

# **ARMDD**

## **EXERCISE 6 TUTORIAL**

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DEI-ISEP



# Get Started

Build your first app in 5 minutes!

Maximize your productivity with these tips and tricks for Visual Studio

Take advantage of the newest technologies to deploy beautiful, low-cost and reliable websites

Develop modern, fully-native, Android and iOS apps

Produce more, fix faster and deliver updates seamlessly

# Recent

This week

- Data Mart.sln**  D:\Temp\ARPAD\Data Mart
- Create Date Dimension 2.sln** D:\Temp\ARPAD\Create Date Dimension 2
- Create CSV Date Dimension.sln** D:\Temp\ARPAD\Create CSV Date Dimension

## Open

Get code from a remote version control system or open something on your local drive.

Checkout from:

- Azure DevOps

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- Open Project / Solution**
- Open Folder**

## New project

Search project templates 

Recent project templates:

- Analysis Services M... Analysis Services
- Integration Serv... Business Intelligence
- Analysis Services M... Analysis Services

[Create new project...](#)

## Developer News

Visual Studio 2019 v16.8 and v16.9 Preview 1 Release  
Visual Studio team is proud to announce the release of Visual Studio 2019 v16.8 and v16.9 Preview 1. These releases have several notable f... [NEW 12 de novembro de 2020](#)

Announcing the Release of the Git Experience in Visual Studio  
We're excited to announce that our new Git tooling is now the default source control experience in Visual Studio 2019, beginning wit... [NEW 12 de novembro de 2020](#)

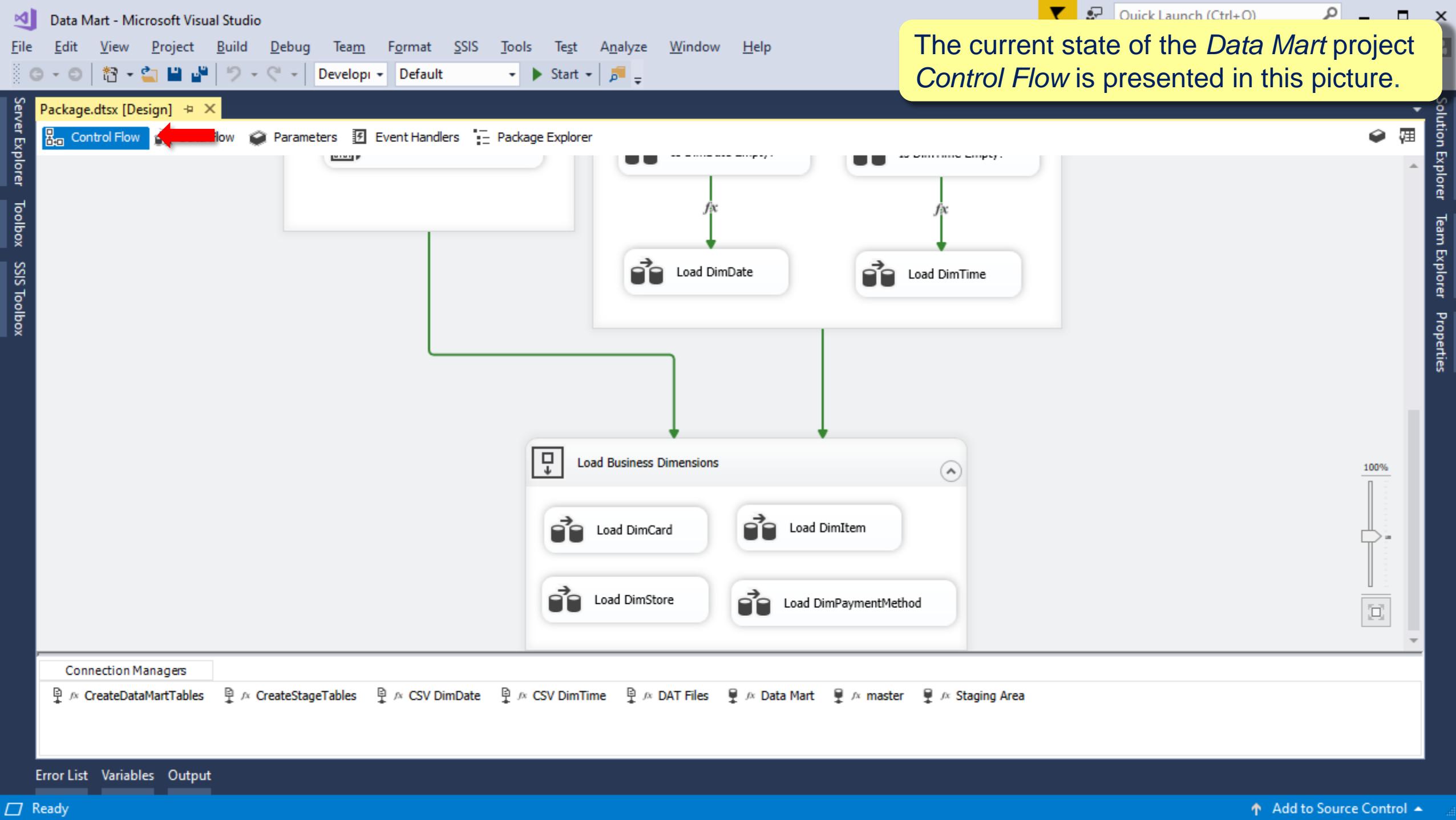
Announcing .NET 5.0  
We're excited to release .NET 5.0 today and for you to start using it. It's a major release — including C# 9 and F# 5 — with a broad set of n... [NEW 12 de novembro de 2020](#)

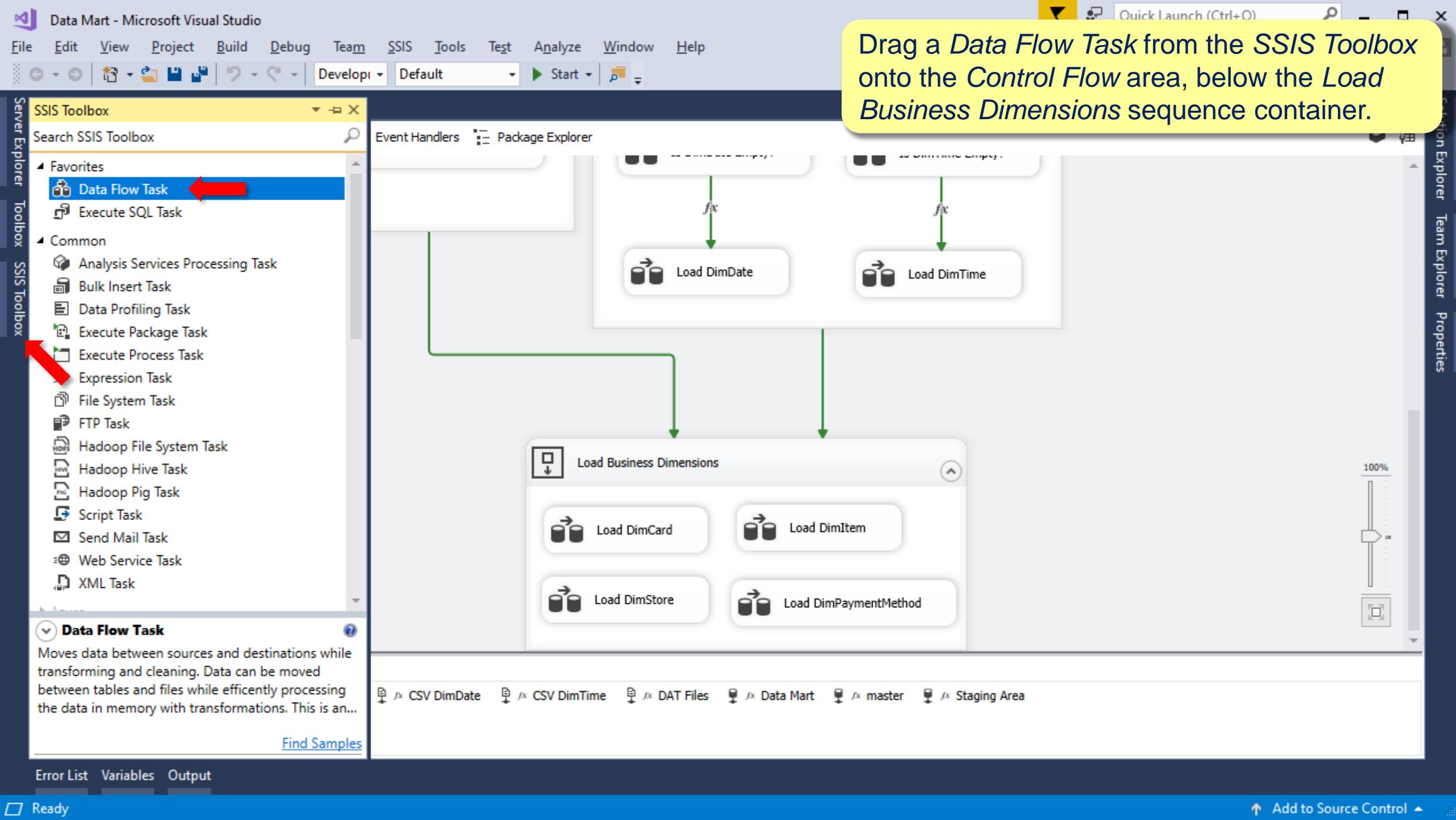
Announcing ASP.NET Core in .NET 5

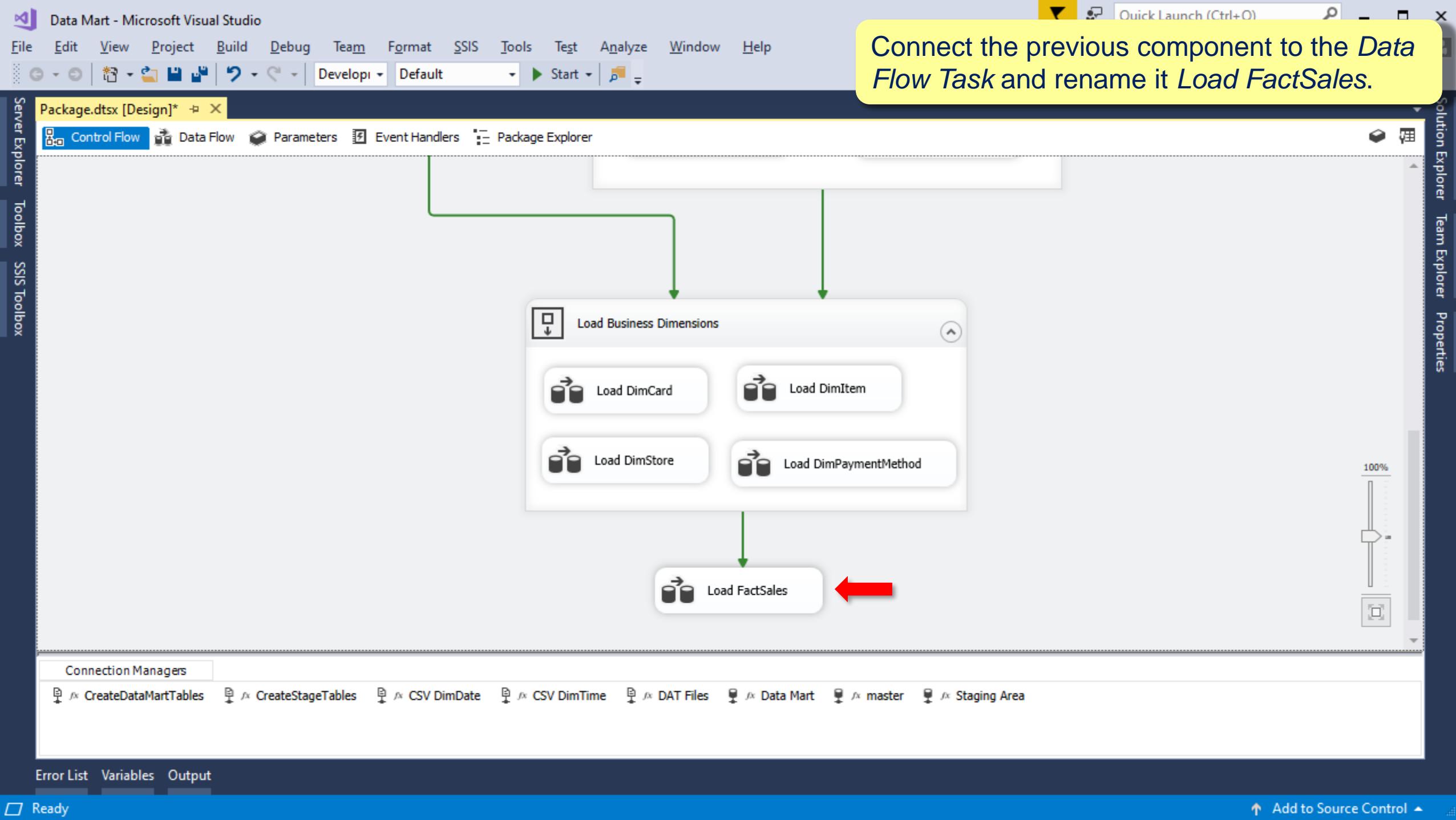
[More news...](#)

Error List Variables Output

Ready







Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Access the *Data Flow* area of the *Load FactSales* component.

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named 'Package.dtsx'. The 'Data Flow' tab is highlighted with a red arrow, indicating the active workspace. Below it, the 'Data Flow Task' dropdown also has a red arrow pointing to the entry 'Load FactSales', which is currently selected. The rest of the interface includes the standard Visual Studio menu bar, toolbars, and various windows like Server Explorer, Toolbox, and Solution Explorer.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

SSIS Toolbox

Search SSIS Toolbox

Event Handlers Package Explorer

Server Explorer

Toolbox

SSIS Toolbox

Sort

Union All

Azure

Other Transforms

Other Sources

- ADO NET Source
- CDC Source
- Excel Source
- Flat File Source
- OLE DB Source**
- Raw File Source
- XML Source

Other Destinations

- ADO NET Destination
- Data Mining Model Training
- DataReader Destination
- Dimension Processing
- Excel Destination
- Flat File Destination

**OLE DB Source**

Extracts data from an OLE DB-compliant relational database. Extract from a database table or view, or use a SQL command. For example, extract data from tables in Microsoft Office Access or SQL Server...

Find Samples

CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Drag an *OLE DB Source* from the *SSIS Toolbox* onto the *Data Flow area*.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Rename the *OLE DB Source* to *Transaction* & *Transaction\_Item* (i.e., the two fact table data sources from the staging area database).

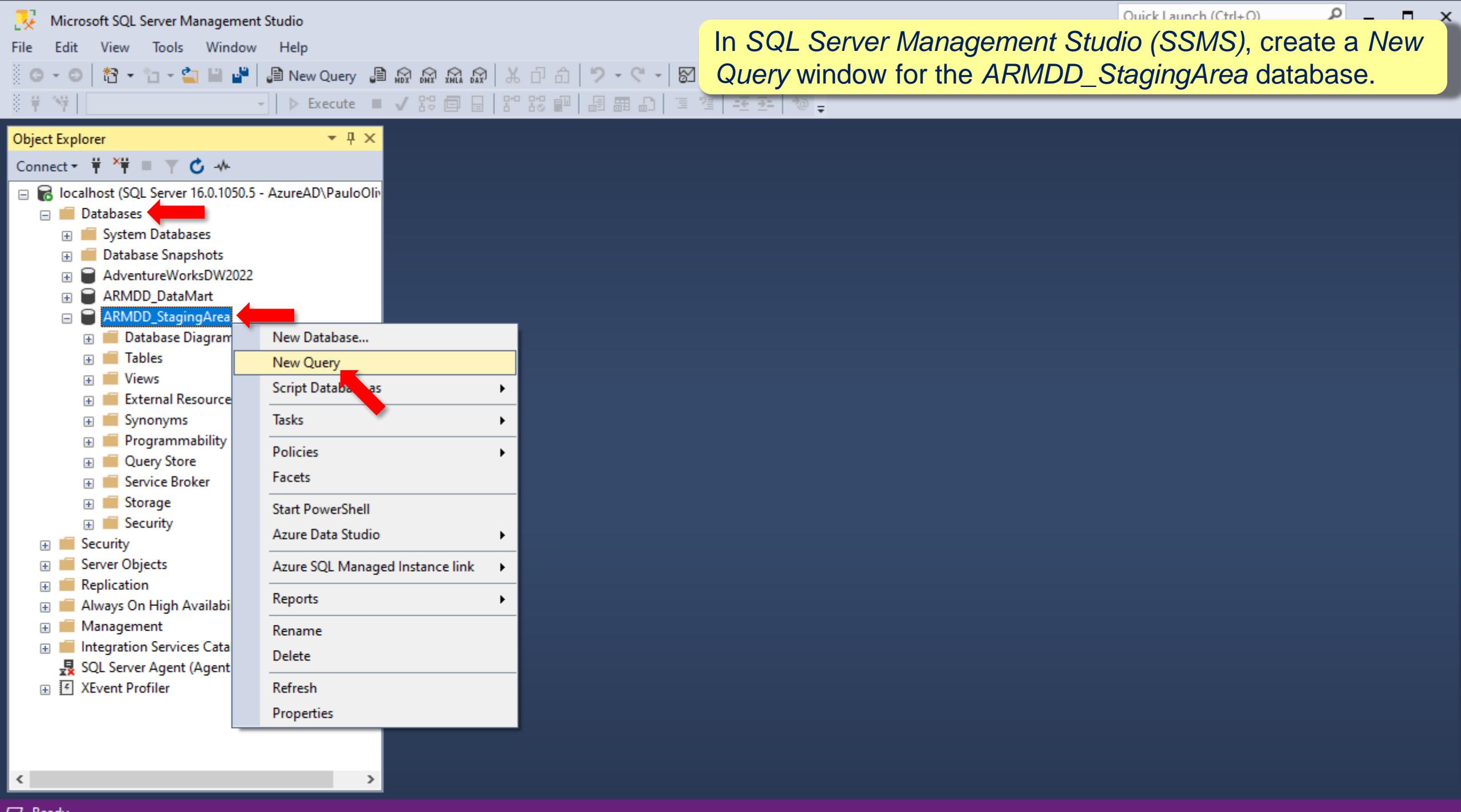
Connection Managers

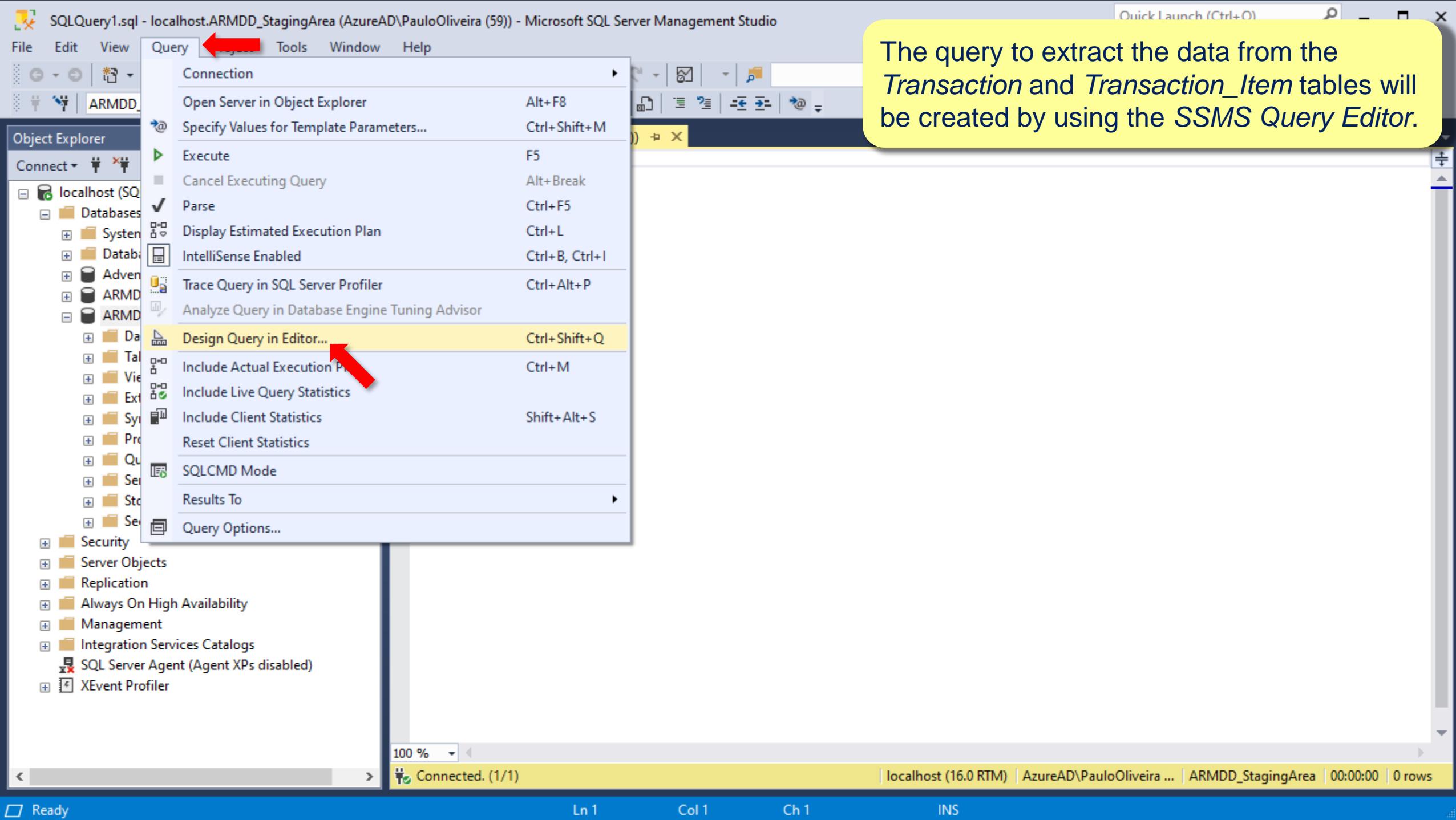
- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Add to Source Control

```
graph TD; Transaction[Transaction & Transaction_Item] --> FactSales[Load FactSales]
```





The query to extract the data from the *Transaction* and *Transaction\_Item* tables will be created by using the *SSMS Query Editor*.

