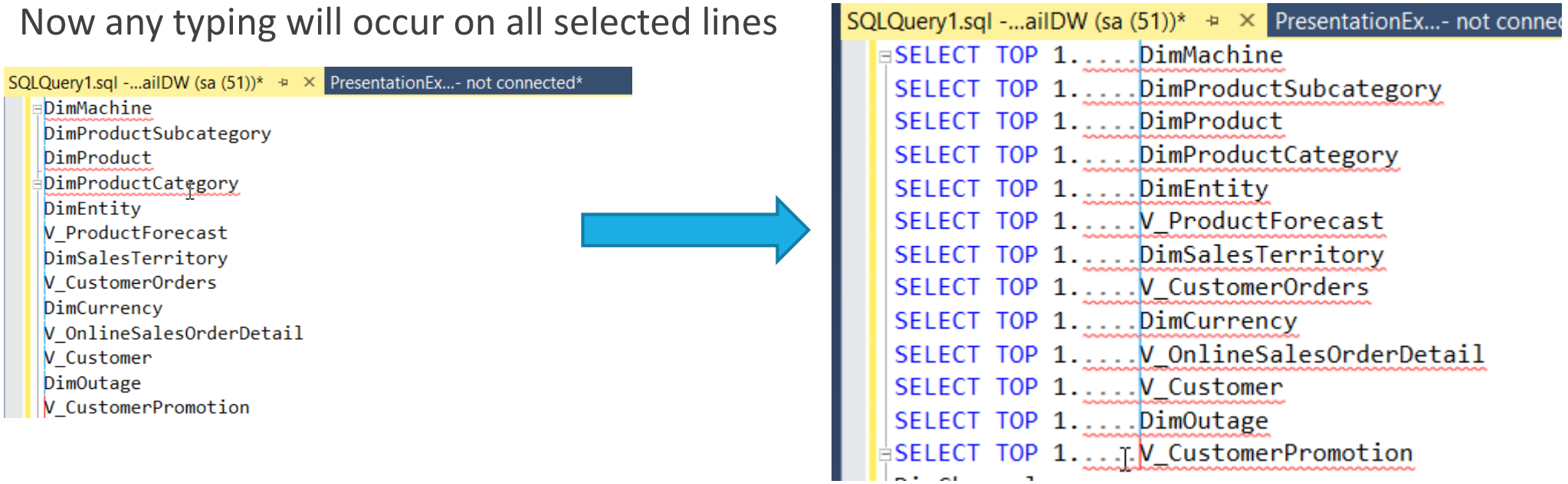


Drag n’ Drop Some Things



SSMS Editing Multiple Lines Concurrently

- SSMS works pretty well
  Hold Alt + Shift + Arrow Up/Down to put a cursor on each line
  Now any typing will occur on all selected lines



Visual Studio Code Editing Multiple Lines

- Visual Studio Code is even better…
  Hold Ctrl + Alt + Arrow Up/Down to put a cursor on each line
  Now any typing will occur on all selected lines just like in SSMS…

- So why's it better?
  - If you have multiple cursors on screen, you can do Ctrl + Arrow Right / Arrow Left, it will jump ALL the cursors to the end or beginning of the following word – SSMS will NOT do this

WHERE 1=0 Magic or Top 0

```
-- Creates an empty shell copy of the DimCustomer table
SELECT *
INTO dbo.DimCustomerCopy
FROM dbo.DimCustomer
WHERE 1=0

-- A meetup attendee also said you can do this...(it works too!)
SELECT TOP 0 *
INTO dbo.DimCustomerCopy
FROM dbo.DimCustomer
```

