

U3M2.LW.Developing Integration Services Solutions

Shkrabatouskaya Vera

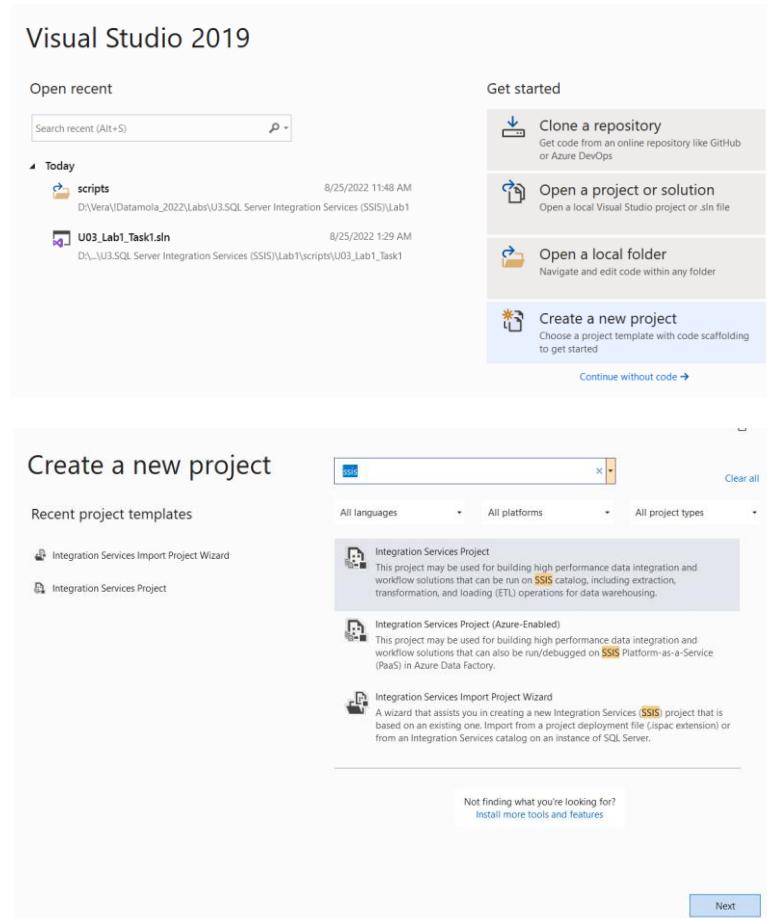
https://github.com/VeraShkrabatouskaya/DataMola_Data-Camping-2022

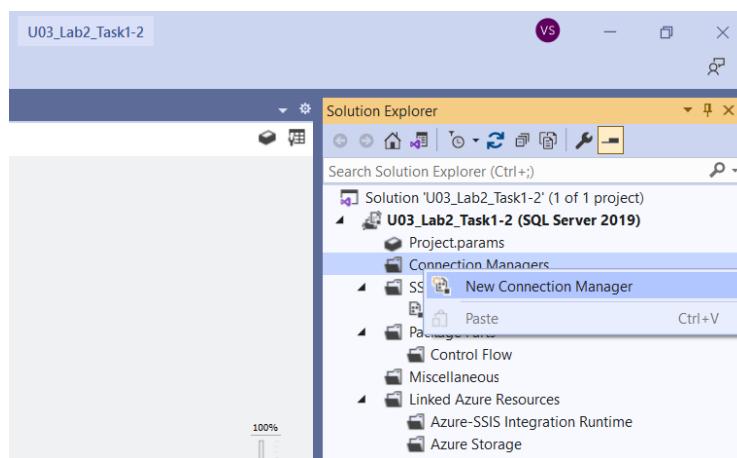
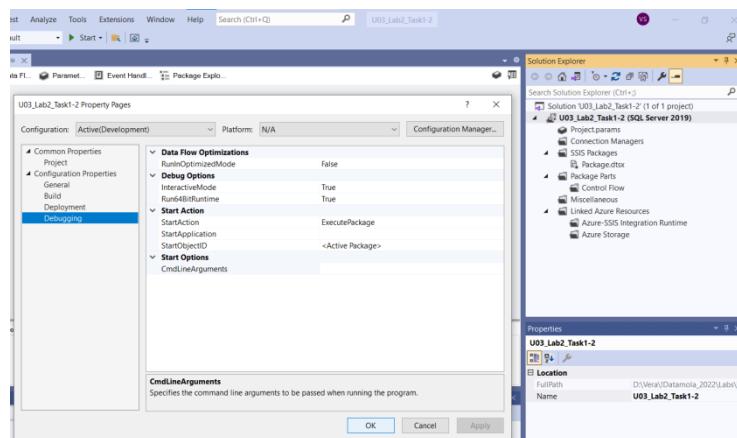
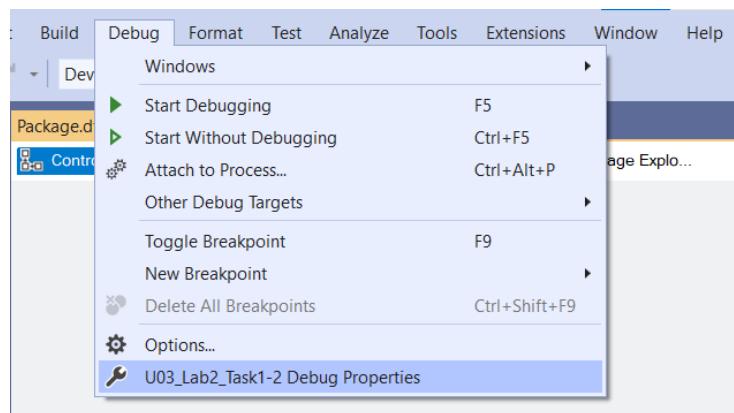
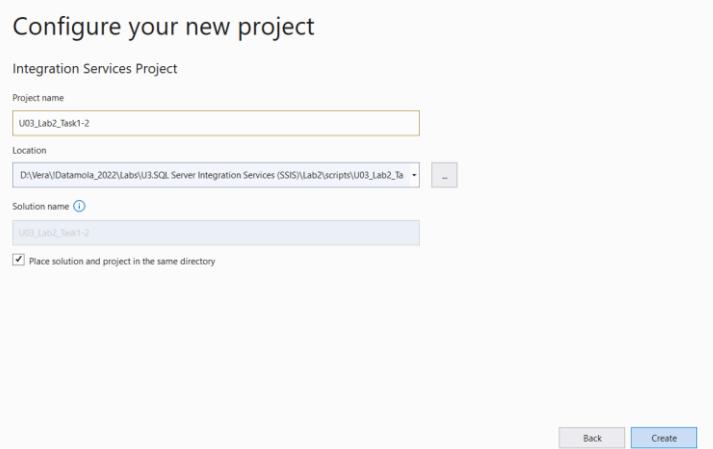
1. Developing Integration Services Solutions

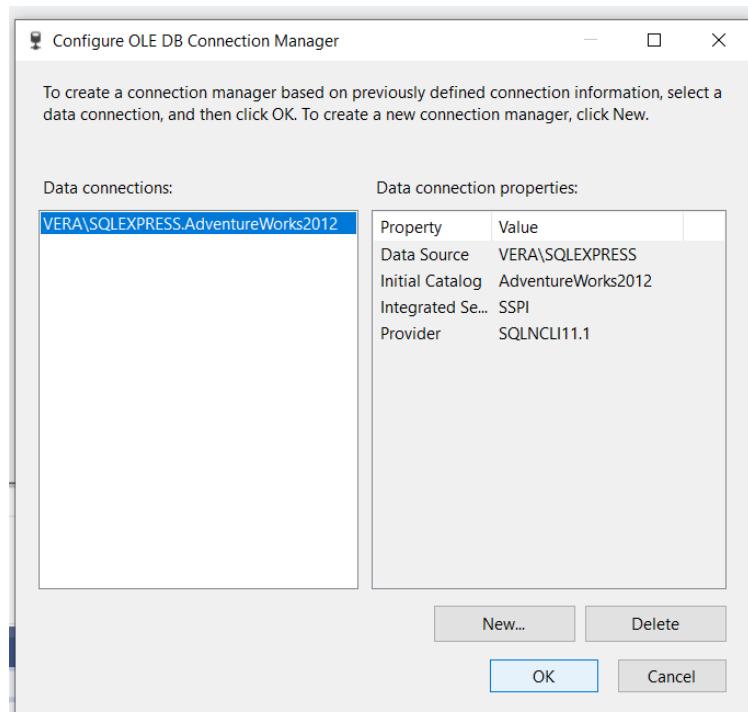
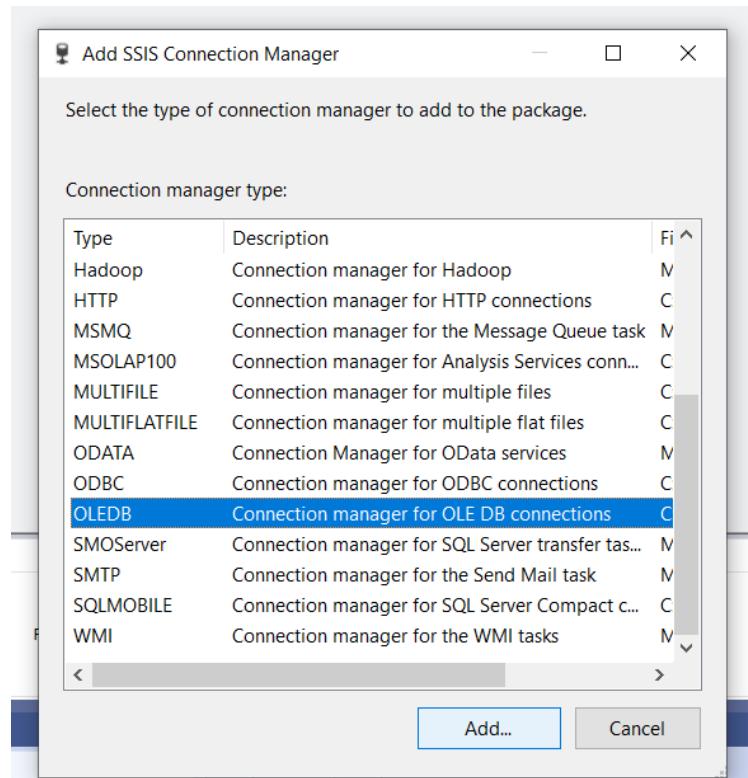
1.1. Exercise 1: Creating an Integration Services Project and implementing a package

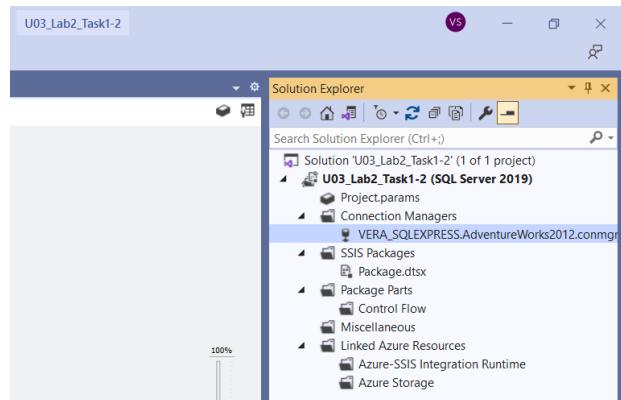
The Marketing department has requested a list of products from the Adventure Works database.

Let's create a new project in Visual Studio 2019.