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauLOliveira\_50) Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window

New Query Execute

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD\PauLOliveira\_50)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

Query Designer

Add Table

Tables Views Functions Synonyms

Brand  
Card  
CardDQP  
Category  
Item  
MaritalStatusDescription\_Lookup  
PaymentMethodDescription\_Lookup  
StoreName\_Lookup  
SubCategory  
**Transaction** ←  
**Transaction\_Item** ←  
TransactionDQP

SELECT FROM

Refresh Add Close

OK Cancel

Ready

Ln 1 Col 1 Ch 1 INS

Quick Launch (Ctrl+O)

Select the two tables to use in the query by holding down the Ctrl key and then close the dialog box.

PauloOliveira\_50 | ARMDD\_StagingArea | 00:00:00 | 0 rows

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (50)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window

ARMDD\_StagingArea New Query Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD\PauloOliveira)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
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    - Storage
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  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

Query Designer

Transaction

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- CardID
- PaymentMethod

Transaction\_Item

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- ItemNumber
- ItemCode
- Amount
- Flag

The selected tables' attributes become visible/available.

Column Alias Table Out... Sort Type Sort Order Filter

SELECT FROM [Transaction] CROSS JOIN Transaction\_Item

OK Cancel

Ready

Ln 1 Col 1 Ch 1 INS

Quick Launch (Ctrl+O)

PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

SQLQuery1.sql - localhost.ARMDD\_StagingArea

File Edit View Query Project Tools

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureADV) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart ARMDD\_StagingArea Database Diagrams Tables Views External Resources Synonyms Programmability Query Store Service Broker Storage Security Security Server Objects Replication Always On High Availability Management Integration Services Catalogs SQL Server Agent (Agent XPs disabled) XEvent Profiler

Query Designer

Transaction

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- CardID
- PaymentMethod

Transaction

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- ItemNumber
- ItemCode
- Amount
- Flag

Drag each of the four attributes (Store, Date, Time and TransactionID) onto the corresponding attribute in the related table to establish the relationship between both tables.

Column Alias Table Out... Sort Type Sort Order Filter Or...  
[Transaction] INNER JOIN  
Transaction\_Item ON [Transaction].Store = Transaction\_Item.Store AND [Transaction].Date = Transaction\_Item.Date AND  
[Transaction].TransactionID = Transaction\_Item.TransactionID

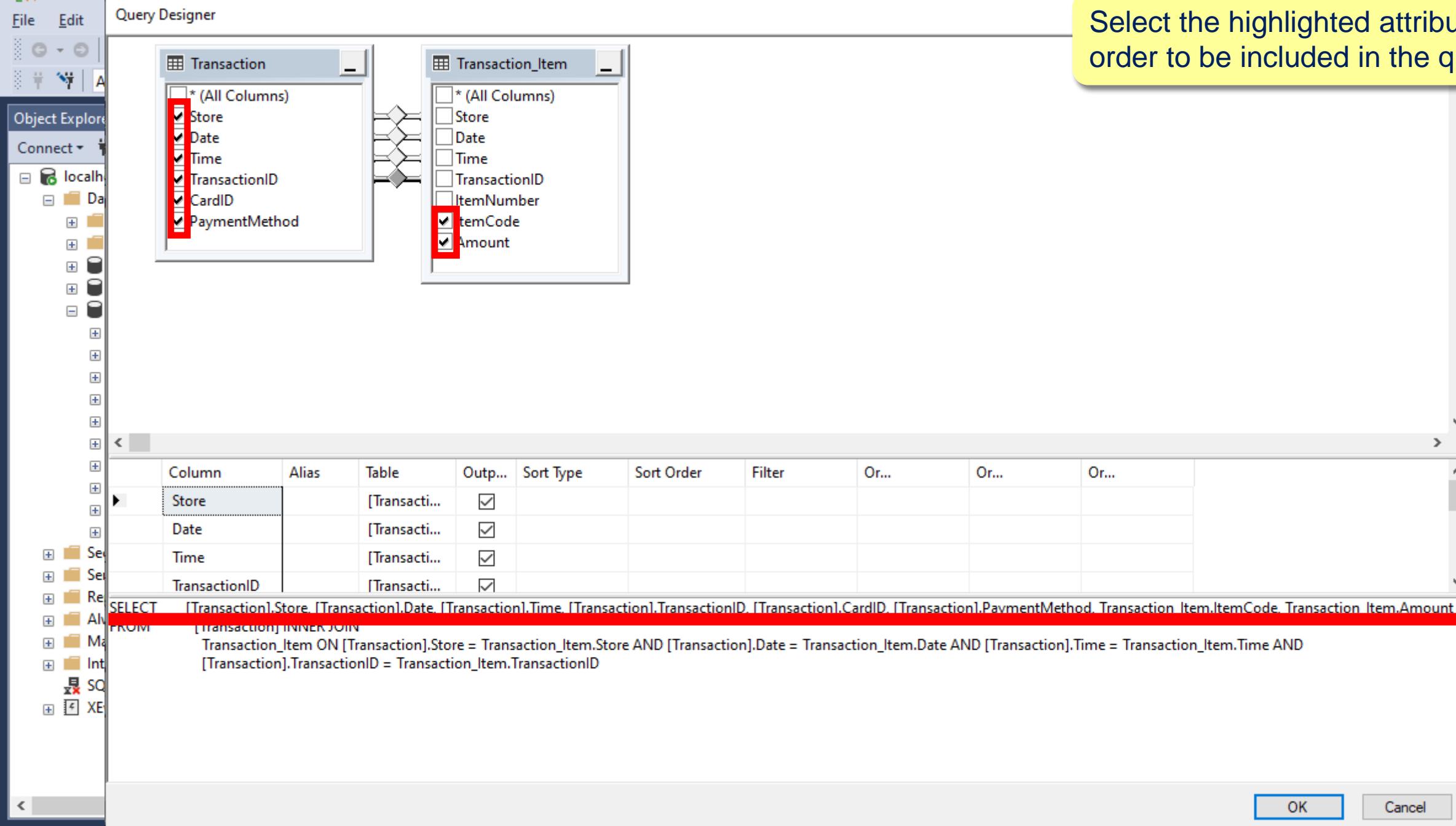
OK Cancel

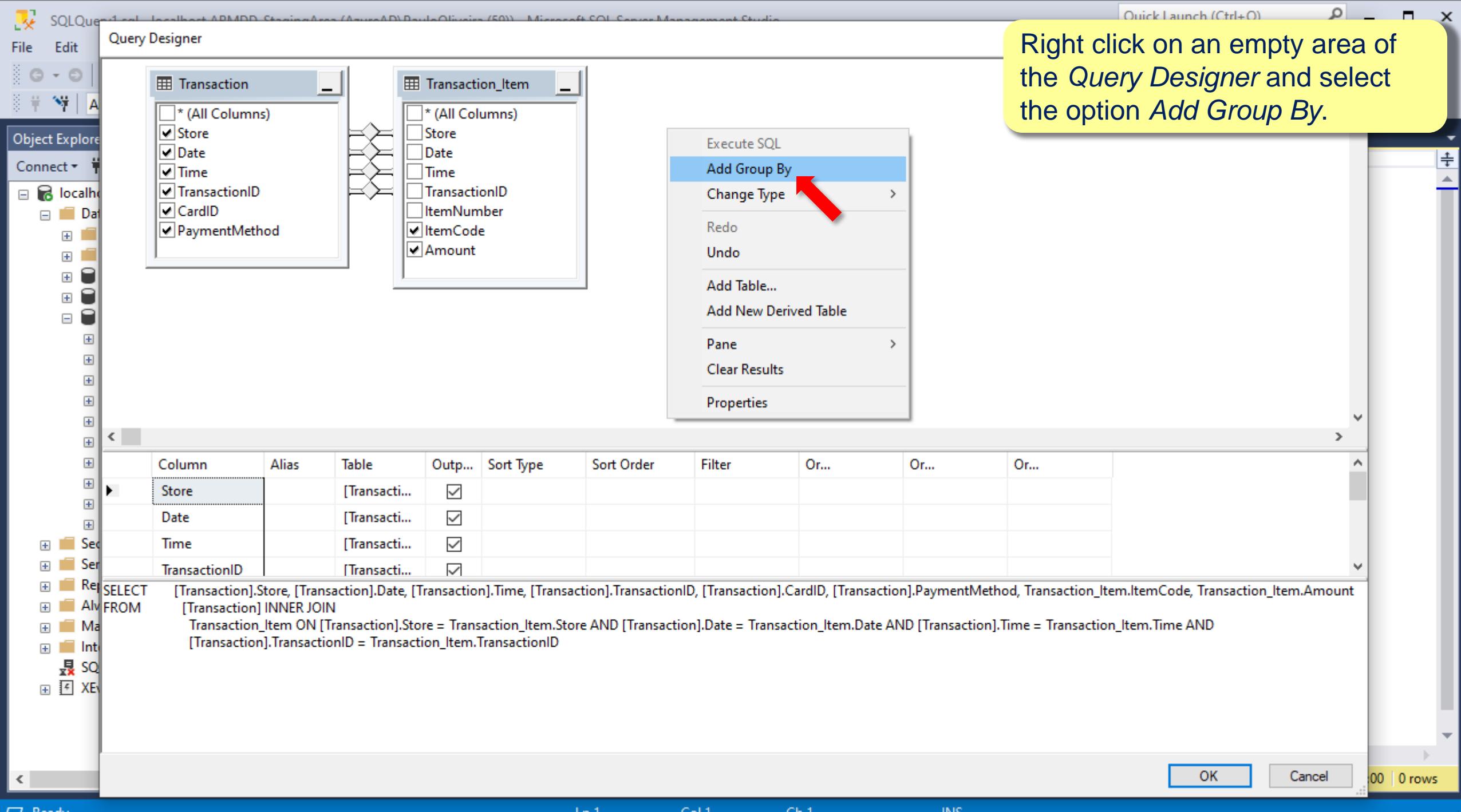
Ready

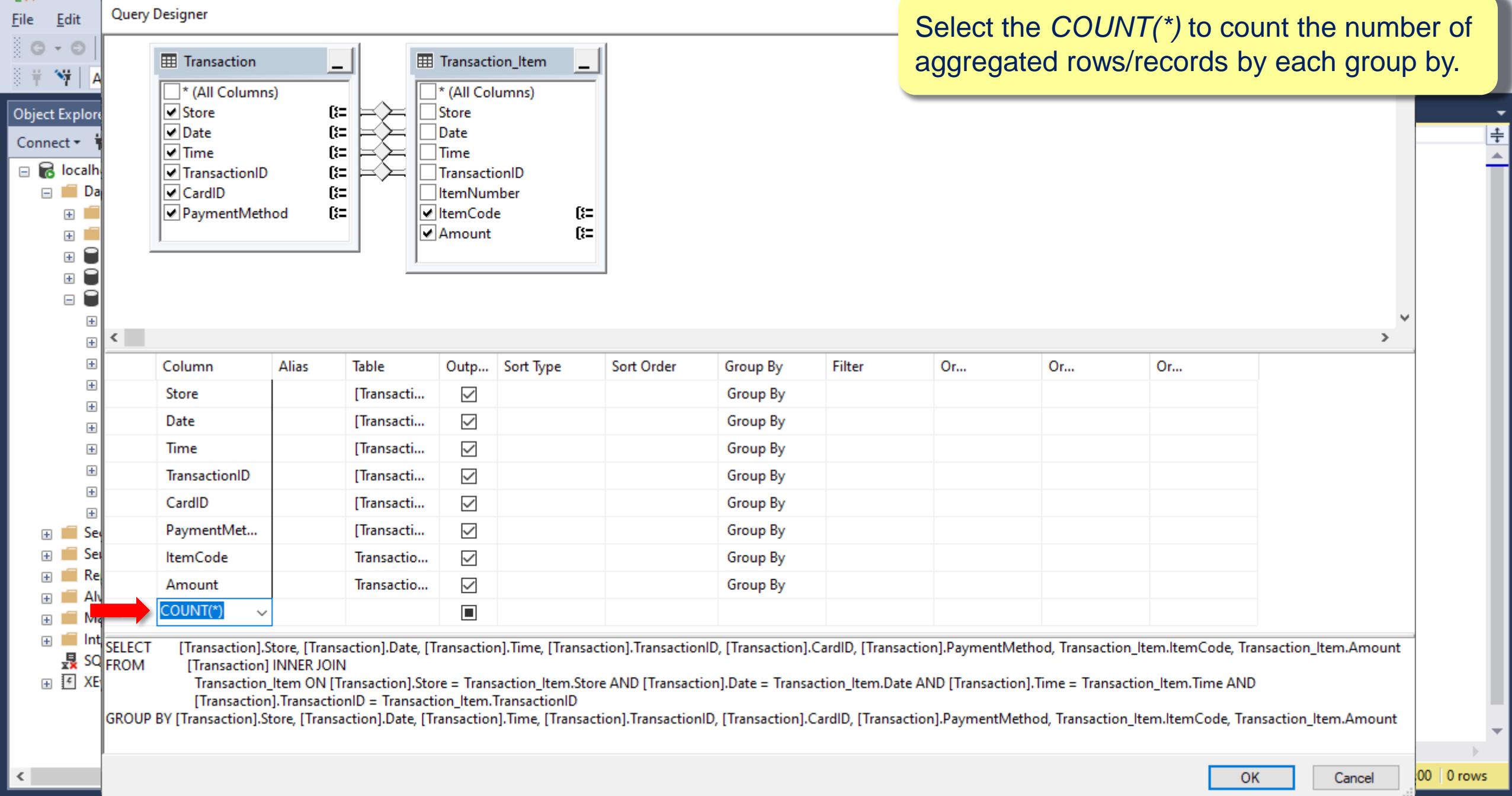
Ln 1 Col 1 Ch 1 INS

veira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

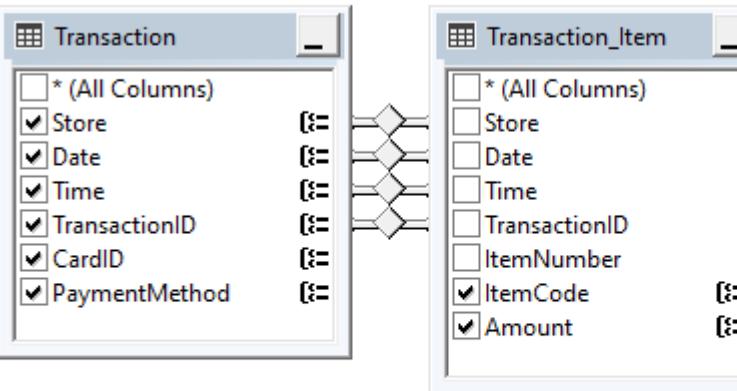
Select the highlighted attributes in order to be included in the query.



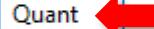




Rename the new query attribute as *Quant*.



Column	Alias	Table	Outp...	Sort Type	Sort Order	Group By	Filter	Or...	Or...	Or...
Store		[Transacti...	<input checked="" type="checkbox"/>			Group By				
Date		[Transacti...	<input checked="" type="checkbox"/>			Group By				
Time		[Transacti...	<input checked="" type="checkbox"/>			Group By				
TransactionID		[Transacti...	<input checked="" type="checkbox"/>			Group By				
CardID		[Transacti...	<input checked="" type="checkbox"/>			Group By				
PaymentMet...		[Transacti...	<input checked="" type="checkbox"/>			Group By				
ItemCode		Transactio...	<input checked="" type="checkbox"/>			Group By				
Amount		Transactio...	<input checked="" type="checkbox"/>			Group By				
*	Quant		<input checked="" type="checkbox"/>			Count				



```

SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].PaymentMethod, Transaction_Item.ItemCode, Transaction_Item.Amount
FROM [Transaction] INNER JOIN
      Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.Date AND [Transaction].Time = Transaction_Item.Time AND
      [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].PaymentMethod, Transaction_Item.ItemCode, Transaction_Item.Amount

```

OK

[Cancel](#)

00 | 0 rows

SQLQuery1.sql - localhost.ARMDD\_StagingArea

File Edit View Query Project Tools

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart ARMDD\_StagingArea Database Diagrams Tables Views External Resources Synonyms Programmability Query Store Service Broker Storage Security Security Server Objects Replication Always On High Availability Management Integration Services Catalogs SQL Server Agent (Agent XPs disabled) XEvent Profiler

Query Designer

Transaction Transaction\_Item

Transaction

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- CardID
- PaymentMethod

Transaction\_Item

- \* (All Columns)
- Store
- Date
- Time
- TransactionID
- ItemNumber
- ItemCode
- Amount
- Flag

Column Alias Table Output Sort Type Sort Order Group By P

Column	Alias	Table	Output	Sort Type	Sort Order	Group By
Store		[Transaction]	<input checked="" type="checkbox"/>			Group By
Date		[Transaction]	<input checked="" type="checkbox"/>			Group By
Time		[Transaction]	<input checked="" type="checkbox"/>			Group By
TransactionID		[Transaction]	<input checked="" type="checkbox"/>			Group By
CardID		[Transaction]	<input checked="" type="checkbox"/>			Group By
PaymentMethod		[Transaction]	<input checked="" type="checkbox"/>			Group By
ItemCode		[Transaction_Item]	<input checked="" type="checkbox"/>			Group By
Amount		[Transaction_Item]	<input checked="" type="checkbox"/>			Group By
*	Quant		<input checked="" type="checkbox"/>			Count

SELECT FROM GROUP Transaction\_Item.Store Transaction\_Item.Date Transaction\_Item.Time Transaction\_Item.TransactionID Transaction\_Item.ItemNumber Transaction\_Item.ItemCode Transaction\_Item.Amount Transaction\_Item.Flag

Select the **Amount** attribute from the **Transaction\_Item** table.

OK Cancel

SQLQuery1.sql - localhost.ARMDD\_Stagi

File Edit View Query Project Tools

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart ARMDD\_StagingArea Database Diagrams Tables Views External Resources Synonyms Programmability Query Store Service Broker Storage Security Security Server Objects Replication Always On High Availability Management Integration Services Catalogs SQL Server Agent (Agent XPs disabled) XEvent Profiler

Query Designer

Transaction

\* (All Columns)  
Store  
Date  
Time  
TransactionID  
CardID  
PaymentMethod

Transaction

\* (All Columns)  
Store  
Date  
Time  
TransactionID  
ItemNumber  
ItemCode  
Amount  
Flag

Column Alias Table Output Sort Type Sort Order Group By

Store [Transaction]   
Date [Transaction]   
Time [Transaction]   
TransactionID [Transaction]   
CardID [Transaction]   
PaymentMethod [Transaction]   
ItemCode Transaction\_...   
Amount Transaction\_...   
\* Quant   
Amount TotalAmount   Count Sum

SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].PaymentMethod, SUM(Transaction\_Item.Amount) AS TotalAmount  
FROM [Transaction] INNER JOIN Transaction\_Item ON [Transaction].Store = Transaction\_Item.Store AND [Transaction].Date = Transaction\_Item.Date AND [Transaction].Time = Transaction\_Item.Time AND [Transaction].TransactionID = Transaction\_Item.TransactionID

OK Cancel

Rename the new query attribute as *TotalAmount* and change the *Group By* column to *Sum*.

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (59)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

Quick Launch (Ctrl+O)

Execute the query to see the result.

