

U3M3.LW.Implementing Data Flow

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

1. Exercise 1: Creating new database for HR department

Create the «HumanResources» database for HR department in Microsoft SQL Server Management Studio.

```
--DROP TABLE dbo.EmployeesExternal;

CREATE TABLE dbo.EmployeesExternal
(EmployeeID INT PRIMARY KEY,
 FirstName NVARCHAR(50) NOT NULL,
 LastName NVARCHAR(50) NOT NULL,
 JobTitle NVARCHAR(50) NOT NULL,
 EmailAddress NVARCHAR(50) NULL,
 City NVARCHAR(50) NOT NULL,
 StateProvinceName NVARCHAR(50) NOT NULL,
 CountryRegionName NVARCHAR(50) NOT NULL);

--DROP TABLE dbo.EmailAddressesAW;

CREATE TABLE dbo.EmailAddressesAW
(BusinessEntityID INT PRIMARY KEY,
 FirstName NVARCHAR(50) NOT NULL,
 LastName NVARCHAR(50) NOT NULL,
 JobTitle NVARCHAR(50) NULL);

--DROP TABLE dbo.EmployeesAW;

CREATE TABLE dbo.EmployeesAW
(BusinessEntityID INT PRIMARY KEY,
 FirstName NVARCHAR(50) NOT NULL,
 LastName NVARCHAR(50) NOT NULL,
 JobTitle NVARCHAR(50) NULL);
```

Completion time: 2022-08-27T14:31:19.2027728+03:00

Completion time: 2022-08-27T14:33:03.3211056+03:00

Completion time: 2022-08-27T14:33:44.4011613+03:00

Completion time: 2022-08-27T14:34:12.3387443+03:00

Result: SQL scripts that created needed objects.

```
USE AdventureWorks2012
GO
```

- **dbo.EmployeesExternal**

```
--1.
SELECT
    e.[BusinessEntityID] AS [EmployeeID]
    ,p.[FirstName]
    ,p.[LastName]
    ,e.[JobTitle]
    ,ea.[EmailAddress]
    ,a.[City]
    ,sp.[Name] AS [StateProvinceName]
    ,cr.[Name] AS [CountryRegionName]
FROM [HumanResources].[Employee] e
INNER JOIN [Person].[Person] p
ON p.[BusinessEntityID] = e.[BusinessEntityID]
INNER JOIN [Person].[BusinessEntityAddress] bea
ON bea.[BusinessEntityID] = e.[BusinessEntityID]
INNER JOIN [Person].[Address] a
ON a.[AddressID] = bea.[AddressID]
INNER JOIN [Person].[StateProvince] sp
ON sp.[StateProvinceID] = a.[StateProvinceID]
INNER JOIN [Person].[CountryRegion] cr
ON cr.[CountryRegionCode] = sp.[CountryRegionCode]
LEFT OUTER JOIN [Person].[PersonPhone] pp
ON pp.BusinessEntityID = p.[BusinessEntityID]
LEFT OUTER JOIN [Person].[PhoneNumberType] pnt
ON pp.[PhoneNumberTypeID] = pnt.[PhoneNumberTypeID]
LEFT OUTER JOIN [Person].[EmailAddress] ea
ON p.[BusinessEntityID] = ea.[BusinessEntityID]
order by [EmployeeID],[FirstName],[LastName];
```

100 %

	EmployeeID	FirstName	LastName	JobTitle	EmailAddress	City	StateProvinceName	CountryRegionName
1	1	Ken	Sánchez	Chief Executive Officer	ken0@adventure-works.com	Newport Hills	Washington	United States
2	2	Terri	Duffy	Vice President of Engineering	terri0@adventure-works.com	Renton	Washington	United States
3	3	Roberto	Tamburello	Engineering Manager	roberto0@adventure-works.com	Redmond	Washington	United States
4	4	Rob	Walters	Senior Tool Designer	rob0@adventure-works.com	Minneapolis	Minnesota	United States
5	5	Gail	Erickson	Design Engineer	gail0@adventure-works.com	Bellevue	Washington	United States

Query executed successfully. | VERA\SQLEXPRESS (15.0 RTM) | VERA\Vera (60) | AdventureWorks2012 | 00:00:00 | 290 rows

- **dbo.EmployeesAW**

```
--2.
select p.[BusinessEntityID],[FirstName],[LastName],[JobTitle]
from [Person].[Person] p
inner join [HumanResources].[Employee] e
on p.BusinessEntityID = e.BusinessEntityID
order by [BusinessEntityID],[FirstName],[LastName];
```

100 %

Results Messages

	BusinessEntityID	FirstName	LastName	JobTitle
1	1	Ken	Sánchez	Chief Executive Officer
2	2	Terri	Duffy	Vice President of Engineering
3	3	Roberto	Tamburello	Engineering Manager
4	4	Rob	Walters	Senior Tool Designer
5	5	Gail	Erickson	Design Engineer
6	6	Jossef	Goldberg	Design Engineer
7	7	Dylan	Miller	Research and Development Manager
8	8	Diane	Margheim	Research and Development Engineer
9	9	Gigi	Matthew	Research and Development Engineer
10	10	Michael	Raheem	Research and Development Manager
11	11	Ovidiu	Craciun	Senior Tool Designer
12	12	Thierry	D'Hers	Tool Designer
13	13	Janice	Galvin	Tool Designer
14	14	Michael	Sullivan	Senior Design Engineer
15	15	Sharon	Salavarria	Design Engineer
16	16	David	Bradley	Marketing Manager
17	17	Kevin	Brown	Marketing Assistant
18	18	John	Wood	Marketing Specialist
19	19	Mary	Dempsey	Marketing Assistant
20	20	Wanida	Bensoof	Marketing Assistant
21	21	Terry	Eminhizer	Marketing Specialist
22	22	Sariya	Hampden	Marketing Specialist
23	23	Mary	Gibson	Marketing Specialist

Query executed successfully. | VERA\SQLEXPRESS (15.0 RTM) | VERA\Vera (60) | AdventureWorks2012 | 00:00:00 | 290 rows

- **dbo.EmailAddressesAW**

```
--3.
select [EmailAddressID],p.[BusinessEntityID],[EmailAddress]
from [Person].[EmailAddress] e
inner join [Person].[Person] p
on e.[BusinessEntityID] = p.BusinessEntityID
order by [EmailAddressID], [BusinessEntityID];
```

100 %

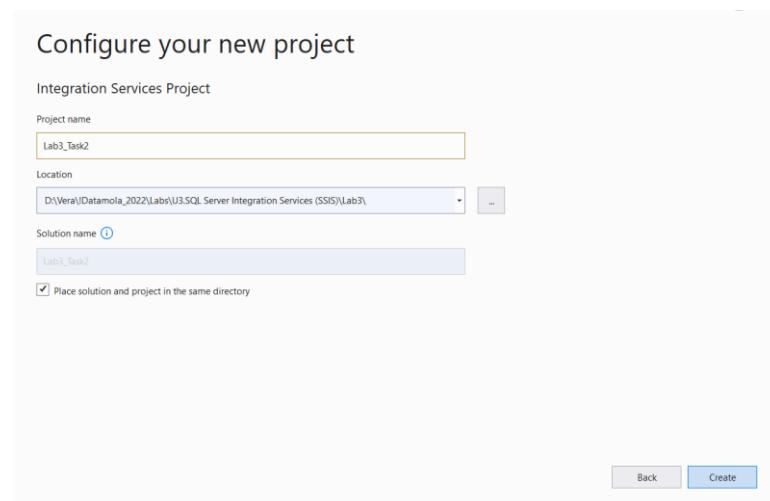
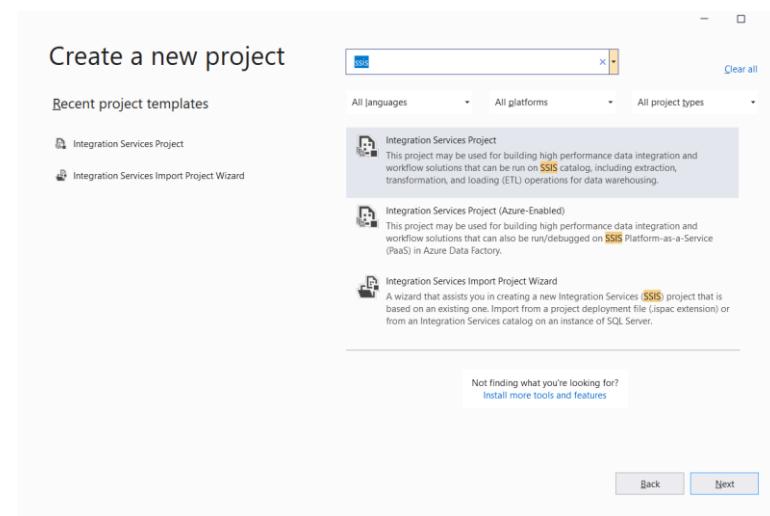
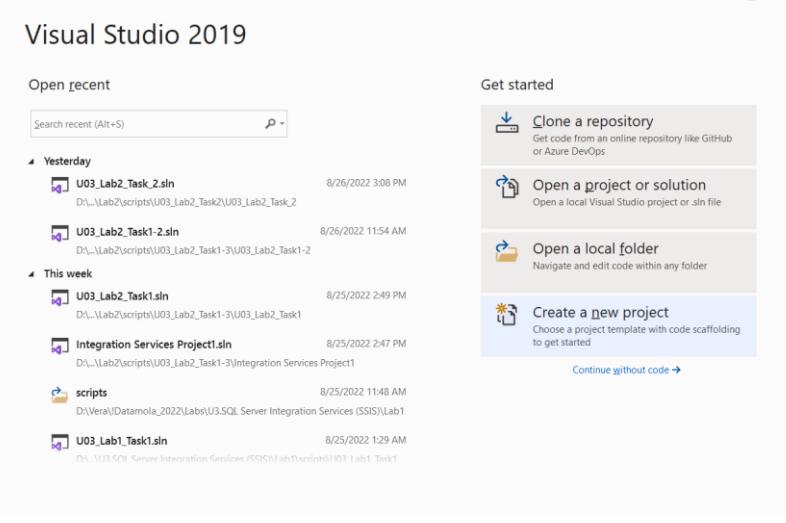
Results Messages

	EmailAddressID	BusinessEntityID	EmailAddress
1	1	1	ken0@adventure-works.com
2	2	2	terri0@adventure-works.com
3	3	3	roberto0@adventure-works.com
4	4	4	rob0@adventure-works.com
5	5	5	gail0@adventure-works.com
6	6	6	jossef0@adventure-works.com
7	7	7	dylan0@adventure-works.com
8	8	8	diane1@adventure-works.com
9	9	9	gigi0@adventure-works.com
10	10	10	michael6@adventure-works.com
11	11	11	ovidiu0@adventure-works.com
12	12	12	thierry0@adventure-works.com
13	13	13	janice0@adventure-works.com
14	14	14	michael8@adventure-works.com

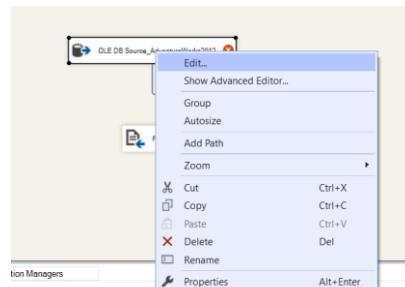
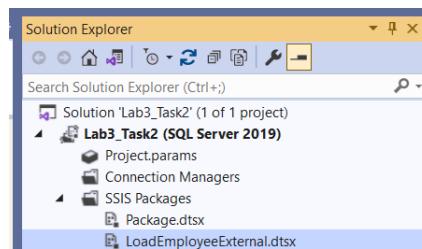
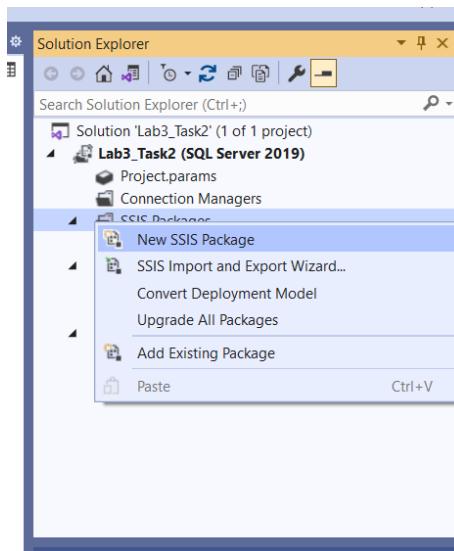
Query executed successfully. | VERA\SQLEXPRESS (15.0 RTM) | VERA\Vera (60) | AdventureWorks2012 | 00:00:00 | 19,972 rows

2. Exercise 2: Creating ETL solution to import employees from different sources

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



Create the LoadEmployeeExternal package to load employee data from the AdventureWorks2012 database in Microsoft SQL Server Management Studio into a flat file.



OLE DB Source Editor

Configure the properties used by a data flow to obtain data from any OLE DB provider.

Connection Manager
Specify an OLE DB connection manager, a data source, or a data source view, and select the data access mode. If using the SQL command access mode, specify the SQL command either by typing the query or by using Query Builder.

OLE DB connection manager: VERA\SQLEXPRESS.AdventureWorks2012
Data access mode: SQL command
SQL command text:

```

SELECT
    e.BusinessEntityID AS [EmployeeID]
    ,p.FirstName
    ,p.LastName
    ,e.JobTitle
    ,ea.EmailAddress
    ,a.[City]
    ,sp.Name AS [StateProvinceName]
    ,cr.Name AS [CountryRegionName]
FROM [HumanResources].[Employee] e
INNER JOIN [Person].[Person] p
ON p.BusinessEntityID = e.BusinessEntityID
INNER JOIN [Person].[BusinessEntityAddress] bea
ON bea.BusinessEntityID = e.BusinessEntityID
    
```

Preview... **OK** **Cancel**

Solution Explorer

Search Solution Explorer (Ctrl+;)

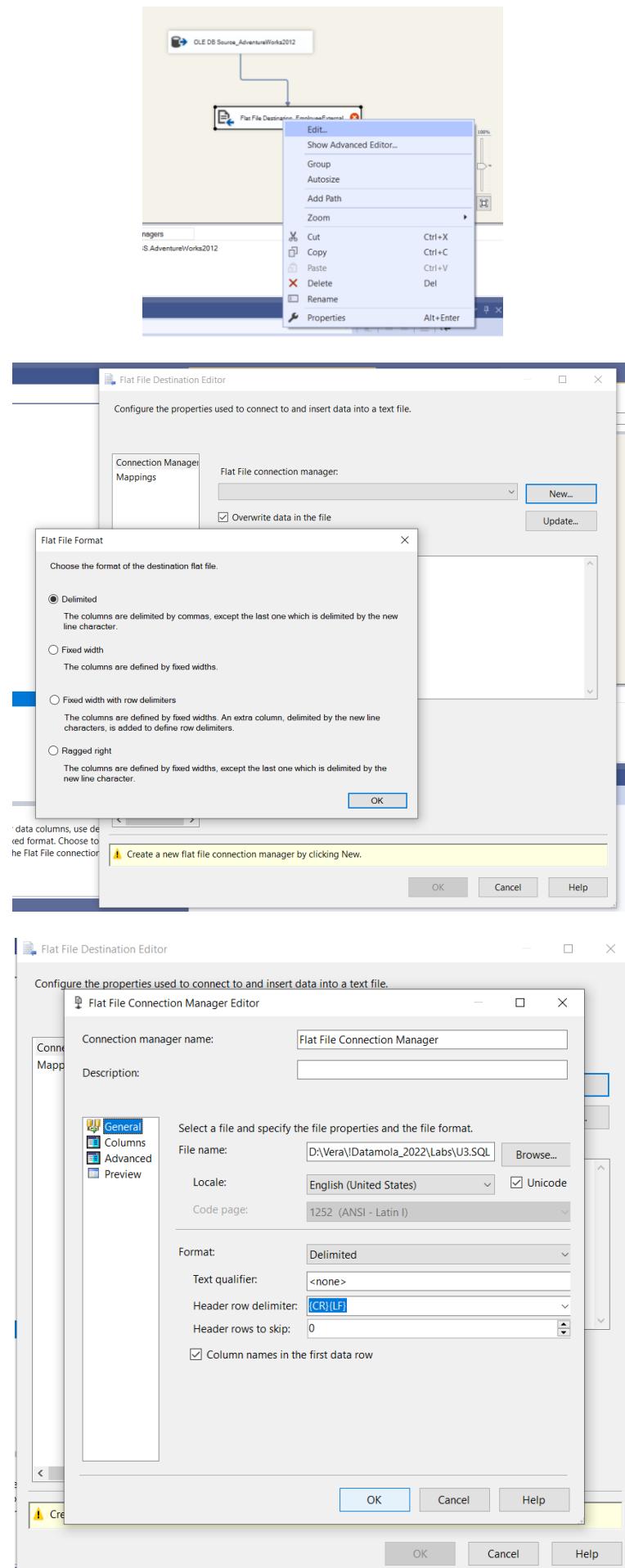
- Solution 'Lab3_Task2' (1 of 1 project)
 - Lab3_Task2 (SQL Server 2019)
 - Project.params
 - Connection Managers
 - SSIS Packages
 - Package.dtsx
 - LoadEmployeeExternal.dtsx
 - Package Parts
 - Control Flow
 - Miscellaneous
 - Linked Azure Resources
 - Azure-SQL Integration
 - Azure Storage