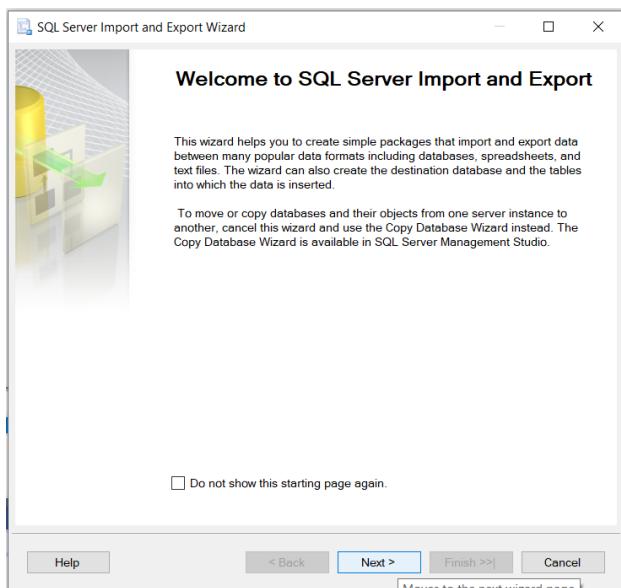
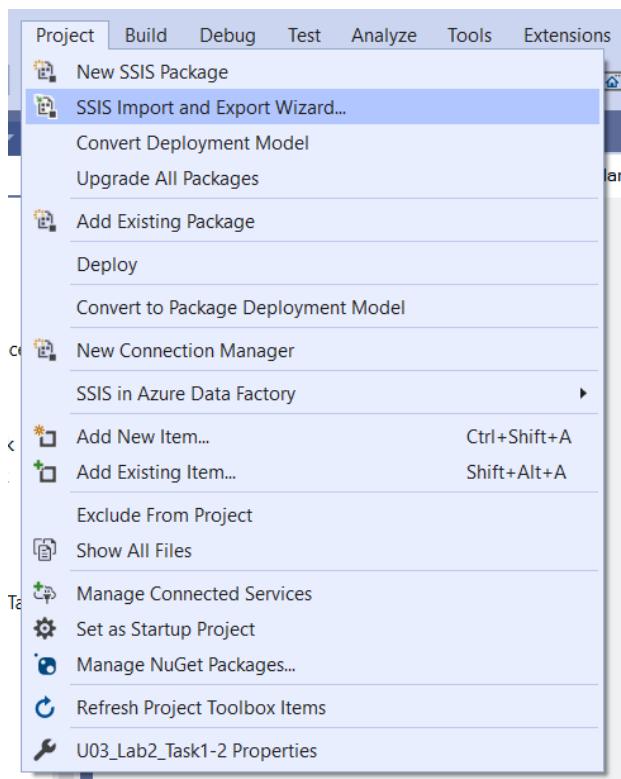


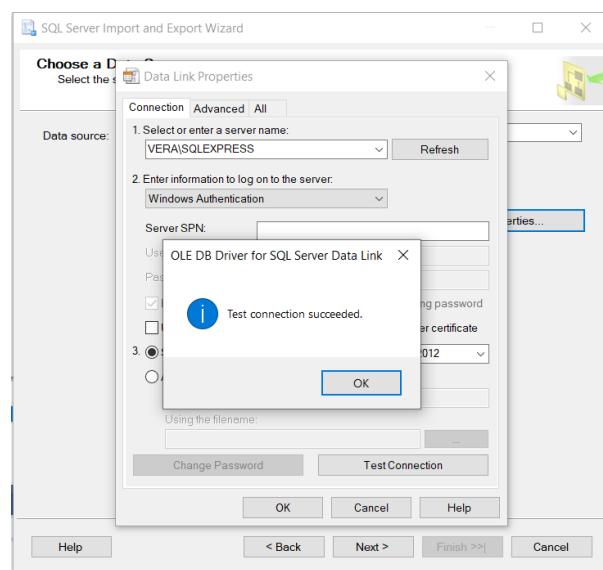
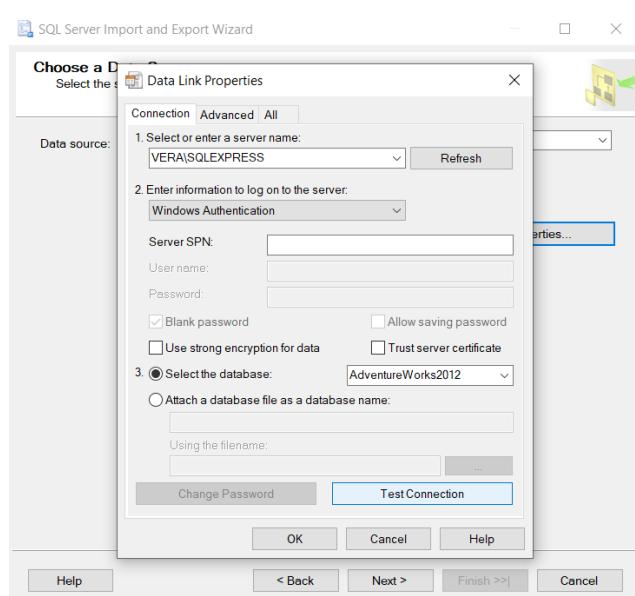
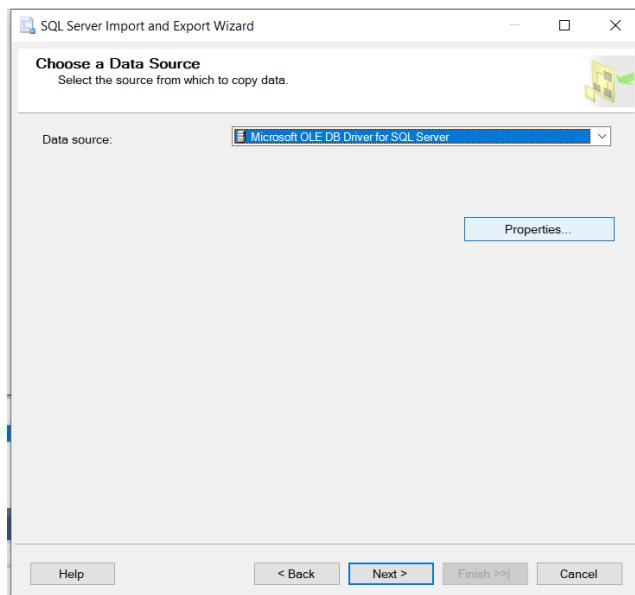


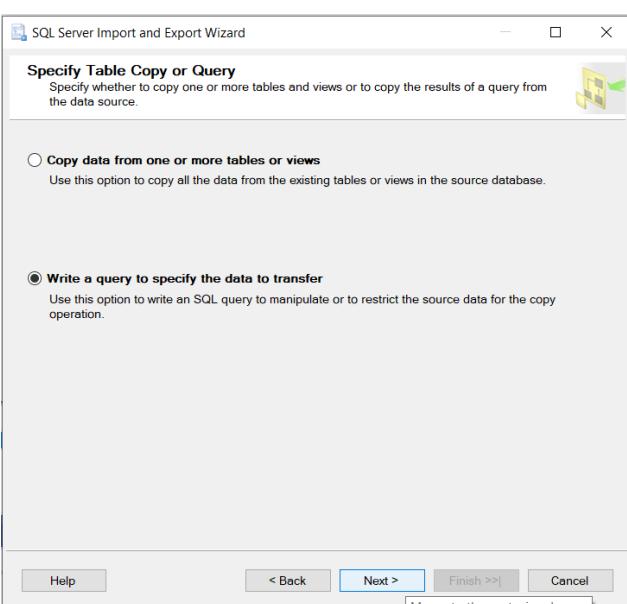
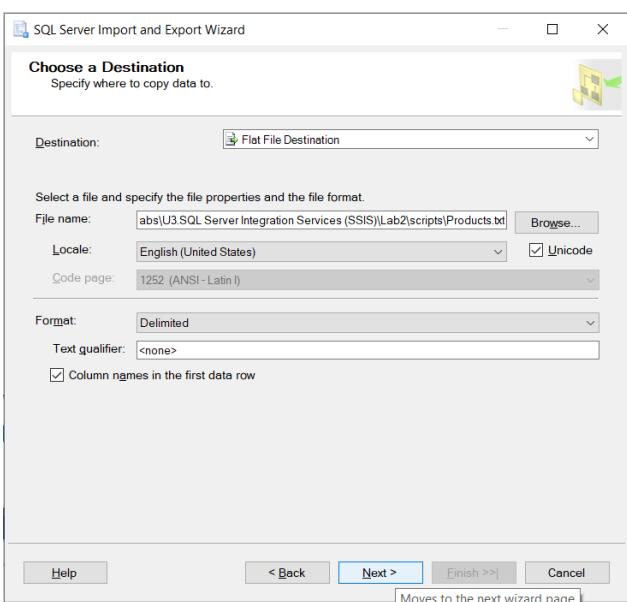
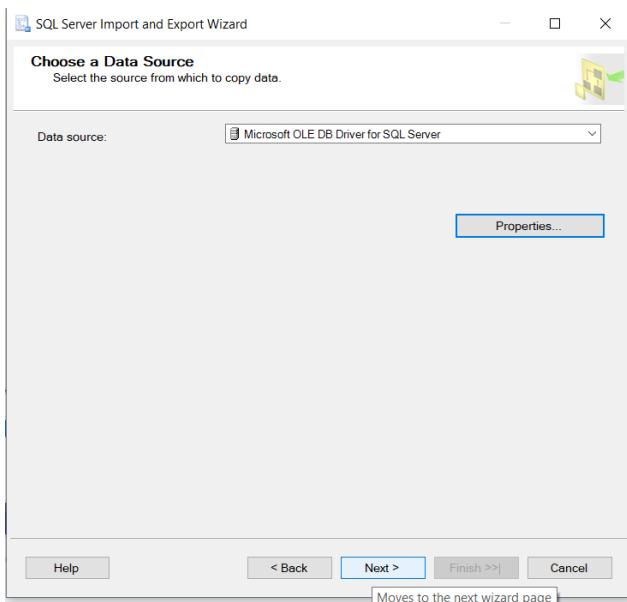


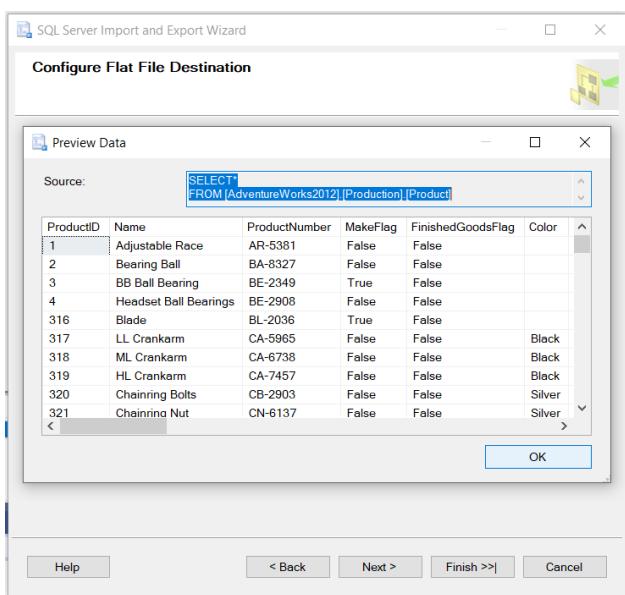
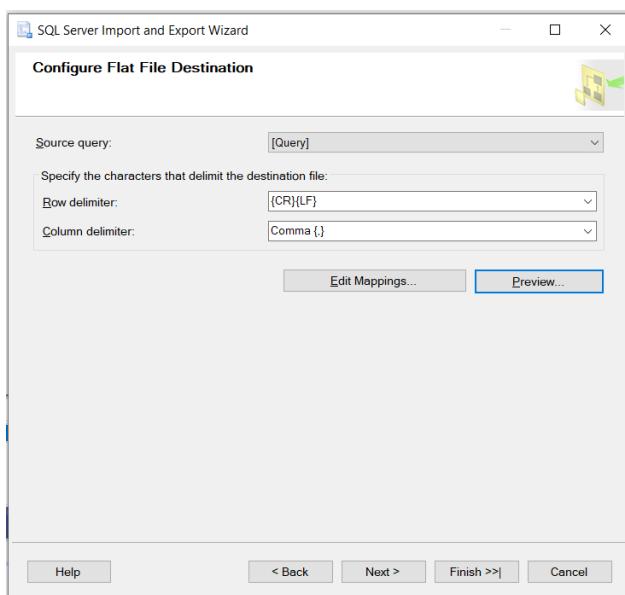
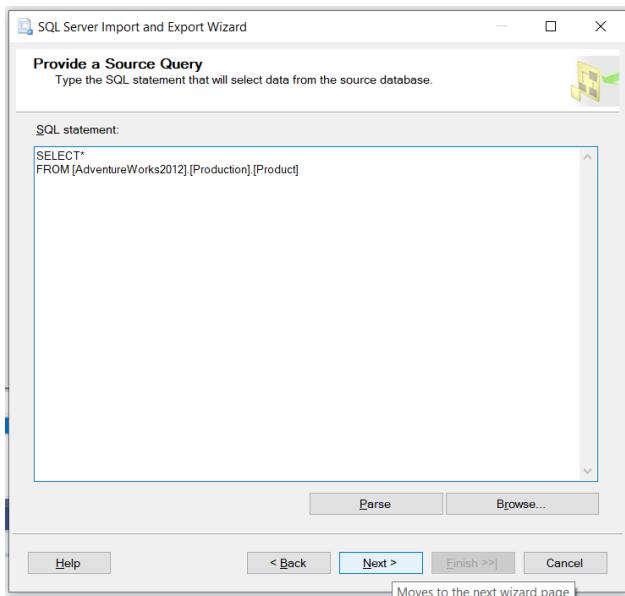