ARMDD\_StagingArea Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
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- Integration Services Catalogs
- SQL Server Agent (Agent XPs disabled)
- XEvent Profiler

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (59))

```
SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].CustomerID, SUM(Transaction_Item.Amount) AS TotalAmount
FROM [Transaction] INNER JOIN
     Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.Date AND [Transaction].Time = Transaction_Item.Time AND [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].CustomerID
```

100 %

Connected. (1/1) | localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

Ln 6 Col 201 Ch 201

INS Connected. (1/1)

Ready

SQLQuery1.sql - localhost.ARMD\_StagingArea (AzureAD\PauloOliveira (59)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_StagingArea Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

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- SQL Server Agent (Agent XPs disabled)
- XEvent Profiler

SQLQuery1.sql - loc...\\PauloOliveira (59)

```
SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transac
    SUM(Transaction_Item.Amount) AS TotalAmount
FROM [Transaction] INNER JOIN
    Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.
    [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transactio
```

Results

	Store	Date	Time	TransactionID	CardID	PaymentMethod	ItemCode	Amount	Quant	TotalAmount
1	S0002	2001-04-11 00:00:00.000	1134	T10000138	C0100167922	CC	I0000000412	199,00	1	199,00
2	S0002	2001-04-02 00:00:00.000	1450	T10000233	C0101234196	CH	I0000000184	2,49	1	2,49
3	S0002	2001-04-12 00:00:00.000	1146	T10000136	C0104239769	CH	I0000000174	2,49	1	2,49
4	S0002	2001-03-05 00:00:00.000	915	T10000013	C0105504683	CC	I0000000052	13,99	1	13,99
5	S0002	2001-04-14 00:00:00.000	1318	T10000203	C0100024159	CH	I00000000634	69,00	1	69,00
6	S0002	2001-05-20 00:00:00.000	1148	T10000158	C0105662172	CA	I0000000091	19,99	1	19,99
7	S0002	2001-09-10 00:00:00.000	1152	T10000092	C0102932305	DC	I00000000617	9,99	1	9,99
8	S0002	2001-09-10 00:00:00.000	1403	T10000189	C0106259827	CC	I00000000188	8,49	1	8,49
9	S0002	2001-09-14 00:00:00.000	1712	T10000280	C0101927882	DC	I00000000149	24,99	1	24,99
10	S0002	2001-11-10 00:00:00.000	925	T10000014	C0103133193	DC	I00000000064	8,99	1	8,99
11	S0002	2001-11-25 00:00:00.000	910	T10000008	C0101418798	DC	I00000000698	299,00	1	299,00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:06 | 394 367 rows

Ready

SQLQuery1.sql - localhost.ARMD\_StagingArea (AzureAD\PauloOliveira (59))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DML XMLA DAX

ARMDD\_StagingArea Execute

Add the presented *HAVING* clause to the query to see the rows/records in which the *Quant* attribute is greater than 1.

```
SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].PaymentMethod, SUM(Transaction_Item.Amount) AS TotalAmount
FROM [Transaction] INNER JOIN
      Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.Date
      AND [Transaction].Time = Transaction_Item.Time
      AND [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transaction].PaymentMethod
HAVING COUNT(*) > 1
```

Results

	Store	Date	Time	TransactionID	CardID	PaymentMethod	ItemCode	Amount	Quant	TotalAmount
1	S0002	2001-04-11 00:00:00.000	1134	T10000138	C0100167922	CC	I0000000412	199,00	1	199,00
2	S0002	2001-04-02 00:00:00.000	1450	T10000233	C0101234196	CH	I0000000184	2,49	1	2,49
3	S0002	2001-04-12 00:00:00.000	1146	T10000136	C0104239769	CH	I0000000174	2,49	1	2,49
4	S0002	2001-03-05 00:00:00.000	915	T10000013	C0105504683	CC	I0000000052	13,99	1	13,99
5	S0002	2001-04-14 00:00:00.000	1318	T10000203	C0100024159	CH	I00000000634	69,00	1	69,00
6	S0002	2001-05-20 00:00:00.000	1148	T10000158	C0105662172	CA	I0000000091	19,99	1	19,99
7	S0002	2001-09-10 00:00:00.000	1152	T10000092	C0102932305	DC	I00000000617	9,99	1	9,99
8	S0002	2001-09-10 00:00:00.000	1403	T10000189	C0106259827	CC	I00000000188	8,49	1	8,49
9	S0002	2001-09-14 00:00:00.000	1712	T10000280	C0101927882	DC	I00000000149	24,99	1	24,99
10	S0002	2001-11-10 00:00:00.000	925	T10000014	C0103133193	DC	I00000000064	8,99	1	8,99
11	S0002	2001-11-25 00:00:00.000	910	T10000008	C0101418798	DC	I00000000698	299,00	1	299,00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:06 | 394 367 rows

Ln 7 Col 20 Ch 20 INS

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (59))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

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- XEvent Profiler

SQLQuery1.sql - loc...\\PauloOliveira (59)\*

```
SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transac
FROM [Transaction] INNER JOIN
    Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.
    [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transactio
HAVING COUNT(*) > 1
```

Results Messages

	Store	Date	Time	TransactionID	CardID	PaymentMethod	ItemCode	Amount	Quant	TotalAmount
1	S0034	2001-04-21 00:00:00.000	1648	T10000387	C0104771779	CC	I0000000178	1,99	2	3,98
2	S0056	2001-08-25 00:00:00.000	1440	T10000184	C0103891156	CC	I0000000168	4,99	2	9,98
3	S0040	2001-08-17 00:00:00.000	1709	T10000279	C0100574698	DC	I0000000134	4,99	2	9,98
4	S0002	2001-07-02 00:00:00.000	1538	T10000254	C0104380567	CC	I0000000075	2,99	2	5,98
5	S0034	2001-09-22 00:00:00.000	1413	T10000174	C0104421290	DC	I0000000135	4,99	2	9,98
6	S0056	2001-06-01 00:00:00.000	1225	T10000196	C0100869957	CH	I0000000134	4,99	2	9,98
7	S0006	2001-11-05 00:00:00.000	1331	T10000156	C0105184730	CC	I0000000024	3,99	2	7,98
8	S0056	2001-04-25 00:00:00.000	1043	T10000094	C0100732342	CH	I0000000041	4,99	2	9,98
9	S0056	2001-01-16 00:00:00.000	957	T10000047	C0100233340	CA	I00000000620	9,99	2	19,98
10	S0034	2001-11-23 00:00:00.000	1707	T10000289	C0106311896	DC	I0000000181	5,49	2	10,98
11	S0034	2001-11-24 00:00:00.000	1247	T10000122	C0102483548	CC	I0000000083	2,99	2	5,98

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 126 rows

Ready

Ln 7 Col 20 Ch 20 INS

SQLQuery1.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (59)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

Databases

- System Databases
- Database Snapshots
- AdventureWorksDW2022
- ARMDD\_DataMart
- ARMDD\_StagingArea
  - Database Diagrams
  - Tables
  - Views
  - External Resources
  - Synonyms
  - Programmability
  - Query Store
  - Service Broker
  - Storage
  - Security
- Security
- Server Objects
- Replication
- Always On High Availability
- Management
- Integration Services Catalogs
- SQL Server Agent (Agent XPs disabled)
- XEvent Profiler

SQLQuery1.sql - loc...\\PauloOliveira (59)\*

```
SELECT [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transac
FROM [Transaction] INNER JOIN
    Transaction_Item ON [Transaction].Store = Transaction_Item.Store AND [Transaction].Date = Transaction_Item.Date
    [Transaction].TransactionID = Transaction_Item.TransactionID
GROUP BY [Transaction].Store, [Transaction].Date, [Transaction].Time, [Transaction].TransactionID, [Transaction].CardID, [Transactio

```

Results Messages

	Store	Date	Time	TransactionID	CardID
1	S0034	2001-04-21 00:00:00.000	1648	T10000387	C01047
2	S0056	2001-08-25 00:00:00.000	1440	T10000184	C01038
3	S0040	2001-08-17 00:00:00.000	1709	T10000279	C01005
4	S0002	2001-07-02 00:00:00.000	1538	T10000254	C01043
5	S0034	2001-09-22 00:00:00.000	1413	T10000174	C01044
6	S0056	2001-06-01 00:00:00.000	1225	T10000196	C01008
7	S0006	2001-11-05 00:00:00.000	1331	T10000156	C01051
8	S0056	2001-04-25 00:00:00.000	1043	T10000094	C01007
9	S0056	2001-01-16 00:00:00.000	957	T10000047	C01002
10	S0034	2001-11-23 00:00:00.000	1707	T10000289	C01063
11	S0034	2001-11-24 00:00:00.000	1247	T10000122	C01024

Query executed successfully.

Quick Launch (Ctrl+O) | ARMDD\_StagingArea | 00:00:00 | 126 rows

Ln 7 Col 1 Ch 1 INS

Remove the *HAVING* clause from the query and copy it to the clipboard.

Cut Ctrl+X

**Copy** Ctrl+C

Paste Ctrl+V

Insert Snippet... Ctrl+K, Ctrl+X

Surround With... Ctrl+K, Ctrl+S

Connection

Open Server in Object Explorer Alt+F8

Execute F5

Display Estimated Execution Plan Ctrl+L

IntelliSense Enabled Ctrl+B, Ctrl+I

Trace Query in SQL Server Profiler Ctrl+Alt+P

Analyze Query in Database Engine Tuning Advisor

Design Query in Editor... Ctrl+Shift+Q

Include Actual Execution Plan Ctrl+M

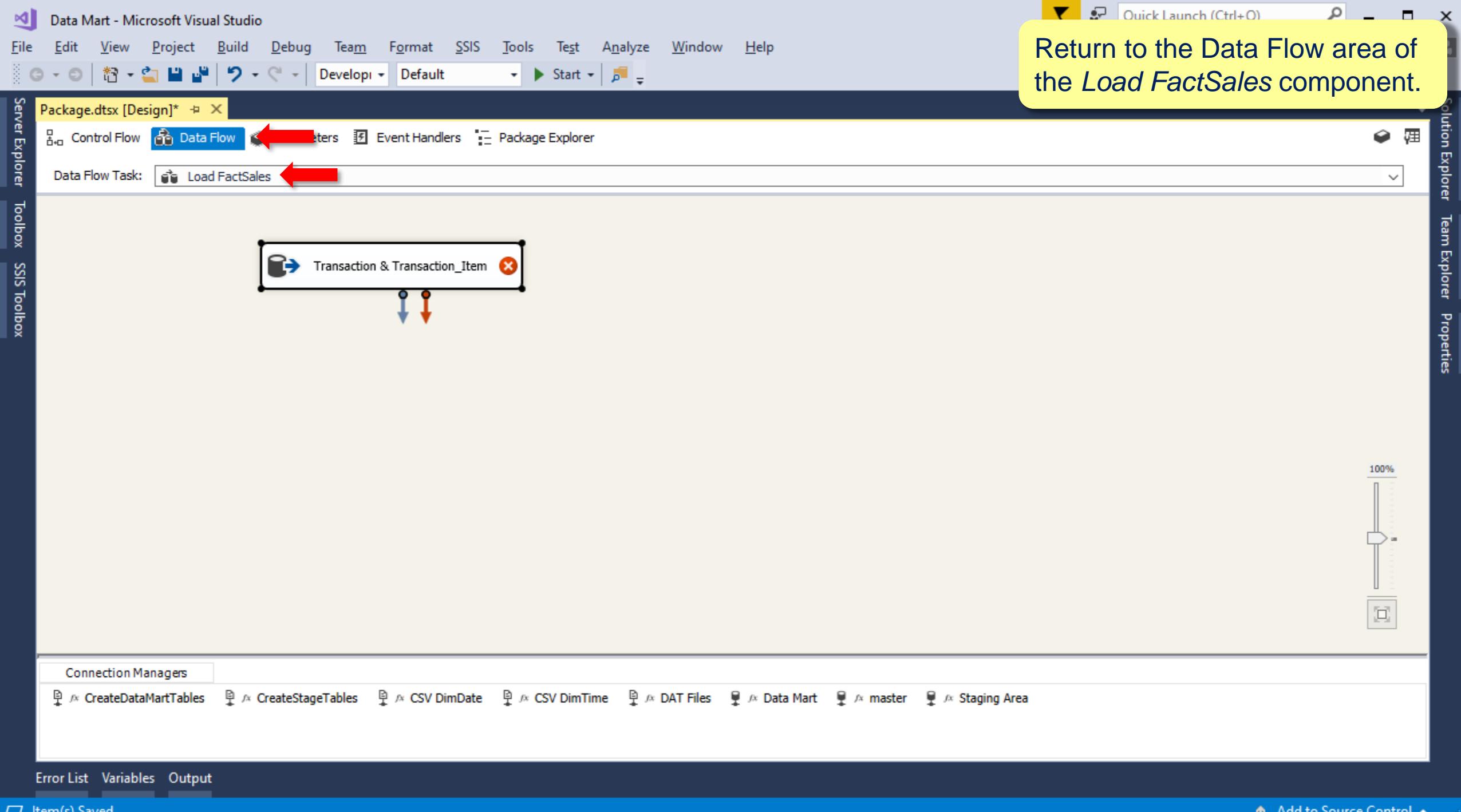
Include Live Query Statistics

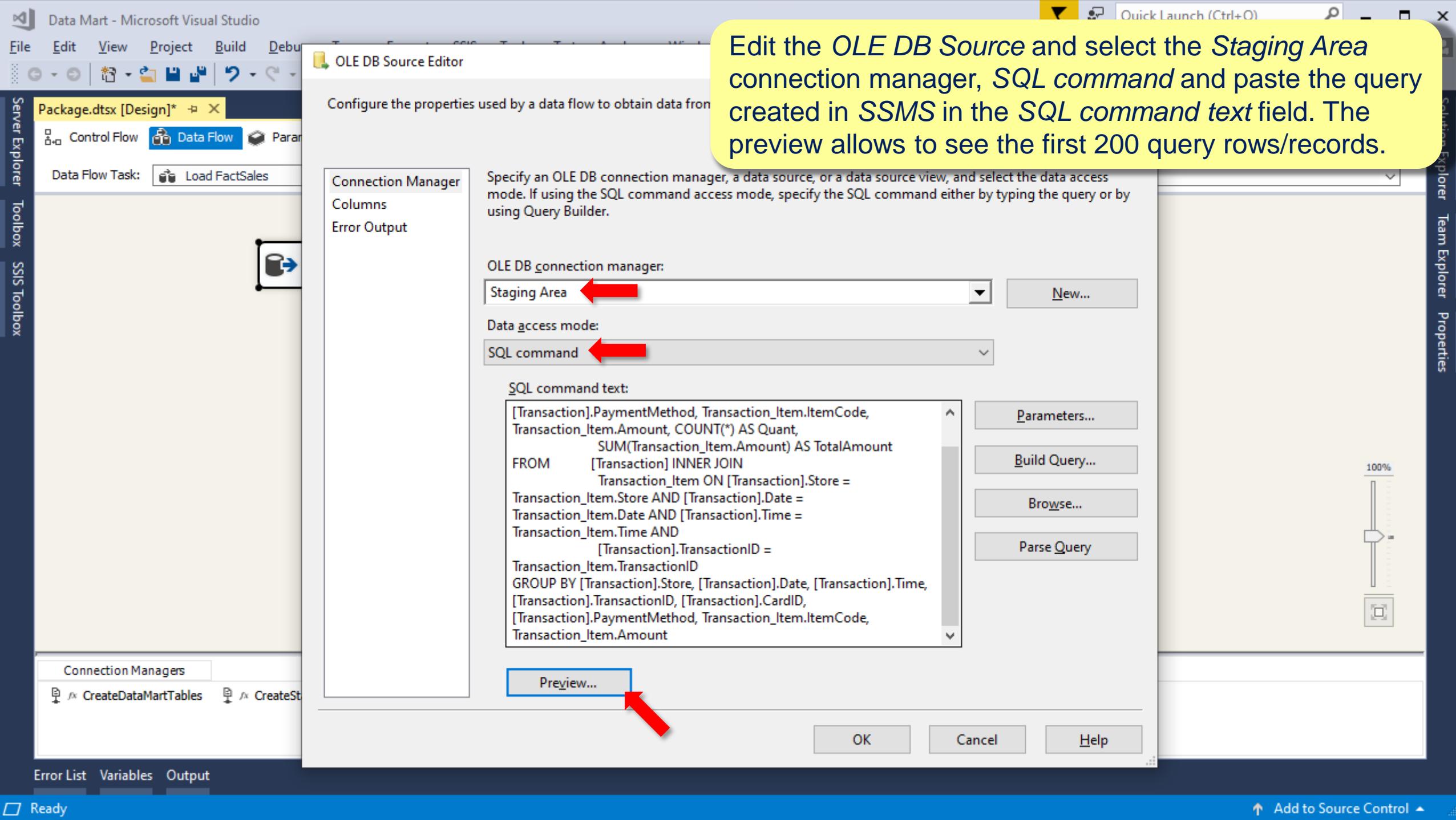
Include Client Statistics Shift+Alt+S

Results To

Properties Window F4

Query Options...





File Edit View Project Build Debug

Quick Launch (Ctrl+Q) Sign in

Server Explorer Solution Explorer Team Explorer Properties

OLE DB Source Editor

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

Specifying an OLE DB connection manager, a data source, or a data source view, and selecting the data access type by typing the query or by

Connection Manager

Columns

Error Output

Preview Query Results

Query result (up to the first 200 rows):

Store	Date	Time	Transactio...	CardID	Paym ^
S0006	23/03/20...	958	T10000064	C0100663...	CC
S0006	23/03/20...	1256	T10000242	C0102059...	DC
S0006	28/08/20...	1737	T10000286	C0104814...	DC
S0006	02/09/20...	1505	T10000212	C0102091...	CC
S0006	17/09/20...	1432	T10000212	C0106218...	CH
S0006	30/09/20...	1727	T10000339	C0105428...	CC
S0015	08/04/20...	1402	T10000228	C0106294...	DC
S0015	28/04/20...	1221	T10000157	C0103984...	CC
S0015	28/04/20...	1723	T10000405	C0100596...	DC
S0015	11/11/20...	1253	T10000132	C0103568...	CC
S0034	07/05/20...	1512	T10000340	C0104395...	CC
S0034	22/05/20...	1348	T10000252	C0102223...	CC
S0034	23/05/20	930	T10000021	C0100173	CH

New...

Parameters...

Build Query...

Browse...

Parse Query

Close

Preview...

OK Cancel Help

Add to Source Control

Ready

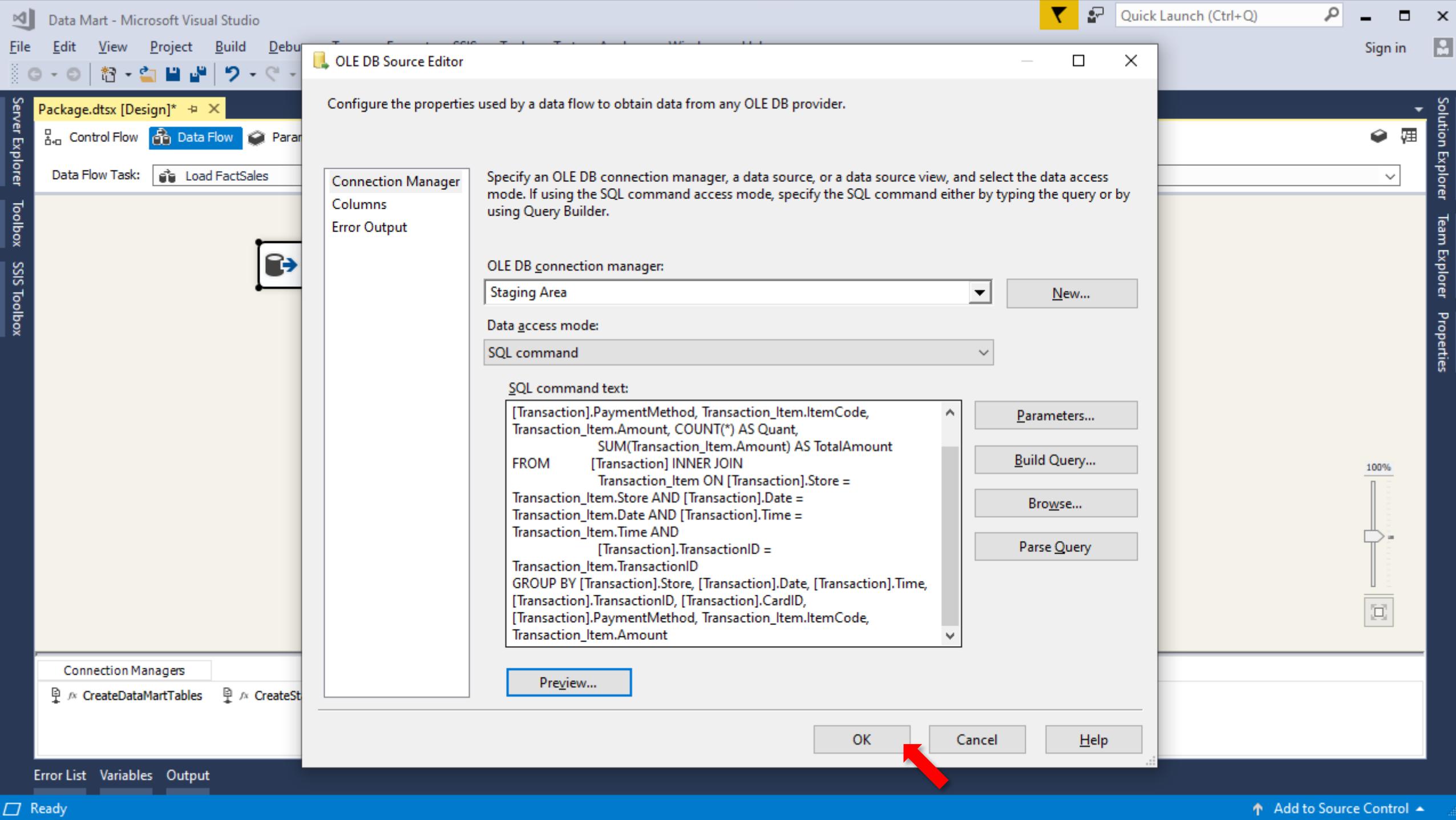
Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

CreateDataMartTables CreateSt

Error List Variables Output



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

The OLED DB Source is now properly configured.