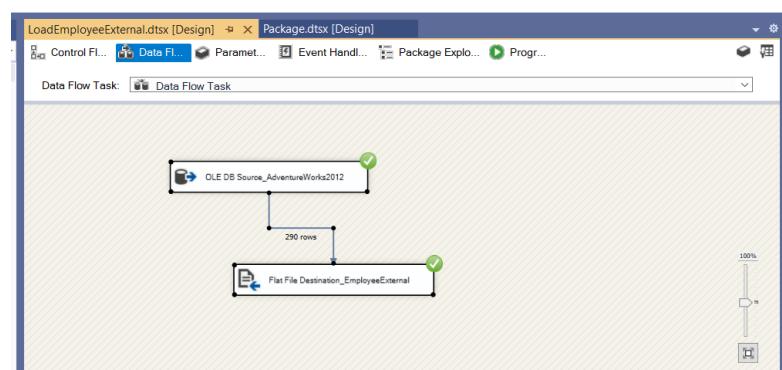
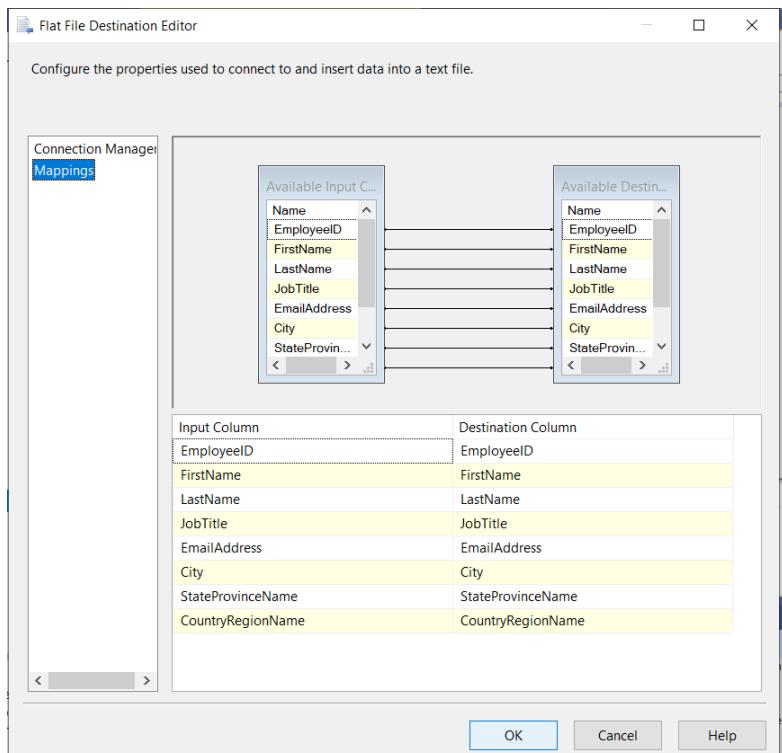
Preview Query Results

Query result (up to the first 200 rows):

EmployeeID	FirstName	LastName	JobTitle	EmailAddress	City
1	Ken	Sánchez	Chief Executive Officer	ken01@Adventureworks.com	Newport Woods
2	Terri	Duffy	Vice President	terri01@Adventureworks.com	Renton
3	Roberto	Tamburello	Engineer	roberto01@Adventureworks.com	Redmond
4	Rob	Walter	Senior Software Engineer	rob01@Adventureworks.com	Minneapolis
5	Gail	Erickson	Design Engineer	gail01@Adventureworks.com	Seattle
6	Jossef	Goldberg	Design Engineer	josef01@Adventureworks.com	Renton
7	Dylan	Mller	Researcher	dylan01@Adventureworks.com	Kennmore
8	Diane	Margheim	Researcher	diane01@Adventureworks.com	Everett
9	Gigli	Matthew	Researcher	gigli01@Adventureworks.com	Bellevue
10	Michael	Rahreen	Researcher	michael01@Adventureworks.com	San Francisco
11	Ovidiu	Cracium	Senior Software Engineer	ovidiu01@Adventureworks.com	Kennmore
12	Therry	D'Hers	Tool Designer	therry01@Adventureworks.com	Bothell
13	Janice	Galvin	Tool Designer	janice01@Adventureworks.com	Redmond
14	Michael	Sullivan	Senior Software Engineer	michael01@Adventureworks.com	Renton
15	Sharon	Salavarria	Design Engineer	sharon01@Adventureworks.com	Renton

Find Samples **Close**





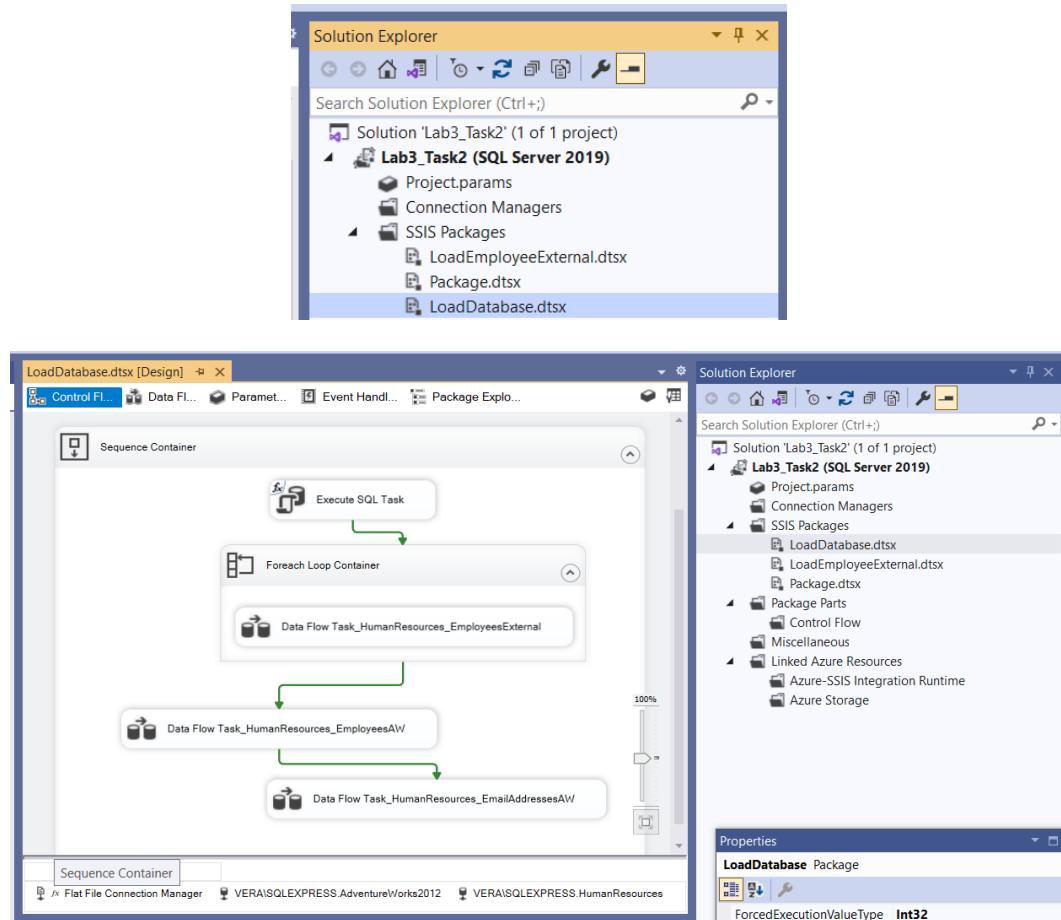
EmployeeExternal_1 - Notepad

```

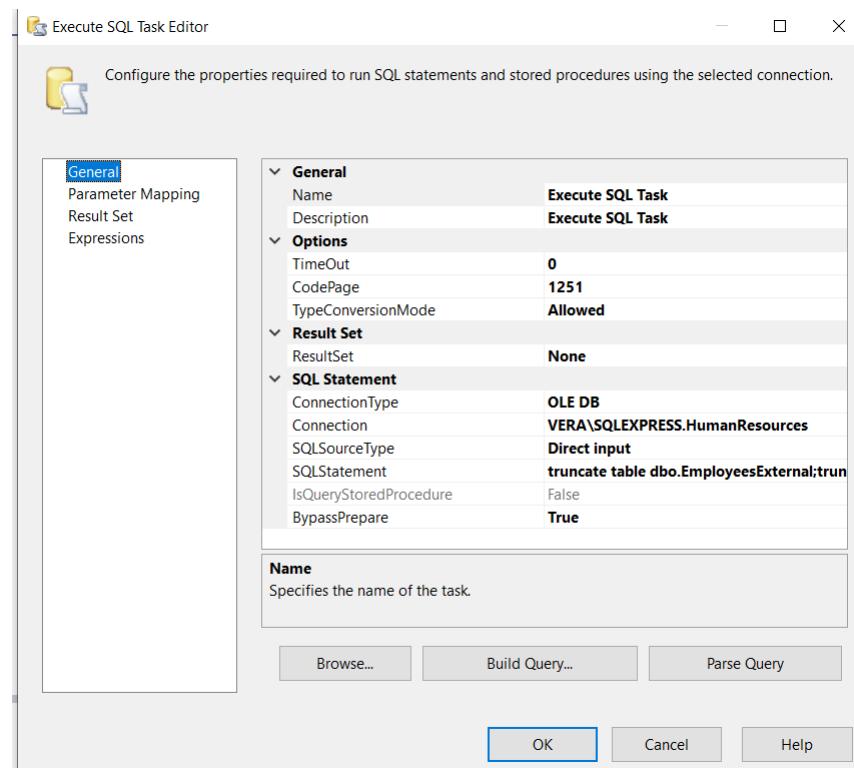
File Edit Format View Help
EmployeeID,FirstName,LastName,JobTitle,EmailAddress,City,StateProvinceName,CountryRegionName
1,Ken,Sánchez,Chief Executive Officer,ken0@adventure-works.com,Newport Hills,Washington,United States
2,Terri,Duffy,Vice President of Engineering,terri0@adventure-works.com,Renton,Washington,United States
3,Roberto,Tamburello,Engineering Manager,roberto0@adventure-works.com,Redmond,Washington,United States
4,Rob,Walters,Senior Tool Designer,rob0@adventure-works.com,Minneapolis,Minnesota,United States
5,Gail,Erickson,Design Engineer,gail0@adventure-works.com,Bellevue,Washington,United States
6,Jossef,Goldberg,Design Engineer,jossef0@adventure-works.com,Renton,Washington,United States
7,Dylan,Miller,Research and Development Manager,dylan0@adventure-works.com,Kenmore,Washington,United States
8,Diane,Margheim,Research and Development Engineer,diane1@adventure-works.com,Everett,Washington,United States
9,Gigi,Matthew,Research and Development Engineer,gigi0@adventure-works.com,Bellevue,Washington,United States
10,Michael,Raheem,Research and Development Manager,michael0@adventure-works.com,San Francisco,California,United States
11,Ovidiu,Cracium,Senior Tool Designer,ovidiu0@adventure-works.com,Kenmore,Washington,United States
12,Thierry,D'Hers,Tool Designer,thierry0@adventure-works.com,Bothell,Washington,United States
13,Janice,Galvin,Tool Designer,janice0@adventure-works.com,Redmond,Washington,United States
14,Michael,Sullivan,Senior Design Engineer,michael0@adventure-works.com,Renton,Washington,United States
15,Sharon,Salavarria,Design Engineer,sharon0@adventure-works.com,Renton,Washington,United States
16,David,Bradley,Marketing Manager,david0@adventure-works.com,Redmond,Washington,United States
17,Kevin,Brown,Marketing Assistant,kevin0@adventure-works.com,Everett,Washington,United States
18,John,Wood,Marketing Specialist,john0@adventure-works.com,Redmond,Washington,United States
19,Mary,Dempsey,Marketing Assistant,mary0@adventure-works.com,Bellevue,Washington,United States
20,Wanida,Benshoof,Marketing Assistant,wanida0@adventure-works.com,Sammamish,Washington,United States
21,Terry,Eminhizer,Marketing Specialist,terry0@adventure-works.com,Bellevue,Washington,United States
22,Sariya,Harnpadoungsataya,Marketing Specialist,sariya0@adventure-works.com,Everett,Washington,United States
23,Mary,Gibson,Marketing Specialist,mary0@adventure-works.com,Everett,Washington,United States
24,Jill,Williams,Marketing Specialist,jill0@adventure-works.com,Everett,Washington,United States
25,James,Hamilton,Vice President of Production,james1@adventure-works.com,Monroe,Washington,United States
26,Peter,Krebs,Production Control Manager,peter0@adventure-works.com,Bellevue,Washington,United States
27,Jo,Brown,Production Supervisor - WC60,jo0@adventure-works.com,Duvall,Washington,United States
28,Guy,Gilbert,Production Technician - WC60,guy1@adventure-works.com,Monroe,Washington,United States
29,Mark,McArthur,Production Technician - WC60,mark1@adventure-works.com,Redmond,Washington,United States
30,Britta,Simon,Production Technician - WC60,britta0@adventure-works.com,Edmonds,Washington,United States
31,Margie,Shoop,Production Technician - WC60,margie0@adventure-works.com,Edmonds,Washington,United States
32,Rebecca,Laszlo,Production Technician - WC60,rebecca0@adventure-works.com,Bellevue,Washington,United States

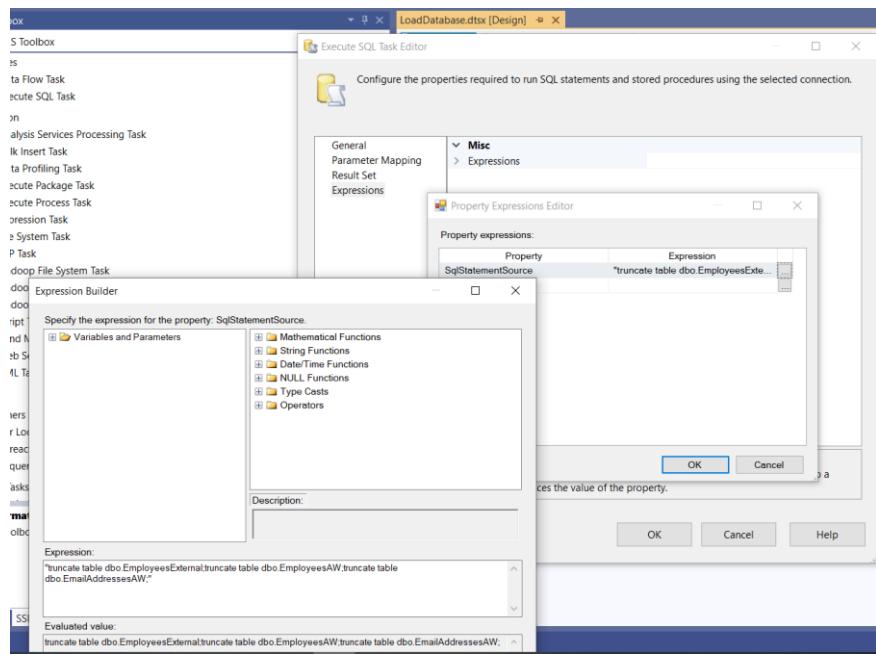
```

Create the LoadDatabase package to load data from the AdventureWorks2012 database into the HumanResources database in one package.