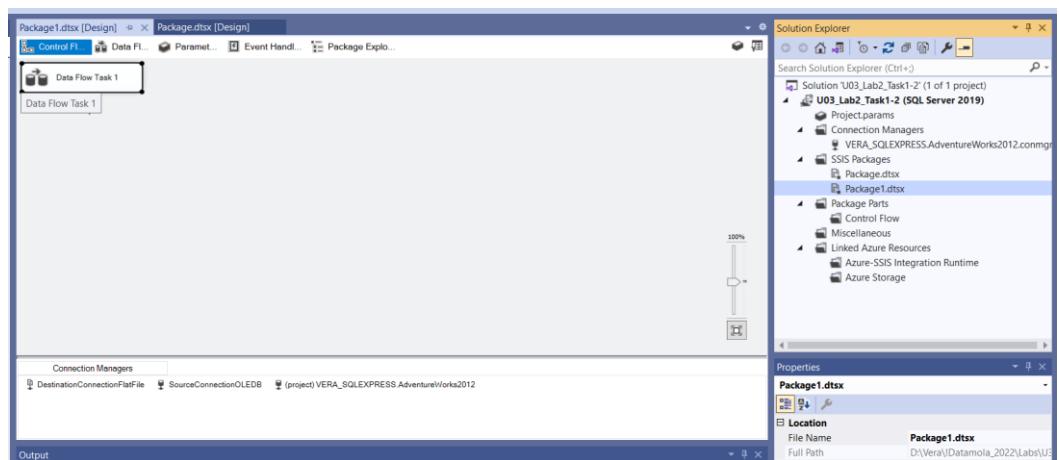
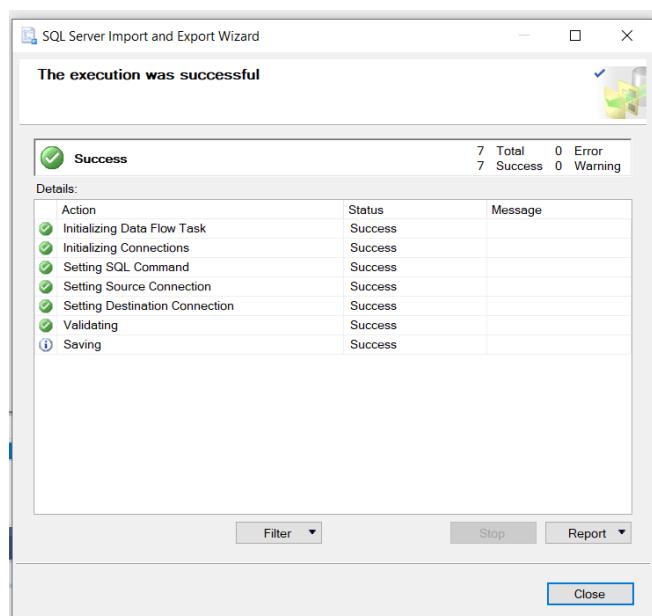
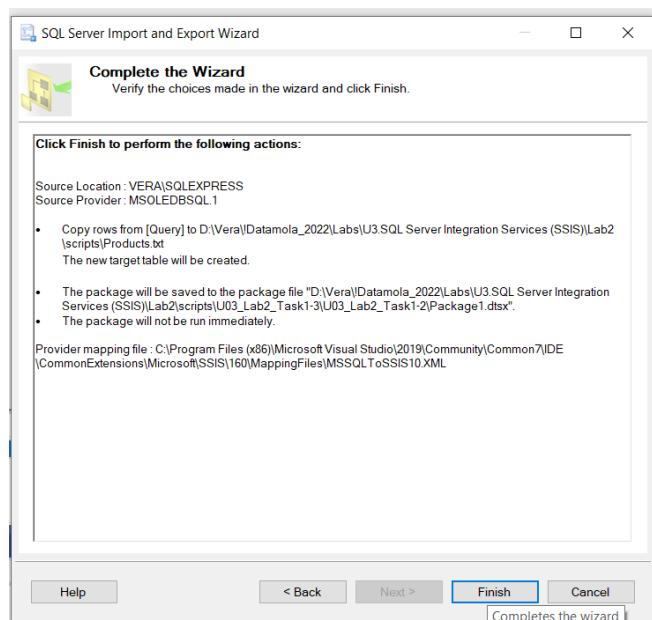
Let's create a package using the Import and Export wizard to load all the columns from the product table of the Adventure Works database (Microsoft SQL Server) into Products.txt.











Rename the package from Package1 to Products.



Let's run the Products package from Visual Studio and confirm that the export completed successfully.



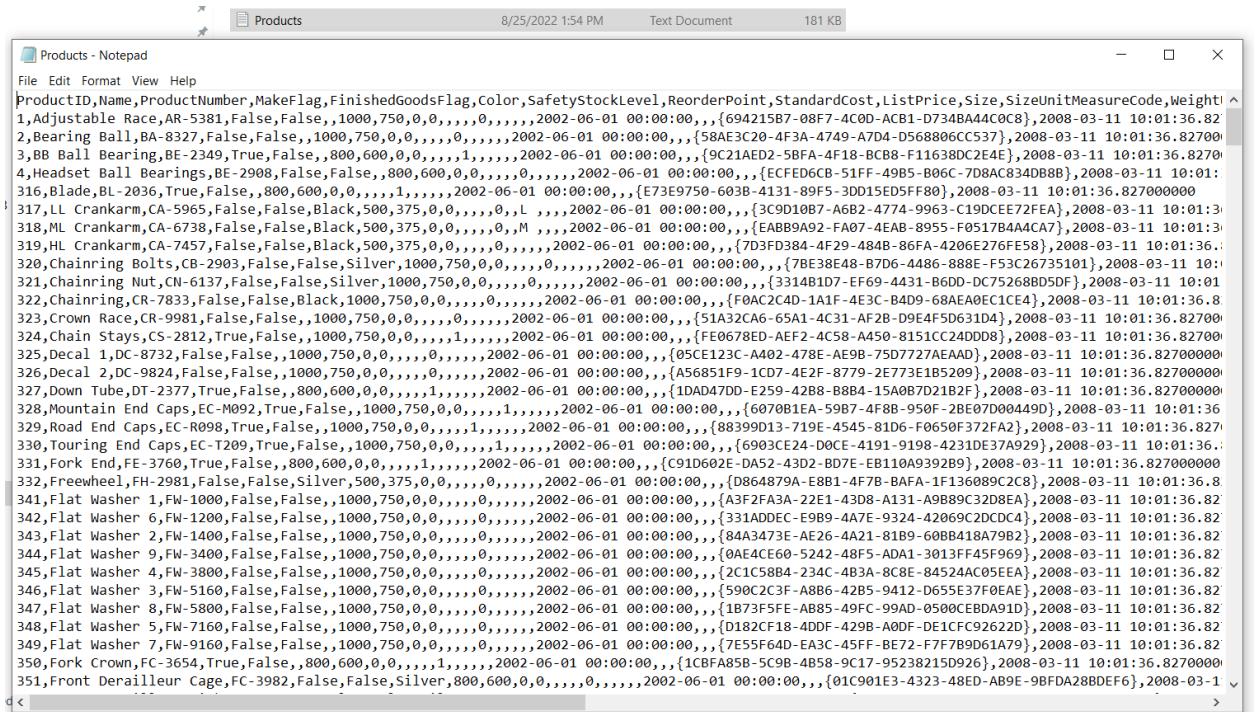
Package execute completed with successful.

If you look at the number of rows from the Adventure Works (Microsoft SQL Server) database product table, you can see that the data matches the number of rows in the Product.txt file.

ProductID	Name	ProductNumber	ManufacturingID	FinishedGoodsFlag	Color	SafetyStockLevel	ReorderPoint	StandardCost	LastPrice	Size	SpecsUnitMeasureC
480	Mountain-500 Silver	BK-M188-42	1	1	Silver	100	75	308.2179	564.99	42	CM
491	Mountain-500 Silver	BK-M188-44	1	1	Silver	100	75	308.2179	564.99	44	CM
492	Mountain-500 Silver	BK-M188-48	1	1	Silver	100	75	308.2179	564.99	48	CM
493	Mountain-500 Silver	BK-M188-52	1	1	Silver	100	75	308.2179	564.99	52	CM
494	Mountain-500 Silver	BK-M188-54	1	1	Black	100	75	294.5797	539.99	42	CM
495	Mountain-500 Black	BK-M188-42	1	1	Black	100	75	294.5797	539.99	42	CM
496	Mountain-500 Black	BK-M188-44	1	1	Black	100	75	294.5797	539.99	44	CM
497	Mountain-500 Black	BK-M188-48	1	1	Black	100	75	294.5797	539.99	48	CM
498	Mountain-500 Black	BK-M188-52	1	1	Black	100	75	294.5797	539.99	52	CM
499	L1_Bottom Bracket	BB-T421	1	1	NULL	500	375	23.9716	51.89	NULL	NULL
500	ML_Bottom Bracket	BB-T107	1	1	NULL	500	375	44.9505	101.24	NULL	NULL
501	HL_Bottom Bracket	BB-T108	1	1	NULL	500	375	53.9416	121.49	NULL	NULL
502	ML_Middle Bracket	BB-T109-44	1	1	Black	100	75	343.6496	539.99	45	CM
503	Row-750 Black_45	BK-R198-40	1	1	Black	100	75	343.6496	539.99	45	CM
504	Row-750 Black_52	BK-R198-52	1	1	Black	100	75	343.6496	539.99	52	CM

Let's see how the package worked. Did the data get transferred to the file?

Result: Output file that contains the list of products.



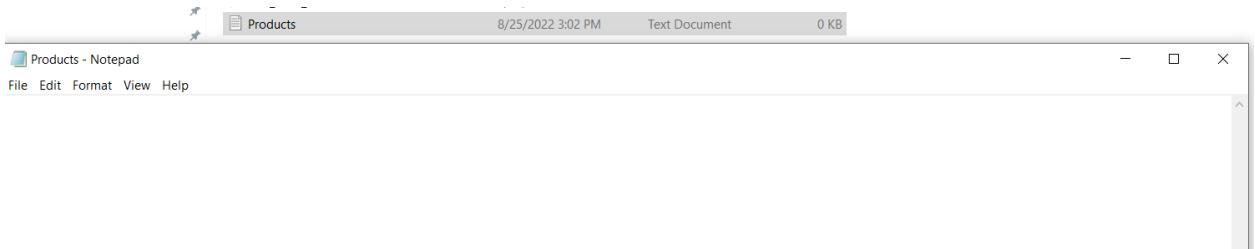
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Products - Notepad
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Let's create variables to count the number of rows.

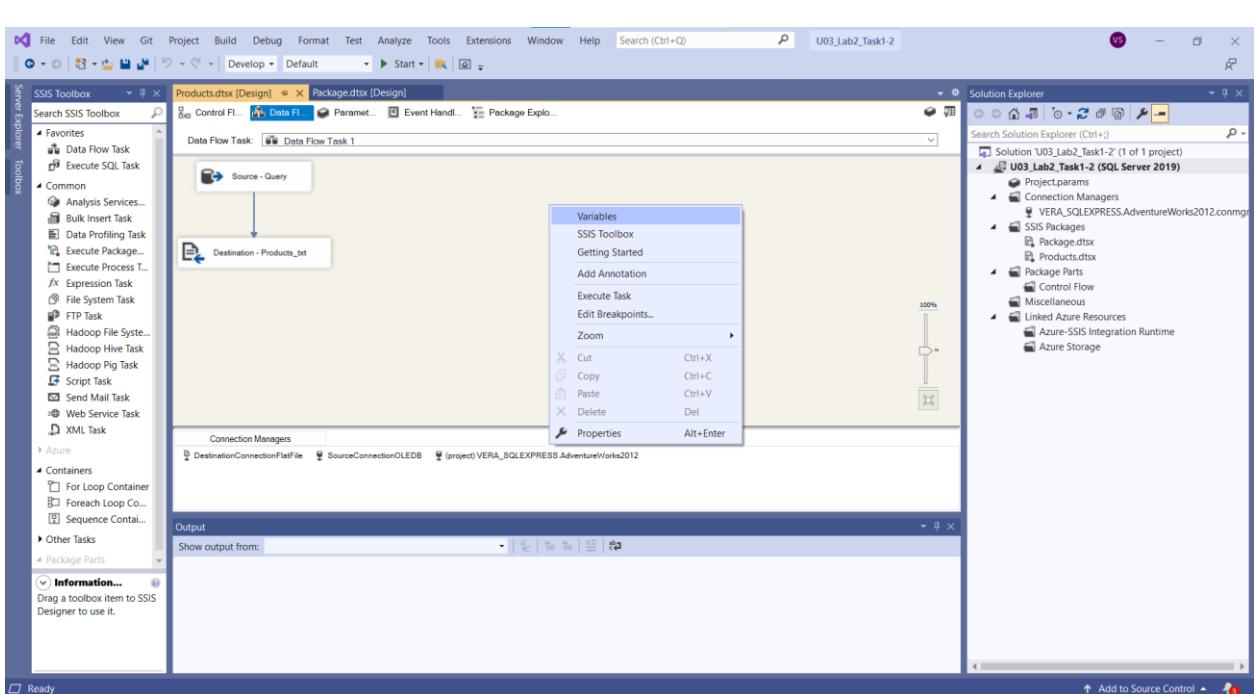
At the beginning, let's clean up the Product.txt file.