Package.dtsx [Design] X

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Connection Managers

- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Item(s) Saved Add to Source Control

Server Explorer Solution Explorer Team Explorer Properties

100%

This screenshot shows the Microsoft Visual Studio interface for an SSIS package named 'Package.dtsx'. The main window displays the 'Data Flow' tab, which contains a single data flow task named 'Load FactSales'. Inside this task, there is one data source component labeled 'Transaction & Transaction\_Item'. The 'Control Flow' tab is also visible. The bottom left pane shows connection managers for the package, including 'CreateDataMartTables', 'CreateStageTables', and various database connections like 'master' and 'Data Mart'. The bottom navigation bar includes tabs for 'Error List', 'Variables', and 'Output', along with status indicators for saved items and source control integration.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team SSIS Tools Test Analyze Window Help

Developer Default Start

Quick Launch (Ctrl+O)

SSIS Toolbox

Search SSIS Toolbox

Conditional Split  
Data Conversion  
Data Streaming Destination  
Derived Column  
HDFS File Destination  
HDFS File Source  
**Lookup**   
Merge  
Merge Join  
Multicast  
OData Source  
ODBC Destination  
ODBC Source  
OLE DB Command  
Row Count  
Script Component  
Slowly Changing Dimension  
Sort  
Union All

**Lookup**

Joins additional columns to the data flow by looking up values in a table. For example, join to the 'employee id' column the employees table to get 'hire date' and 'employee name'. We recommend...

[Find Samples](#)

Event Handlers Package Explorer

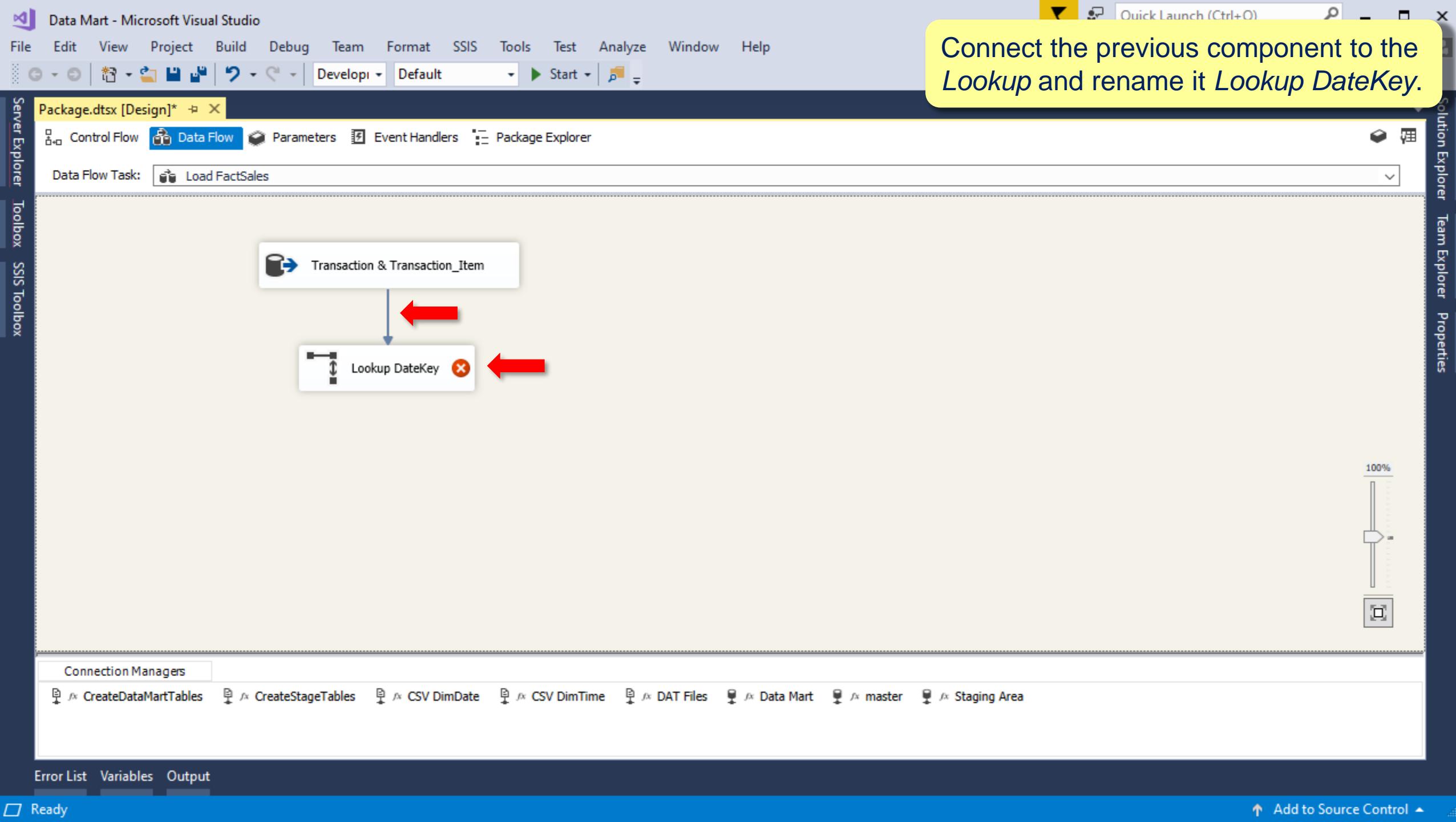
Server Explorer Solution Explorer Team Explorer Properties

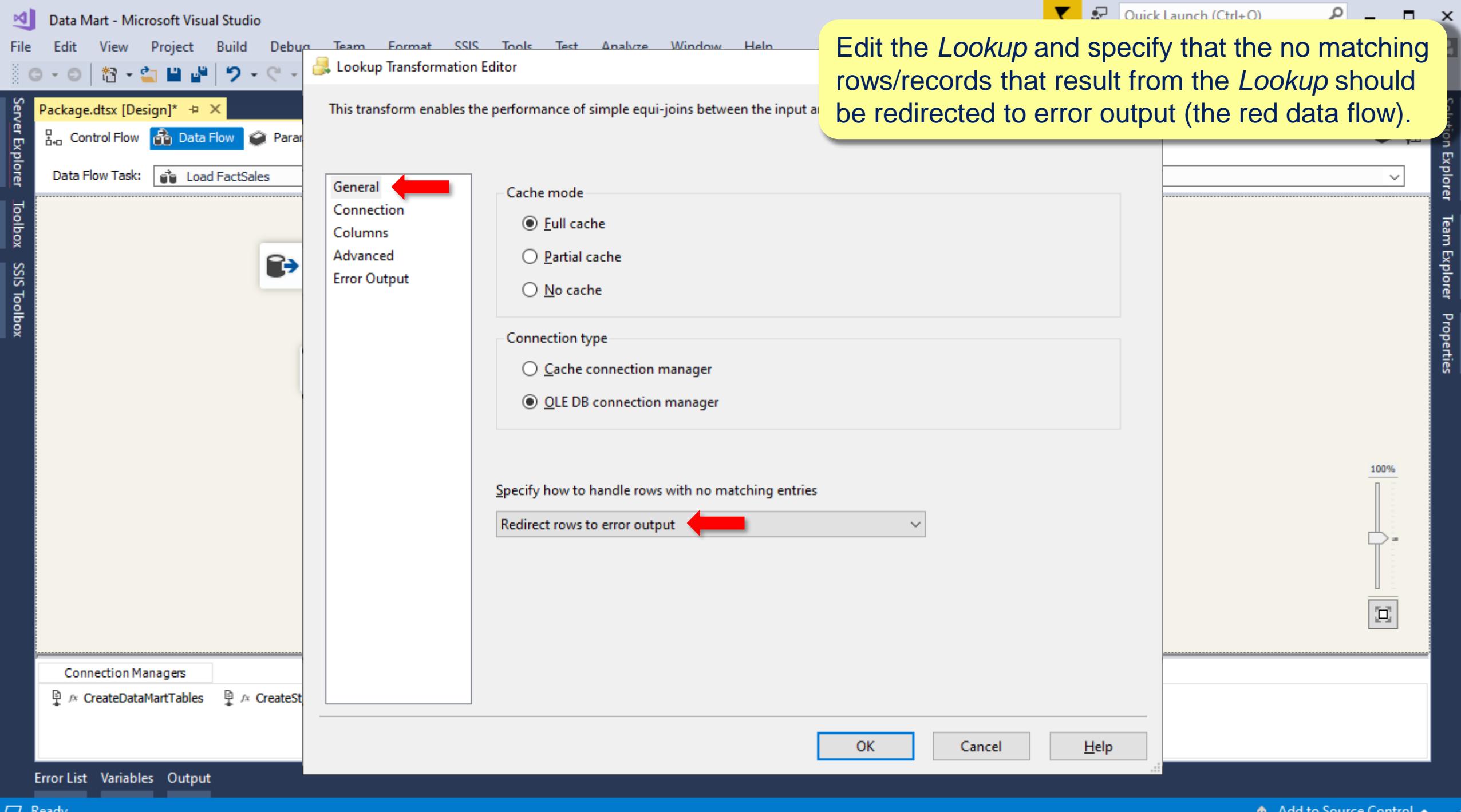
CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

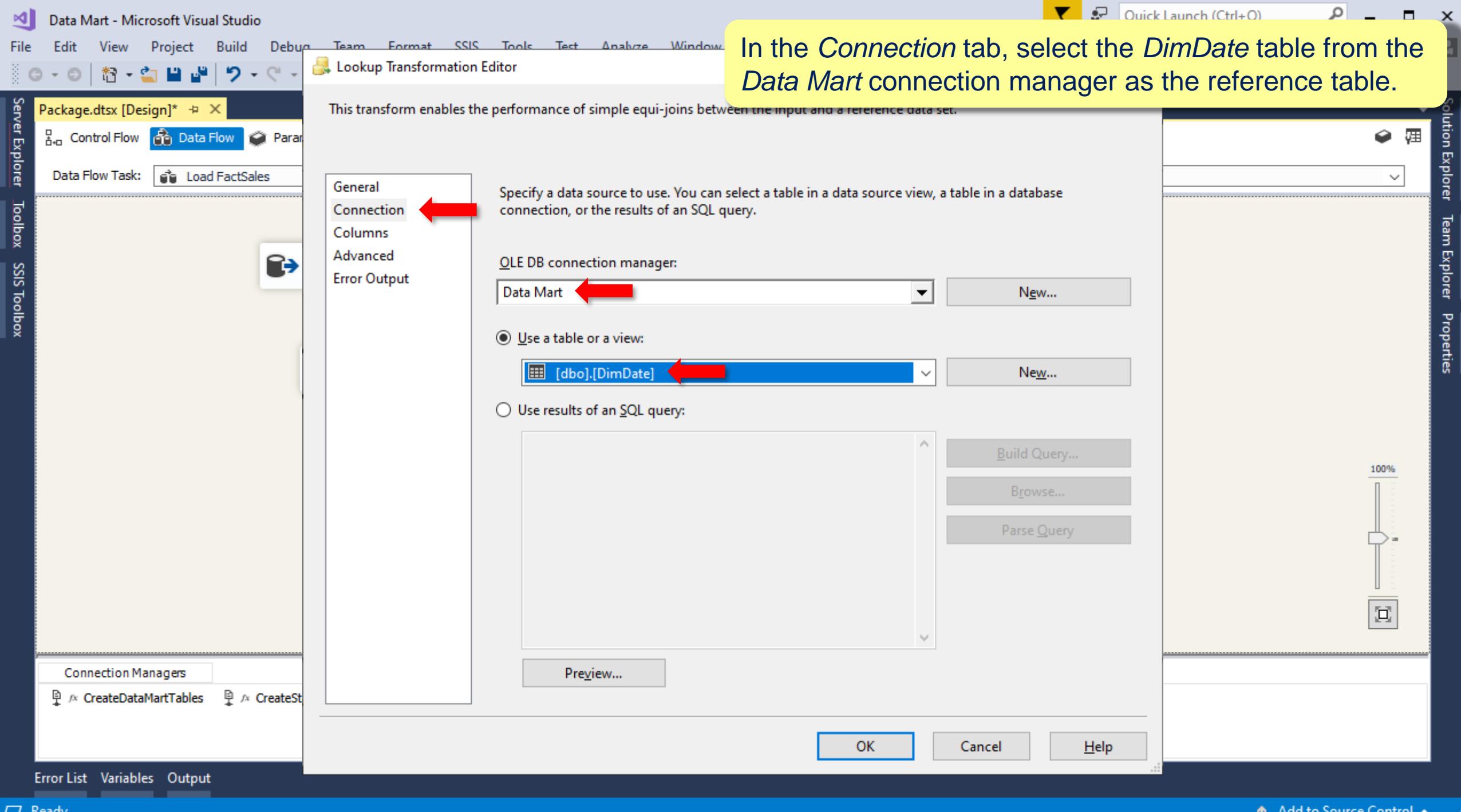
Error List Variables Output

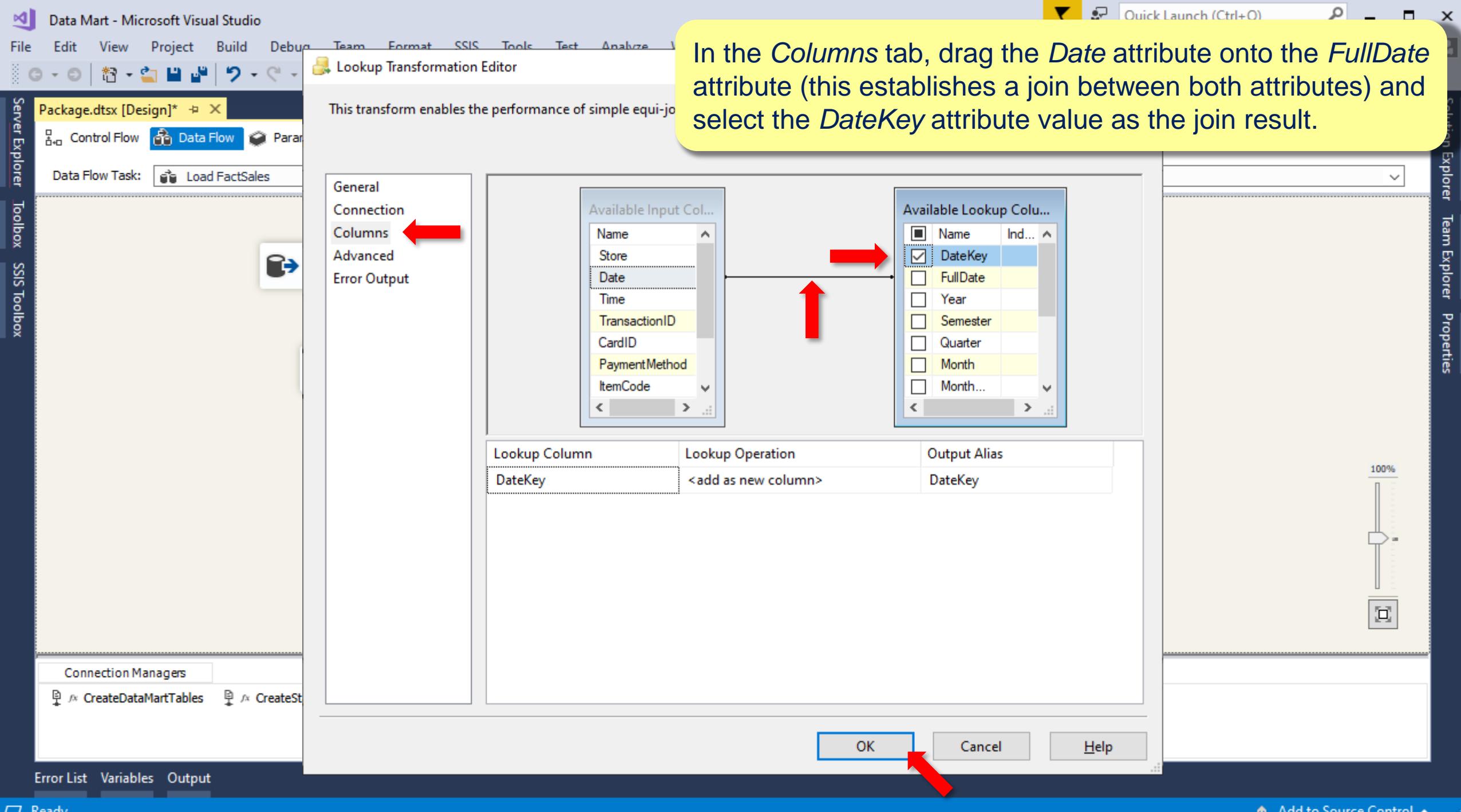
Ready Add to Source Control

Drag a **Lookup** from the **SSIS Toolbox** onto the **Data Flow** area underneath the **OLE DB Source** component.









Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

An exclamation mark appears warning that the *Lookup* errors are not being handled. We will do that latter in the tutorial.