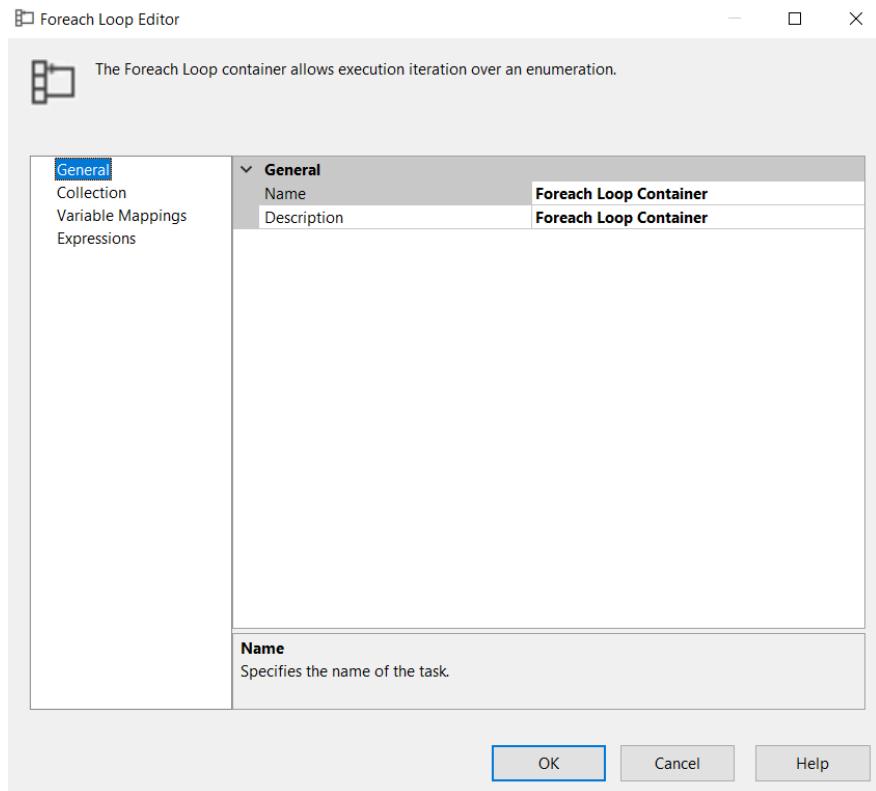


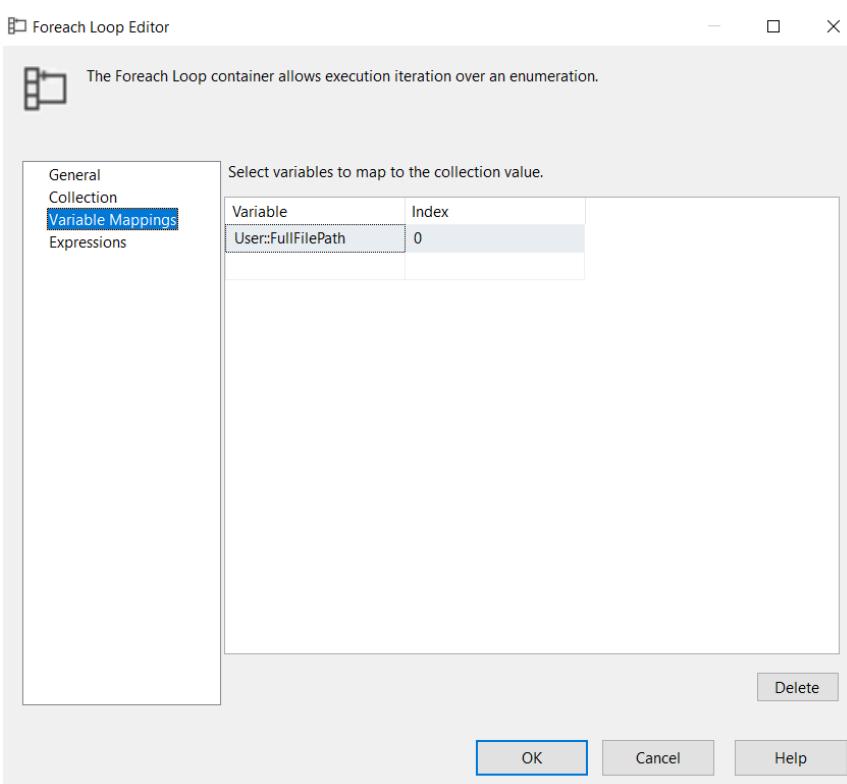
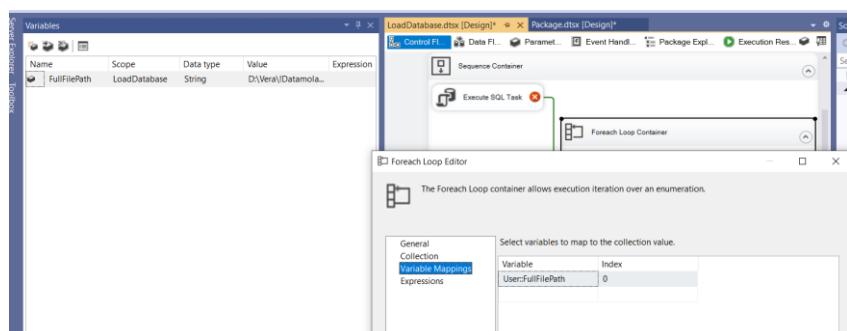
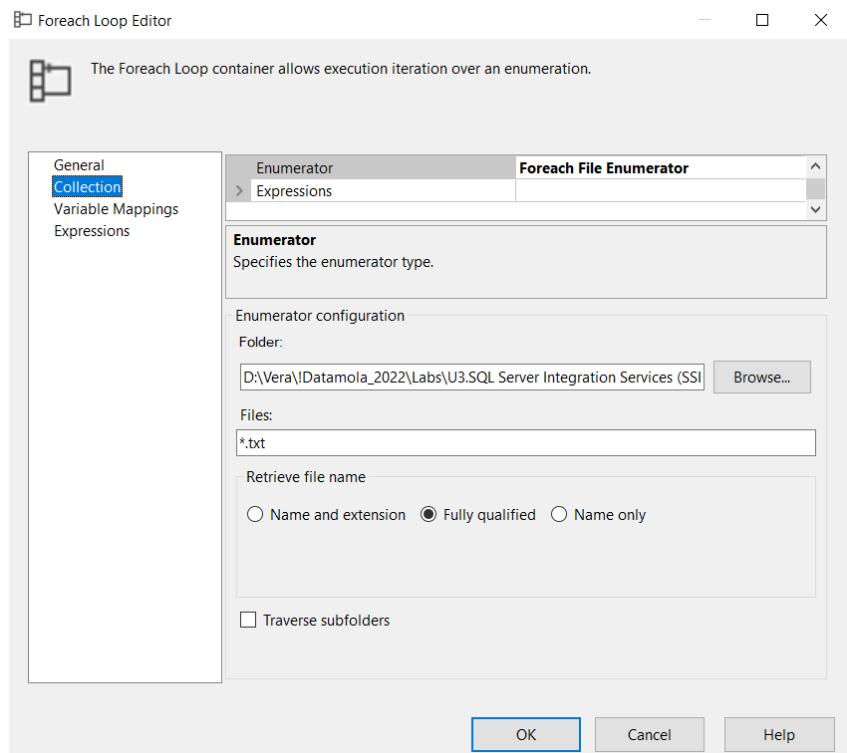
Let's set up an Execute SQL Task, which will clear all tables in the HumanResources database after each run of the LoadDatabase package.

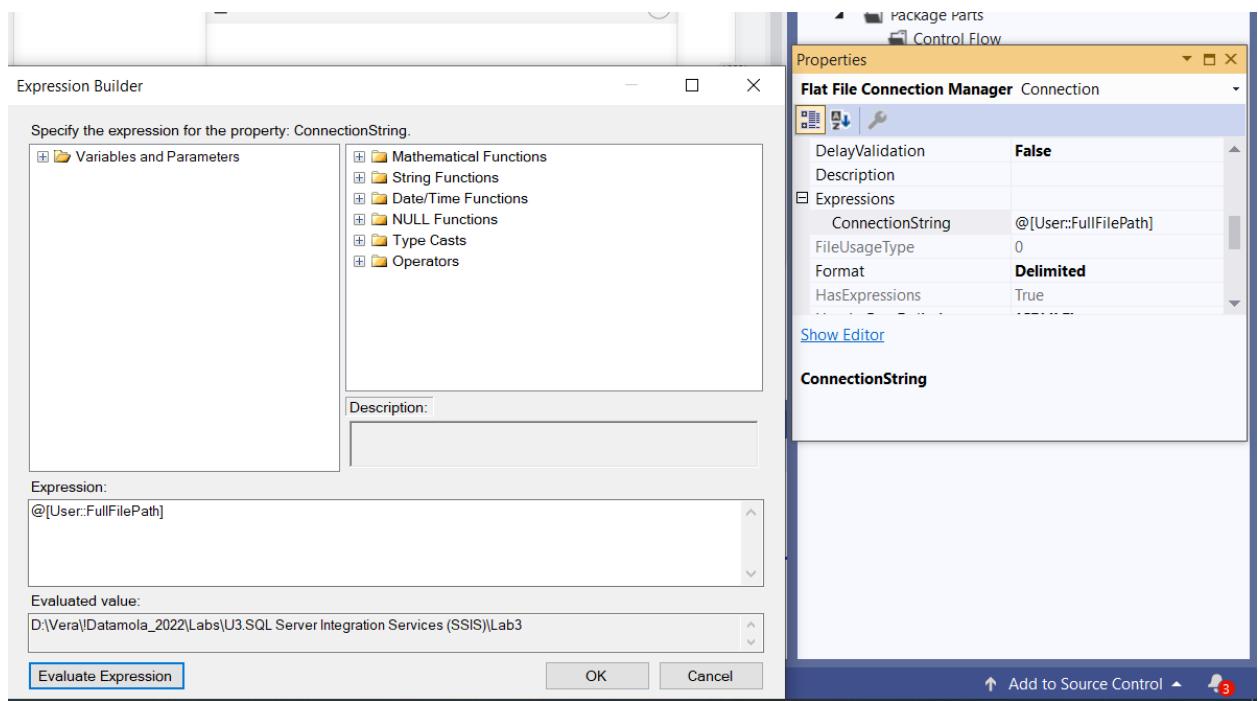




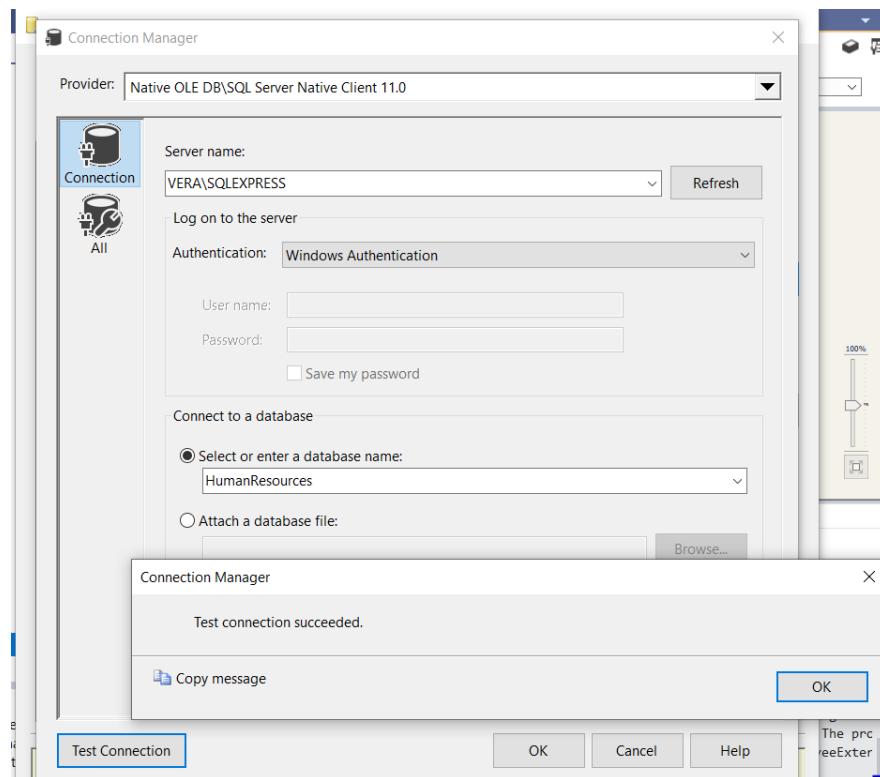
Let's set up the Foreach loop container that will pass data from Flat files to the dbo.EmployeesExternal table of the HumanResources database.



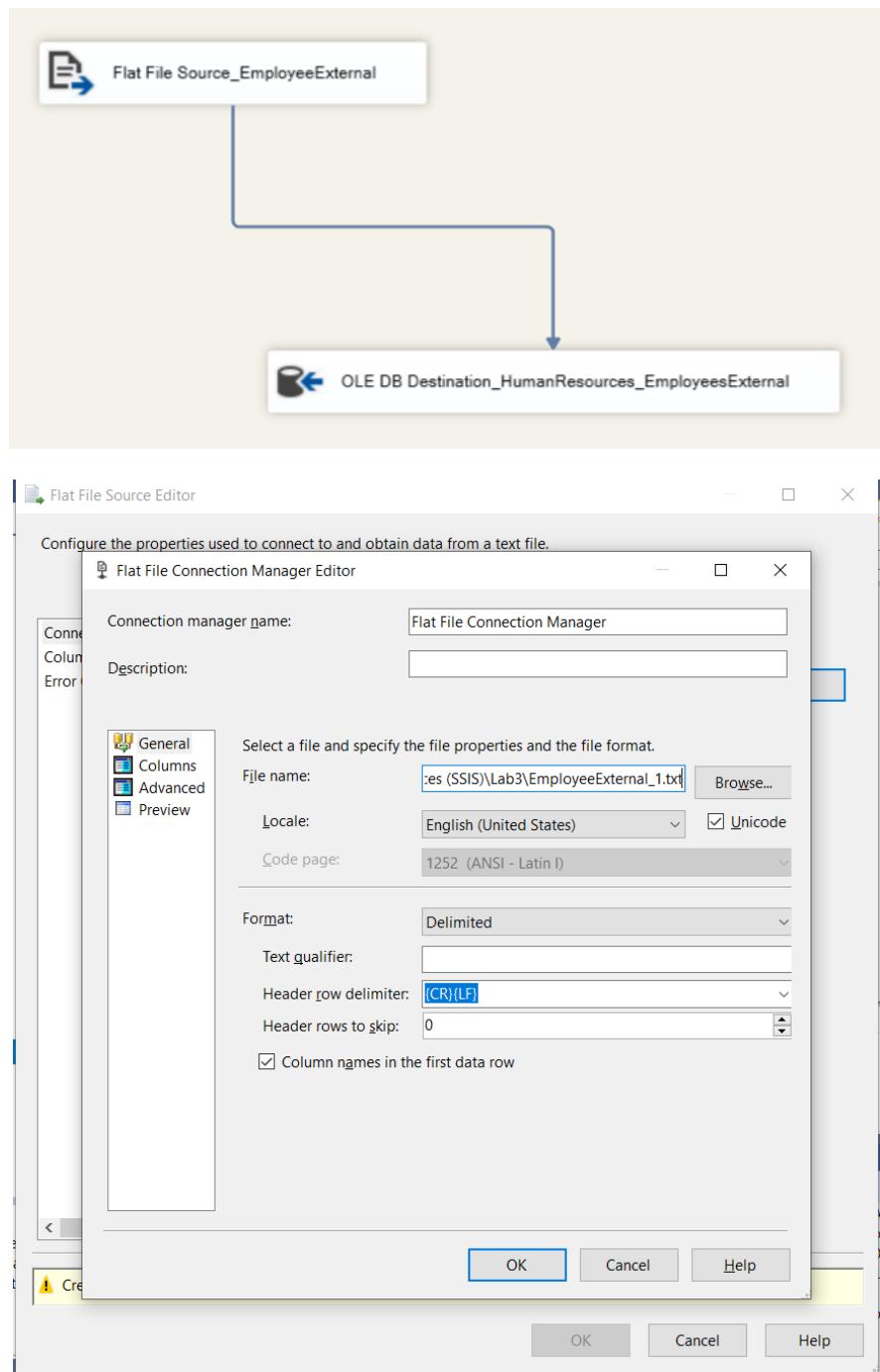


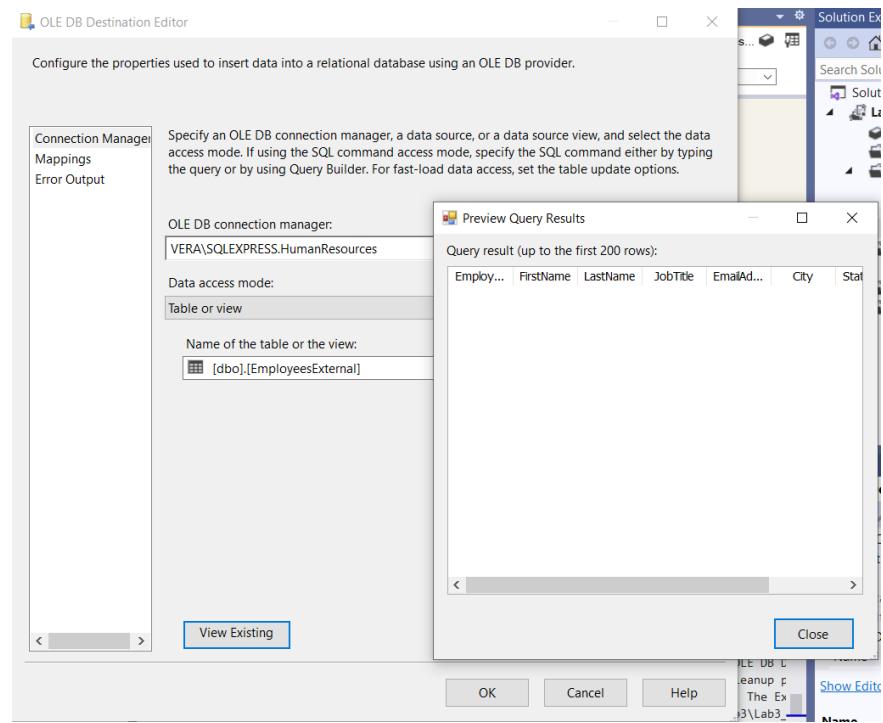
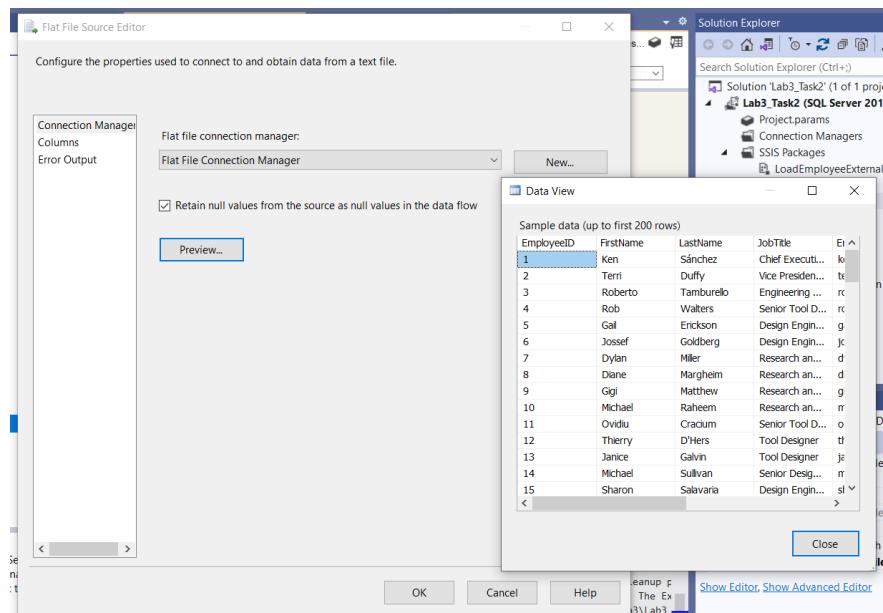


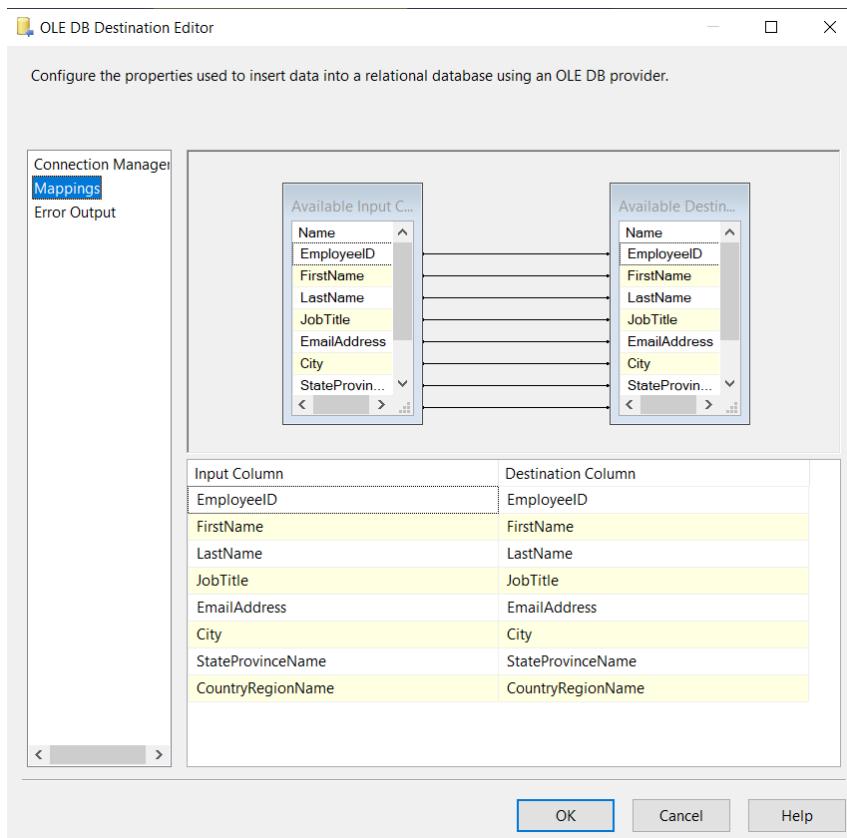
Let's create the HumanResources connection.



- `dbo.EmployeesExternal`







Let's add script task for the Foreach loop container, where event handler: OnPostExecute. If the import process is successful, the package will send an email with the subject line "Employees Imported Successfully".