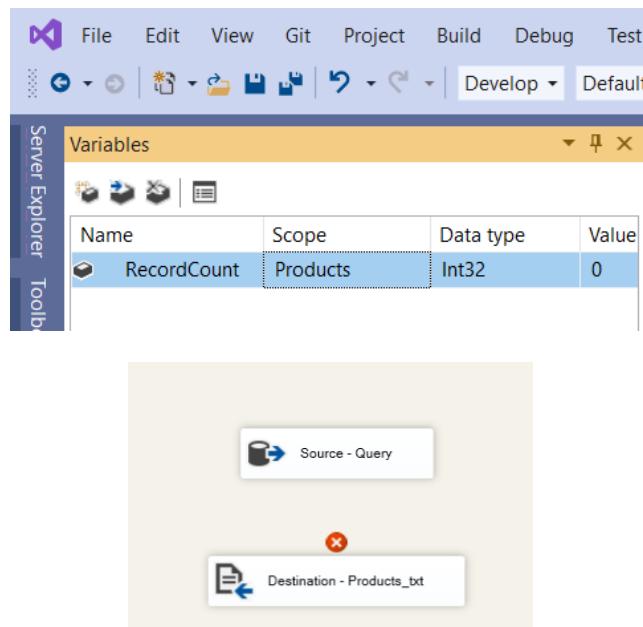


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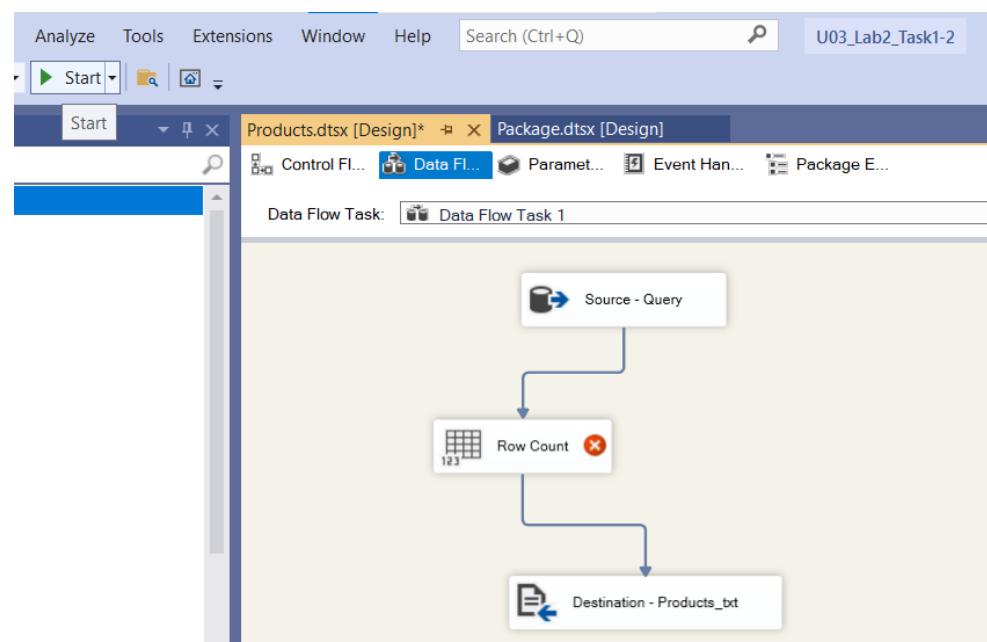
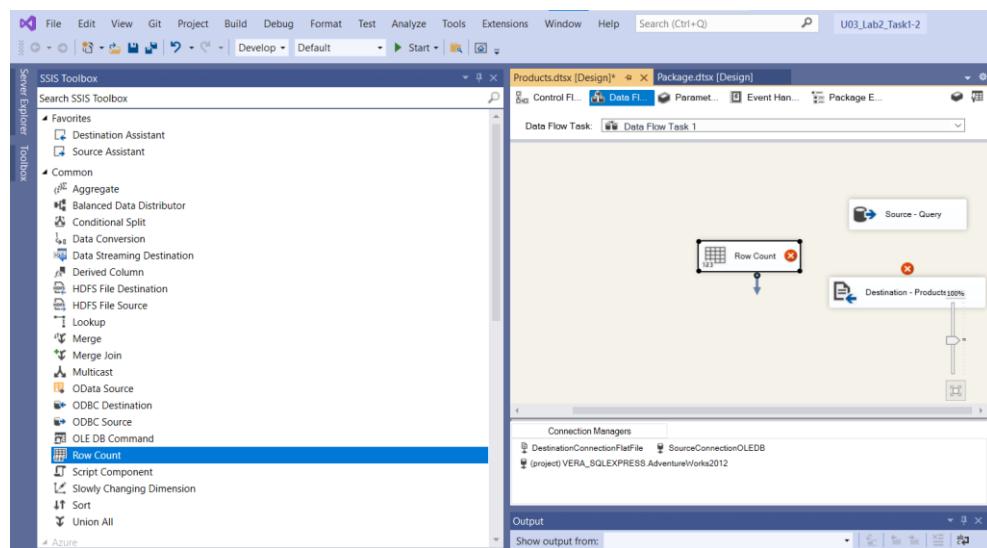
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File Edit Format View Help
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26,Flat Washer 5,FW-2100,False,False,,1000,750,0,0,,,0,,,...,2002-06-01 00:00:00,,,{590C2C3F-A8B6-42B5-9412-D655E37F0EAE},2008-03-11 10:01:36.82700000^
27,Flat Washer 6,FW-12000,False,False,,1000,750,0,0,,,0,,,...,2002-06-01 00:00:00,,,{1B73F5FE-AB85-49FC-994D-0500CEBDA91D},2008-03-11 10:01:36.82700000^
28,Flat Washer 7,FW-7160,False,False,,1000,750,0,0,,,0,,,...,2002-06-01 00:00:00,,,{D182CF18-4DDF-42B9-A00F-DE1CFC92622D},2008-03-11 10:01:36.82700000^
29,Flat Washer 8,FW-5400,False,False,,1000,750,0,0,,,0,,,...,2002-06-01 00:00:00,,,{7E55F64D-EA3C-45FF-BE72-F7FB9D61A79},2008-03-11 10:01:36.82700000^
30,Fork Crown,FC-3654,True,False,,800,600,0,0,,,1,,,...,2002-06-01 00:00:00,,,{1CBFA85B-5C9B-4B58-9C17-95238215D26},2008-03-11 10:01:36.82700000^
31,Front Derailleur Cage,FC-3982,False,False,,Silver,800,600,0,0,,,0,,,...,2002-06-01 00:00:00,,,{01C901E3-4323-4BED-A89E-9BFD428BDEFG},2008-03-11 10:01:36.82700000^

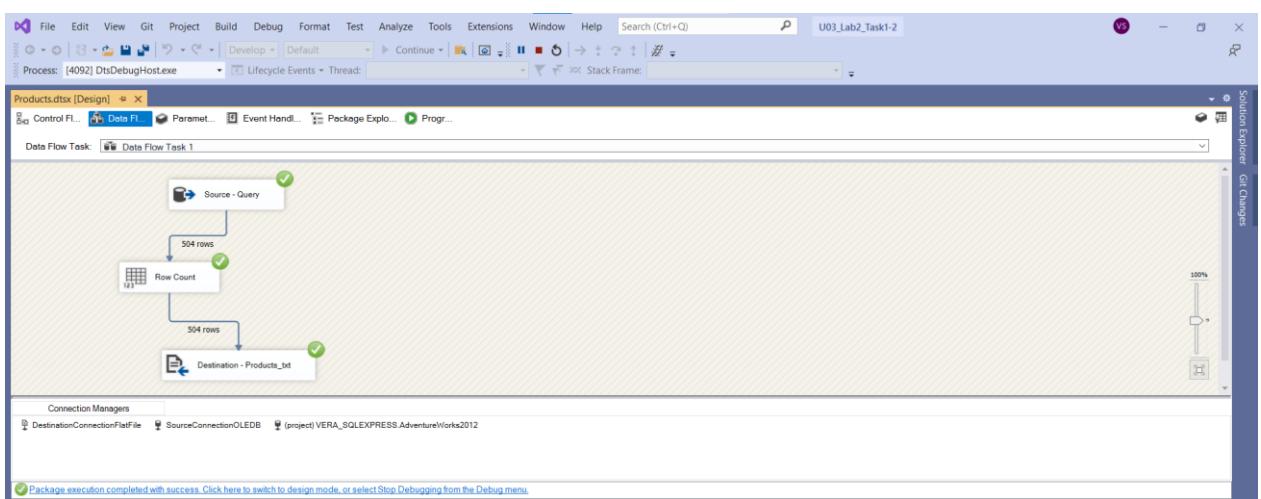
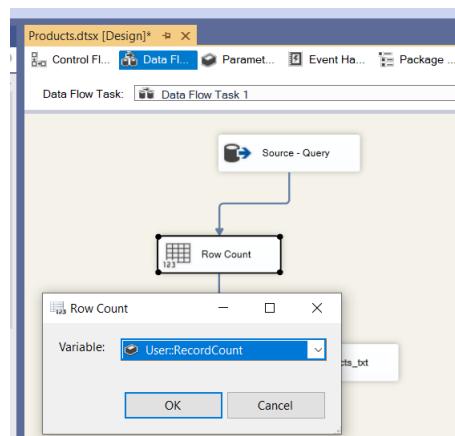
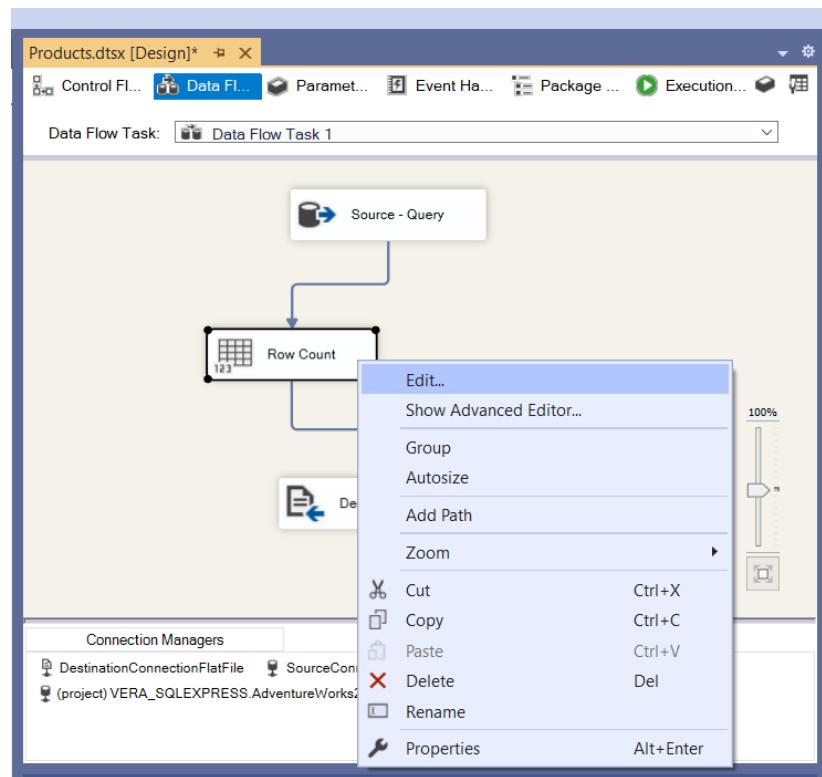
```





Let's add a Row Count field.





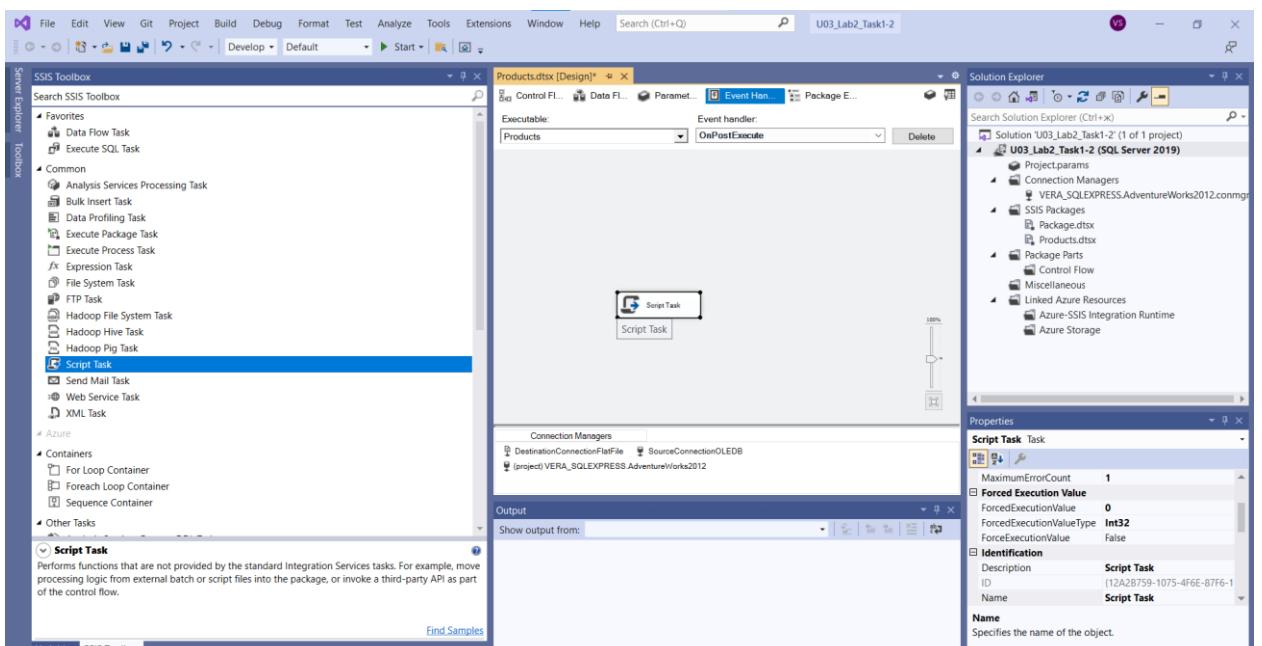
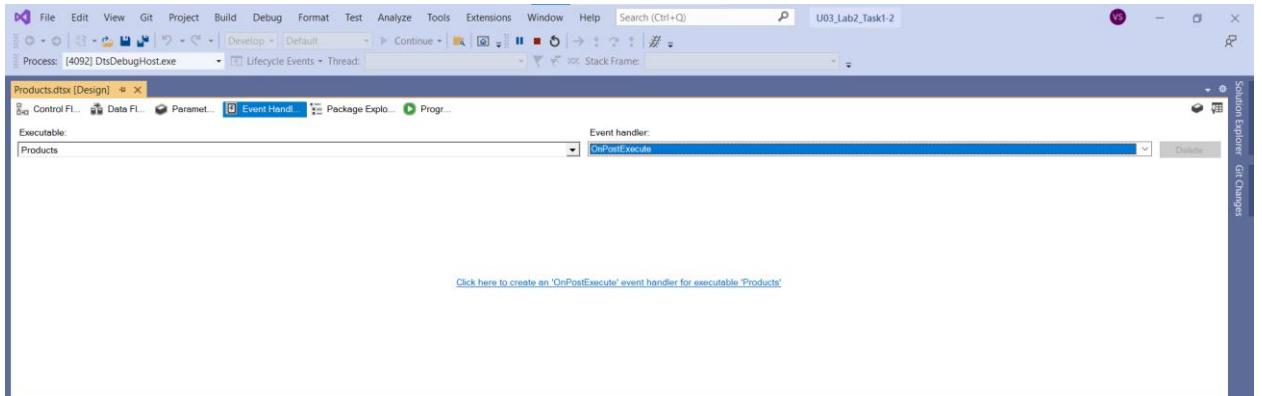
Products - Notepad