Server Explorer Solution Explorer Team Explorer Properties

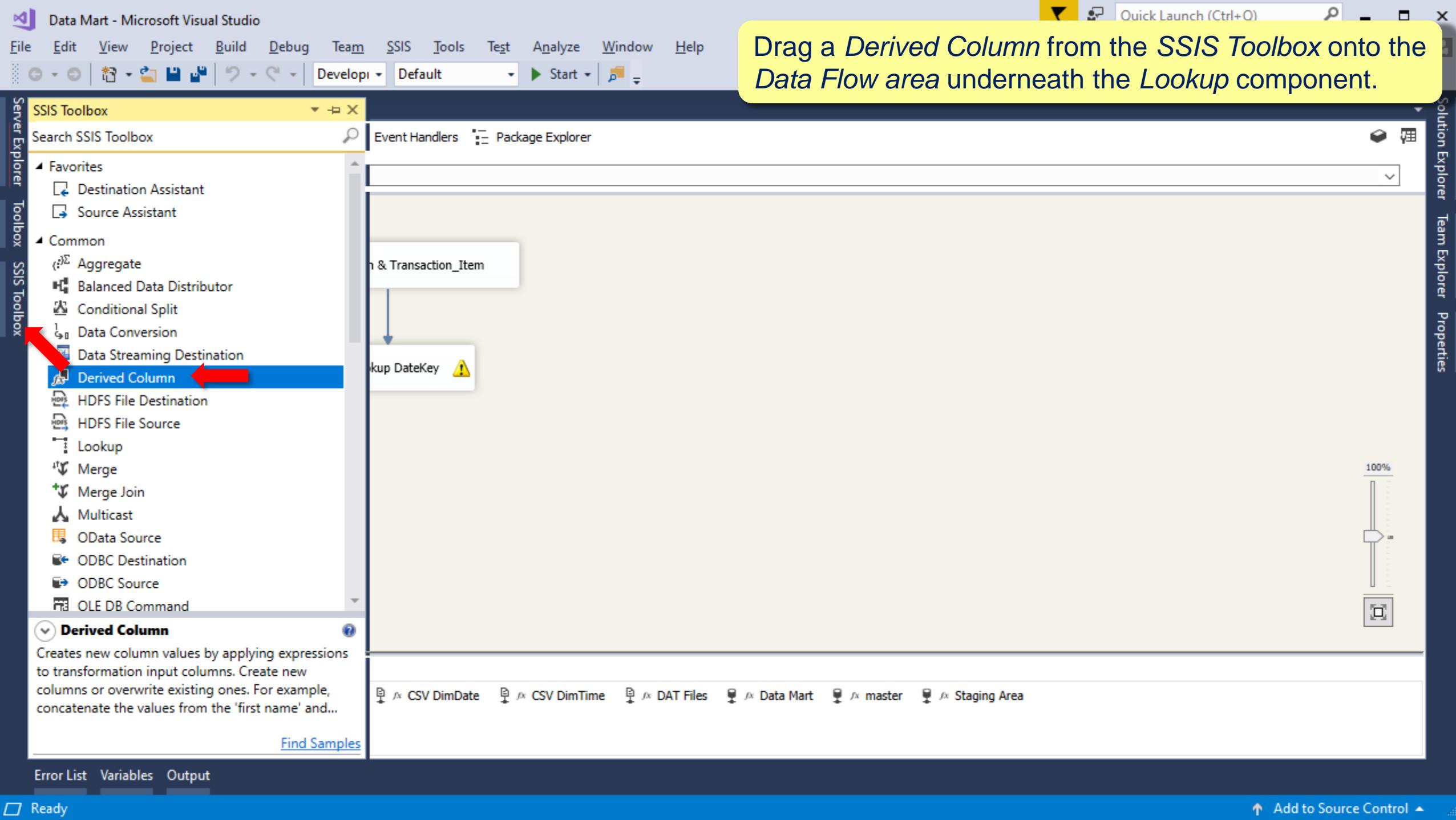
Connection Managers

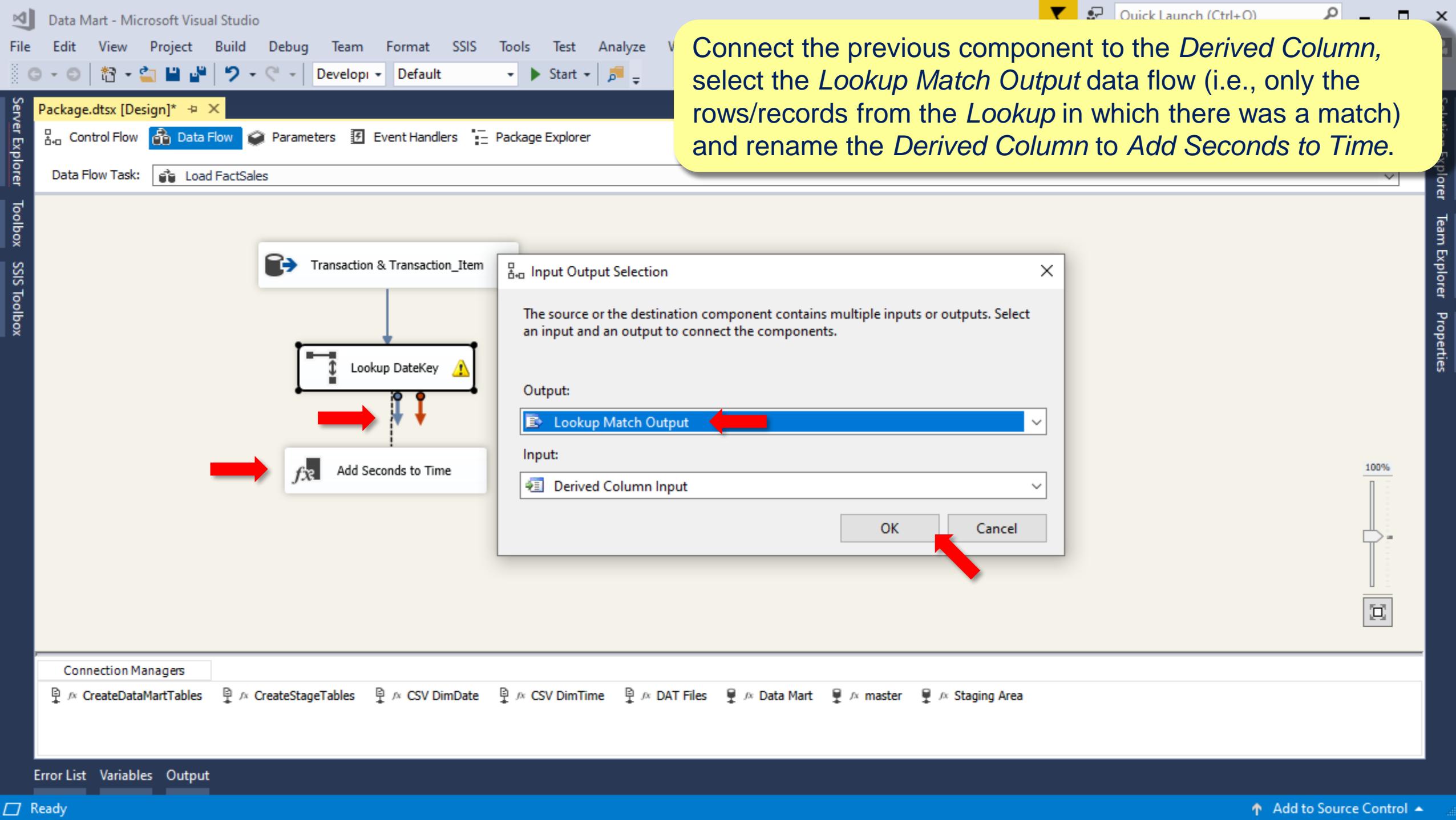
- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

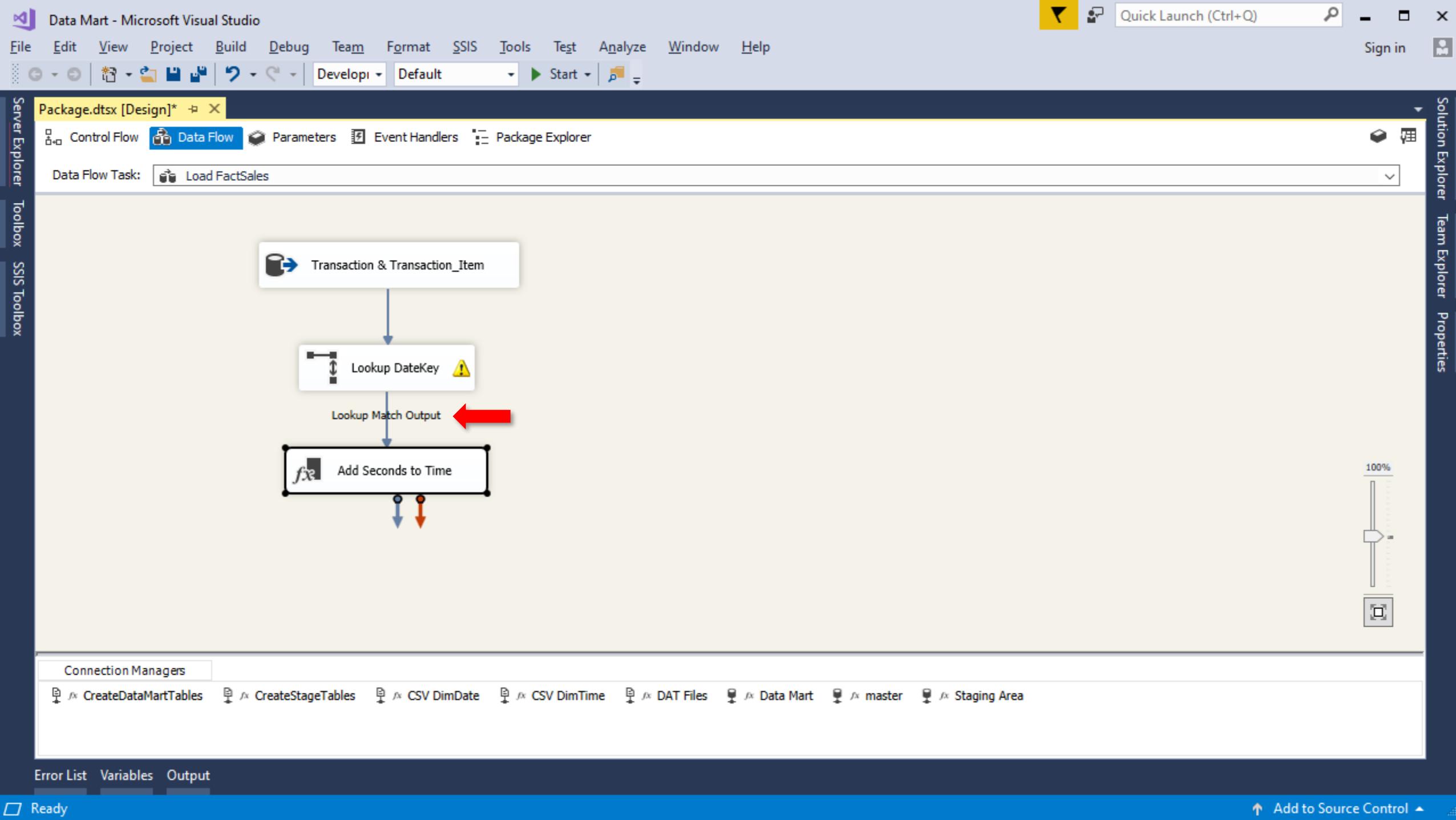
Error List Variables Output

Ready Add to Source Control

```
graph TD; Transaction[Transaction & Transaction_Item] --> Lookup[Lookup DateKey];
```







The screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Data Mart - Microsoft Visual Studio". The main window displays a Data Flow task titled "Load FactSales" with the following components:

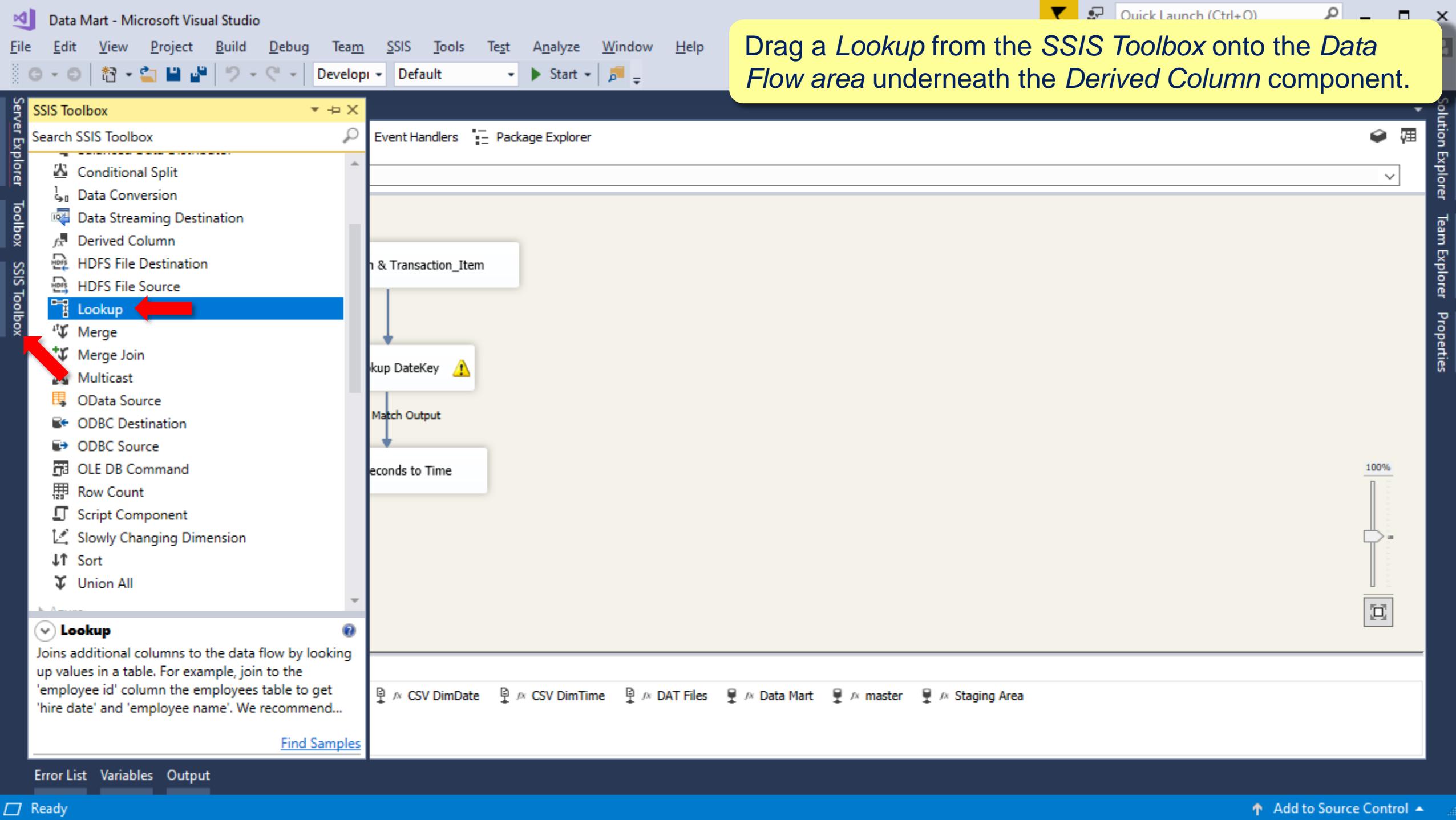
- A source component "Transaction & Transaction\_Item" connected to a "Lookup DateKey" component.
- The "Lookup DateKey" component has an output arrow labeled "Lookup Match Output" pointing to a transformation component "Add Seconds to Time".
- The "Add Seconds to Time" component has two output arrows: one blue arrow pointing down and one orange arrow pointing down.

The "Add Seconds to Time" component is highlighted with a red arrow pointing to the "Derived Column" dialog box, which is open on the right side of the screen. The dialog box is titled "Derived Column" and contains the following information:

Derived Column Name	Derived Column	Expression	Data Type
Time_With_Seconds	<add as new column>	[Time] * 100	four-byte signed integer

The "Expression" field contains the value "[Time] \* 100". A red arrow points to this expression. Another red arrow points to the "OK" button at the bottom right of the dialog box. A large yellow callout bubble provides the following explanatory text:

The *Time* attribute is an integer and is only at the minute granularity level (e.g., 901 to represent 9:01). The *Fulltime\_int* attribute is at the second granularity level (e.g., 90100 to represent 9:01:00). In order for the *Lookup* to succeed, the *Time* attribute needs to be converted to the second granularity level. Edit the *Derived Column* and add the new *Time\_With\_Seconds* attribute which results from multiplying the existing *Time* attribute by 100.



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Server Explorer Solution Explorer Team Explorer Properties

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the previous component to the Lookup and rename it *Lookup TimeKey*.

```
graph TD; A[Transaction & Transaction_Item] --> B[Lookup DateKey]; B --> C[Add Seconds to Time]; C --> D[Lookup TimeKey];
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS

Quick Launch (Ctrl+O)

Server Explorer

Toolbox

SSIS Toolbox

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate

Error List Variables Output

Ready Add to Source Control

Lookup Transformation Editor

This transform enables the performance of simple lookups.

General Connection Columns Advanced Error Output

Cache mode

- Full cache
- Partial cache
- No cache

Connection type

- Cache connection manager
- OLE DB connection manager

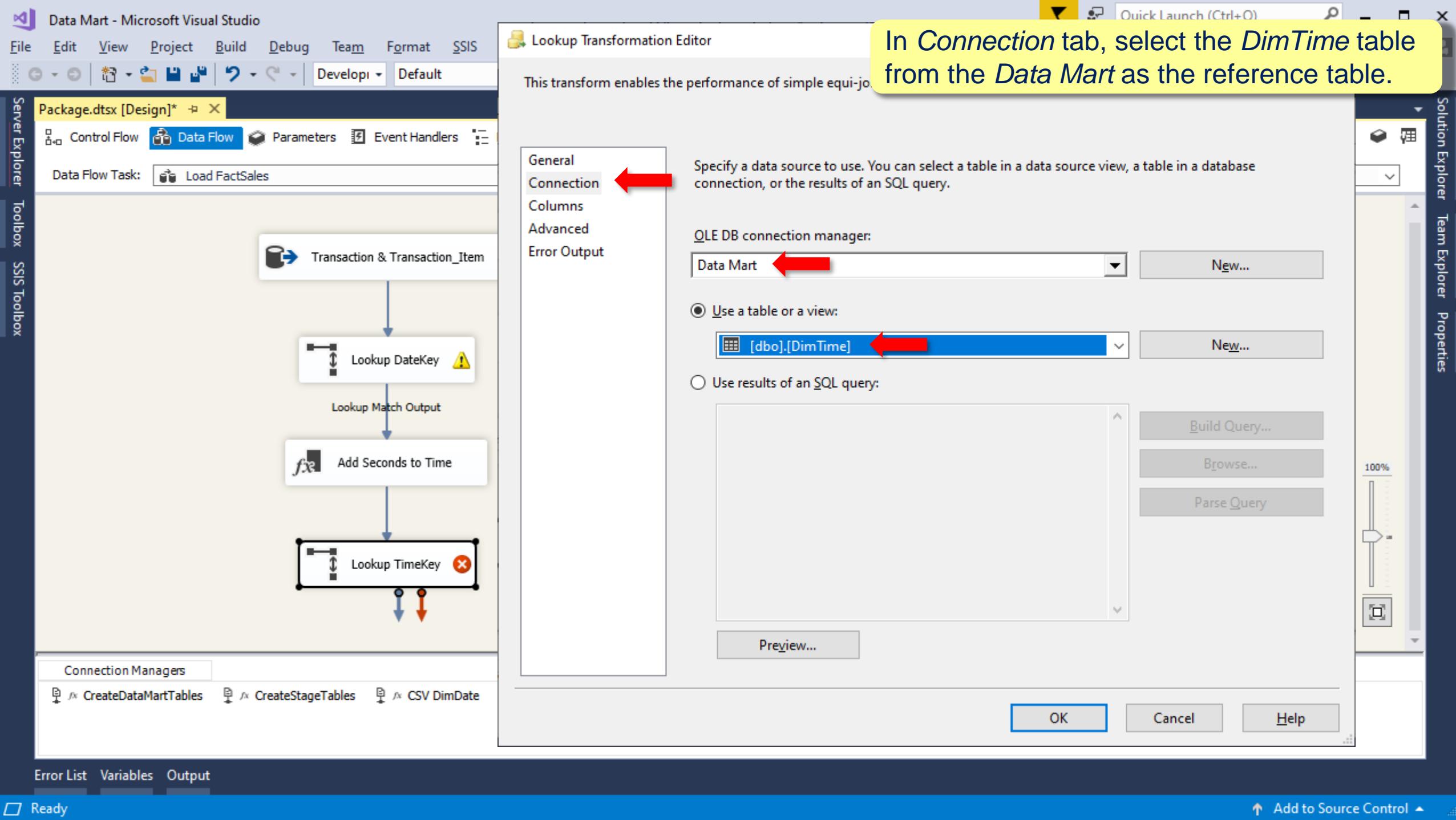
Specify how to handle rows with no matching entries

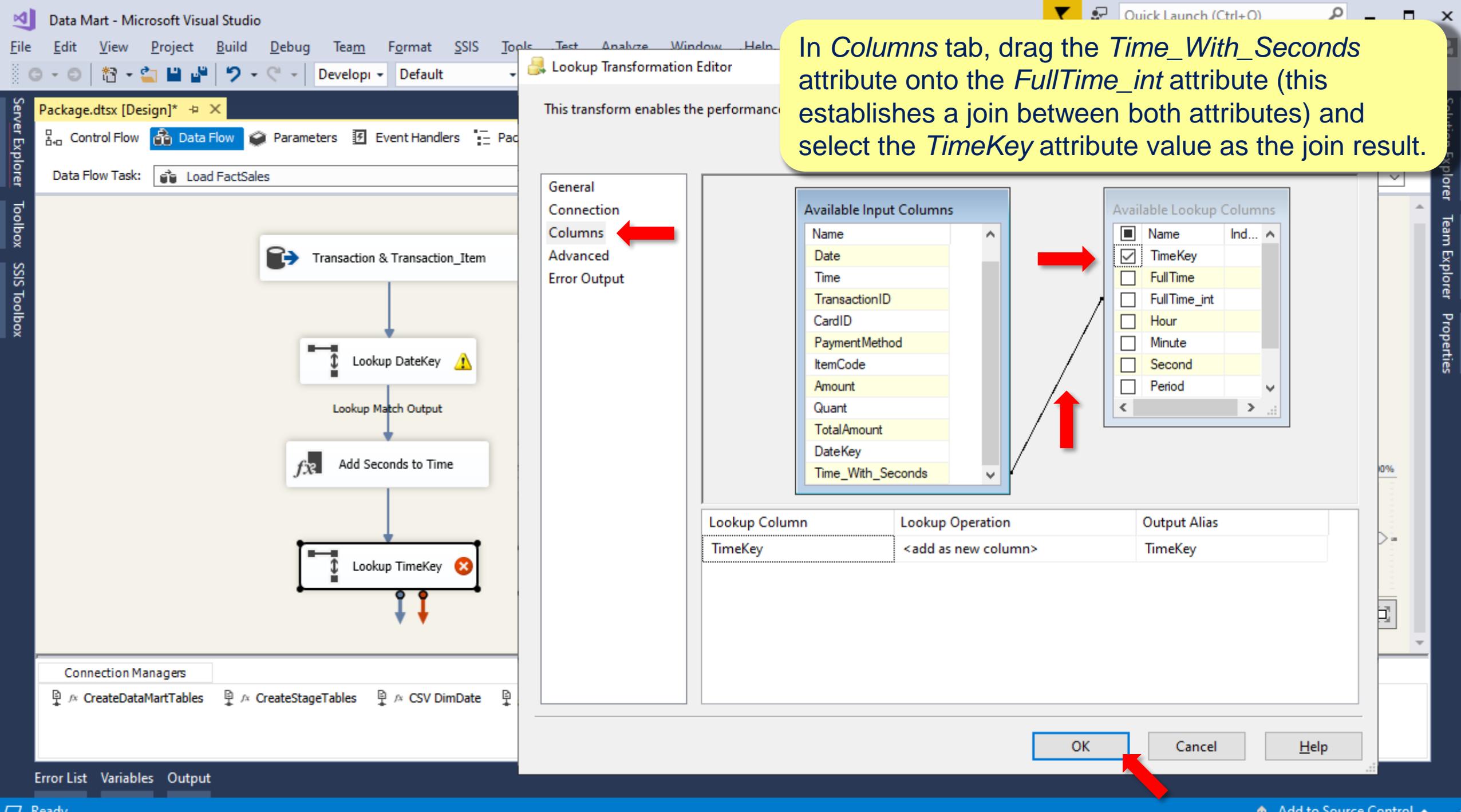
Redirect rows to error output

OK Cancel Help

Edit the *Lookup* and specify that the no matching rows/records that result from the *Lookup* should be redirected to error output (the red data flow).