The screenshot shows three windows of the SSIS Designer:

- Event Handler Configuration:** Shows the Foreach Loop Container selected as the executable and the OnPostExecute event handler assigned.
- Variables Window:** Displays the following variables:

Name	Scope	Data type	Value	Expression
From	LoadDatabase	String	v.shkrabatovskaya...	
FullPath	LoadDatabase	String	D:\Vera\!Datamola...	
Subject	LoadDatabase	String	Employee_Message	
To	LoadDatabase	String	v.shkrabatovskaya...	

- Script Task Code:** The code in the ScriptMain.cs file is as follows:

```
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
19 namespace ST_ac7b2ae5593d4f1588cfada5106557c
```

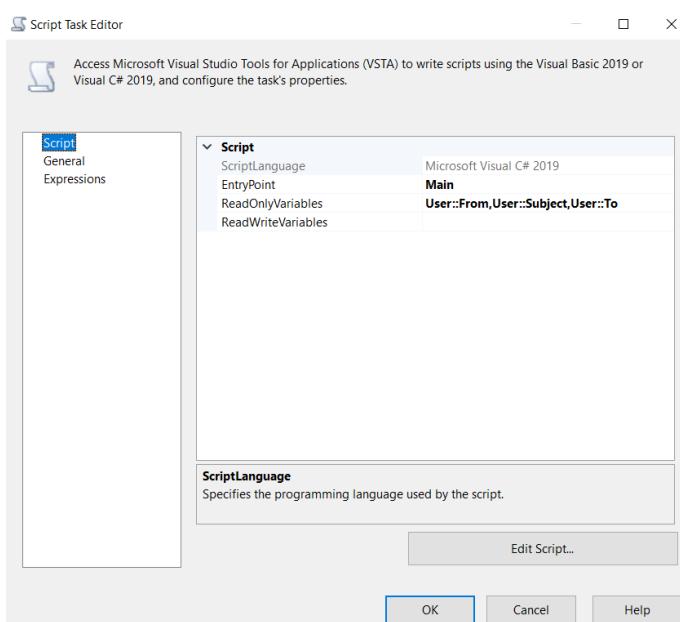
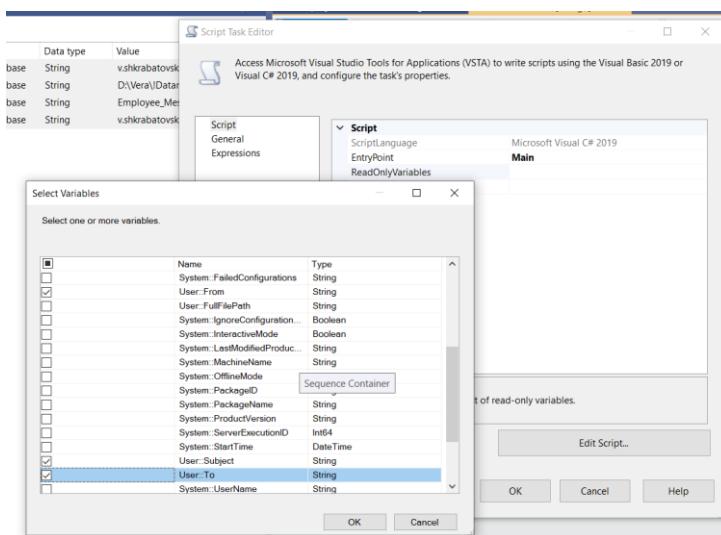
ScriptMain.cs

```

90  /// Before returning from this method, set the value of Dts.TaskResult to
91  /// To open Help, press F1.
92  /// </summary>
93  0 references
94  public void Main()
95  {
96      // C# code
97      String SendMailFrom = Dts.Variables["From"].Value.ToString();
98      String SendMailTo = Dts.Variables["To"].Value.ToString();
99      String SendMailSubject = Dts.Variables["Subject"].Value.ToString();
100     String SendMailBody = "Employees have been imported successfully";
101
102    try
103    {
104        MailMessage email = new MailMessage();
105        SmtpClient SmtpServer = new SmtpClient("smtp.gmail.com");
106        // START
107        email.From = new MailAddress(SendMailFrom);
108        email.To.Add(SendMailTo);
109        email.Subject = SendMailSubject;
110        email.Body = SendMailBody;
111        //END
112
113        SmtpServer.Port = 587;
114        SmtpServer.Credentials = new System.Net.NetworkCredential(SendMailFrom, SendMailBody);
115        SmtpServer.EnableSsl = true;
116
117        SmtpServer.Send(email);
118    }
119
120    catch (Exception ex)
121    {
122        Dts.Variables["Error"].Value = ex.Message;
123    }
124
125    finally
126    {
127        Dts.TaskResult = (int)ScriptResults.Success;
128    }
129}

```

No issues found



Let's add script task for the Foreach loop container, where event handler: OnError. If the import process is not successful, the package will send an email with the subject line "Error loading employees".

The screenshot shows the SSIS Script Task Editor window. In the top-left corner, the package name is LoadDatabase.dtsx [Design]. The Event Handler dropdown is set to "OnError". Below it, there is a "Script Task" icon.

The main area of the editor is titled "Script Task Editor" and contains the following configuration:

- Script Language:** Microsoft Visual C# 2019
- EntryPoint:** Main
- ReadOnlyVariables:** User::From, User::Subject, User::To
- ReadWriteVariables:** (empty)

Below these settings is a table titled "adOnlyVariables" which lists variables: User::From, User::FullPath, System::IgnoreConfiguration..., System::InteractiveMode, System::LastModifiedProduct..., System::MachineName, System::OfflineMode, System::PackageID, System::PackageName, System::ProductVersion, System::ServerExecutionID, System::StartTime, User::Subject, and User::To.

At the bottom right of the editor are OK, Cancel, and Help buttons.

The code editor shows the generated C# script for the Main() method:

```

1  /* The Script Task allows you to perform virtually any operation that can be done from within a .Net application within the context of an Integration Services control flow. */
2  * Expand the other regions which have "Help" prefixes for examples of script tasks. */
3
4
5  /* Integration Services features within this script task. */
6
7 
```

Region Namespaces:

```

8  #region Namespaces
9
10 using System;
11 using System.Data;
12 using Microsoft.SqlServer.Dts.Runtime;
13 using System.Windows.Forms;
14 using System.Net;
15 using System.Net.Mail;
16 #endregion
17 
```

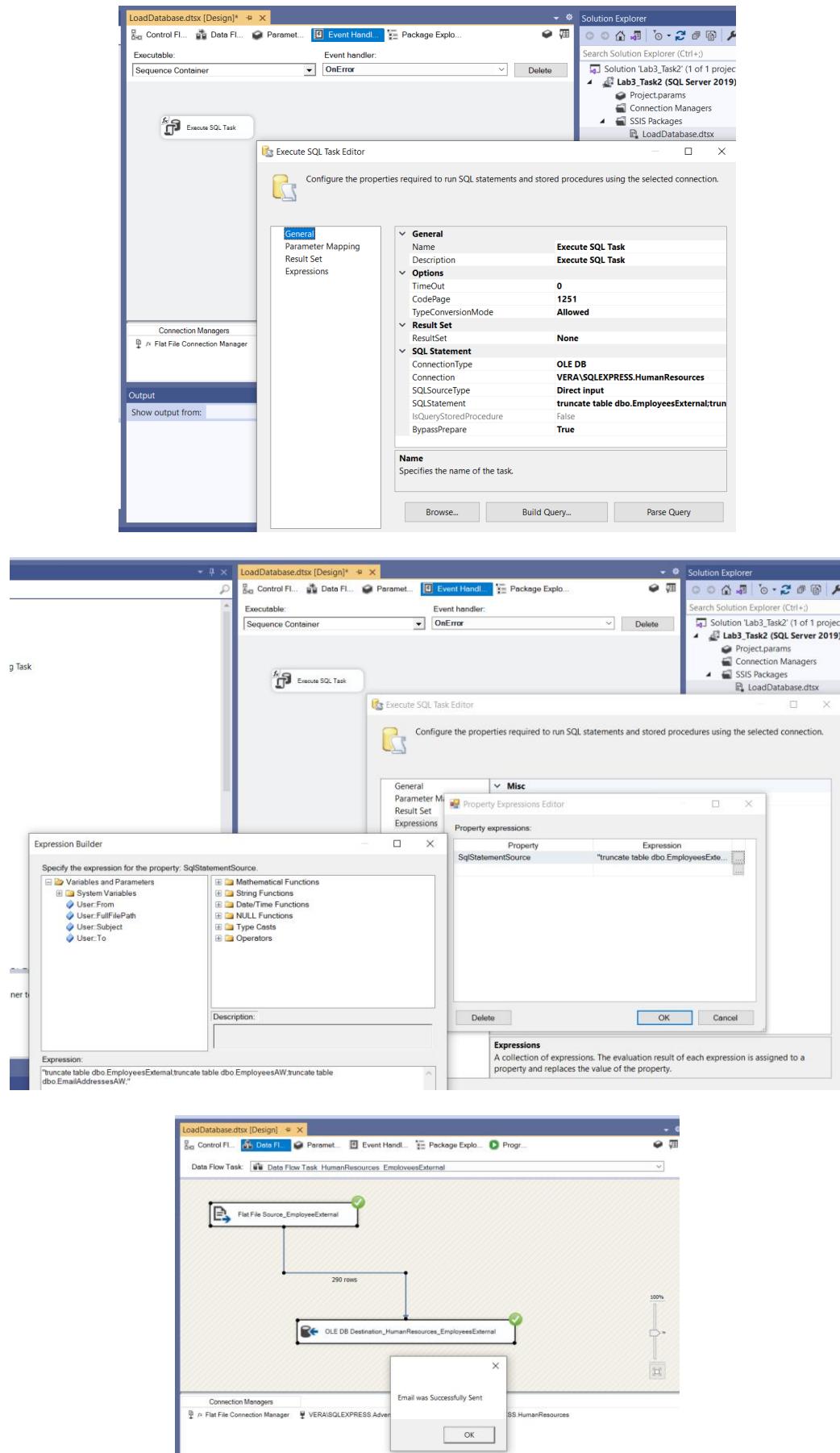

The code editor shows the implementation of the Main() method:

```

87
88  /// <summary>
89  /// This method is called when this script task executes in the control
90  /// Before returning from this method, set the value of Dts.TaskResult
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 = "Error loading employees";
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;
110         //END
111
112         SmtpServer.Port = 587;
113         SmtpServer.Credentials = new System.Net.NetworkCredential(SendMailFrom, SendMailFrom);
114     }
115 } 
```

At the bottom of the editor, status information includes "No issues found", "Ln: 103 Ch: 55 MIXED CRLF", and a progress bar at 100%.

Let's add script task for the Sequence Container, where event handler: OnError. If the import process is not successful, the package will send an email with the subject line "Error loading employees".



select * from dbo.EmployeesExternal;

100 %

Results Messages

	EmployeeID	FirstName	LastName	JobTitle	EmailAddress	City	StateProvinceName	CountryRegionName
1	1	Ken	Sánchez	Chief Executive Officer	ken0@adventure-works.com	Newport Hills	Washington	United States
2	2	Terri	Duffy	Vice President of Engineering	terri0@adventure-works.com	Renton	Washington	United States
3	3	Roberto	Tamburello	Engineering Manager	roberto0@adventure-works.com	Redmond	Washington	United States
4	4	Rob	Walters	Senior Tool Designer	rob0@adventure-works.com	Minneapolis	Minnesota	United States
5	5	Gail	Erickson	Design Engineer	gail0@adventure-works.com	Bellevue	Washington	United States
6	6	Jossef	Goldberg	Design Engineer	jossef0@adventure-works.com	Renton	Washington	United States
7	7	Dylan	Miller	Research and Development Manager	dylan0@adventure-works.com	Kenmore	Washington	United States
8	8	Diane	Margheim	Research and Development Engineer	diane1@adventure-works.com	Everett	Washington	United States
9	9	Gigi	Matthew	Research and Development Engineer	gigi0@adventure-works.com	Bellevue	Washington	United States
10	10	Michael	Raheem	Research and Development Manager	michael6@adventure-works.com	San Francisco	California	United States
11	11	Ovidiu	Craciun	Senior Tool Designer	ovidiu0@adventure-works.com	Kenmore	Washington	United States
12	12	Thierry	D'Hers	Tool Designer	thierry0@adventure-works.com	Bothell	Washington	United States
13	13	Janice	Galvin	Tool Designer	janice0@adventure-works.com	Redmond	Washington	United States
14	14	Michael	Sullivan	Senior Design Engineer	michael8@adventure-works.com	Renton	Washington	United States
15	15	Sharon	Salavarria	Design Engineer	sharon0@adventure-works.com	Renton	Washington	United States
16	16	David	Bradley	Marketing Manager	david0@adventure-works.com	Redmond	Washington	United States
17	17	Kevin	Brown	Marketing Assistant	kevin0@adventure-works.com	Everett	Washington	United States
18	18	John	Wood	Marketing Specialist	john5@adventure-works.com	Redmond	Washington	United States
19	19	Mary	Dempsey	Marketing Assistant	mary2@adventure-works.com	Bellevue	Washington	United States
20	20	Wanida	Benshoof	Marketing Assistant	wanida0@adventure-works.com	Sammamish	Washington	United States

Query executed successfully.

VERA\SQLEXPRESS (15.0 RTM) | VERA\Vera (63) | HumanResources | 00:00:00 | 290 rows

- **dbo.EmployeesAW**

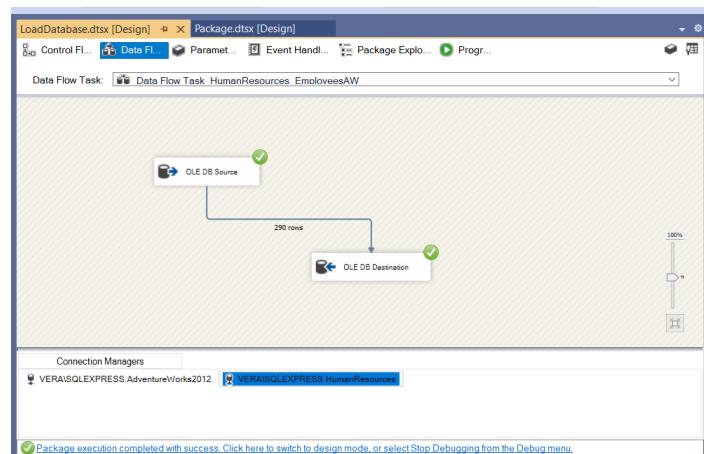
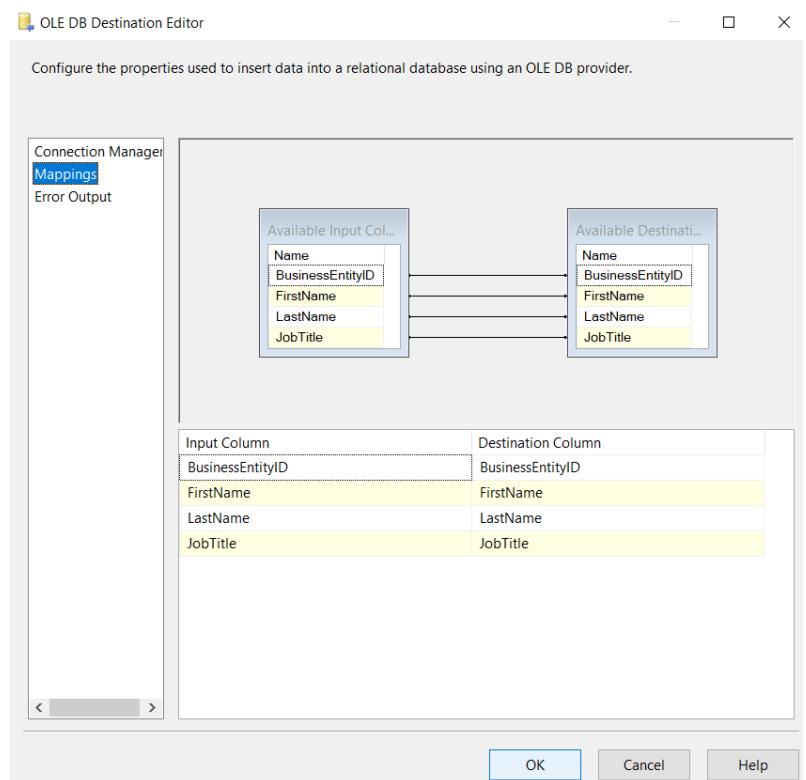
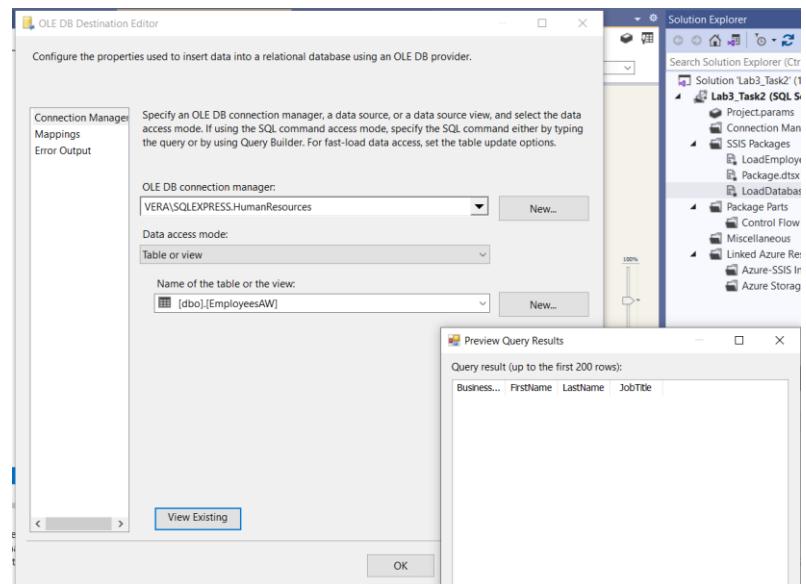
The screenshot shows the SSIS Data Flow Task design interface. It features a central workspace with two main components: an "OLE DB Source" at the top and an "OLE DB Destination" at the bottom. A blue arrow indicates the flow of data from the source to the destination.