```

File Edit Format View Help
ProductID,Name,ProductNumber,MakeFlag,FinishedGoodsFlag,Color,SafetyStockLevel,ReorderPoint,StandardCost,ListPrice,Size,SizeUnitMeasureCode,Weight
1,Adjustable Race,AR-5381,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{694215B7-08F7-4C0D-ACB1-D734BA44C0C8},2008-03-11 10:01:36.82
2,Bearing Ball,BA-8327,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{58AE3C20-AF3A-4749-A7D4-D568806CC537},2008-03-11 10:01:36.82700
3,BB Ball Bearing,BE-2349,True,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{9C21AE2-5BFA-4F18-BCB8-F116380C2E4E},2008-03-11 10:01:36.8270
4,Headset Ball Bearings,CB-2908,False,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{ECFED6CB-51FF-49B5-B06C-7D8AC834DBB8},2008-03-11 10:01:36.8270
516,Blade,BL-2036,True,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{E73E9750-603B-4131-89F5-3D15ED5FF80},2008-03-11 10:01:36.827000000
317,LL Crankarm,CA-5965,False,False,Black,500,375,0,0,,,,2002-06-01 00:00:00,,,{3C9D10B7-A6B2-4774-9963-C19DCEE72FFA},2008-03-11 10:01:3
318,LL Crankarm,CA-6738,False,False,Black,500,375,0,0,,,,2002-06-01 00:00:00,,,{EABBA92-F0517B4AAC7},2008-03-11 10:01:3
319,HL Crankarm,CA-7457,False,False,Black,500,375,0,0,,,,2002-06-01 00:00:00,,,{7D3FD3B4-4F29-484B-86FA-4206E276FE58},2008-03-11 10:01:36.
320,Chainring Bolts,Nut,CN-6137,False,False,Silver,1000,750,0,0,,,,2002-06-01 00:00:00,,,{3314B1D7-EF69-4431-B6D0-DC75268BD5D},2008-03-11 10:01:3
321,Chainring Bolts,CR-7833,False,False,Black,1000,750,0,0,,,,2002-06-01 00:00:00,,,{FOAC2CAD-1A1F-4E3C-B4D9-68AE0E01CE4},2008-03-11 10:01:36.8
322,Chainring,CR-9981,False,False,Black,1000,750,0,0,,,,2002-06-01 00:00:00,,,{51A32CA6-65A1-4C31-AF28-D9E4F5D631DA},2008-03-11 10:01:36.82700
323,Crown Race,CR-9981,False,False,Black,1000,750,0,0,,,,2002-06-01 00:00:00,,,{51A32CA6-65A1-4C31-AF28-D9E4F5D631DA},2008-03-11 10:01:36.82700
324,Chain Stays,CS-2812,True,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{F0E678ED-AE2F-4C58-A450-8151C240DD8},2008-03-11 10:01:36.82700
325,Decal 1,DC-8732,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{05CE123C-A402-47BE-AE9B-75D7727AEAD},2008-03-11 10:01:36.827000000
326,Decal 2,DC-9824,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{A56851F9-1CD7-4E2F-8779-2E773E1B5209},2008-03-11 10:01:36.827000000
327,Down Tube,DT-2377,True,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{1DA047D0-E259-42B8-B884-15A0B7D21B2F},2008-03-11 10:01:36.827000000
328,Mountain End Caps,EC-M092,True,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{6070B1EA-59B7-4F8B-950F-2BE07D00449D},2008-03-11 10:01:36
329,Road End Caps,EC-R098,True,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{8839D913-719E-4545-81D6-F650F372FA2},2008-03-11 10:01:36.827
330,Touring End Caps,EC-T209,True,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{6903CE24-D0CE-4191-9198-4231DE37A929},2008-03-11 10:01:36.827000000
331,For End,FH-3760,True,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{C91DG02E-DA52-43D2-BD7E-EB110A93929},2008-03-11 10:01:36.827000000
332,Freewheel,FH-2981,False,False,Silver,500,375,0,0,,,,2002-06-01 00:00:00,,,{D864879A-E8B1-4F7B-BABA-1F136089C28},2008-03-11 10:01:36.8
341,Flat Washer 1,FW-1000,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{A3F2A3CA-22E1-4D3B-A131-A9B893C3D8EA},2008-03-11 10:01:36.82
342,Flat Washer 6,FW-1200,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{331ADD8C-E9B9-4A7E-9324-42069C2DCC4},2008-03-11 10:01:36.82
343,Flat Washer 2,FW-1400,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{A043473E-AE26-4A21-81B9-60B8A18A7B2},2008-03-11 10:01:36.82
344,Flat Washer 9,FW-3400,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{0AE4CE60-5242-48F5-ADA1-3013FF45F969},2008-03-11 10:01:36.82
345,Flat Washer 4,FW-3800,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{2C1C5884-234C-4B3A-8C8E-84524AC05EEA},2008-03-11 10:01:36.82
346,Flat Washer 3,FW-5160,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{590C2CF-A8B6-42B5-9412-D655E37F0EAE},2008-03-11 10:01:36.82
347,Flat Washer 8,FW-5800,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{1B73F5FE-AE85-49FC-99AD-0500CEBDA91D},2008-03-11 10:01:36.82
348,Flat Washer 5,FW-7160,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{1B2C2F18-4DFF-429B-A0DF-DE1CCF9262D},2008-03-11 10:01:36.82
349,Flat Washer 7,FW-9160,False,False,,1000,750,0,0,,,,2002-06-01 00:00:00,,,{T5E5F64D-EA3C-45FF-BE72-F7789D61A79},2008-03-11 10:01:36.82
350,Fork Crown,FC-3654,True,False,,800,600,0,0,,,,2002-06-01 00:00:00,,,{1CBFA85B-5C9B-4B58-9C17-95238215D926},2008-03-11 10:01:36.827000000
351,Front Derailleur Cage,FG-3982,False,False,Silver,800,600,0,0,,,,2002-06-01 00:00:00,,,{01C901E3-4323-4BED-AB9E-9BFDAA28BDEF6},2008-03-1

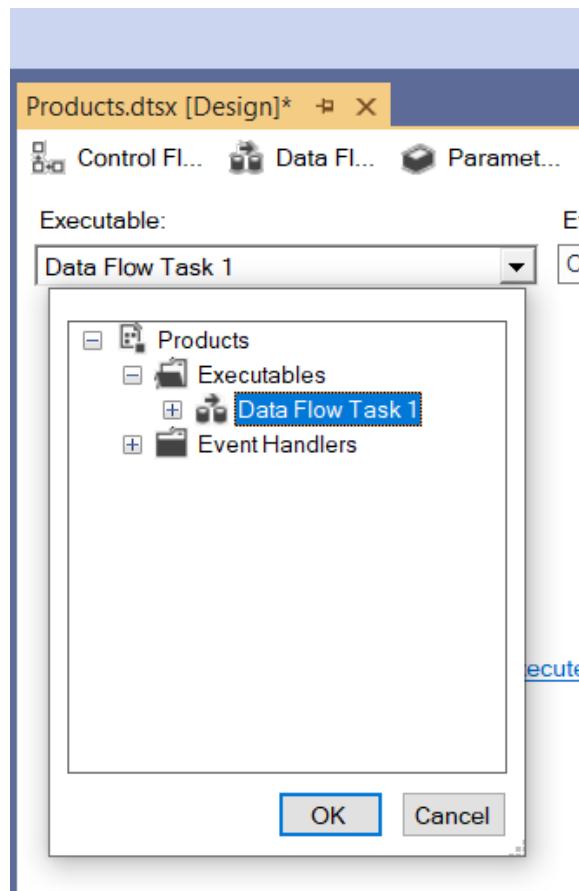
```

Let's create a script to send a message about the number of rows to the mail.



Variables

Name	Scope	Data type	Value	Expression
From	Products	String	v.shkrabatovskaya...	...
RecordCount	Products	Int32	0	...
Subject	Products	String	Row count:	...
To	Products	String	v.shkrabatovskaya...	...



Select Variables

Select one or more variables.

	Name	Type
<input type="checkbox"/>	System::OfflineMode	Boolean
<input type="checkbox"/>	System::PackageID	String
<input type="checkbox"/>	System::PackageName	String
<input type="checkbox"/>	System::ProductVersion	String
<input checked="" type="checkbox"/>	User::RecordCount	Int32
<input type="checkbox"/>	System::ServerExecutionID	Int64
<input type="checkbox"/>	System::StartTime	DateTime
<input checked="" type="checkbox"/>	User::Subject	String
<input checked="" type="checkbox"/>	User::To	String
<input type="checkbox"/>	System::UserName	String
<input type="checkbox"/>	System::VersionBuild	Int32
<input type="checkbox"/>	System::VersionComments	String

OK Cancel

ReadOnlyVariables

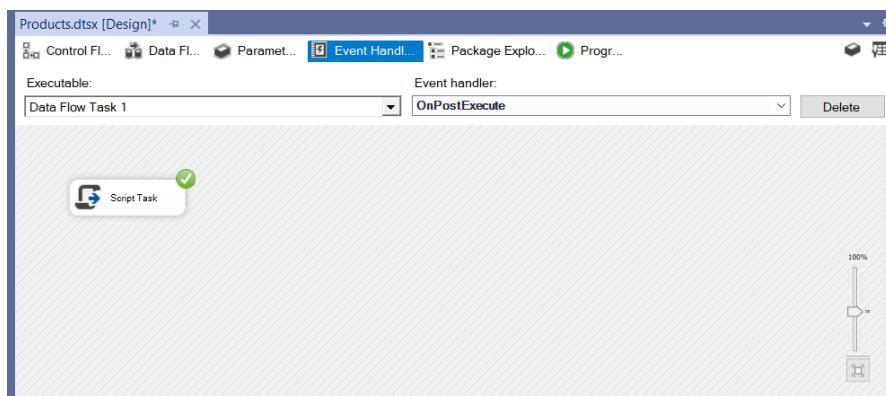
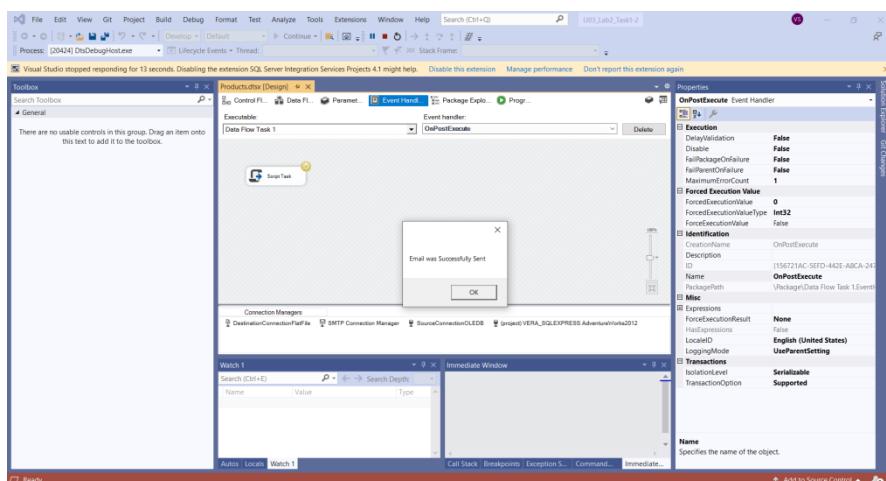
ScriptMain.cs*