```
graph TD; Transaction[Transaction & Transaction_Item] --> Lookup1[Lookup DateKey]; Transaction --> AddTime[Add Seconds to Time]; Lookup1 --> AddTime; AddTime --> Lookup2[Lookup TimeKey];
```





Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey !

Lookup Match Output

Add Seconds to Time

Lookup TimeKey !

The exclamation mark appears by the motive previously presented.

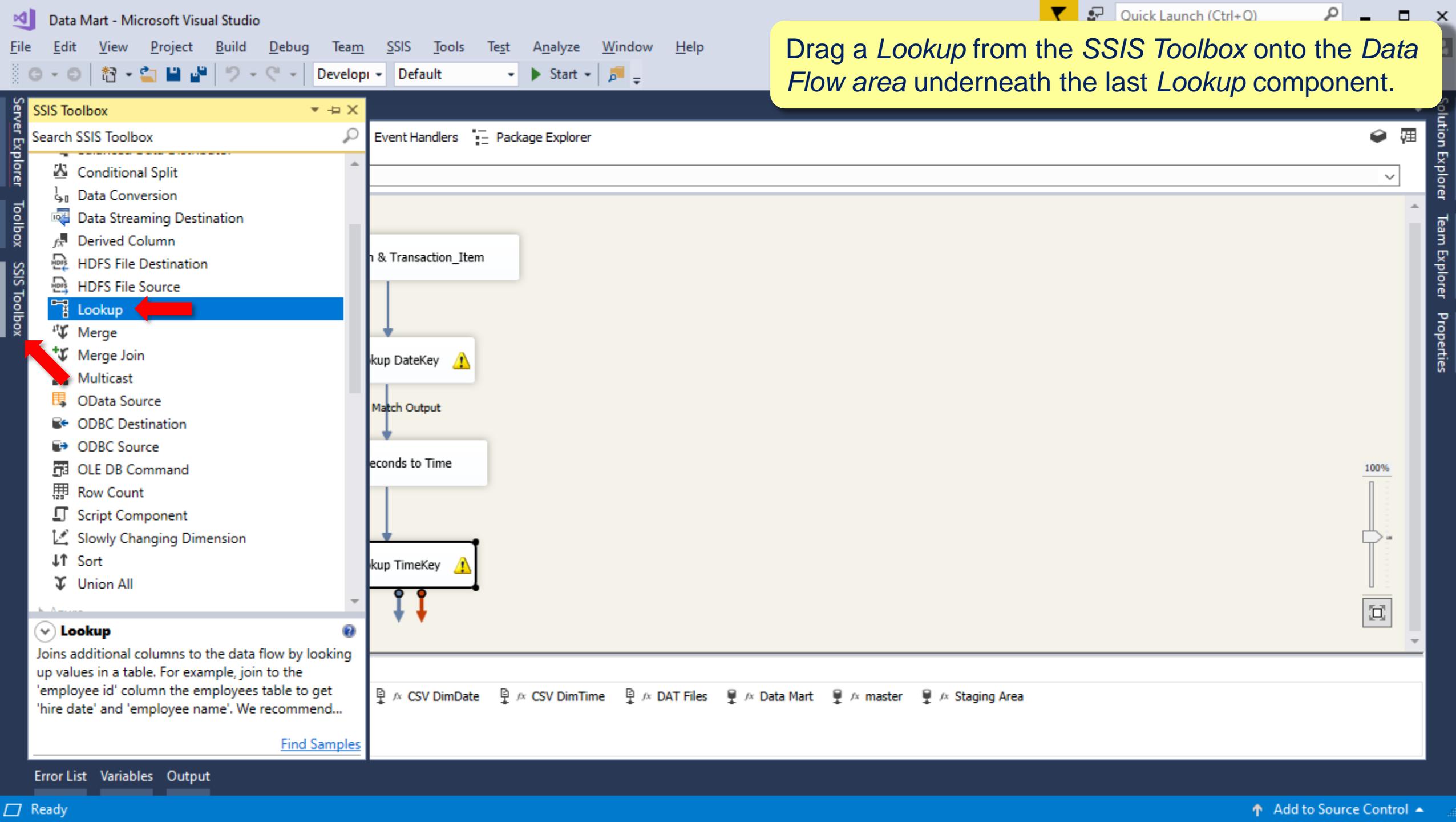
Connection Managers

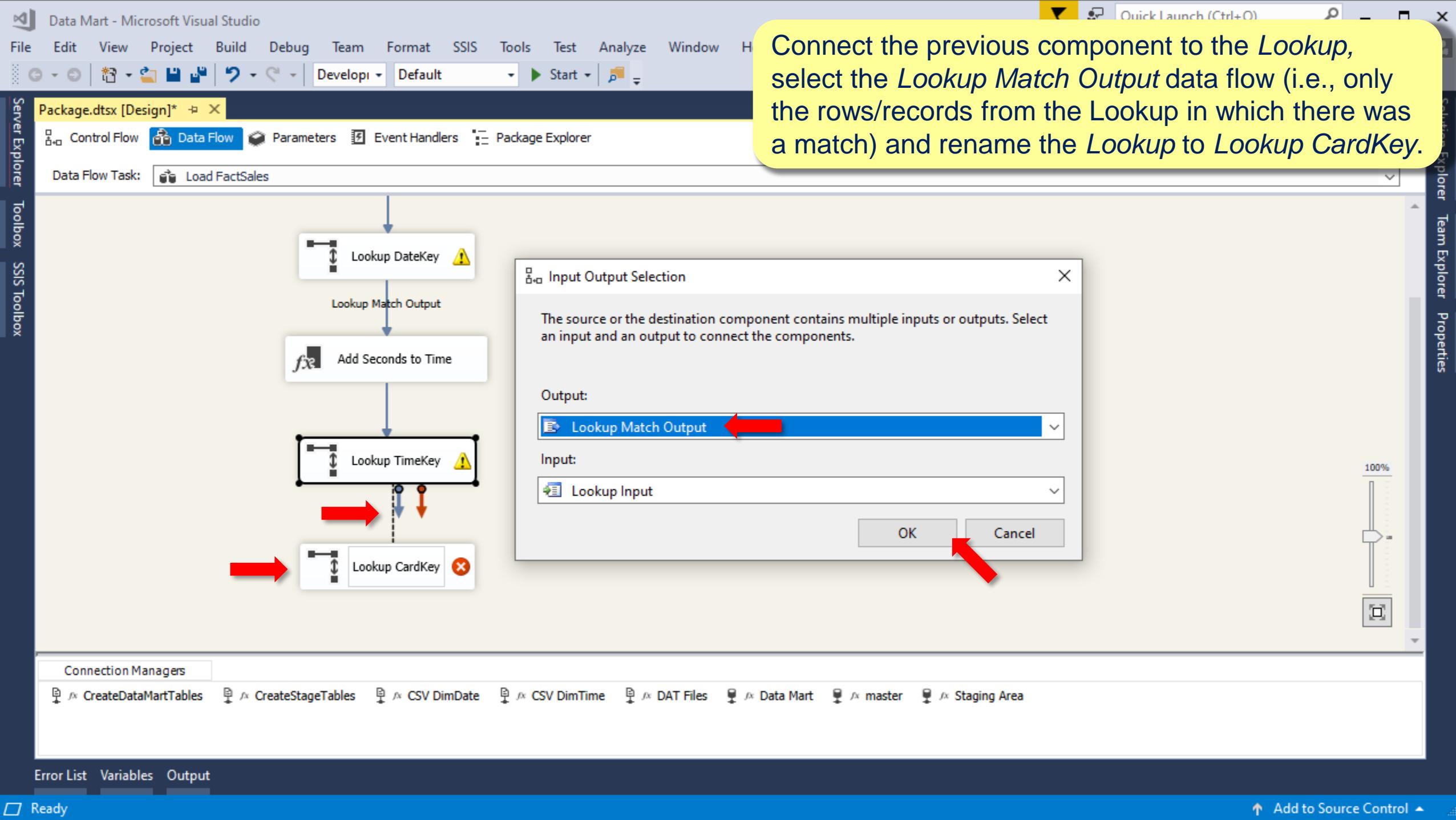
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

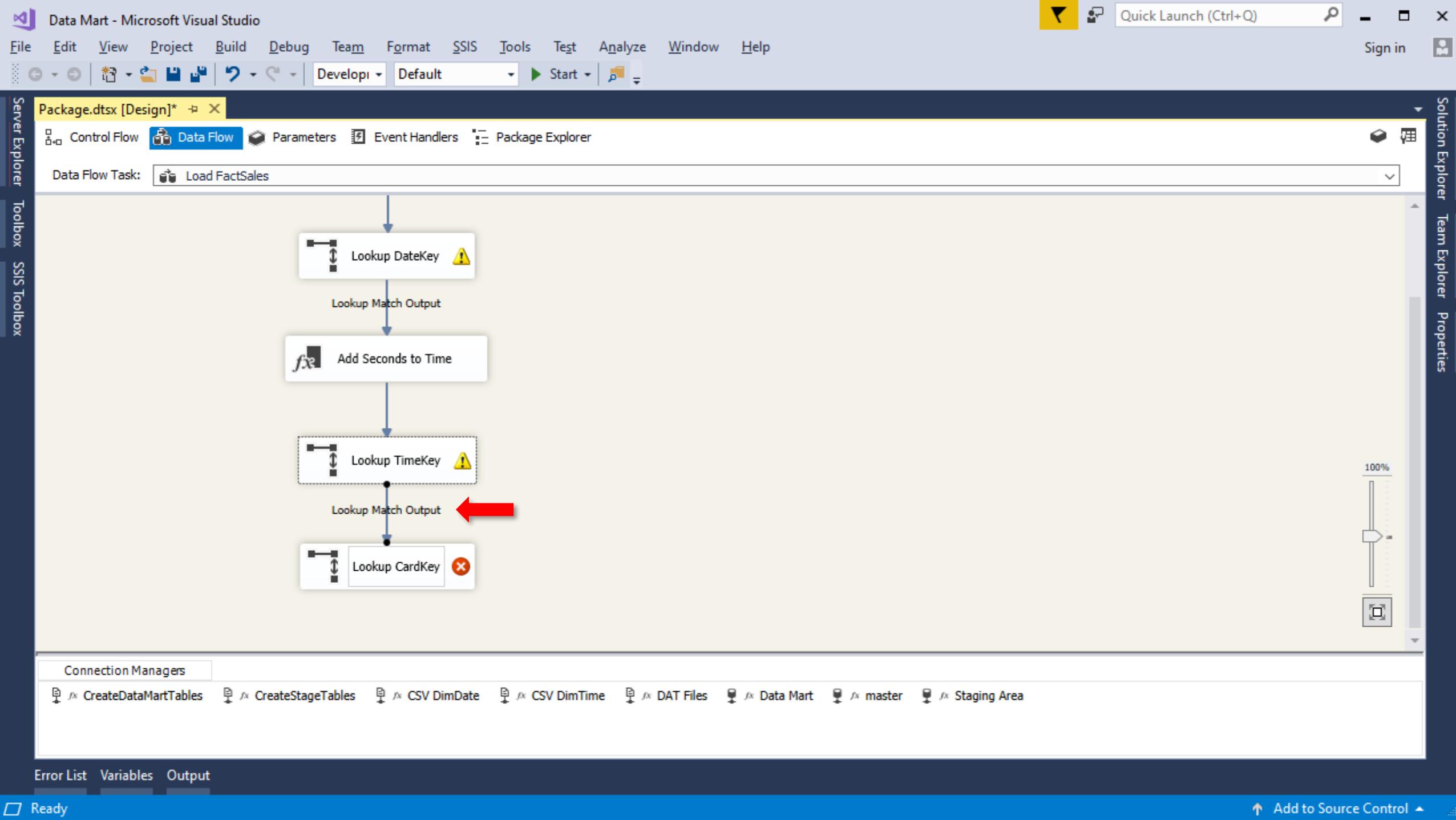
Error List Variables Output

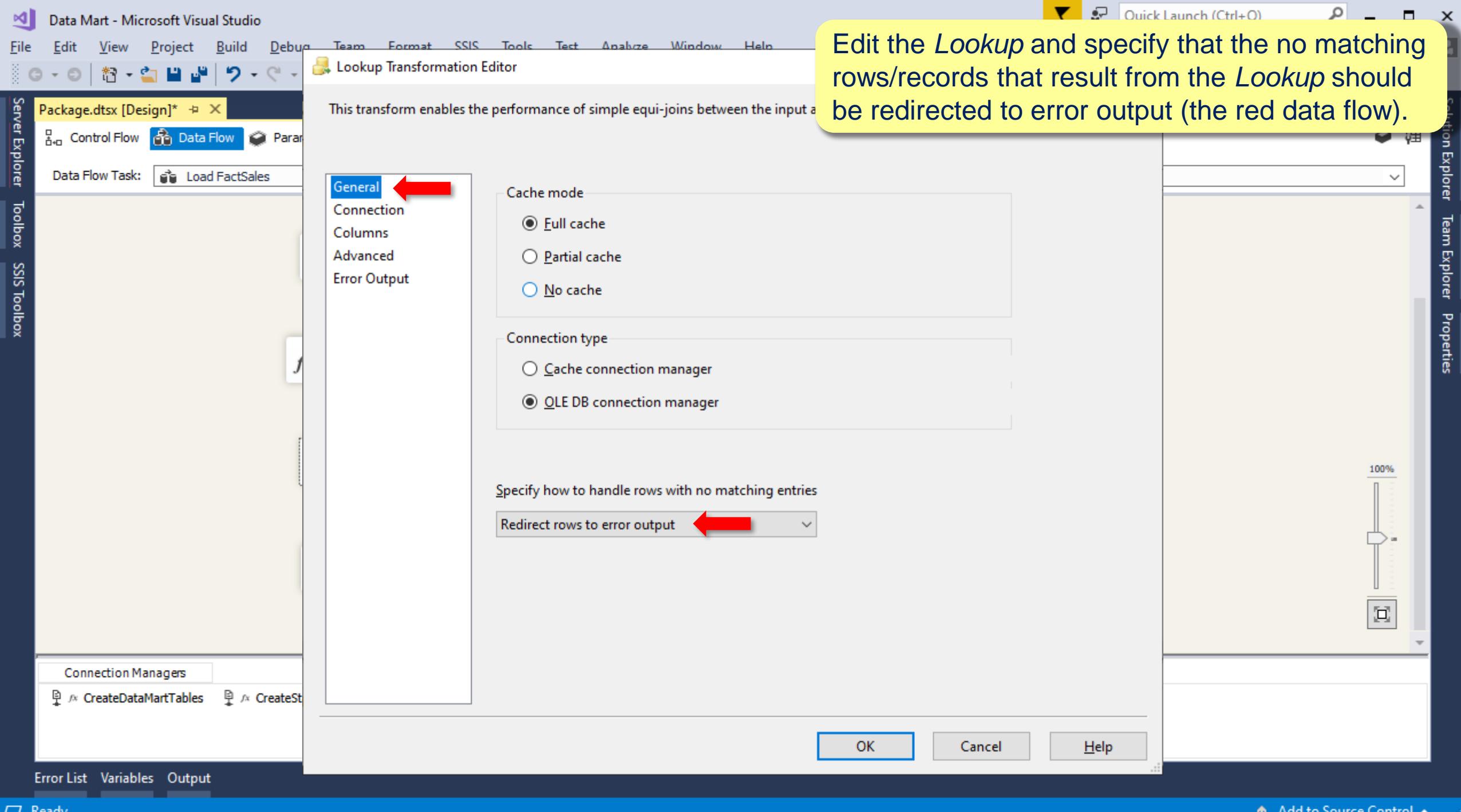
Ready Add to Source Control