OLE DB Source Editor:

- Connection Manager:** Set to "VERA\SQLEXPRESS.AdventureWorks2012".
- Data access mode:** Set to "SQL command".
- SQL command text:**

```
select p.BusinessEntityID,[FirstName],[LastName],JobTitle
from [Person].[Person] p
inner join [HumanResources].[Employee] e
on p.BusinessEntityID = e.BusinessEntityID
order by [BusinessEntityID],[FirstName],[LastName];
```
- Preview Query Results:** A preview window shows the first 200 rows of the query results, matching the data shown in the SQL query results above.

Solution Explorer: Shows the project structure with files like "LoadEmployeeExternal.dtsx" and "Lab3_Task2 (SQL Server 2019)".



HumanResources

SQL Server Object Explorer

\\SQLEXPRESS (SQL Server 15.0.2000 - VERA\Vera)

Databases

System Databases

Database Snapshots

AdventureWorks2012

AdventureWorksDW2012

HumanResources

Security

Server Objects

Application

Management

Event Profiler

SQLQuery_Lab3_Task.s (VERA\Vera (60))

```

JobTitle NVARCHAR(50) NULL);

--DROP TABLE dbo.EmailAddressesAW;

CREATE TABLE dbo.EmailAddressesAW
(
    EmailAddressID INT PRIMARY KEY,
    BusinessEntityID INT NOT NULL,
    EmailAddress NVARCHAR(50) NOT NULL
);

select * from dbo.EmployeesExternal;
select * from dbo.EmployeesAW;

```

100 %

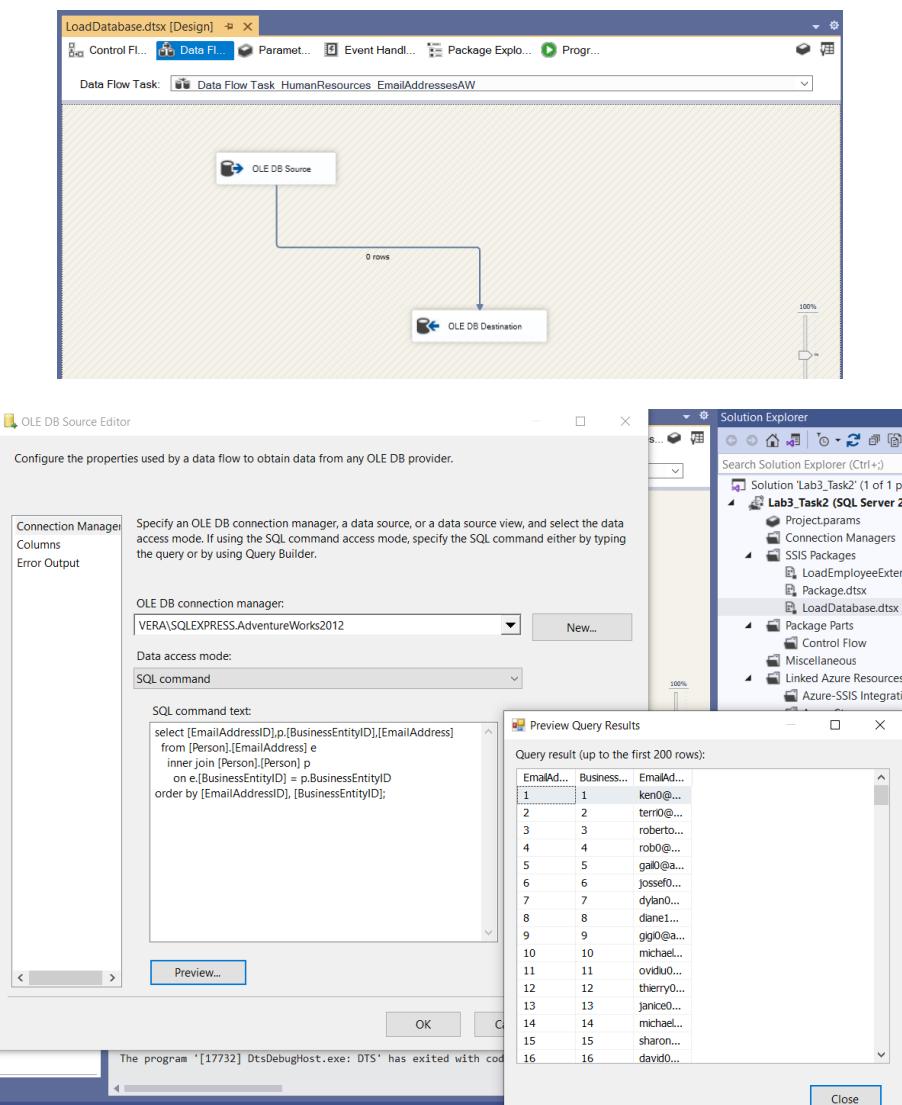
Results

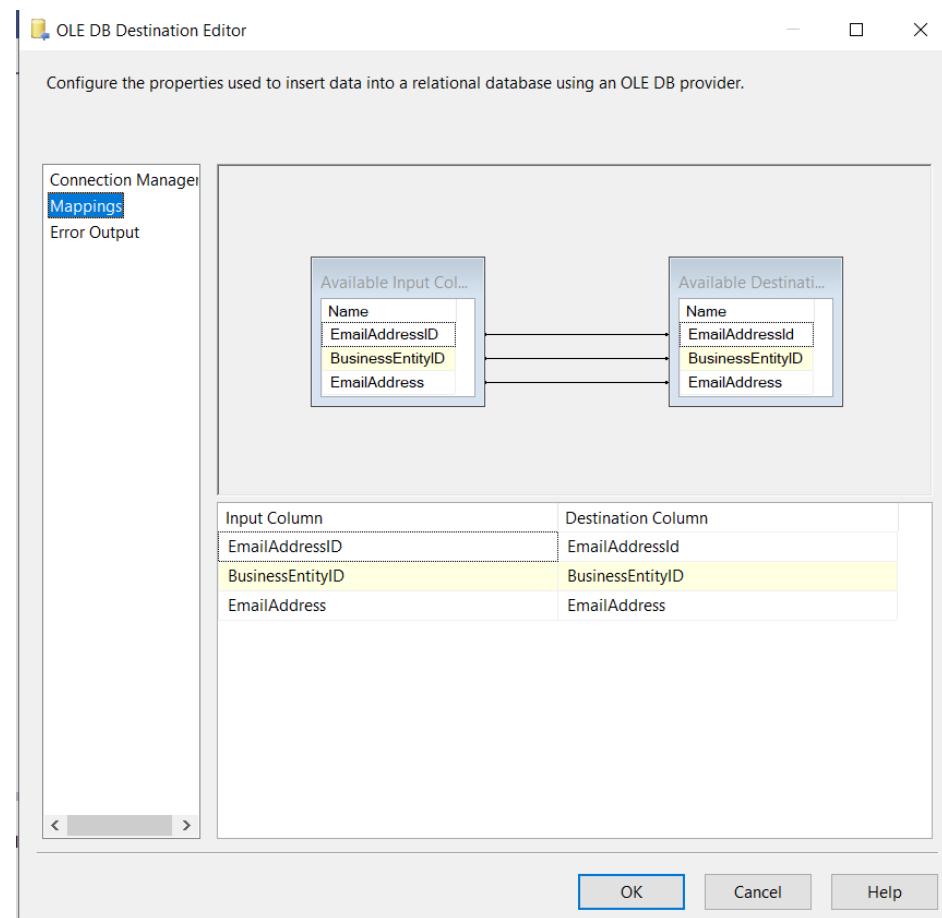
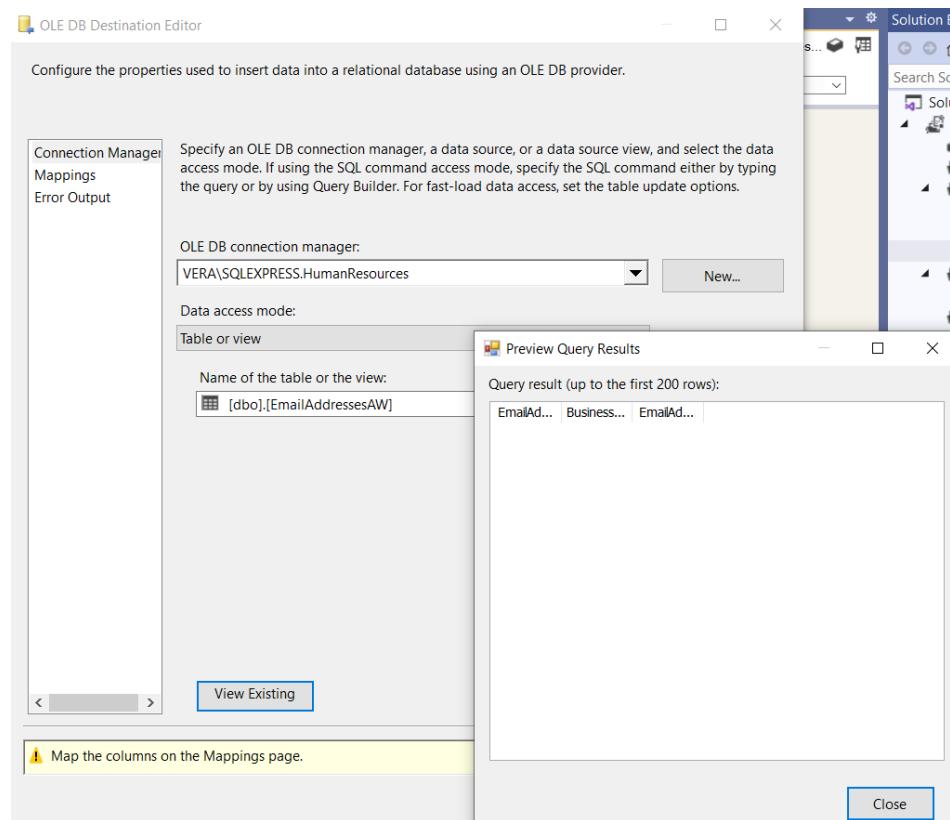
BusinessEntityID	FirstName	LastName	JobTitle
1	Ken	Sánchez	Chief Executive Officer
2	Terri	Duffy	Vice President of Engineering
3	Roberto	Tamburello	Engineering Manager
4	Rob	Walters	Senior Tool Designer
5	Gail	Erickson	Design Engineer
6	Jossef	Goldberg	Design Engineer
7	Dylan	Miller	Research and Development Manager
8	Diane	Margheim	Research and Development Engineer
9	Gigi	Matthew	Research and Development Engineer
10	Michael	Rahiem	Research and Development Manager
11	Ovidiu	Craciun	Senior Tool Designer
12	Thierry	D'Hers	Tool Designer
13	Janice	Galvin	Tool Designer
14	Michael	Sullivan	Senior Design Engineer
15	Sharon	Salavarria	Design Engineer
16	David	Bradley	Marketing Manager
17	Kevin	Brown	Marketing Assistant
18	John	Wood	Marketing Specialist
19	Mary	Dempsey	Marketing Assistant
20	Wanida	Benshoof	Marketing Assistant
21	Terry	Eminizer	Marketing Specialist
22	Sariya	Hampadoungsataya	Marketing Specialist
23	Mary	Gibson	Marketing Specialist
24	Jill	Williams	Marketing Specialist
25	James	Hamilton	Vice President of Production

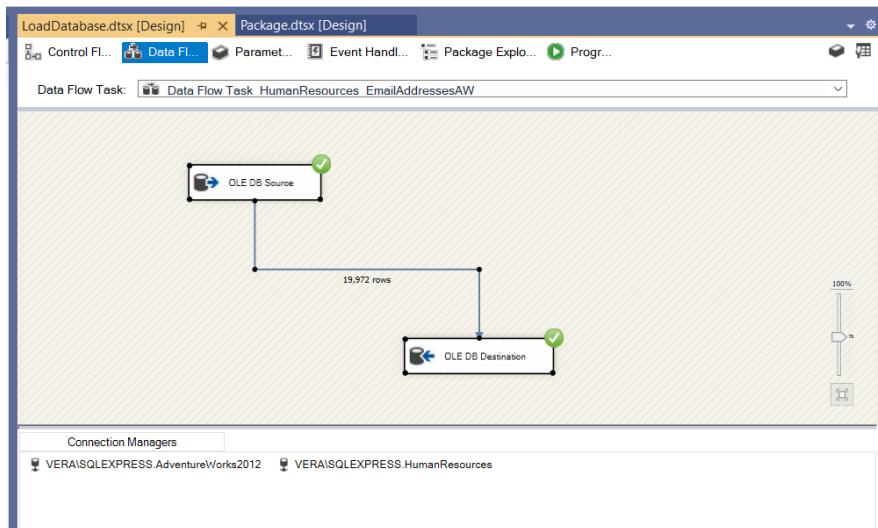
Query executed successfully.

VERA\SQLEXPRESS (15.0 RTM) VERA\Vera (60) HumanResources 00:00:00 | 290 rows

- `dbo.EmailAddressesAW`







```

HumanResources          SQLQuery_Lab3_Task.s (VERA\Vera (60)) 
Server: \SQLEXPRESS (SQL Server 15.0.2000 - VERA\Vera)
Tables: System Databases Database Snapshots AdventureWorks2012 AdventureWorksDW2019 HumanResources Security User Objects Application FlyBase Management Event Profiler

-- DROP TABLE dbo.EmailAddressesAW;
CREATE TABLE dbo.EmailAddressesAW
(EmailAddressId INT PRIMARY KEY,
BusinessEntityID INT NOT NULL,
EmailAddress NVARCHAR(50) NOT NULL);

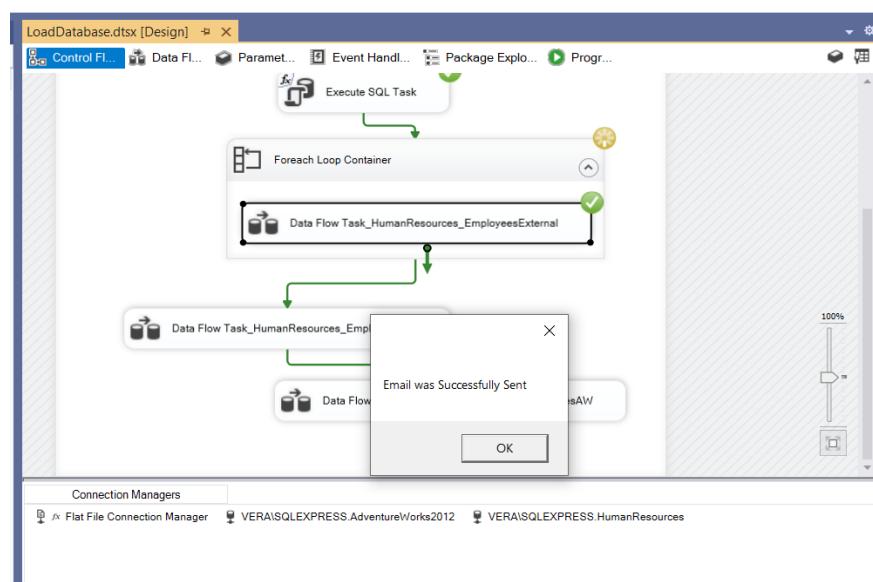
select * from dbo.EmployeesExternal;
select * from dbo.EmployeesAW;
select * from dbo.EmailAddressesAW;
  
```

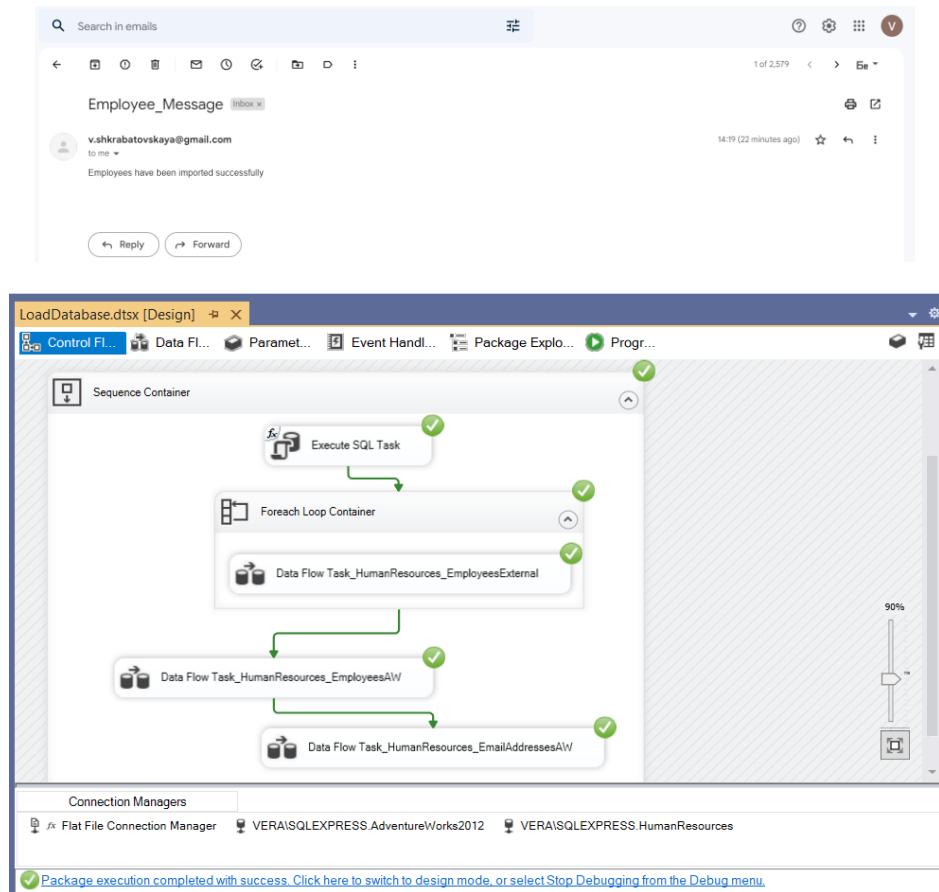
Results

	EmailAddressId	BusinessEntityID	EmailAddress
1	1	1	ken@adventure-works.com
2	2	2	terri@adventure-works.com
3	3	3	roberto@adventure-works.com
4	4	4	rob@adventure-works.com
5	5	5	gail@adventure-works.com
6	6	6	joseph@adventure-works.com
7	7	7	dylan@adventure-works.com
8	8	8	diana1@adventure-works.com
9	9	9	gigi@adventure-works.com
10	10	10	michael@adventure-works.com
11	11	11	ovidiu@adventure-works.com
12	12	12	thien@adventure-works.com
13	13	13	janice@adventure-works.com
14	14	14	michael@adventure-works.com
15	15	15	sharon@adventure-works.com
16	16	16	david@adventure-works.com
17	17	17	kevin@adventure-works.com
18	18	18	john@adventure-works.com
19	19	19	mary@adventure-works.com
20	20	20	wanda@adventure-works.com
21	21	21	terry@adventure-works.com
22	22	22	sariy@adventure-works.com
23	23	23	mary@adventure-works.com
24	24	24	jill@adventure-works.com
25	25	25	james1@adventure-works.com

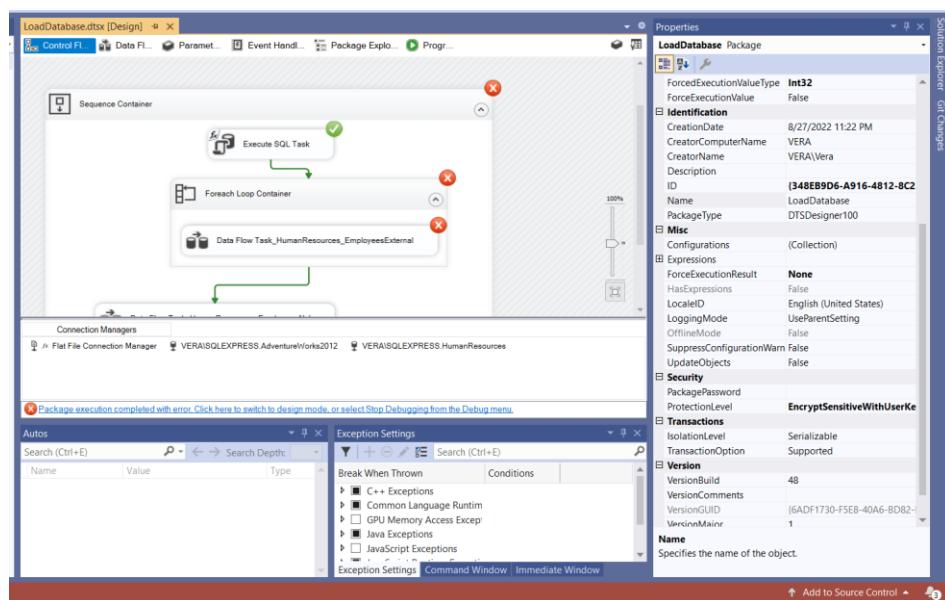
Query executed successfully. | VERAISQLEXPRESS (15.0 RTM) | VERA\Vera (60) | HumanResources | 00:00:00 | 19,972 rows

Result: SSIS solution.