```

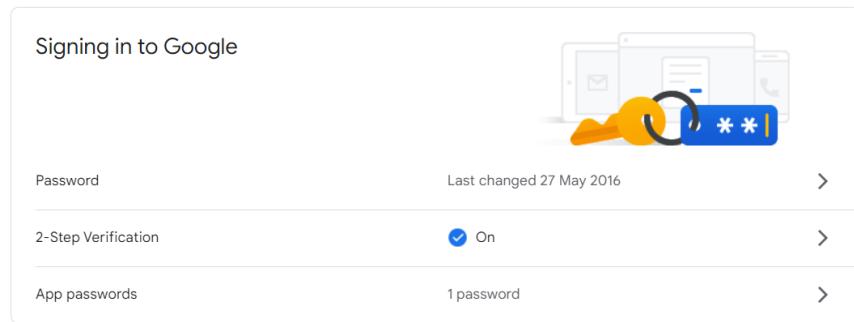
1  Help: Introduction to the script task
8
9
10 #region Namespaces
11 using System;
12 using System.Data;
13 using Microsoft.SqlServer.Dts.Runtime;
14 using System.Windows.Forms;
15 using System.Net;
16 using System.Net.Mail;
17 #endregion
18

91    /// To open Help, press F1.
92    /// </summary>
93    public void Main()
94    {
95        // C# code
96        String SendMailFrom = Dts.Variables["From"].Value.ToString();
97        String SendMailTo = Dts.Variables["To"].Value.ToString();
98        String SendMailSubject = Dts.Variables["Subject"].Value.ToString();
99        String SendMailBody = Dts.Variables["RecordCount"].Value.ToString();
100
101    try
102    {
103        MailMessage email = new MailMessage();
104        SmtpClient SmtpServer = new SmtpClient("smtp.gmail.com");
105        // START
106        email.From = new MailAddress(SendMailFrom);
107        email.To.Add(SendMailTo);
108        email.Subject = SendMailSubject;
109        email.Body = SendMailBody;

```



Let's form the password for the apps in Google mail.

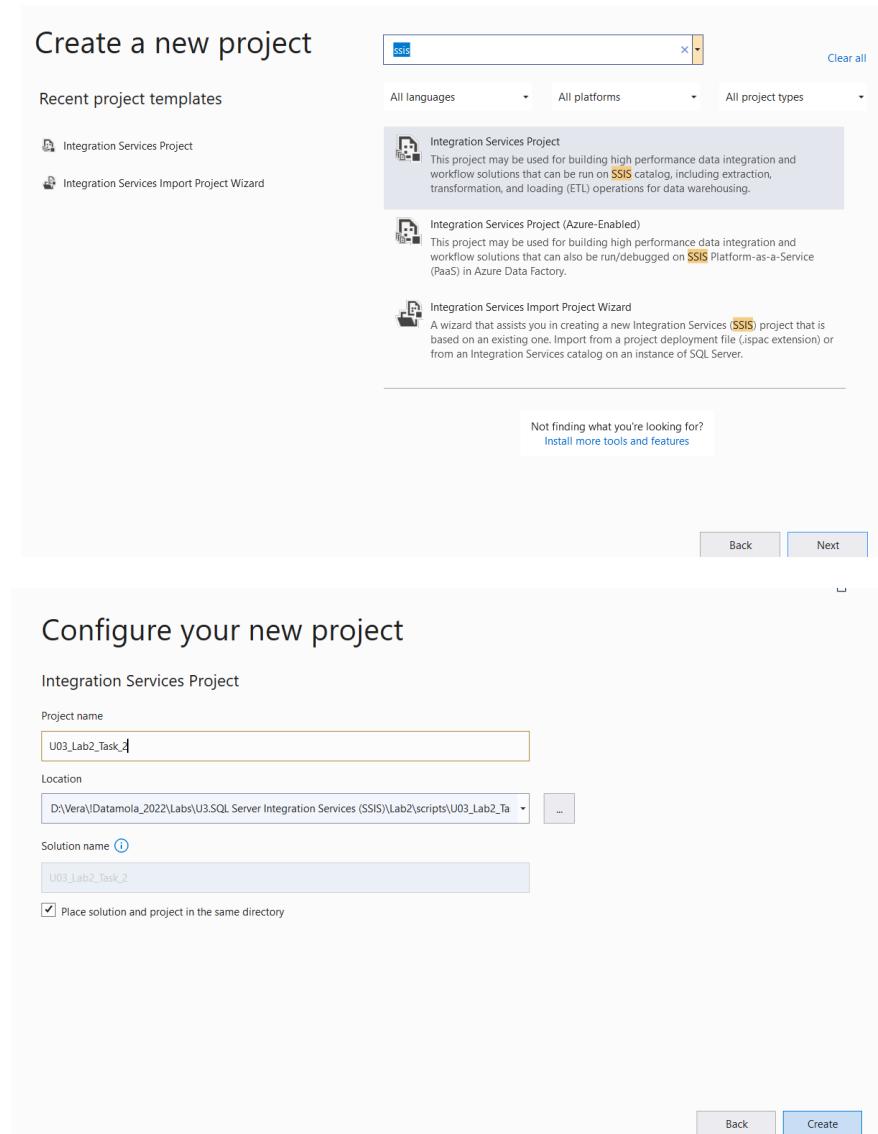


All successfully completed.



1.2. Exercise 2: Creating a package to keep list of files from a directory

Let's create a new project in Visual Studio 2019.



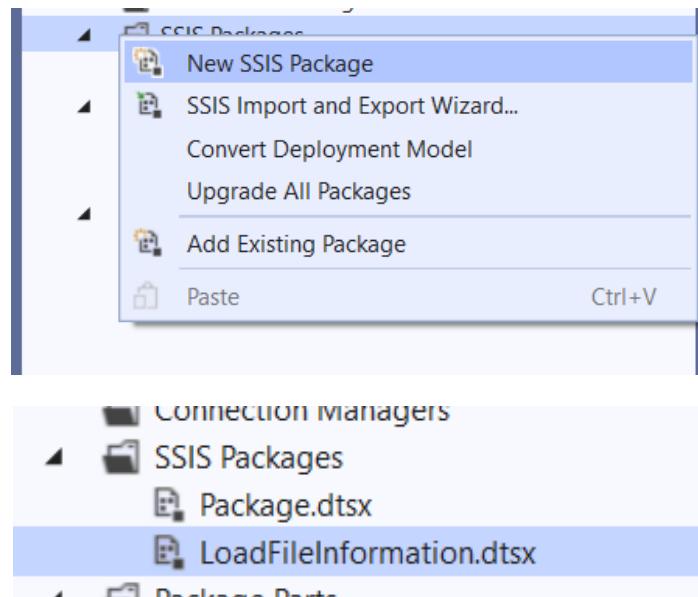
Let's create a table in Microsoft SQL Server

A screenshot of the Microsoft SQL Server Management Studio (SSMS) query editor. The title bar says 'SQLQuery_Lab2_Tas...2 (VERA\Vera (53))*'. The query window contains the following T-SQL code:

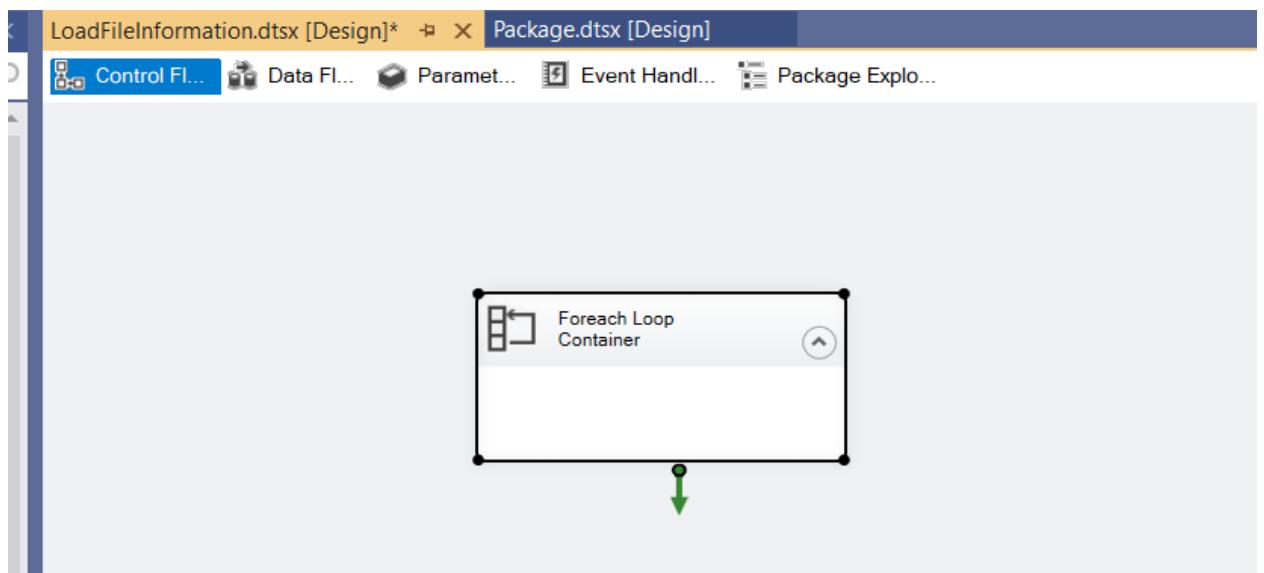
```
USE [AdventureWorks2012]
GO