```
graph TD; A[Transaction & Transaction_Item] --> B[Lookup DateKey !]; B --> C[Add Seconds to Time]; C --> D[Lookup TimeKey !];
```









Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox

Lookup Transformation Editor

This transform enables the performance of simple equi-joins between

General Connection Columns Advanced Error Output

Specify a data source to use. You can select a table in a data source view, a table in a database connection, or the results of an SQL query.

OLE DB connection manager:

Data Mart

Use a table or a view:  
 Use results of an SQL query:  
SELECT CardKey, CardID  
FROM DimCard  
WHERE IsCurrent = 'Yes'

Build Query...  
Browse...  
Parse Query

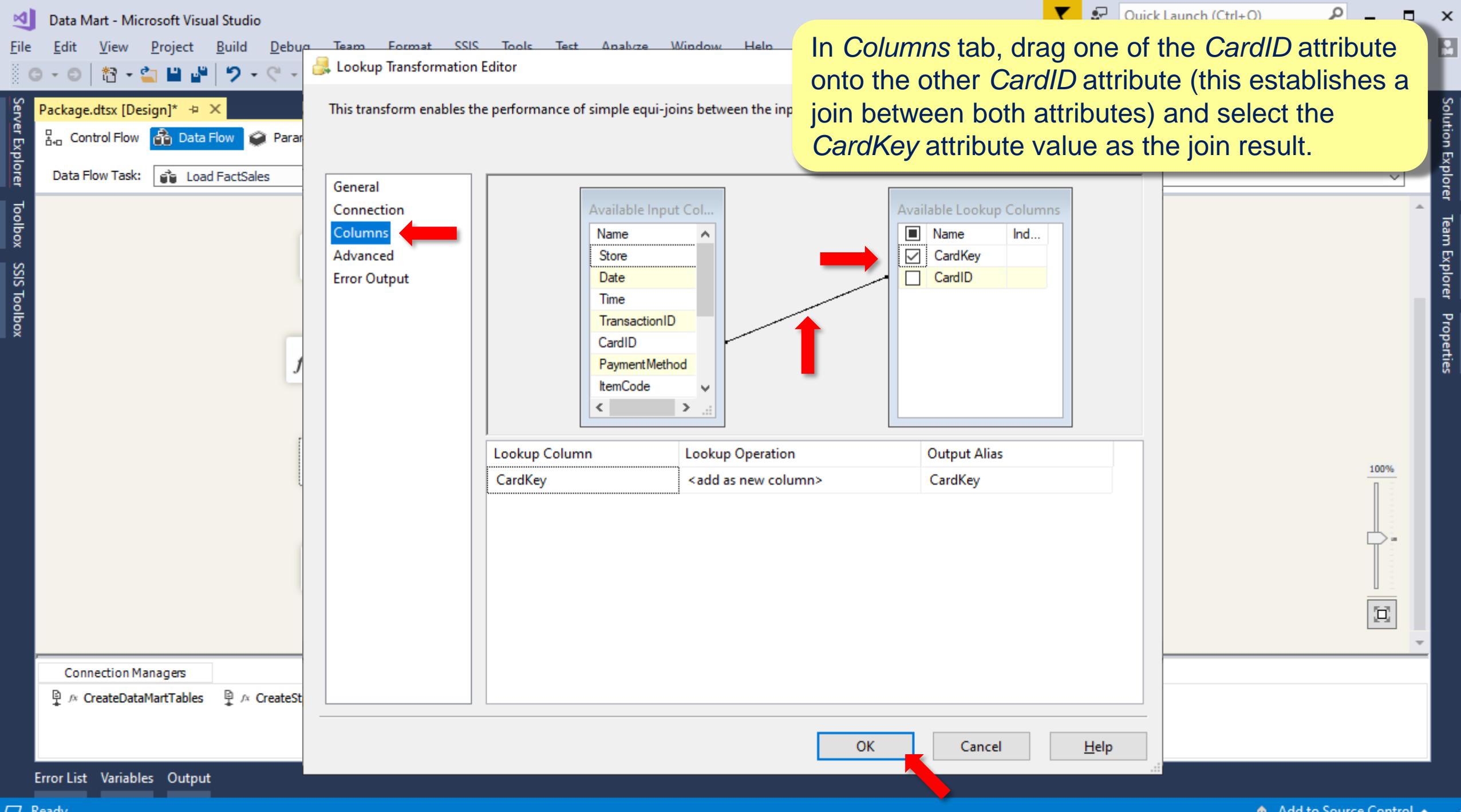
Preview...

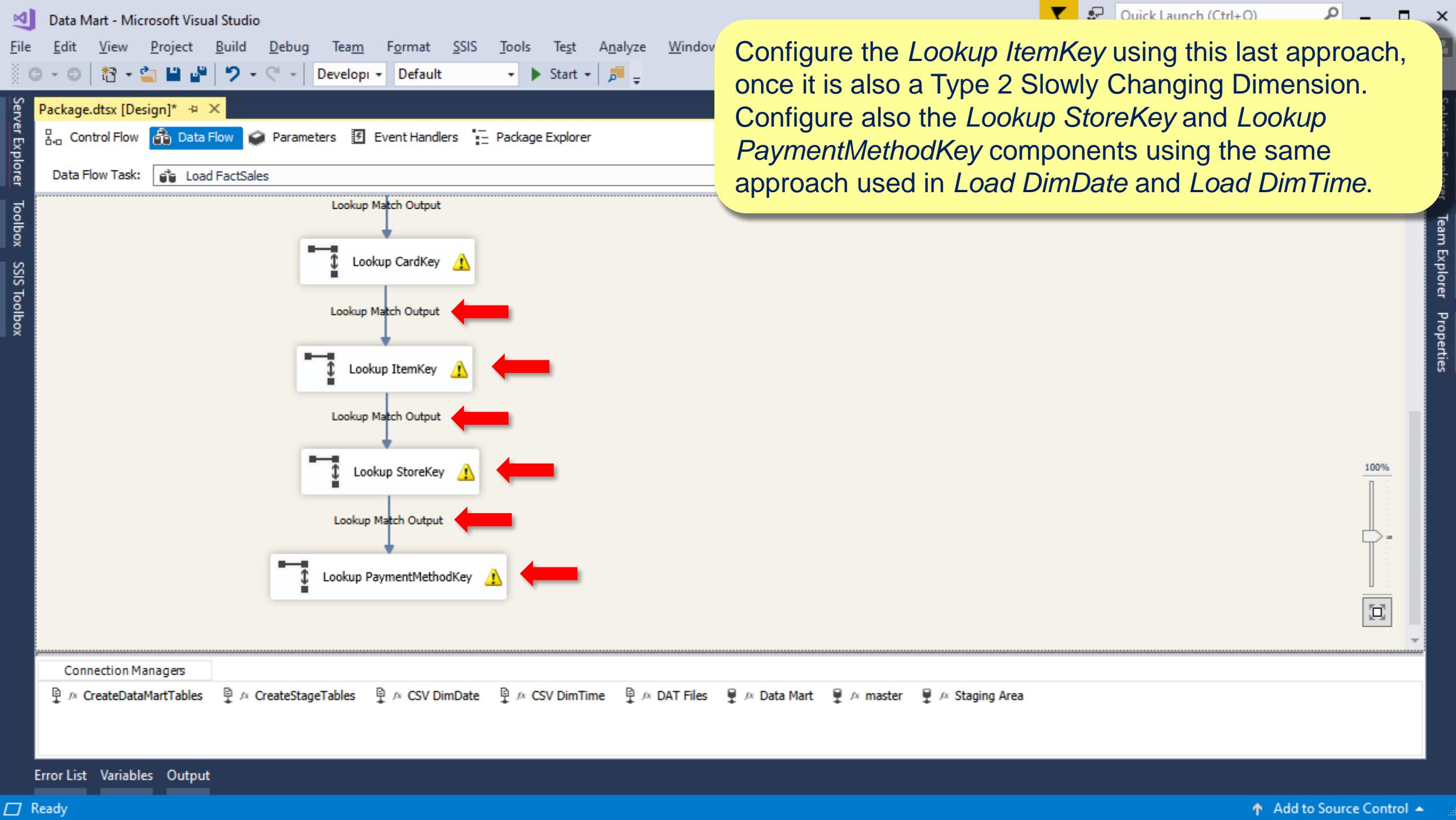
OK Cancel Help

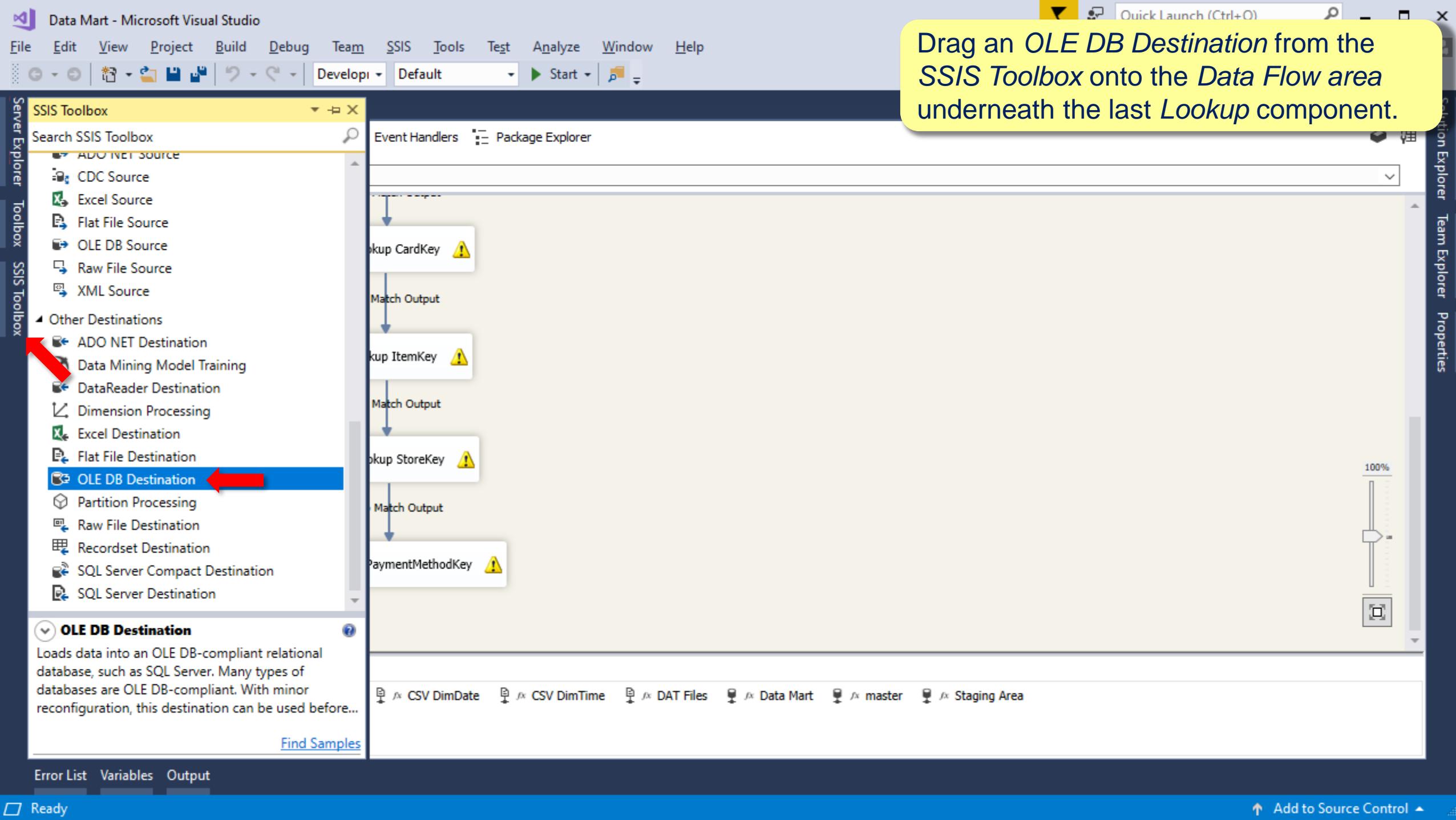
Given that the *DimCard* is a Type 2 Slowly Changing Dimension, we need to use only the current primary keys when loading the *FactSales* table. For that, we need to use the query highlighted in the figure.

100%

Add to Source Control







Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze W

Quick Launch (Ctrl+O)

Server Explorer

Toolbox

SSIS Toolbox

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Lookup Match Output

Lookup ItemKey

Lookup Match Output

Lookup StoreKey

Lookup Match Output

Lookup PaymentMetho

FactSales

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:

Lookup Match Output

Input:

OLE DB Destination Input

OK Cancel

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Add to Source Control

Connect the previous component to the *OLE DB Destination*, select the *Lookup Match Output* data flow (i.e., only the rows/records from the *Lookup* in which there was a match) and rename the *OLE DB Destination* to *FactSales*.

```
graph TD; Start([Start]) --> L1[Lookup Match Output]; L1 --> L2[Lookup ItemKey]; L2 --> L3[Lookup Match Output]; L3 --> L4[Lookup StoreKey]; L4 --> L5[Lookup Match Output]; L5 --> L6[Lookup PaymentMetho]; L6 --> FactSales([FactSales]);
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+Q)

Sign in

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Lookup Match Output

Lookup ItemKey ⚠

Lookup Match Output

Lookup StoreKey ⚠

Lookup Match Output

Lookup PaymentMethodKey ⚠

Lookup Match Output ←

FactSales ✖

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Add to Source Control

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

```
graph TD; L1[Lookup ItemKey] --> L2[Lookup StoreKey]; L2 --> L3[Lookup PaymentMethodKey]; L3 --> L4[FactSales];
```

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The main area displays a "Data Flow" task titled "Load FactSales". The data flow consists of four sequential "Lookup Match Output" components: "Lookup ItemKey", "Lookup StoreKey", "Lookup PaymentMethodKey", and "FactSales". Each lookup component has a yellow warning icon. A red arrow points to the fourth component, "Lookup PaymentMethodKey". The "FactSales" component has a red close button. The "Properties" tab is selected on the right side of the interface.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Server Explorer Solution Explorer Team Explorer Properties

OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB connection manager.

Connection Manager Mappings Error Output

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. For fast-load data access, set the table update options.

OLE DB connection manager: Data Mart

Data access mode: Table or view - fast load

Name of the table or the view: [dbo].[FactSales]

Keep identity  Table lock

Keep nulls  Check constraints

Rows per batch:

Maximum insert commit size: 2147483647

[View Existing](#)

Map the columns on the Mappings page.

OK Cancel Help

Add to Source Control

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Connection Managers

CreateDataMartTables CreateSt

Error List Variables Output

Ready

Quick Launch (Ctrl+Q)

100%

This screenshot shows the 'OLE DB Destination Editor' dialog box within Microsoft Visual Studio. The 'Data Flow' tab is selected in the left sidebar. The main area displays configuration settings for an OLE DB destination. A yellow callout bubble at the top right provides instructions: 'Edit the OLE DB Destination and select the FactSales of the Data Mart as the destination table.' Two red arrows point to the 'Data Mart' dropdown menu and the 'Name of the table or the view' dropdown menu, both of which have '[dbo].[FactSales]' selected. The 'Data Mart' dropdown has a red arrow pointing to its label. The 'Name of the table or the view' dropdown also has a red arrow pointing to its label. The 'OK' button is visible at the bottom right of the dialog.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Server Explorer Solution Explorer Team Explorer Properties

OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB provider.

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Connection Manager Mappings Error Output

Available Input Columns

Name
TotalAmount
DateKey
Time_With_S...
TimeKey
CardKey
ItemKey
StoreKey
PaymentMeth...

Available Destination Columns

Name
DateKey
TimeKey
CardKey
ItemKey
StoreKey
PaymentMethodKey
TransactionID
Quant

Input Column      Destination Column

Input Column	Destination Column
DateKey	DateKey
TimeKey	TimeKey
CardKey	CardKey
ItemKey	ItemKey
StoreKey	StoreKey
PaymentMethodKey	PaymentMethodKey
TransactionID	TransactionID
Quant	Quant
Amount	Amount
TotalAmount	TotalAmount

OK Cancel Help

In the *Mappings* tab check if all the attributes are correctly mapped.

Add to Source Control

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

The FactSales OLE DB Destination is now properly configured.

```
graph TD; L1[Lookup ItemKey] --> L2[Lookup StoreKey]; L2 --> L3[Lookup PaymentMethodKey]; L3 --> L4[FactSales]
```

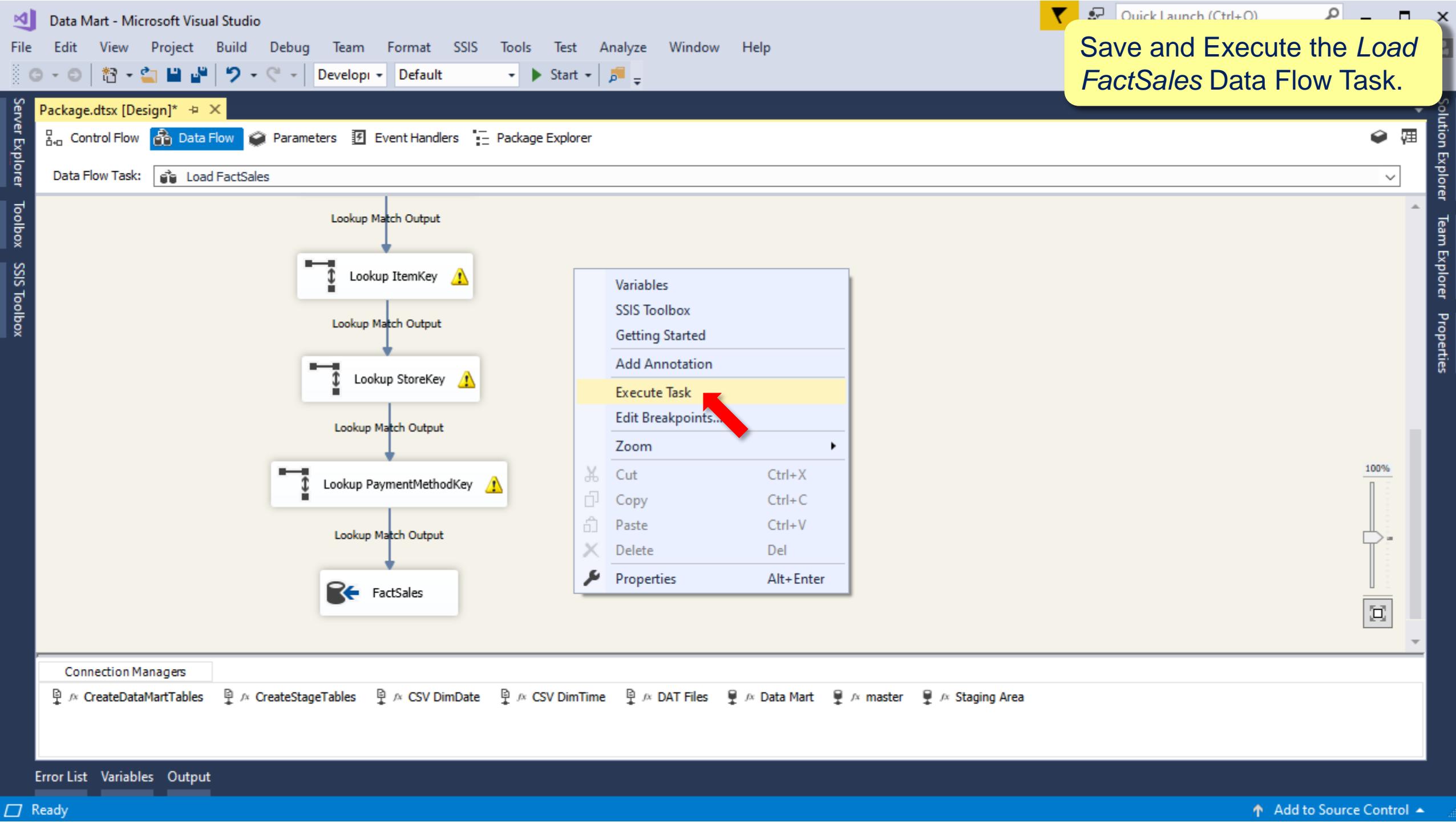
Connection Managers

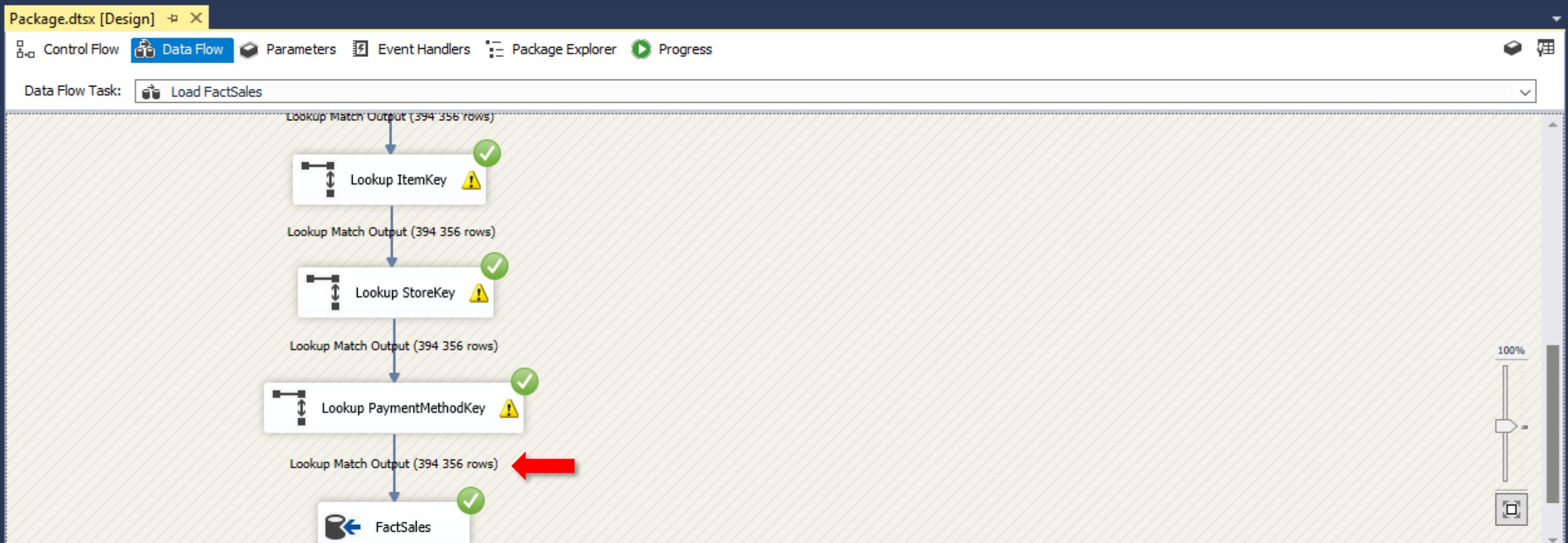
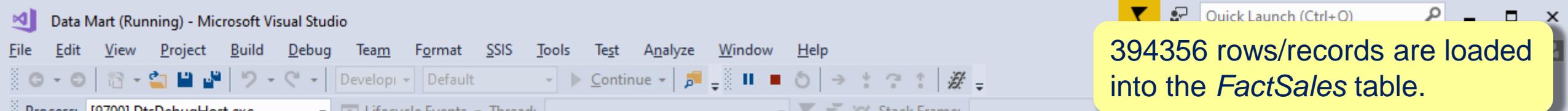
- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Ready Add to Source Control

This screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The main window displays the "Data Flow" tab, specifically the "Load FactSales" task. The data flow consists of four sequential "Lookup Match Output" components: "Lookup ItemKey", "Lookup StoreKey", "Lookup PaymentMethodKey", and "FactSales". Each lookup component has a yellow warning icon. The "FactSales" component is highlighted with a red arrow pointing to it. The bottom left pane shows the "Connection Managers" list, which includes "CreateDataMartTables", "CreateStageTables", "CSV DimDate", "CSV DimTime", "DAT Files", "Data Mart", "master", and "Staging Area". The bottom right corner features a zoom control set to 100%.