If the package is unsuccessful, a message is sent by mail.



Let's add additional rows with information about employees from the Flat file to the dbo.EmployeesExternal table.

Local Disk (D:) > Vera > !Datamola_2022 > Labs > U3.SQL Server Integration Services (SSIS) > Lab3

Name	Date modified	Type	Size
Lab3_Task2	8/28/2022 3:13 PM	File folder	
EmployeeExternal_1	8/28/2022 2:16 PM	Text Document	60 KB
EmployeeExternal_2	8/28/2022 3:24 PM	Text Document	3 KB

EmployeeExternal_2 - Notepad

```
EmployeeID,FirstName,LastName,JobTitle,EmailAddress,City,StateProvinceName,CountryRegionName
291,Pamela,Ansman-Wolfe,Sales Representative,pamela0@adventure-works.com,Portland,Oregon,United States
292,Shu,Ito,Sales Representative,shu0@adventure-works.com,San Francisco,California,United States
293,José,Saraiva,Sales Representative,josé1@adventure-works.com,Ottawa,Ontario,Canada
294,David,Campbell,Sales Representative,david8@adventure-works.com,Bellevue,Washington,United States
295,Tete,Mensa-Annan,Sales Representative,tete0@adventure-works.com,Cambridge,Massachusetts,United States
296,Syed,Abbas,Pacific Sales Manager,syed0@adventure-works.com,Bothell,Washington,United States
297,Lynn,Tsoflias,Sales Representative,lynno@adventure-works.com,Melbourne,Victoria,Australia
298,Amy,Alberts,European Sales Manager,amy0@adventure-works.com,Renton,Washington,United States
299,Rachel,Valdez,Sales Representative,rachel0@adventure-works.com,Berlin,Hamburg,Germany
300,Jae,Pak,Sales Representative,jae0@adventure-works.com,Cambridge,England,United Kingdom
301,Ranjit,Varkey Chudukatil,Sales Representative,ranjit0@adventure-works.com,Bordeaux,Gironde,France
```

LoadDatabase.dtsx [Design]

Properties

LoadDatabase Package

- ForcedExecutionValueType: Int32
- ForceExecutionValue: False
- Identification**
 - CreationDate: 8/27/2022 11:22 PM
 - CreatorComputerName: VERA
 - CreatorName: VERA\Vera
 - Description:
 - ID: (348EB9D6-A916-4812-8C2
 - Name: LoadDatabase
 - PackageType: DTSDesigner100
- Misc**
 - Configurations: (Collection)
- Expressions**
 - ForceExecutionResult: None
 - HasExpressions: False
 - LocaleID: English (United States)
 - LoggingMode: UseParentSetting
 - OfflineMode: False
 - SuppressConfigurationWarn: False
 - UpdateObjects: False
- Security**
 - PackagePassword:
 - ProtectionLevel: EncryptSensitiveWithUserKe
- Transactions**
 - IsolationLevel: Serializable
 - TransactionOption: Supported
- Version**
 - VersionBuild: 48
 - VersionComments:
 - VersionGUID: (6ADF1730-F5E8-40A6-BD82-1
 - VersionMajor: 1

Connection Managers

Package execution completed with success. Click here to switch to design mode, or select Stop Debugging from the Debug menu.

Autos

Exception Settings

Break When Thrown Conditions

- C++ Exceptions
- Common Language Runtime
- GPU Memory Access Excep
- Java Exceptions

Exception Settings | Command Window | Immediate Window

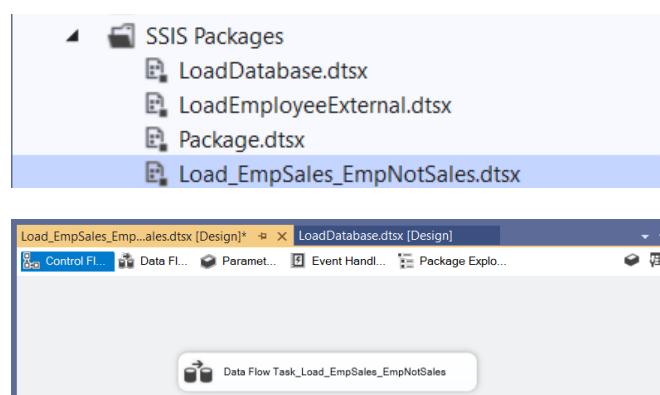
Add to Source Control 3:25 PM

As we can see, additional rows from the EmployeeExternal_2.txt file were added to the table.

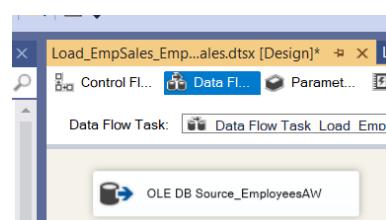
Results									
EmployeeID	FirstName	LastName	JobTitle	EmailAddress	City	StateProvinceName	CountryRegionName		
269	269	Dan	Bacon	Application Specialist	dan0@adventure-works.com	Issaquah	Washington	United States	
270	270	François	Ajenstat	Database Administrator	francois0@adventure-works.com	Issaquah	Washington	United States	
271	271	Dan	Wilson	Database Administrator	dani1@adventure-works.com	Bellevue	Washington	United States	
272	272	Janaina	Bueno	Application Specialist	janaina0@adventure-works.com	Issaquah	Washington	United States	
273	273	Brian	Welcker	Vice President of Sales	brian3@adventure-works.com	Issaquah	Washington	United States	
274	274	Stephen	Jiang	North American Sales Manager	stephen0@adventure-works.com	Redmond	Washington	United States	
275	275	Michael	Blythe	Sales Representative	michael9@adventure-works.com	Detroit	Michigan	United States	
276	276	Linda	Mitchell	Sales Representative	linda3@adventure-works.com	Nevada	Utah	United States	
277	277	Jillian	Carson	Sales Representative	jillian0@adventure-works.com	Duluth	Minnesota	United States	
278	278	Garrett	Vargas	Sales Representative	garrett1@adventure-works.com	Calgary	Alberta	Canada	
279	279	Tsvi	Reiter	Sales Representative	tsvi0@adventure-works.com	Memphis	Tennessee	United States	
280	280	Pamela	Anzman-Wolfe	Sales Representative	pamela0@adventure-works.com	Portland	Oregon	United States	
281	281	Shu	Ito	Sales Representative	shu0@adventure-works.com	San Francisco	California	United States	
282	282	José	Saraiva	Sales Representative	josé1@adventure-works.com	Ottawa	Ontario	Canada	
283	283	David	Campbell	Sales Representative	david8@adventure-works.com	Bellevue	Washington	United States	
284	284	Tete	Mensa-Annan	Sales Representative	tete0@adventure-works.com	Cambridge	Massachusetts	United States	
285	285	Syed	Abbas	Pacific Sales Manager	syed0@adventure-works.com	Bothell	Washington	United States	
286	286	Lynn	Tsoflias	Sales Representative	lynn0@adventure-works.com	Melbourne	Victoria	Australia	
287	287	Amy	Alberts	European Sales Manager	amy0@adventure-works.com	Renton	Washington	United States	
288	288	Rachel	Valdez	Sales Representative	rachel0@adventure-works.com	Berlin	Hamburg	Germany	
289	289	Jae	Pak	Sales Representative	jae0@adventure-works.com	Cambridge	England	United Kingdom	
290	290	Ranjit	Varkey Chudukatil	Sales Representative	ranjit0@adventure-works.com	Bordeaux	Gironde	France	
291	291	Pamela	Anzman-Wolfe	Sales Representative	pamela0@adventure-works.com	Portland	Oregon	United States	
292	292	Shu	Ito	Sales Representative	shu0@adventure-works.com	San Francisco	California	United States	
293	293	José	Saraiva	Sales Representative	josé1@adventure-works.com	Ottawa	Ontario	Canada	
294	294	David	Campbell	Sales Representative	david8@adventure-works.com	Bellevue	Washington	United States	
295	295	Tete	Mensa-Annan	Sales Representative	tete0@adventure-works.com	Cambridge	Massachusetts	United States	
296	296	Syed	Abbas	Pacific Sales Manager	syed0@adventure-works.com	Bothell	Washington	United States	
297	297	Lynn	Tsoflias	Sales Representative	lynn0@adventure-works.com	Melbourne	Victoria	Australia	
298	298	Amy	Alberts	European Sales Manager	amy0@adventure-works.com	Renton	Washington	United States	
299	299	Rachel	Valdez	Sales Representative	rachel0@adventure-works.com	Berlin	Hamburg	Germany	
300	300	Jae	Pak	Sales Representative	jae0@adventure-works.com	Cambridge	England	United Kingdom	
301	301	Ranjit	Varkey Chudukatil	Sales Representative	ranjit0@adventure-works.com	Bordeaux	Gironde	France	

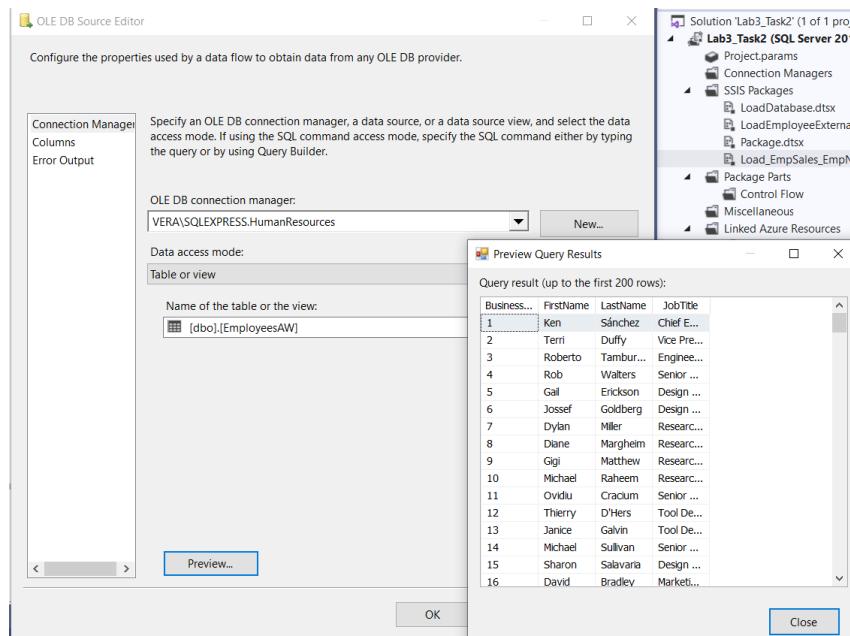
3. Exercise 3: Creating ETL solution to export the data from HumanResourcesdb

Create the Load_EmpSales_EmpNotSales package.

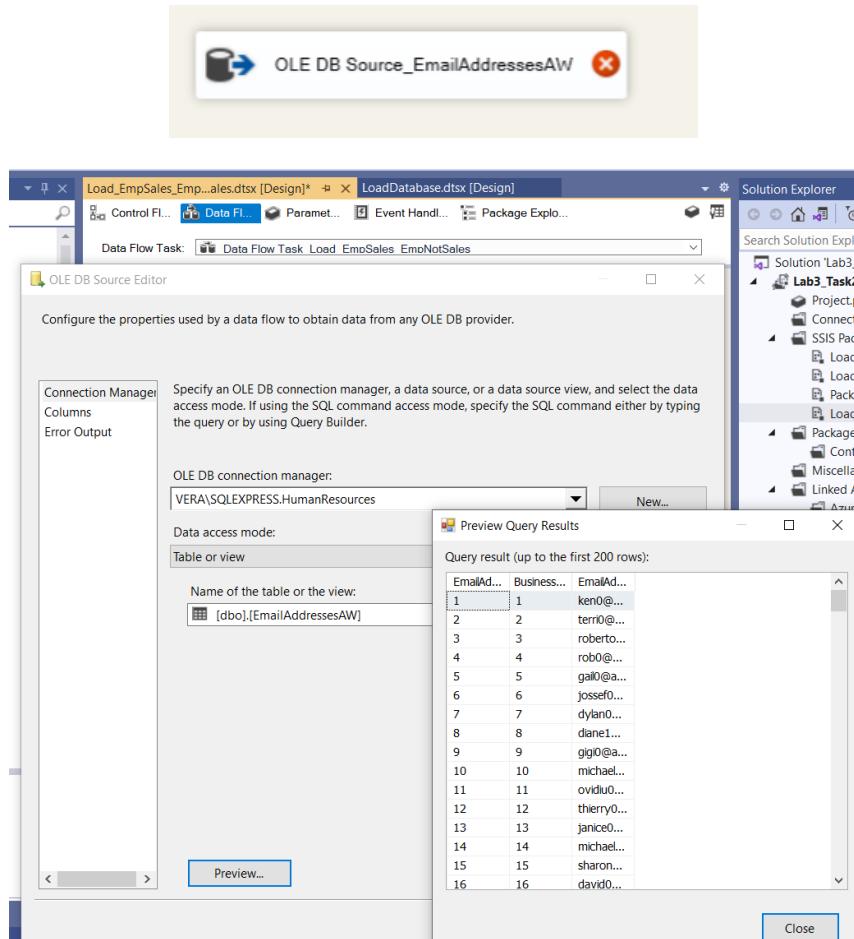


Let's set up loading data from the EmployeesAW table in the Human Resources database.



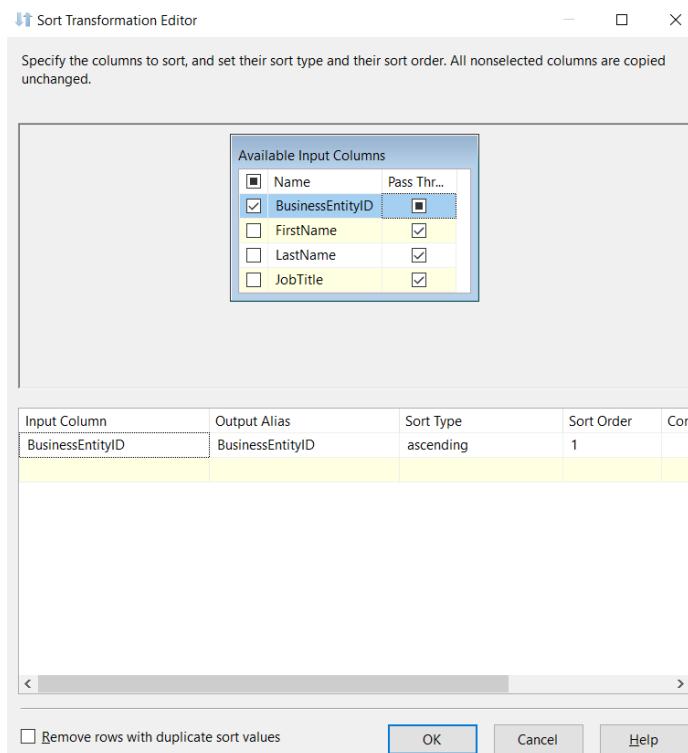


Let's set up loading data from the EmailAddressesAW table in the Human Resources database.