CREATE TABLE dbo.FILES(
    ID int,
    FileFullPath NVARCHAR(150),
    CreationTime DATETIME
)
GO
```

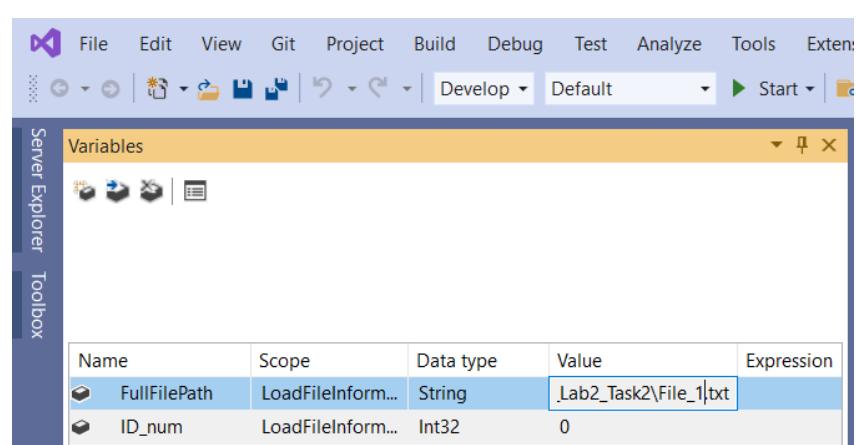
Create the LoadFileInformation package in Visual Studio 2019.

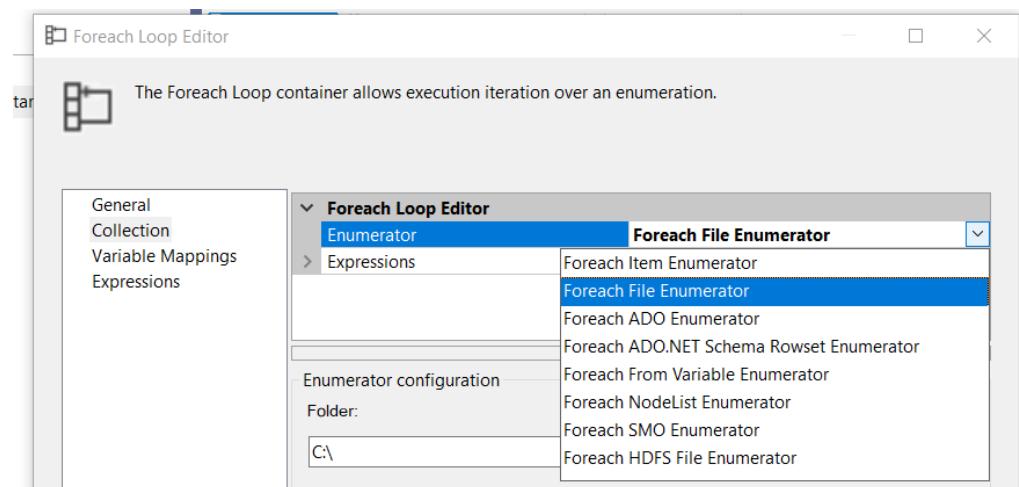
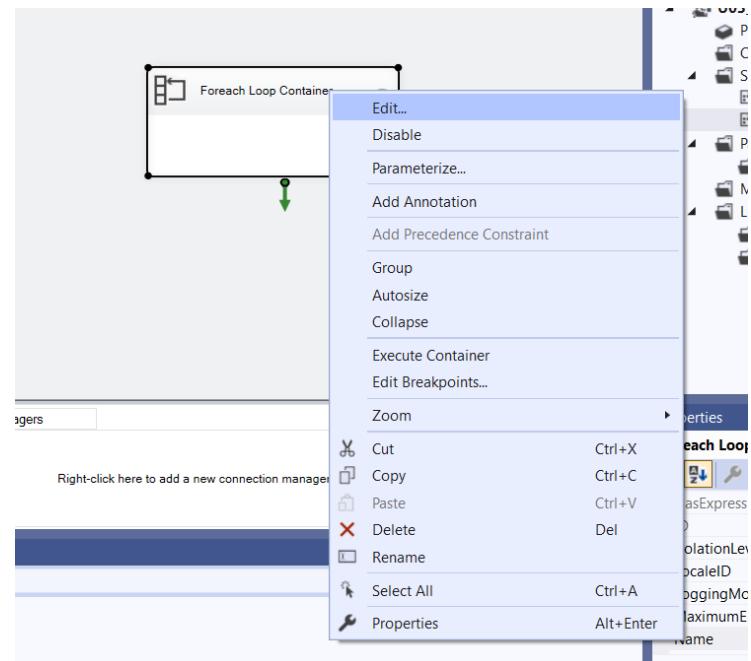


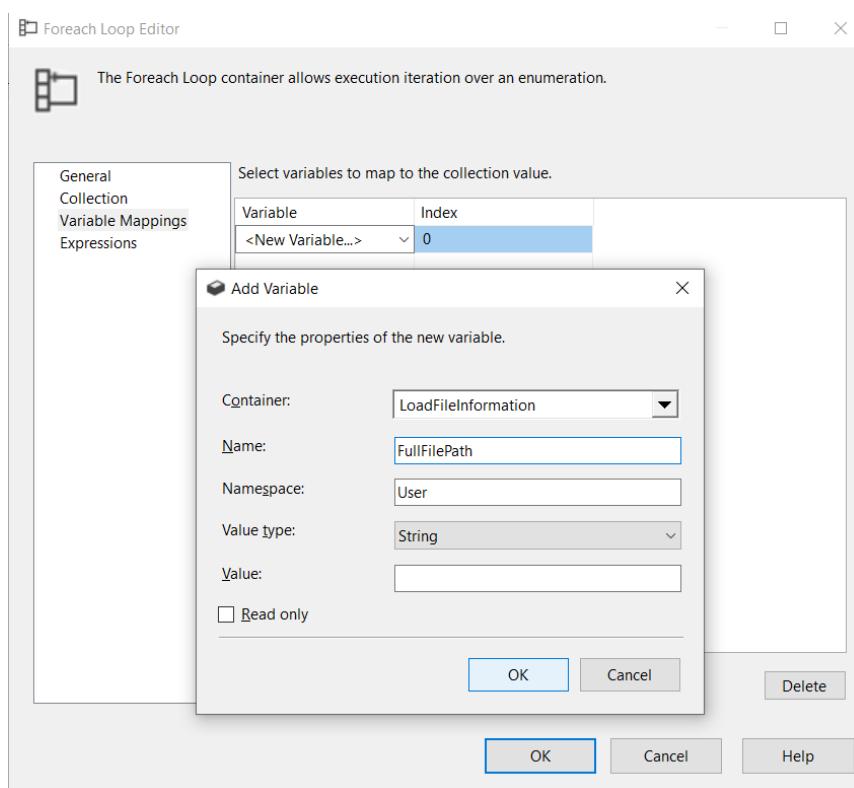
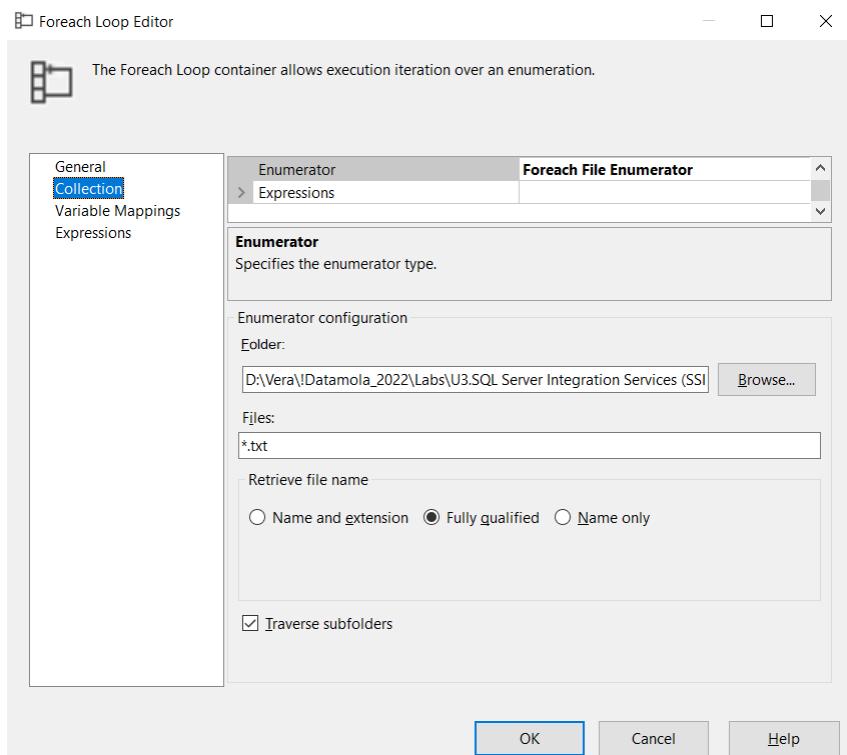
Let's Create a Foreach Loop Container.

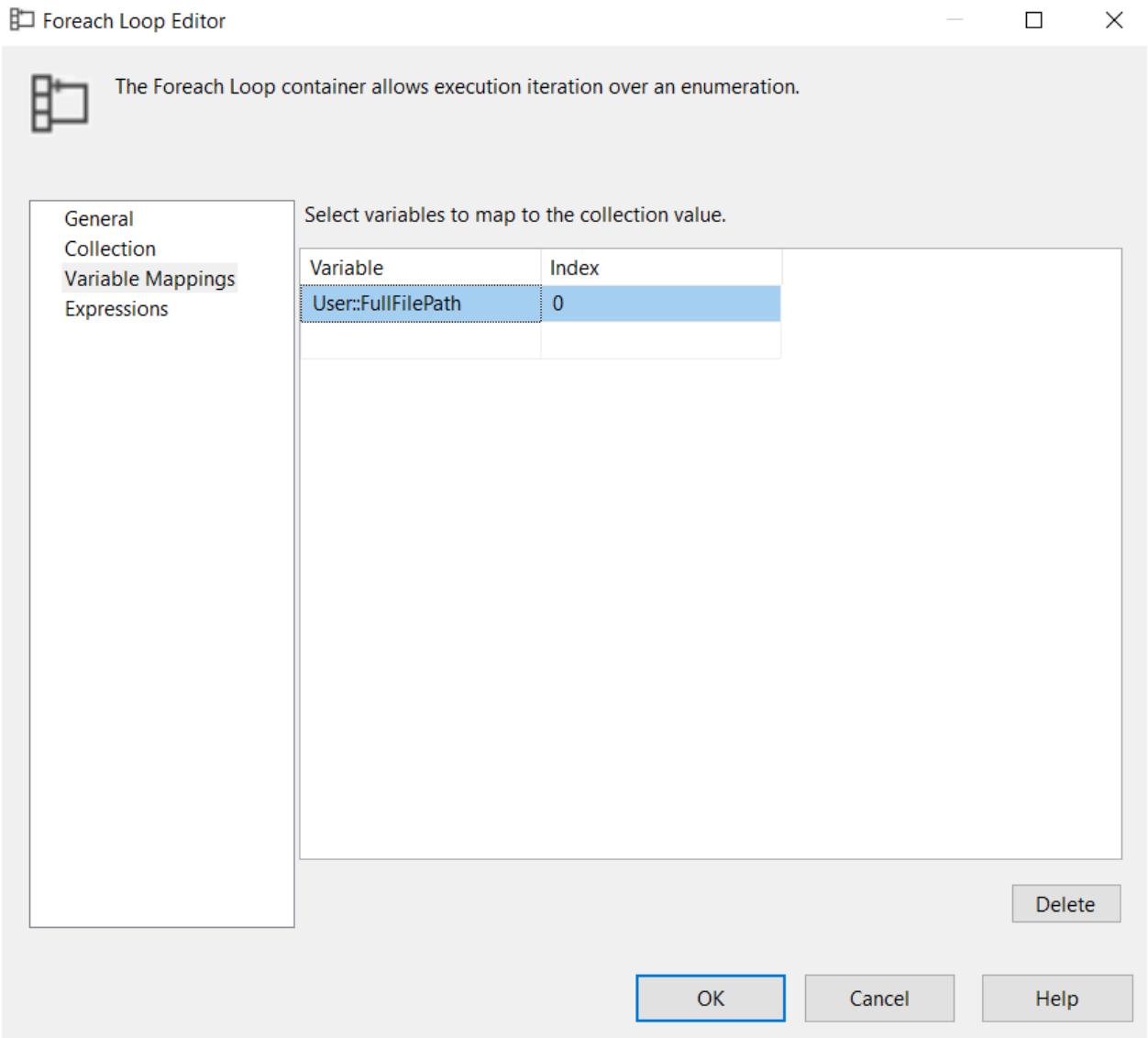


Create new Variables.

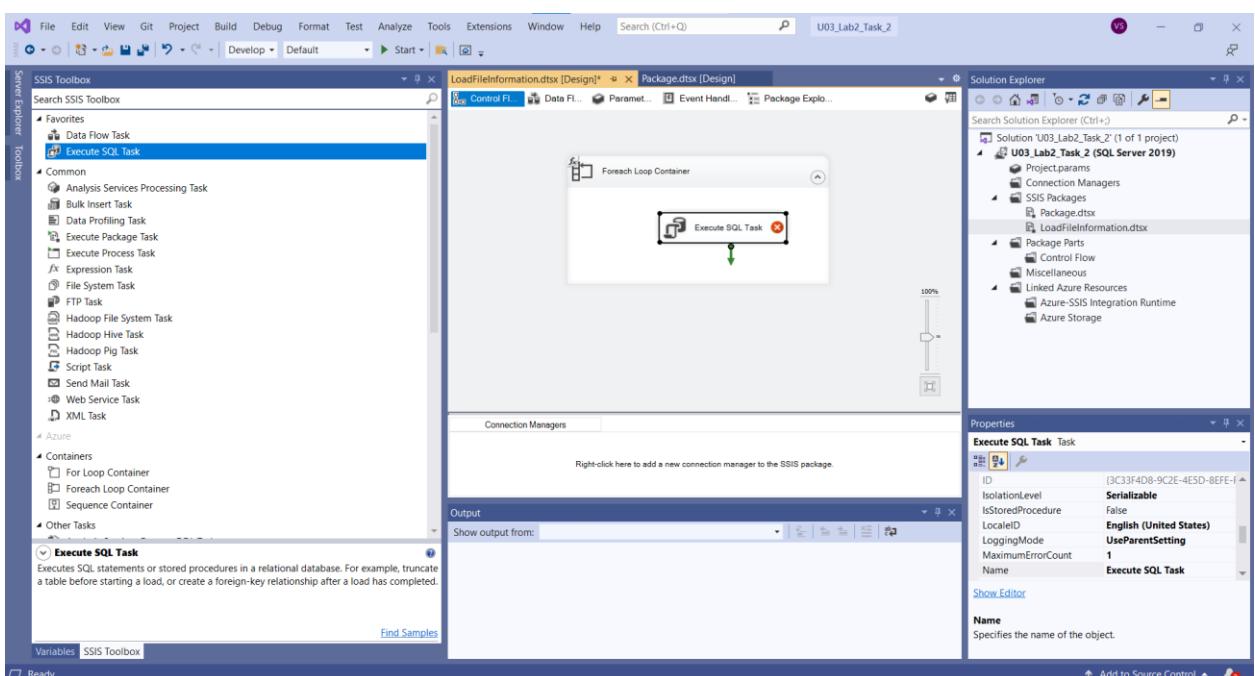


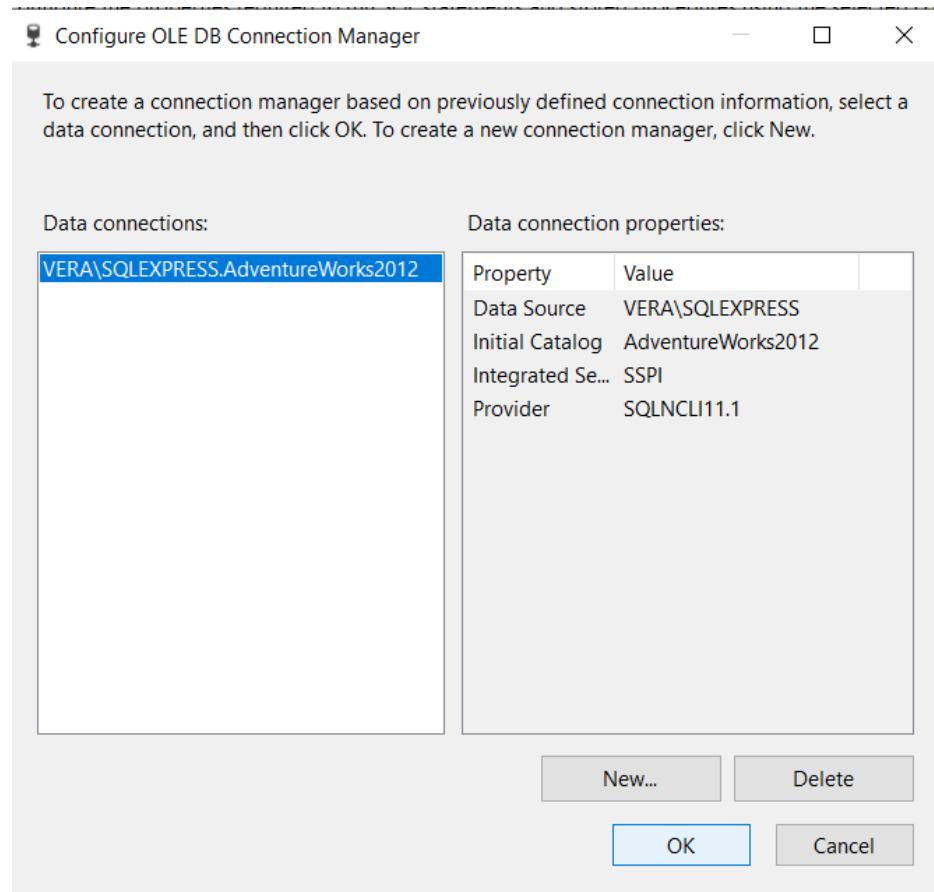
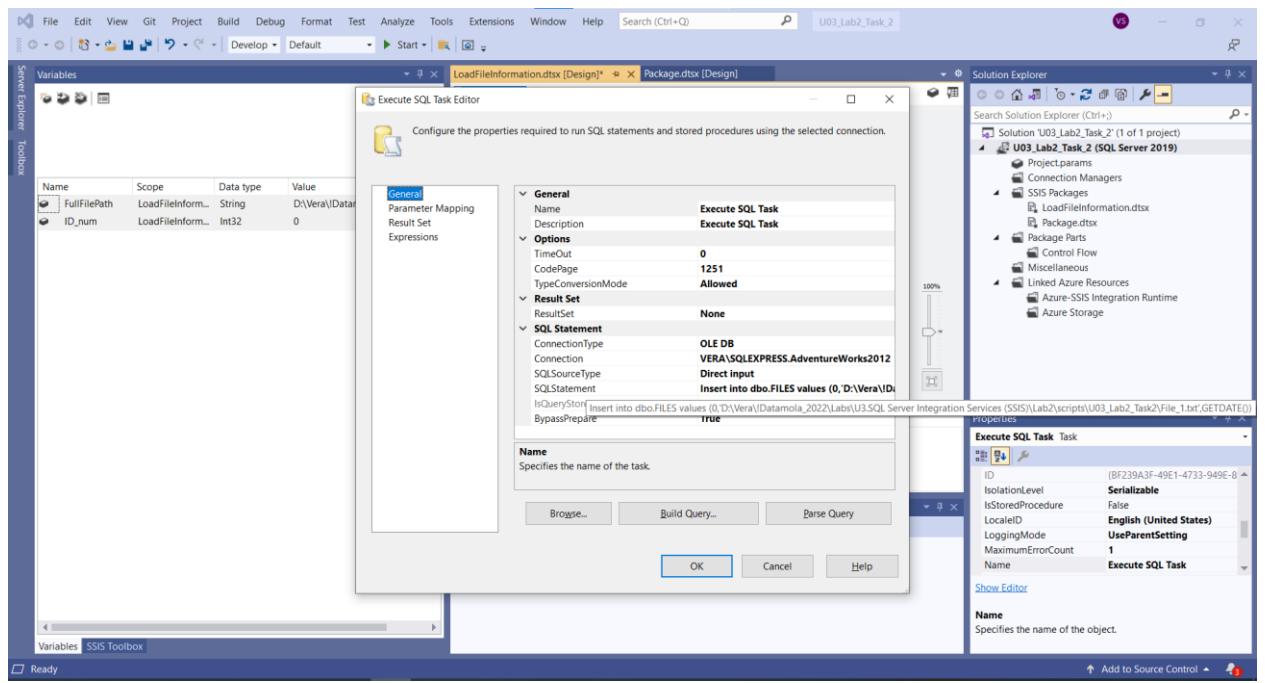


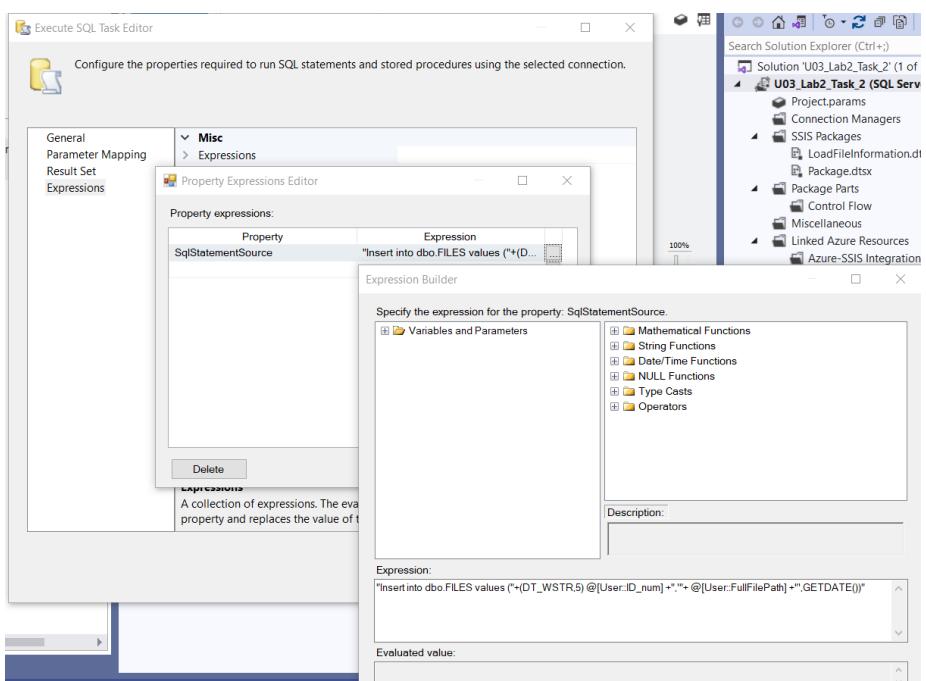
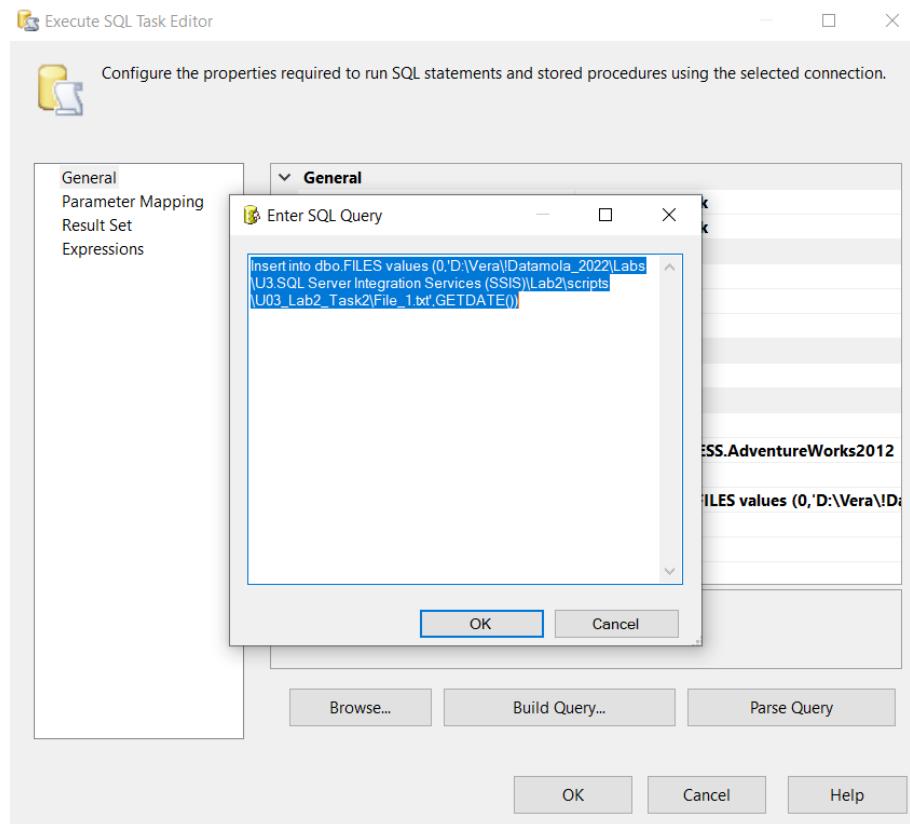




Let's create an Execute SQL Task.

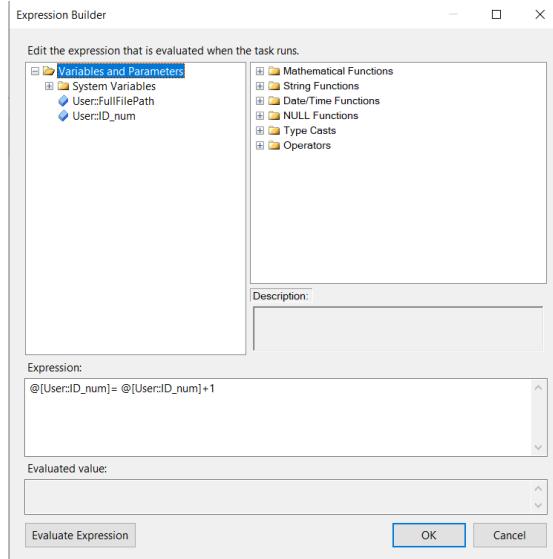




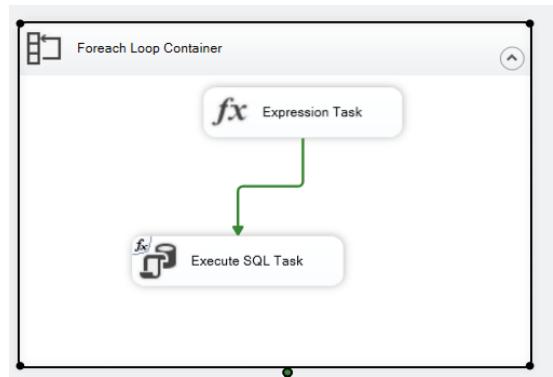


Let's create an Expression Task.





Let's connect the Expression Task to the Execute SQL Task inside the Foreach Loop Container.



Run the LoadFileInformation package.

Name	Description
CheckpointFileName	Never
CheckPointUsage	(Collection)
Configurations	8/26/2022 12:30 PM
CreatorComputerName	VERA
CreatorName	VERA\vera
DelayValidation	False
Description	
Disable	False
DisableEventHandlers	False
Expressions	
FailPackageOnFailure	False
FailParentOnFailure	False
ForceExecutionValue	0
ForceExecutionValueType	Int32
ForceExecutionResult	None
ForceExecutionValue	False
HasExpressions	False
ID	(E202A57B-54CE-406F-AC9
IsolationLevel	Serializable
LocaleID	English (United States)
LoggingMode	UseParentSetting
MaxConcurrentExecutables	-1
MaximumErrorCount	1
Name	LoadFileInformation
OfflineMode	False
PackagePassword	
PackagePriorityClass	Default
PackageType	DTSDesigner100
ProtectionLevel	EncryptSensitiveWithUserKe
SavedInConnectionString	False
Name	Specifies the name of the object.

All successfully completed.

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery_Lab2_Task2.sql - VERA\SQLEXPRESS.AdventureWorks2012 (VERA\Vera (53)) - Microsoft SQL Server Management Studio". The left pane is the Object Explorer, showing the database structure for "VERA\SQLEXPRESS (SQL Server 15.0.2000 - VERA)". The right pane contains a query window with the following script:

```
USE [AdventureWorks2012]
GO
CREATE TABLE dbo.FILES(
    ID int,
    FileFullPath NVARCHAR(150),
    CreationTime DATETIME
)
GO
DROP TABLE dbo.FILES;

SELECT * FROM dbo.FILES
```

The results pane shows a single row of data:

ID	FileFullPath	CreationTime
1	D:\vera\datamono_2022\Label03\SQL Server Integration Services (SSIS)\Lab2\script\l03_Lab2_Task2\file_1.tot	2022-08-26 14:40:25.747
2	D:\vera\datamono_2022\Label03\SQL Server Integration Services (SSIS)\Lab2\script\l03_Lab2_Task2\file_2.tot	2022-08-26 14:40:25.783
3	D:\vera\datamono_2022\Label03\SQL Server Integration Services (SSIS)\Lab2\script\l03_Lab2_Task2\file_3.tot	2022-08-26 14:40:25.803
4	D:\vera\datamono_2022\Label03\SQL Server Integration Services (SSIS)\Lab2\script\l03_Lab2_Task2\file_4.tot	2022-08-26 14:40:25.827

The status bar at the bottom indicates "Query executed successfully." and "VERA\SQLEXPRESS (15.0 RTM) | VERA\Vera (53) AdventureWorks2012 00:00:00 4 rows". The Properties pane on the right shows connection details for "VERA\SQLEXPRESS (VERA\Vera (53))".