Set Based Operations – See SQL file

UNION

UNION ALL

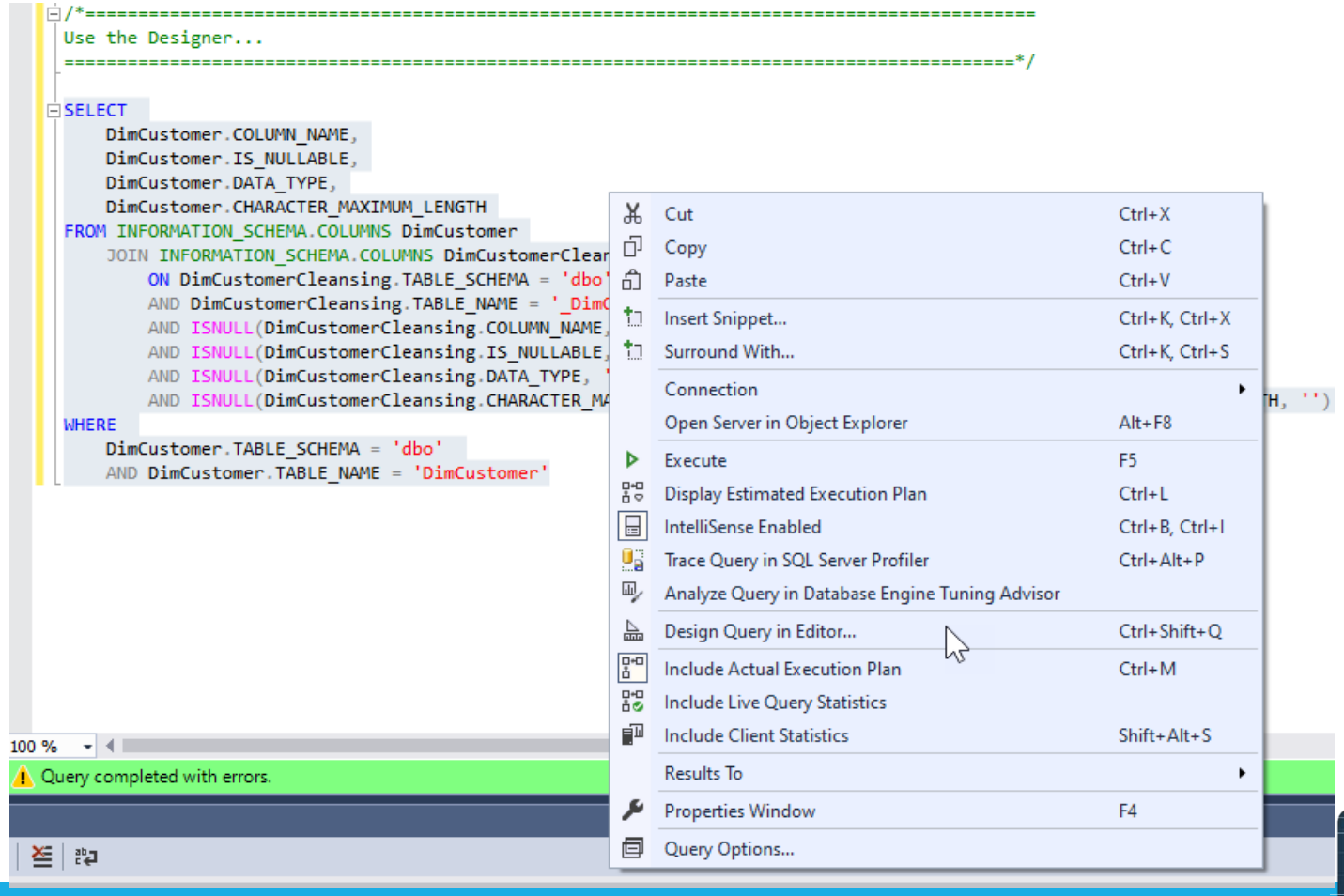
INTERSECT

EXCEPT

ORDER BY Randomness

```
SELECT TOP 100 *
FROM DimCustomer
ORDER BY NEWID()
```

Using the Query Editor – Still Useful



Poor Man's T-SQL Formatter VSCode

All about it

- http://architectshack.com/PoorMansTSqlFormatter.ashx

Visual Studio Code

- https://marketplace.visualstudio.com/items?itemName=TaoKlerks.poor-mans-t-sql-formatter-vscode

Azure Data Studio

https://aka.ms/azuredatastudio

For when you want to access SQL Server (or CosmosDB)
Cross-Platform

- Windows
- Mac
- Linux