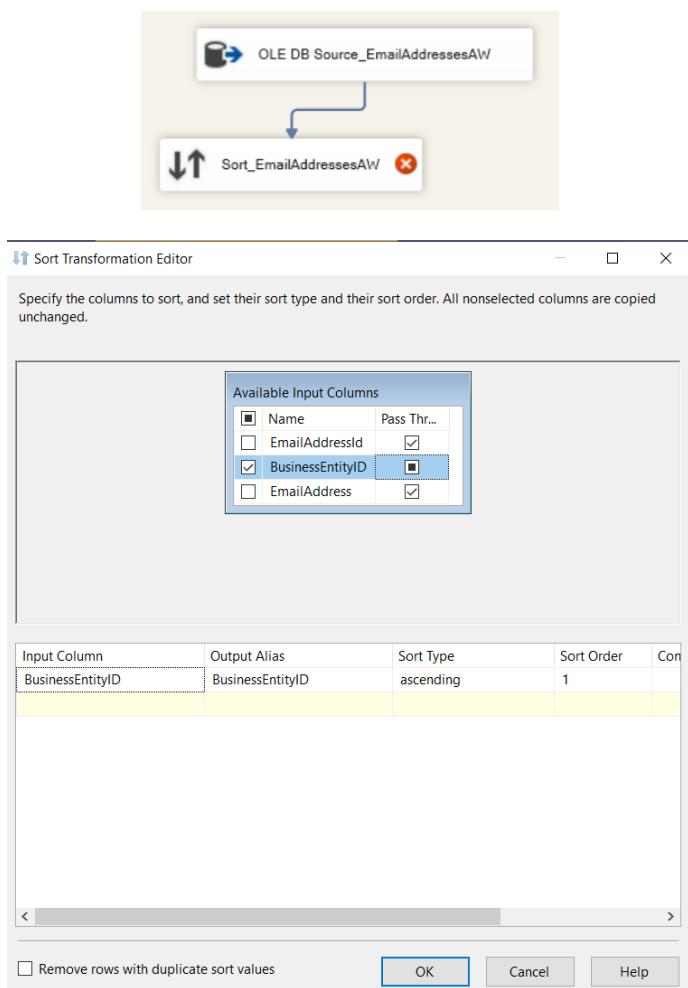


Let's sort the data by BusinessEntityID in the EmployeesAW table.





Let's sort the data by BusinessEntityID in the EmailAddressesAW table.

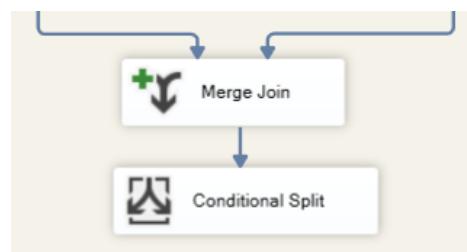


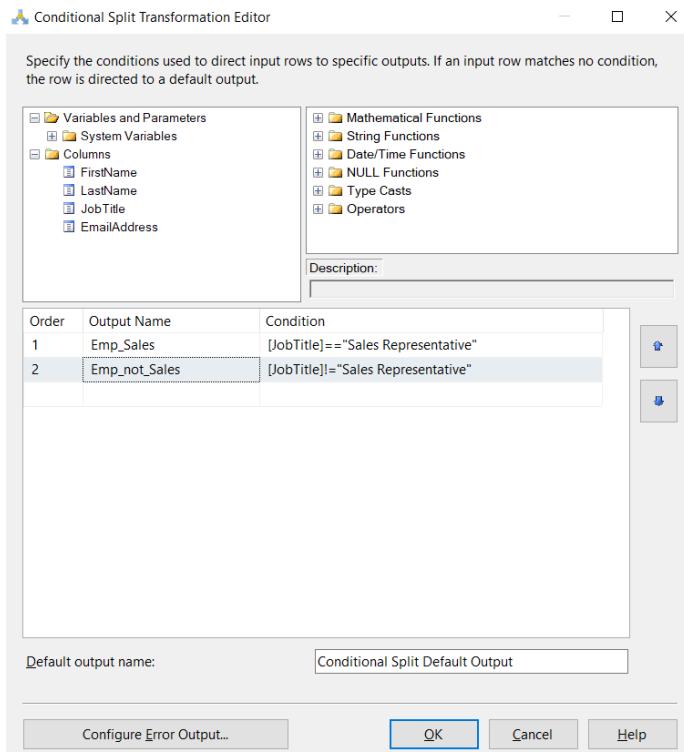
Let's use Merge Join to combine data from two tables.

The screenshot shows the 'Merge Join Transformation Editor' window. At the top, a modal dialog titled 'Input Output Selection' is open, prompting the user to select an output and input. The 'Output' dropdown is set to 'Sort Output'. The 'Input' dropdown is set to 'Merge Join Left Input'. Below this, the main editor area shows two tables: 'Sort_EmployeesAW' and 'Sort_EmailAddressesAW'. The 'Join type' is set to 'Inner join'. The 'Sort_EmployeesAW' table has columns: Name, BusinessEntityID, FirstName, LastName, and JobTitle. The 'FirstName' column is selected for the join key. The 'Sort_EmailAddressesAW' table has columns: Name, EmailAddressId, BusinessEntityID, and EmailAddress. The 'BusinessEntityID' column is selected for the join key. A mapping grid below shows the columns being mapped to output aliases:

Input	Input Column	Output Alias
Sort_EmployeesAW	FirstName	FirstName
Sort_EmployeesAW	LastName	LastName
Sort_EmailAddressesAW	EmailAddress	EmailAddress
Sort_EmployeesAW	JobTitle	JobTitle

Let's use Conditional Split to partition data from two tables. The first text file should include only employees with JobTitle = "Sales Representative". The second text file should include all other employees.





Let's set up an upload of employee data from the "Sales Representative" department to Flat File.

The data in the files must be sorted by the employees' last names and then first names.

Input Column	Output Alias	Sort Type	Sort Order	Condition
FirstName	FirstName	ascending	2	
LastName	LastName	ascending	1	

Remove rows with duplicate sort values

Flat File Destination_Emp_Sales

Input Output Selection

The source or the destination component contains multiple inputs or outputs. Select an input and an output to connect the components.

Output: Emp_Sales

Input: Flat File Destination Input

Flat File Destination Editor

Configure the properties used to connect to and insert data into a text file.

Connection Manager

Flat File connection manager: New...

Overwrite data in the file

Flat File Format

Choose the format of the destination flat file.

Delimited

The columns are delimited by commas, except the last one which is delimited by the new line character.

Fixed width

The columns are defined by fixed widths.

Fixed width with row delimiters

The columns are defined by fixed widths. An extra column, delimited by the new line characters, is added to define row delimiters.

Ragged right

The columns are defined by fixed widths, except the last one which is delimited by the new line character.

Flat File Connection Manager Editor

Connection manager name: Flat File Connection Manager

Description:

General

Select a file and specify the file properties and the file format.

File name: D:\Vera\Datamola_2022\Labs\U3.SQL

Locale: English (United States) Unicode

Code page: 1252 (ANSI - Latin I)

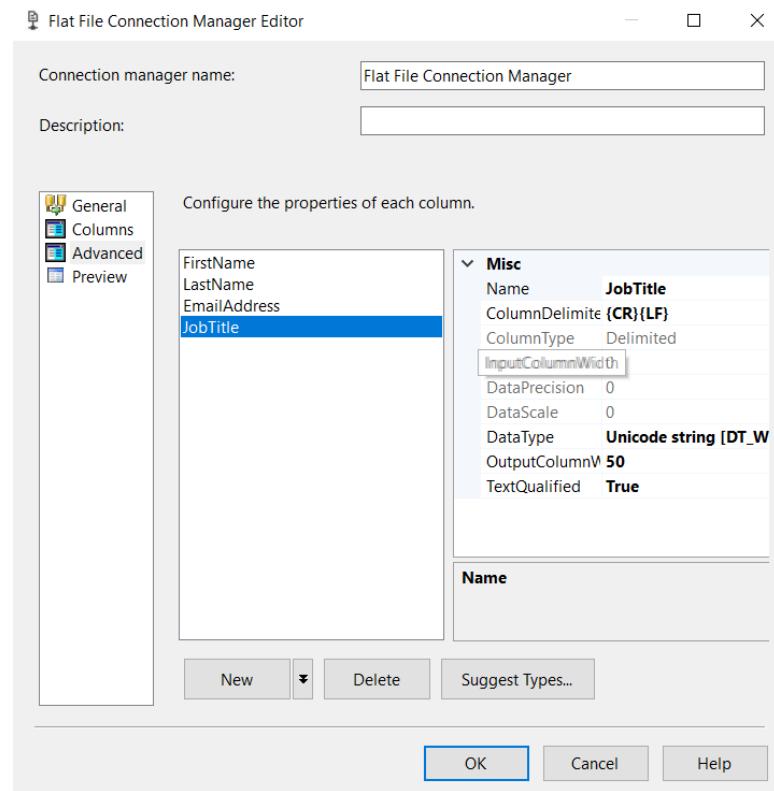
Format: Delimited

Text qualifier: <none>

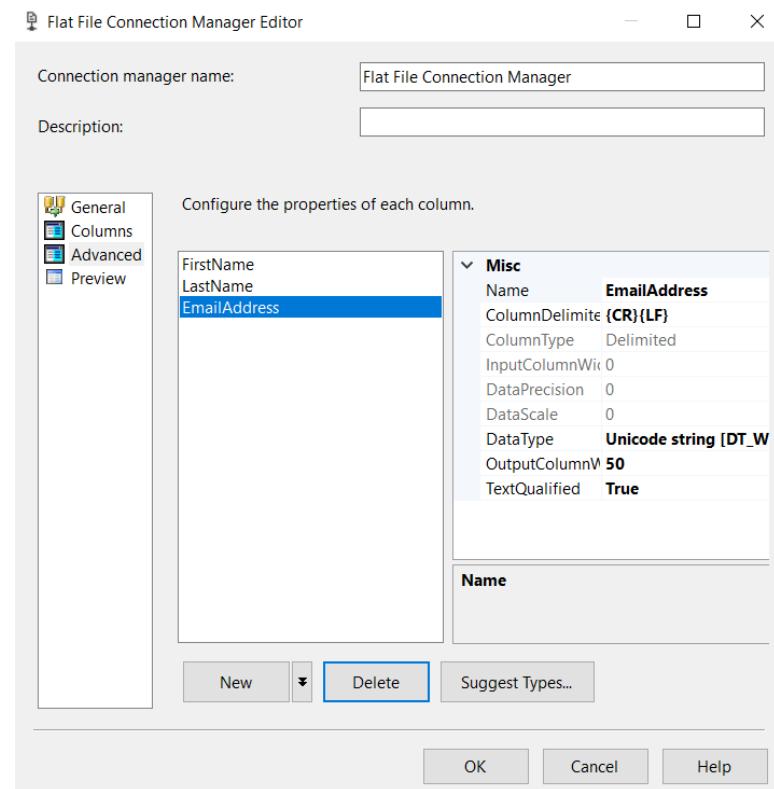
Header row delimiter: (CR)(LF)

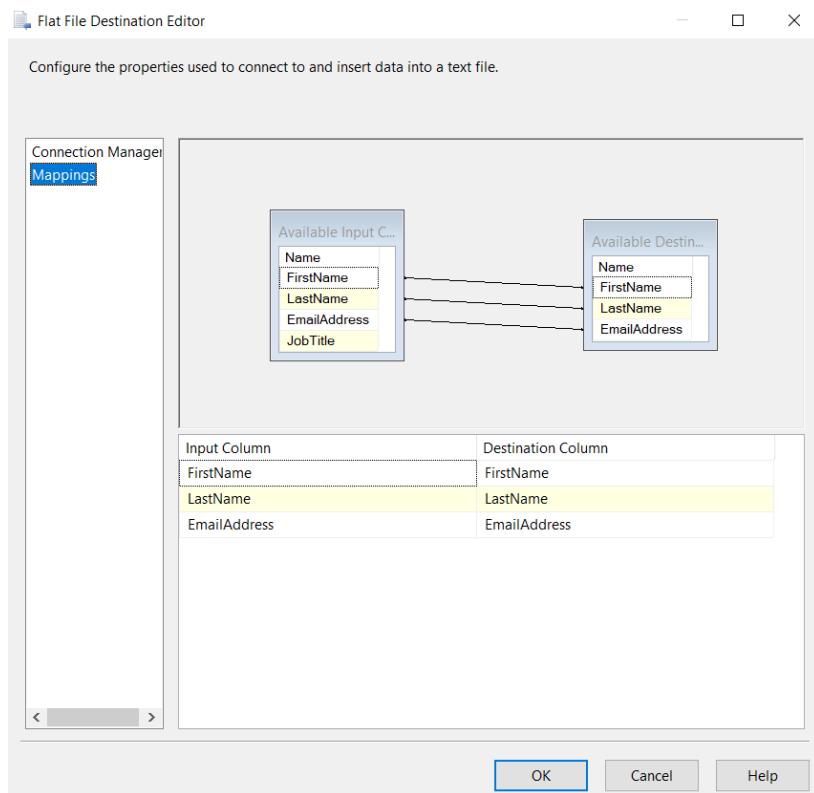
Header rows to skip: 0

Column names in the first data row

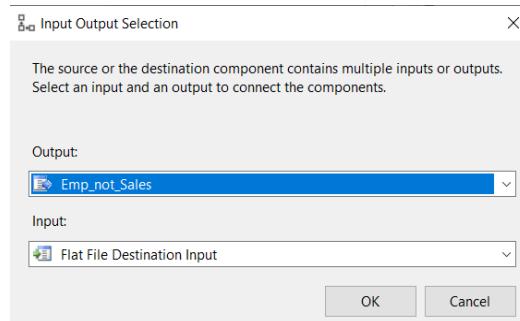


Let's delete the Job Title column, since it is not required in the Flat File upload.

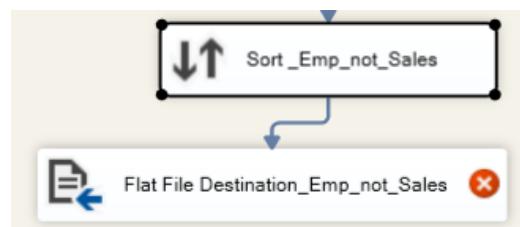


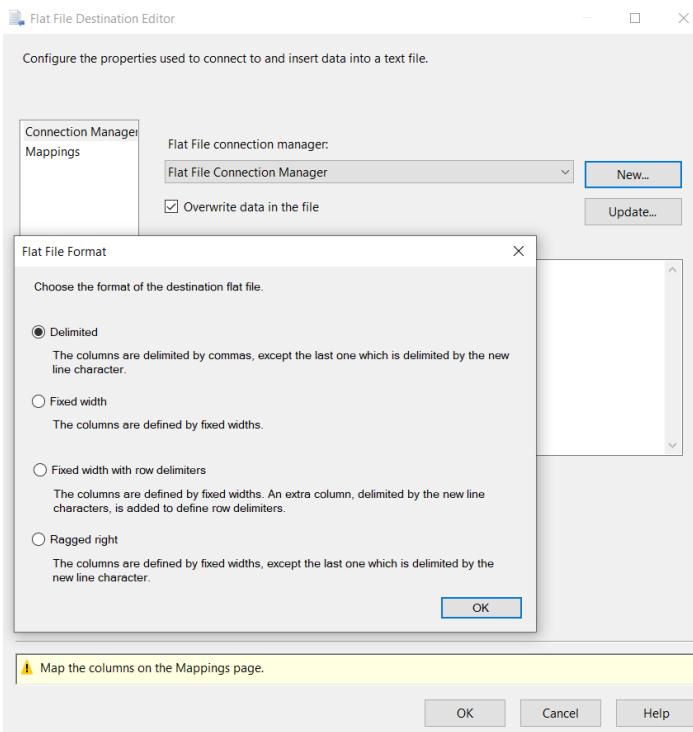
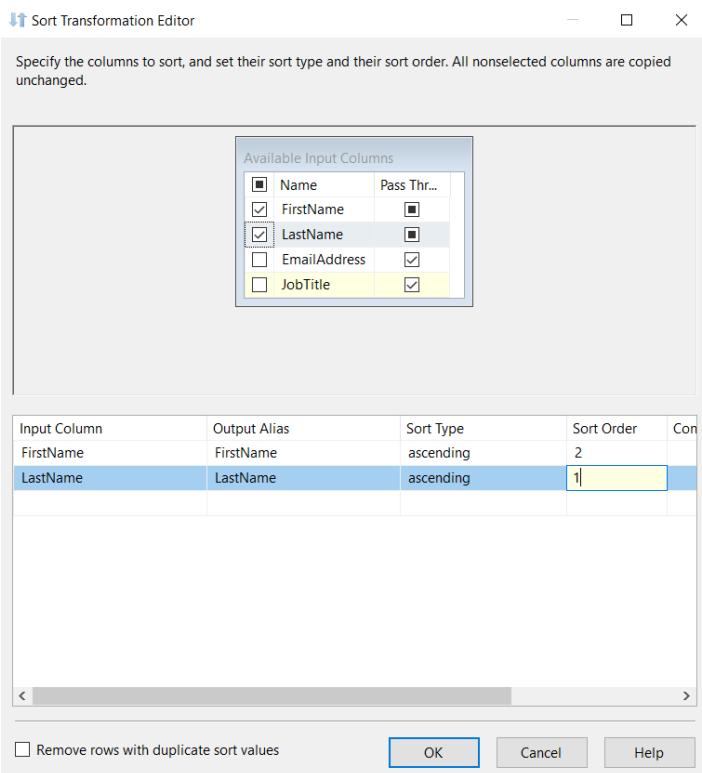


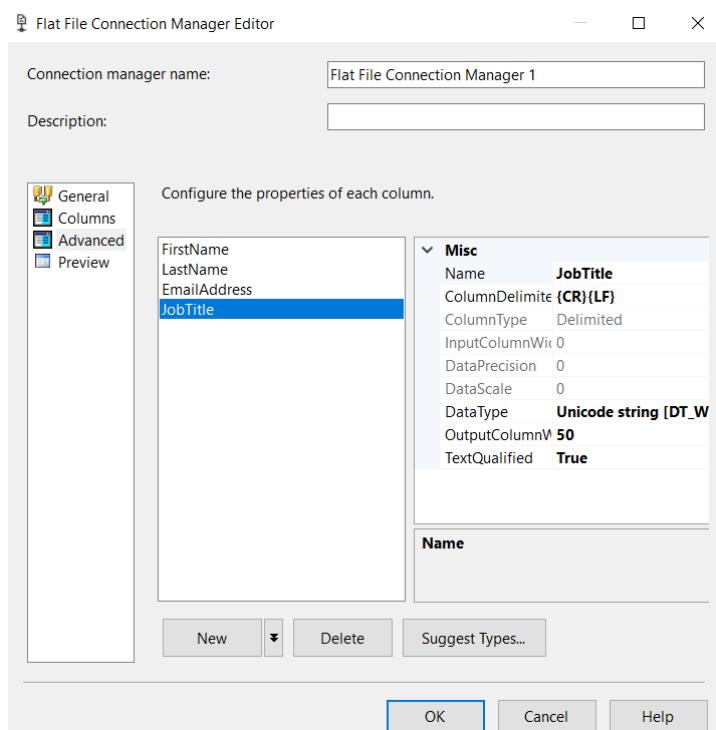
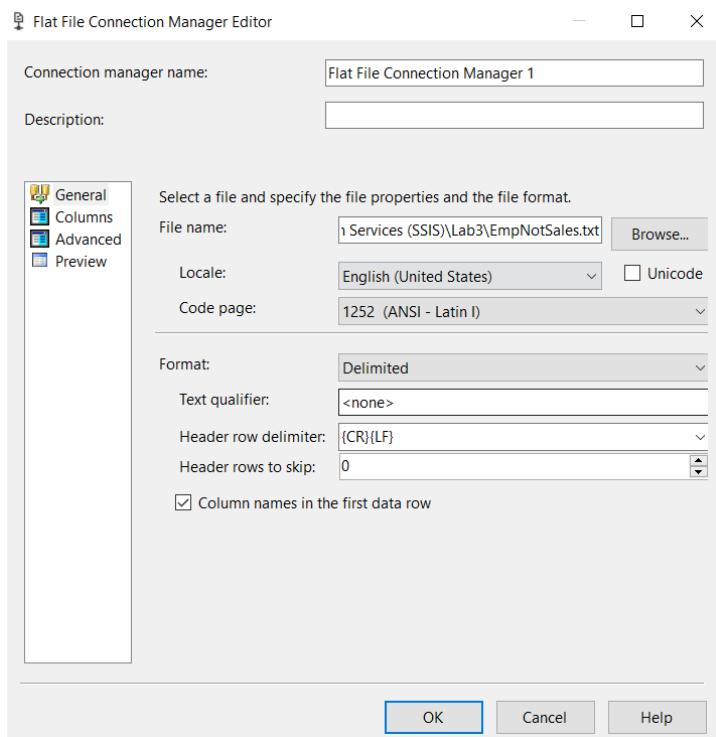
Let's set up the unloading of employee data from outside the Sales Representative department to Flat File.



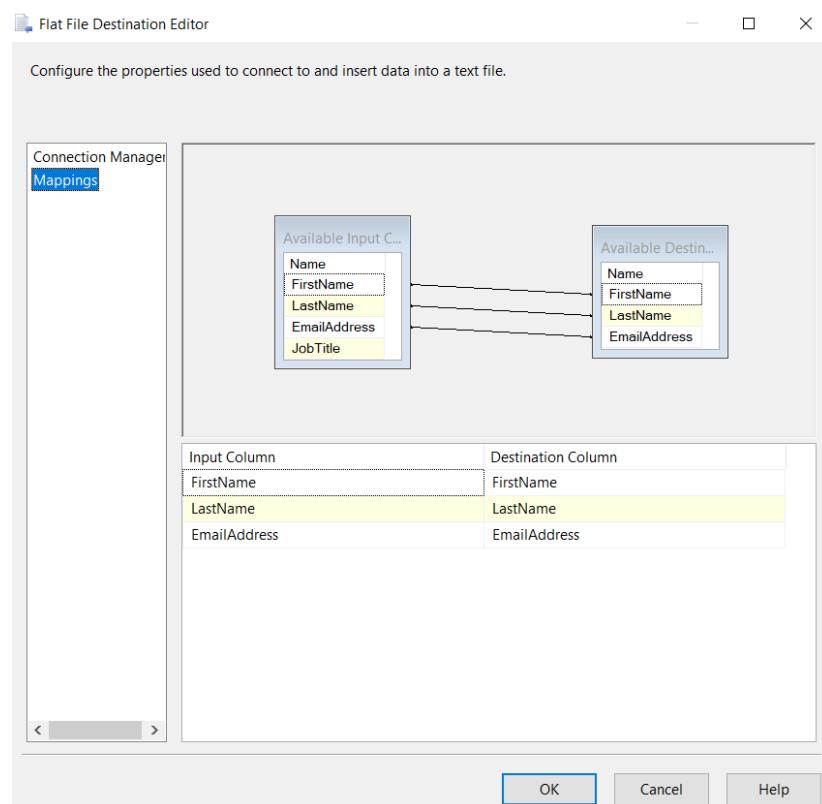
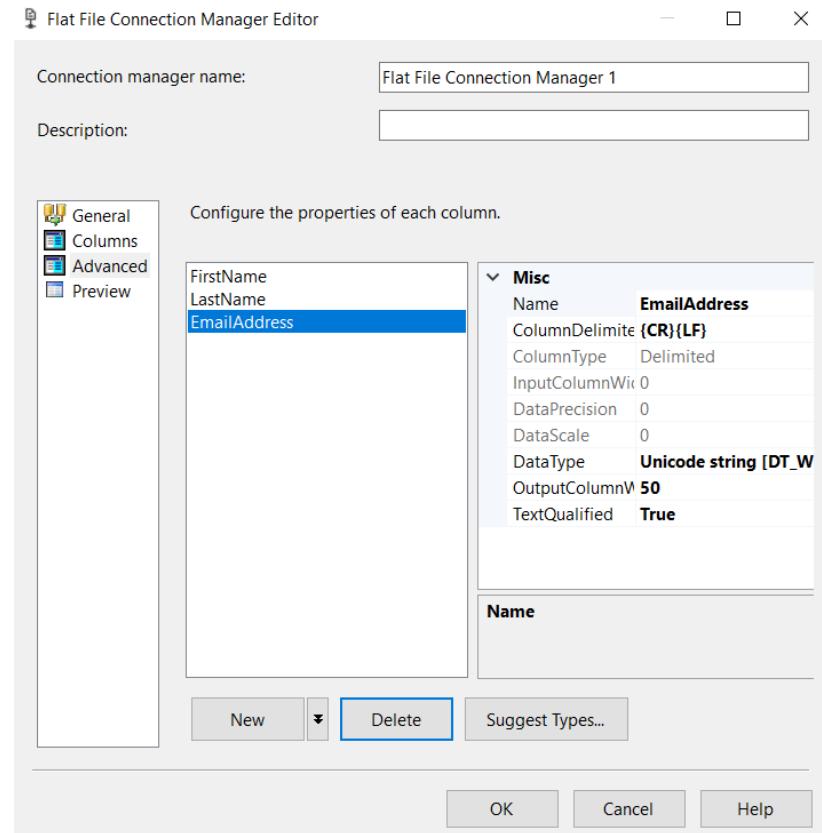
The data in the files must be sorted by the employees' last names and then first names.



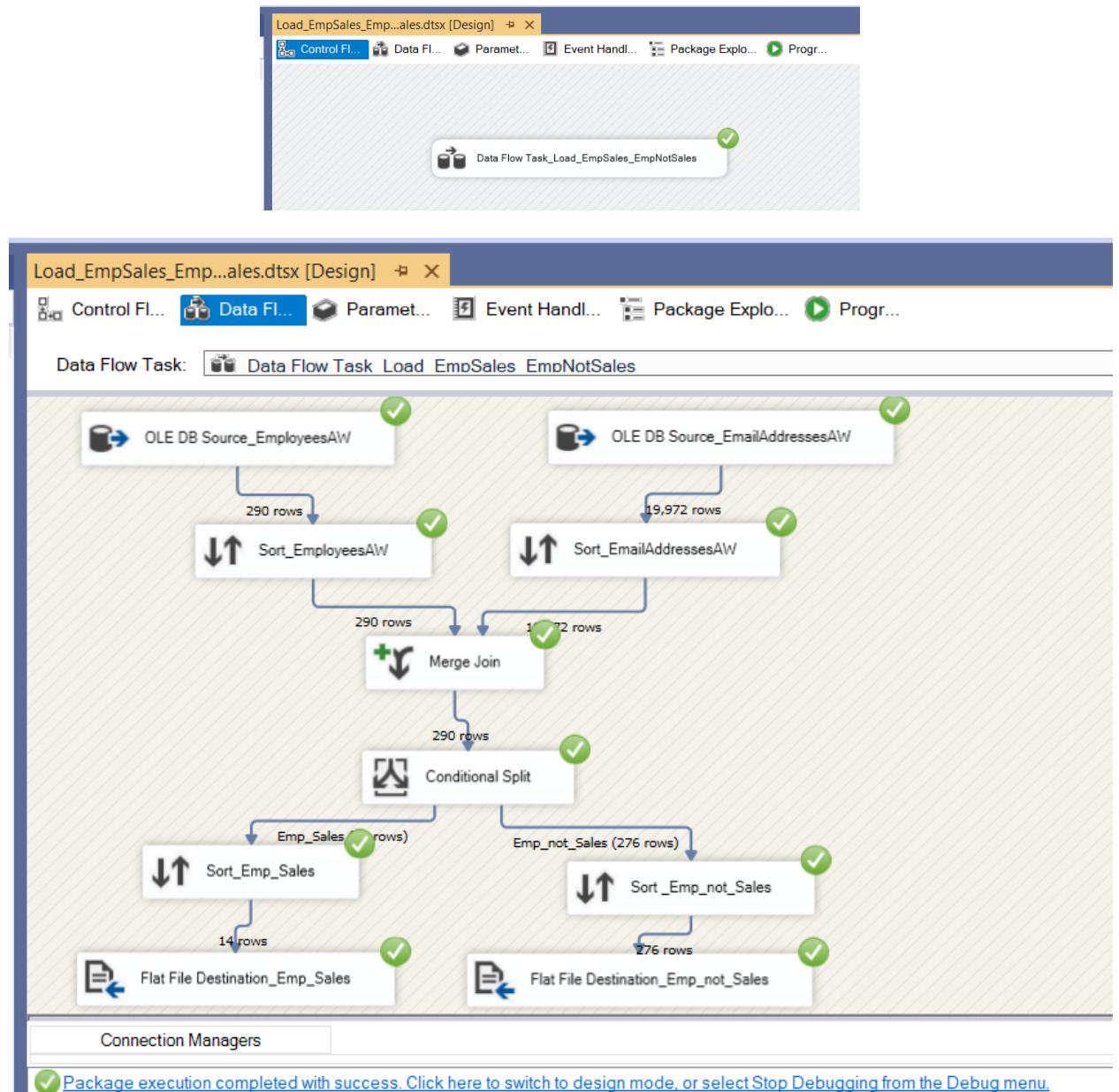




Let's delete the Job Title column, since it is not required in the Flat File upload.



Let's run the Load_EmpSales_EmpNotSales package.



EmpSales		8/29/2022 12:30 PM	Text Document	2 KB
EmpSales - Notepad				
File	Edit	Format	View	Help
FirstName,LastName,EmailAddress	Pamela,Anzman-Wolfe,pamela@adventure-works.com			
Michael,Blythe,michael9@adventure-works.com				
David,Campbell,david8@adventure-works.com				
Jillian,Carson,jillian0@adventure-works.com				
Shu,Ito,shu0@adventure-works.com				
Tete,Mensa-Annan,tete0@adventure-works.com				
Linda,Mitchell,linda3@adventure-works.com				
Jae,Pak,jae0@adventure-works.com				
Tsvi,Reiter,tsvi0@adventure-works.com				
José,Saraiva,josé1@adventure-works.com				
Lynn,Tsoflias,lynn0@adventure-works.com				
Rachel,Valdez,rachel0@adventure-works.com				
Garrett,Vargas,garrett1@adventure-works.com				
Ranjit,Varkey Chudukatil,ranjit0@adventure-works.com				

EmpNotSales

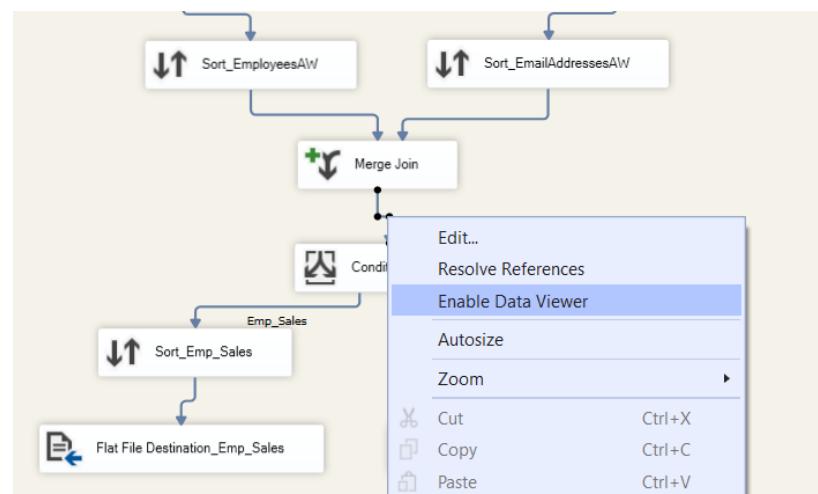
8/29/2022 12:30 PM Text Document 23 KB

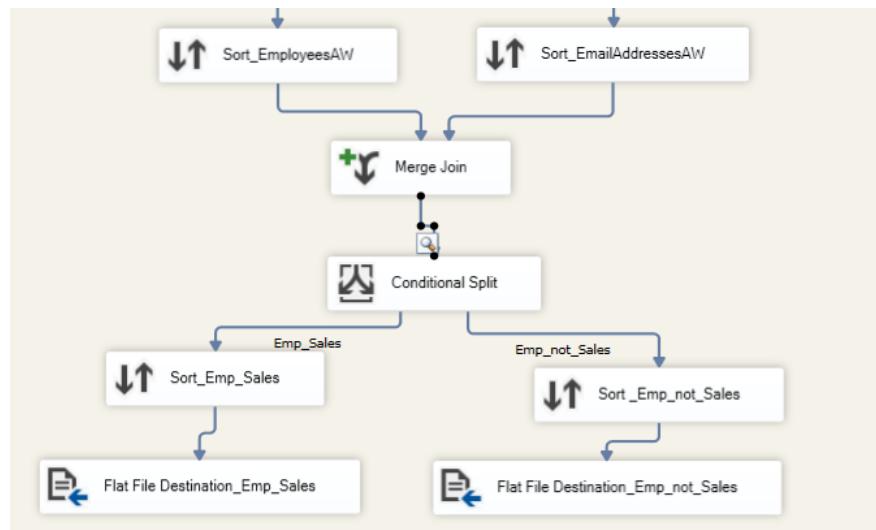
```
EmpNotSales - Notepad
File Edit Format View Help
FirstName,LastName,EmailAddress
Syed,Abbas,syed0@adventure-works.com
Kim,Abercrombie,kim1@adventure-works.com
Hazem,Abolrous,hazem0@adventure-works.com
Pilar,Ackerman,pilar0@adventure-works.com
Jay,Adams,jay0@adventure-works.com
François,Ajenstat,françois0@adventure-works.com
Amy,Alberts,amy0@adventure-works.com
Greg,Alderson,greg0@adventure-works.com
Sean,Alexander,sean0@adventure-works.com
Gary,Altman,gary1@adventure-works.com
Nancy,Anderson,nancy0@adventure-works.com
Zainal,Arifin,zainal0@adventure-works.com
Dan,Bacon,dan0@adventure-works.com
Bryan,Baker,bryan0@adventure-works.com
Mary,Baker,mary1@adventure-works.com
Angela,Barbariol,angela0@adventure-works.com
David,Barber,david5@adventure-works.com
Paula,Barreto de Mattos,paula0@adventure-works.com
Wanida,Benshoof,wanida0@adventure-works.com
Karen,Berg,karen1@adventure-works.com
Karen,Berge,karen0@adventure-works.com
Andreas,Berglund,andreas0@adventure-works.com
Matthias,Berndt,matthias0@adventure-works.com
Jo,Berry,jo1@adventure-works.com
Jimmy,Bischoff,jimmy0@adventure-works.com
David,Bradley,david0@adventure-works.com
Alan,Brewer,alan0@adventure-works.com
Eric,Brown,eric1@adventure-works.com
Jo,Brown,joo@adventure-works.com
Kevin,Brown,kevin0@adventure-works.com
Janaina,Bueno,janaina0@adventure-works.com
John,Campbell,john0@adventure-works.com
```

4. Exercise 4: Using Data Viewers

Let's verify and test data flows functionality using data viewers.

- Add a grid data viewer.





- Run the package, and view the data viewer.

Screenshot of the SSIS Data Flow Task window showing the execution of the package. The Data Flow Task is named "Load_EmpSales_EmpNotSales".

The Data Flow diagram consists of the following components:

- OLE DB Source_EmployeesAW** and **OLE DB Source_EmailAddressesAW** (Sources)
- Sort_EmployeesAW** and **Sort_EmailAddressesAW** (Sort transformations, each with 290 rows output)
- Merge Join** (Join transformation, outputting 1,72 rows)
- Conditional Split** (Split transformation)
 - Emp_Sales** path (290 rows) leads to **Sort_Emp_Sales** and then to **Flat File Destination_Emp_Sales**.
 - Emp_not_Sales** path (1,72 rows) leads to **Sort_Emp_not_Sales** and then to **Flat File Destination_Emp_not_Sales**.
- Flat File Destinations**: **Flat File Destination_Emp_Sales** and **Flat File Destination_Emp_not_Sales**

The Properties pane shows the **Merge Join Output** properties:

- Common Properties**
 - Description: 259
 - IdentificationString: Paths[Merge Join.M]
 - Name: Merge Join Output
- Design**
 - PathAnnotation: AsNeeded
- Misc**

The Data Viewer pane displays the results of the merge join:

FirstName	LastName	EmailAddress	JobTitle
Ken	Sánchez	ken0@adventure-works.com	Chief Executive Officer
Terri	Duffy	terri0@adventure-works.com	Vice President of Engineering
Roberto	Tamburello	roberto0@adventure-works....	Engineering Manager
Rob	Walters	rob0@adventure-works.com	Senior Tool Designer
Gail	Erickson	gail0@adventure-works.com	Design Engineer
Jossef	Goldberg	jossef0@adventure-works.c...	Design Engineer
Dylan	Miller	dylan0@adventure-works.c...	Research and Development
Diane	Margheim	diane1@adventure-works.c...	Research and Development
Gigi	Matthew	gigi0@adventure-works.com	Research and Development
Michael	Raheem	michael8@adventure-works...	Research and Development
Ovidiu	Cracum	ovidiu0@adventure-works.c...	Senior Tool Designer
Thierry	D'Hers	thierry0@adventure-works...	Tool Designer
Janice	Galvin	jance0@adventure-works.c...	Tool Designer
Michael	Sullivan	michael8@adventure-works....	Senior Design Engineer
Sharon	Salavarria	sharon0@adventure-works....	Design Engineer
David	Bradley	david0@adventure-works.c...	Marketing Manager
Kevin	Brown	kevin0@adventure-works.c...	Marketing Assistant
Inhn	Wood	inhn5@adventure-works.com	Marketinn Specialist

Autos and Connection Managers panes are also visible at the bottom of the interface.

- Remove the data viewer.