#### Connection Managers

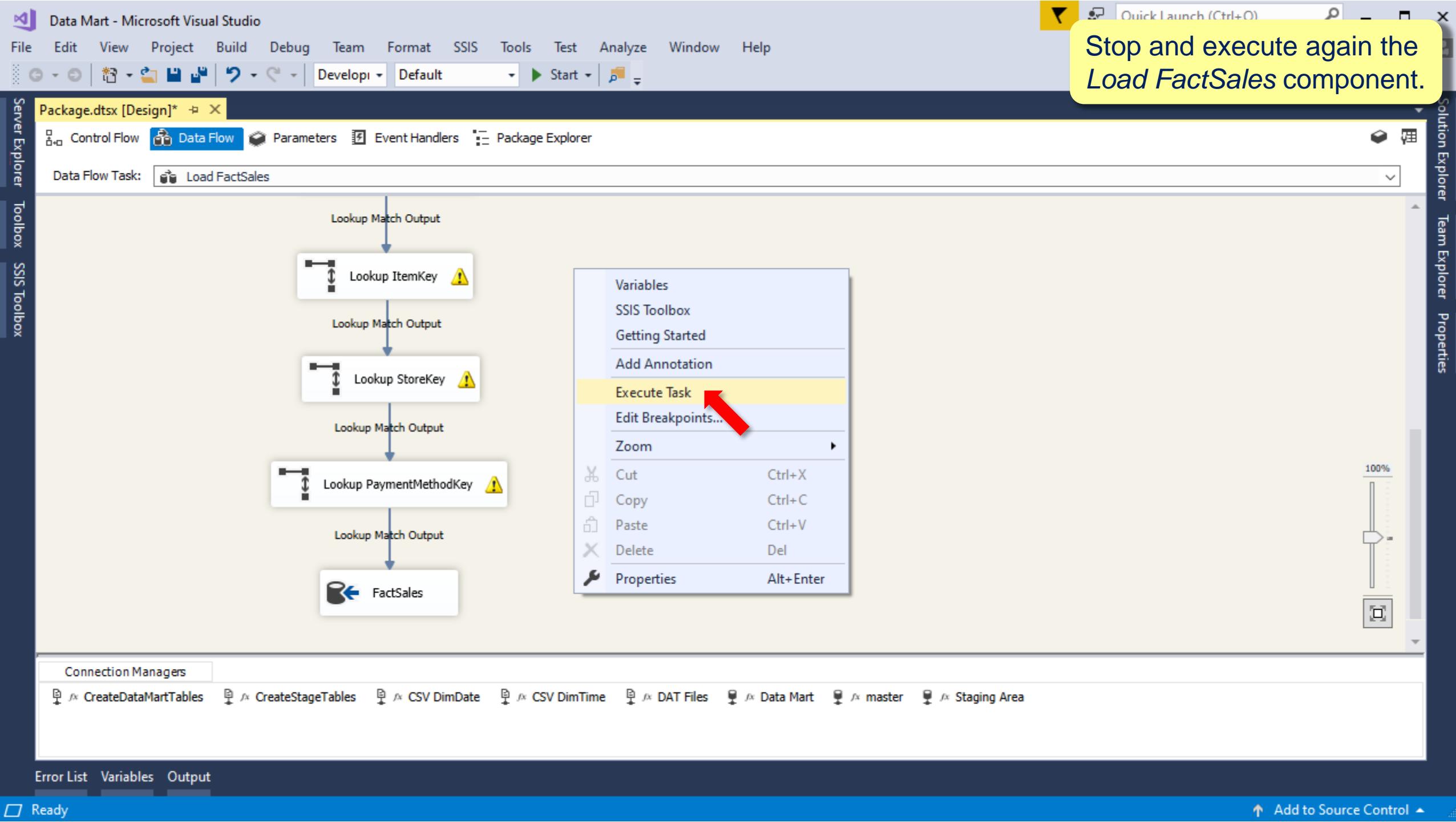
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

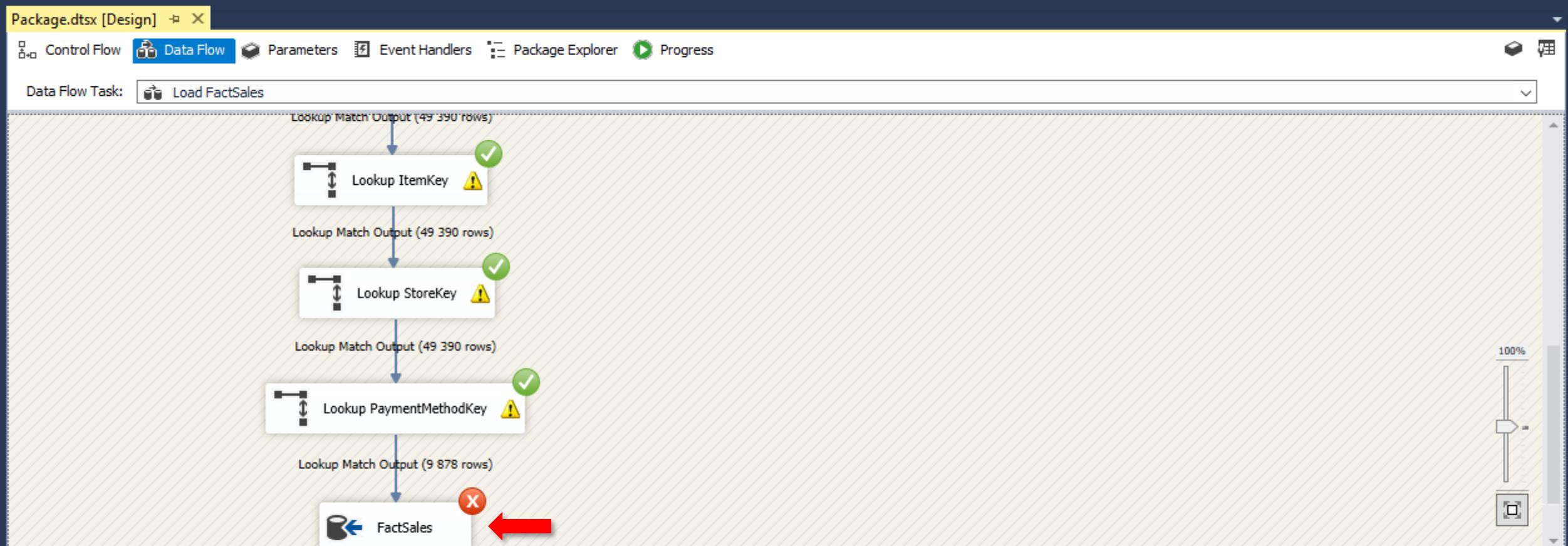
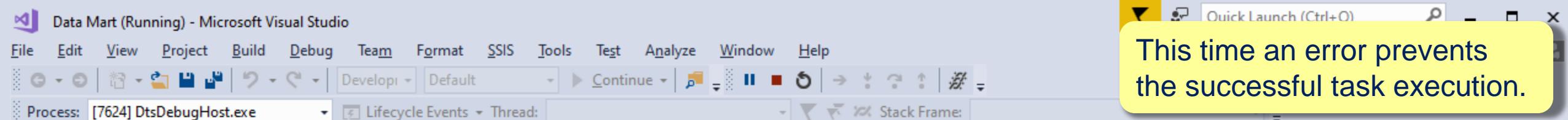
Package execution completed. Click here to switch to design mode, or select Stop Debugging from the Debug menu.

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Add to Source Control ▾





Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Ln 1

Col 1

Ch 1

INS

Add to Source Control

Data Mart (Running) - Microsoft Visual Studio

File Edit View Project Build Debug Team SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Process: [13776] DtsDebugHost.exe Lifecycle Events Thread:

Package.dtsx [Design]

Control Flow Data Flow Parameters Event Handlers Package Explorer Progress

In the *Progress* tab it's possible to see the error that occurred. Actually, the error message is not completely visible, so we need to copy and paste it in a text editor.

[Lookup PaymentMethodKey [124]] Information: The Lookup PaymentMethodKey processed 4 rows in the cache. The processing time was 0.001 seconds. The cache used 188 bytes of memory.  
→ Progress: Pre-Execute - 44 percent complete  
[Lookup TimeKey [174]] Information: Lookup TimeKey has cached 2730 rows.  
[Lookup TimeKey [174]] Information: Lookup TimeKey has cached a total of 54000 rows.  
[Lookup TimeKey [174]] Information: The number of unique rows added to the cache is 54000.  
[Lookup TimeKey [174]] Information: The Lookup TimeKey processed 54000 rows in the cache. The processing time was 0.062 seconds. The cache used 2592000 bytes of memory.  
→ Progress: Pre-Execute - 55 percent complete  
→ Progress: Pre-Execute - 66 percent complete  
→ Progress: Pre-Execute - 77 percent complete  
→ Progress: Pre-Execute - 88 percent complete  
[Lookup StoreKey [149]] Information: Lookup StoreKey has cached 6 rows.  
[Lookup StoreKey [149]] Information: Lookup StoreKey has cached a total of 6 rows.  
[Lookup StoreKey [149]] Information: The number of unique rows added to the cache is 6.  
[Lookup StoreKey [149]] Information: The Lookup StoreKey processed 6 rows in the cache. The processing time was 0.001 seconds. The cache used 300 bytes of memory.  
→ Progress: Pre-Execute - 100 percent complete  
[SSIS.Pipeline] Information: Execute phase is beginning.  
**X [FactSales [12]] Error: SSIS Error Code DTS\_E\_OLEDBERROR. An OLE DB error has occurred. Error code: 0x80004005. An OLE DB record is available. Source: "Microsoft SQL Server Native Client 11.0" Hresult: 0x80004005 Description: [FactSales [12]] Error: SSIS Error Code DTS\_E\_INDUCEDTRANSFORMFAILUREONERROR. The "OLE DB Destination [FactSales]" failed because error code 0xC020907B occurred, and the error row disposition on "FactSales.Inp**  
**X [SSIS.Pipeline] Error: SSIS Error Code DTS\_E\_PROCESSINPUTFAILED. The ProcessInput method on component "FactSales" failed with error code 0xC0209029 while processing input "OLE DB Destination Input" (25). The identified com**  
**X [Transaction & Transaction\_Item [199]] Error: The attempt to add a row to the Data Flow task buffer failed with error code 0xC0209020.**  
**X [SSIS.Pipeline] Error: SSIS Error Code DTS\_E\_PRIMEOUTPUTFAILED. The PrimeOutput method on Transaction & Transaction\_Item returned error code 0xC02020C4. The component returned a failure code when the pipeline engine called**  
[SSIS.Pipeline] Information: Post Execute phase is beginning.  
→ Progress: Post Execute - 0 percent complete  
→ Progress: Post Execute - 11 percent complete  
→ Progress: Post Execute - 22 percent complete  
→ Progress: Post Execute - 33 percent complete  
→ Progress: Post Execute - 44 percent complete  
→ Progress: Post Execute - 55 percent complete  
→ Progress: Post Execute - 66 percent complete

Copy Message Text

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ln 1 Col 1 Ch 1 INS

Ready Add to Source Control

The error message is clear: it's not possible to insert a record with the same primary key. This means that the record was already loaded (i.e., in the previous execution).

```
1 [FactSales [12]] Error: SSIS Error Code DTS_E_OLEDBERROR.  
2 An OLE DB record is available. Source: "Microsoft SQL Server Native Client 11.0" Hresult: 0x80004005 Description:  
"The statement has been terminated."  
3 An OLE DB record is available. Source: "Microsoft SQL Server Native Client 11.0" Hresult: 0x80004005 Description:  
"Violation of PRIMARY KEY constraint 'PK_FactSales'. Cannot insert duplicate key in object 'dbo.FactSales'. The  
duplicate key value is (36891, 1921, 59660, 501, 1)."  
4
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup Match Output

Lookup StoreKey ⚠

Lookup Match Output

Lookup PaymentMethodKey ⚠

FactSales

To correct the problem, delete the data flow between the *Lookup* and the *FactSales* components and drag the *FactSales* to below.

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

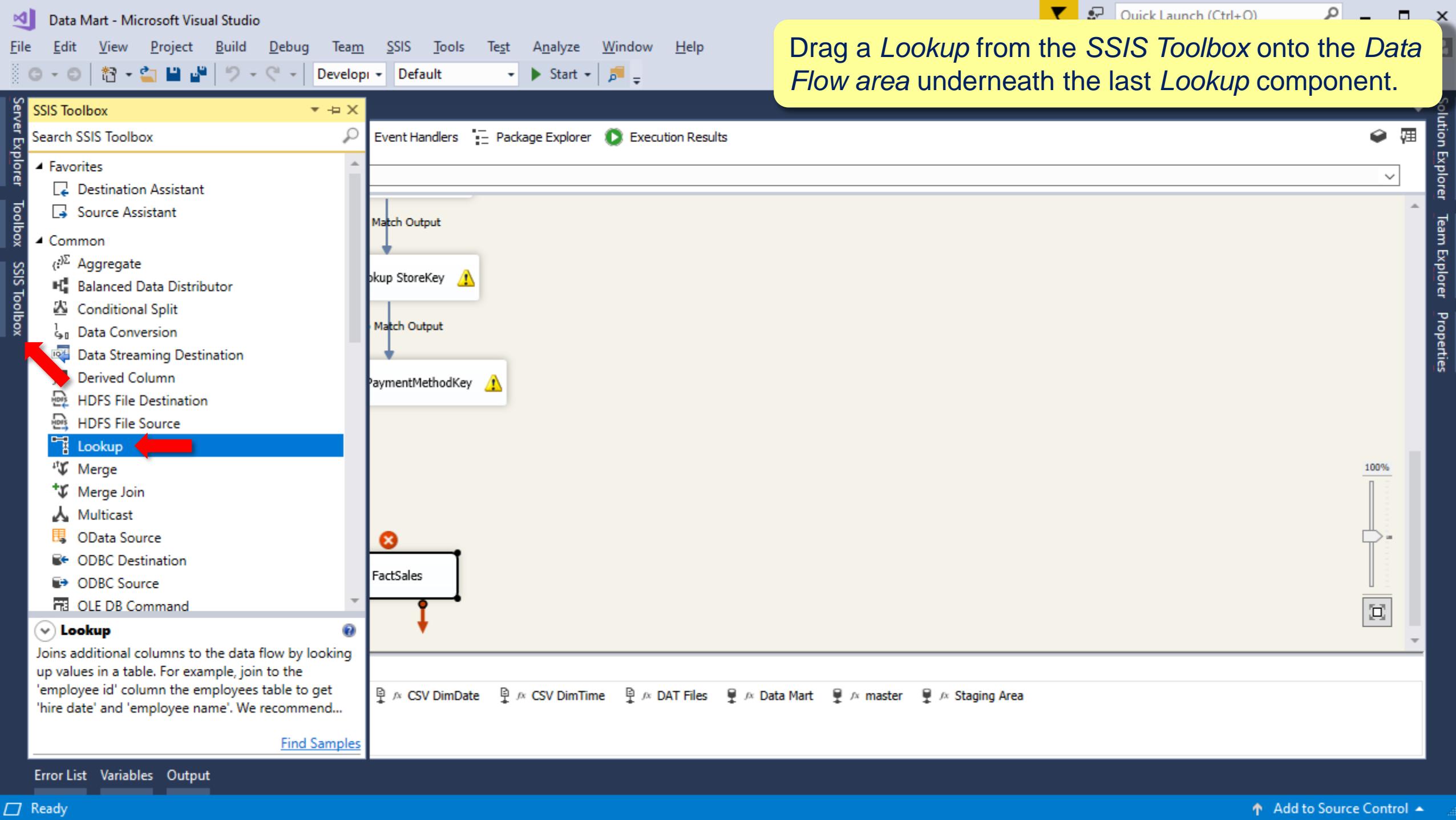
Error List Variables Output

Ln 1 Col 1 Ch 1 INS

Add to Source Control

```
graph TD; L1[Lookup Match Output] --> L2[Lookup StoreKey]; L2 --> L3[Lookup Match Output]; L3 --> L4[Lookup PaymentMethodKey]; L4 --> FS[FactSales];
```

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The "Data Flow" tab is selected in the ribbon. The data flow task is named "Load FactSales". The diagram consists of four components connected sequentially: a "Lookup" component (labeled "StoreKey") with a yellow warning icon, another "Lookup" component (labeled "PaymentMethodKey") with a yellow warning icon, and finally a "FactSales" component. The "FactSales" component has a red "X" icon above it, indicating it is disabled or failed. Arrows show the flow from the first lookup to the second, and from the second to the fact sales component. A yellow callout bubble with black text provides instructions to correct the problem by deleting the data flow between the lookups and dragging the fact sales component below them. The bottom of the screen shows the connection manager list and various status bars.



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup Match Output

Lookup StoreKey

Lookup Match Output

Lookup PaymentMethodKey

Lookup Match Output

Fact Already Exists?

FactSales

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

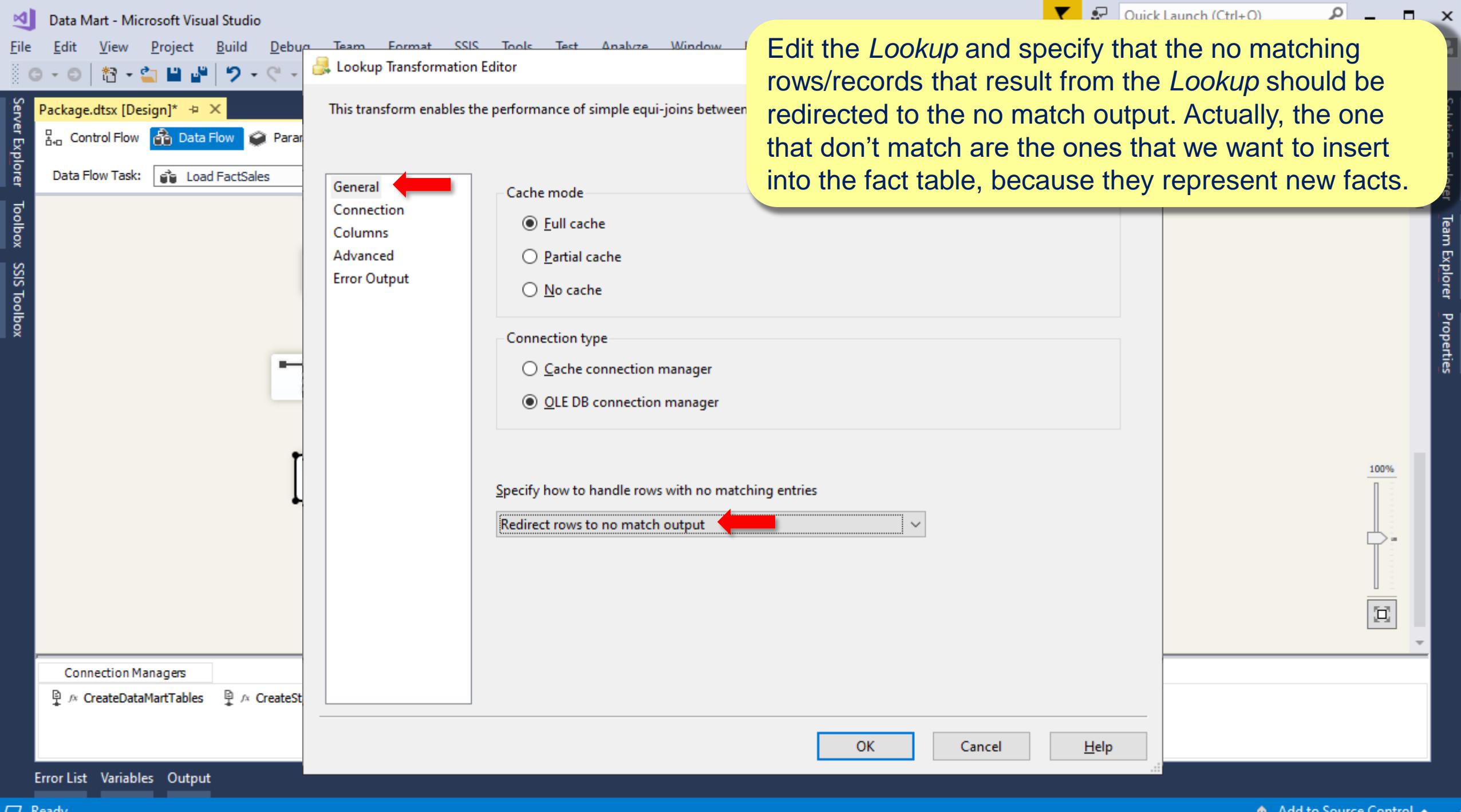
Error List Variables Output

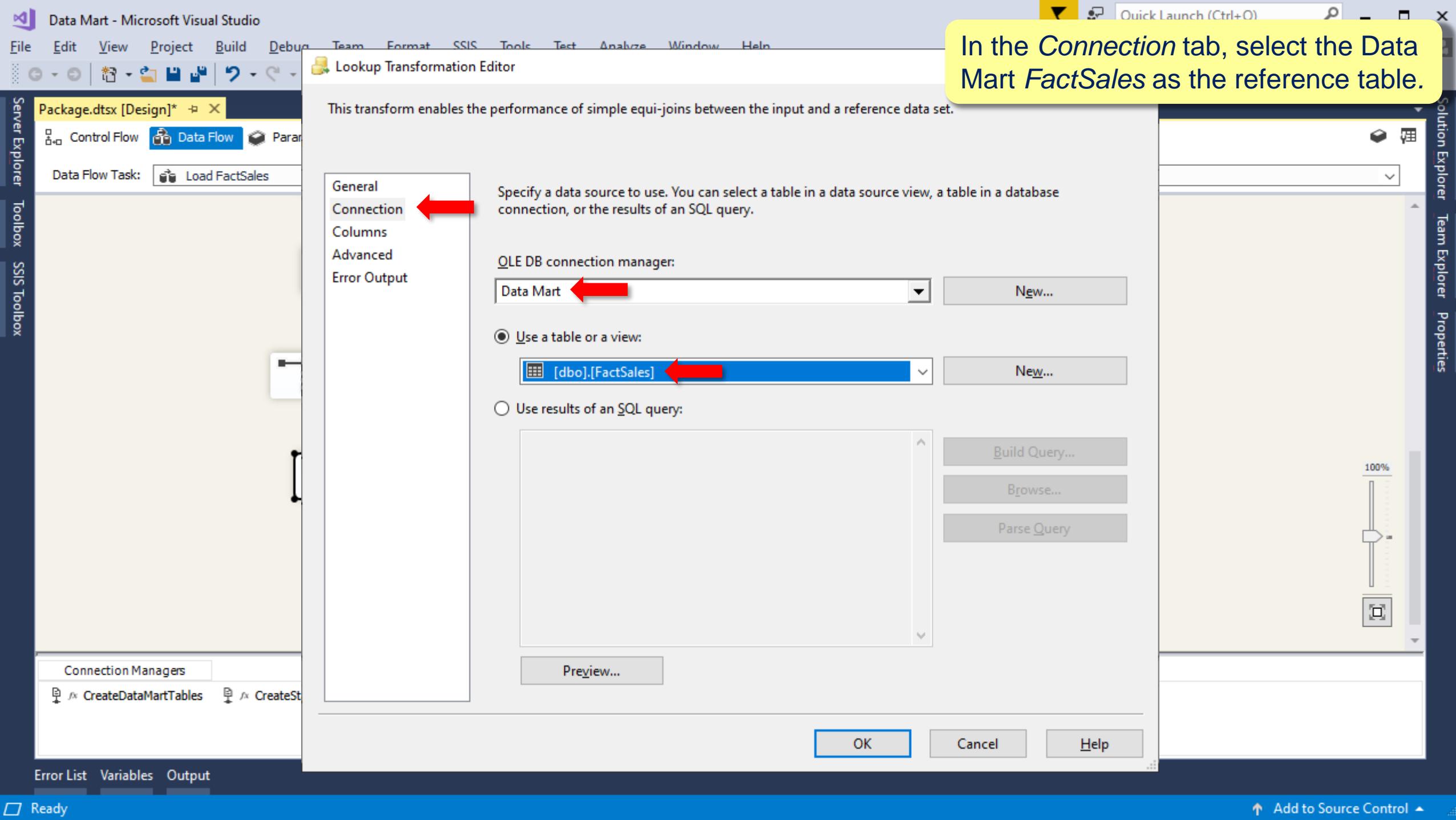
Add to Source Control

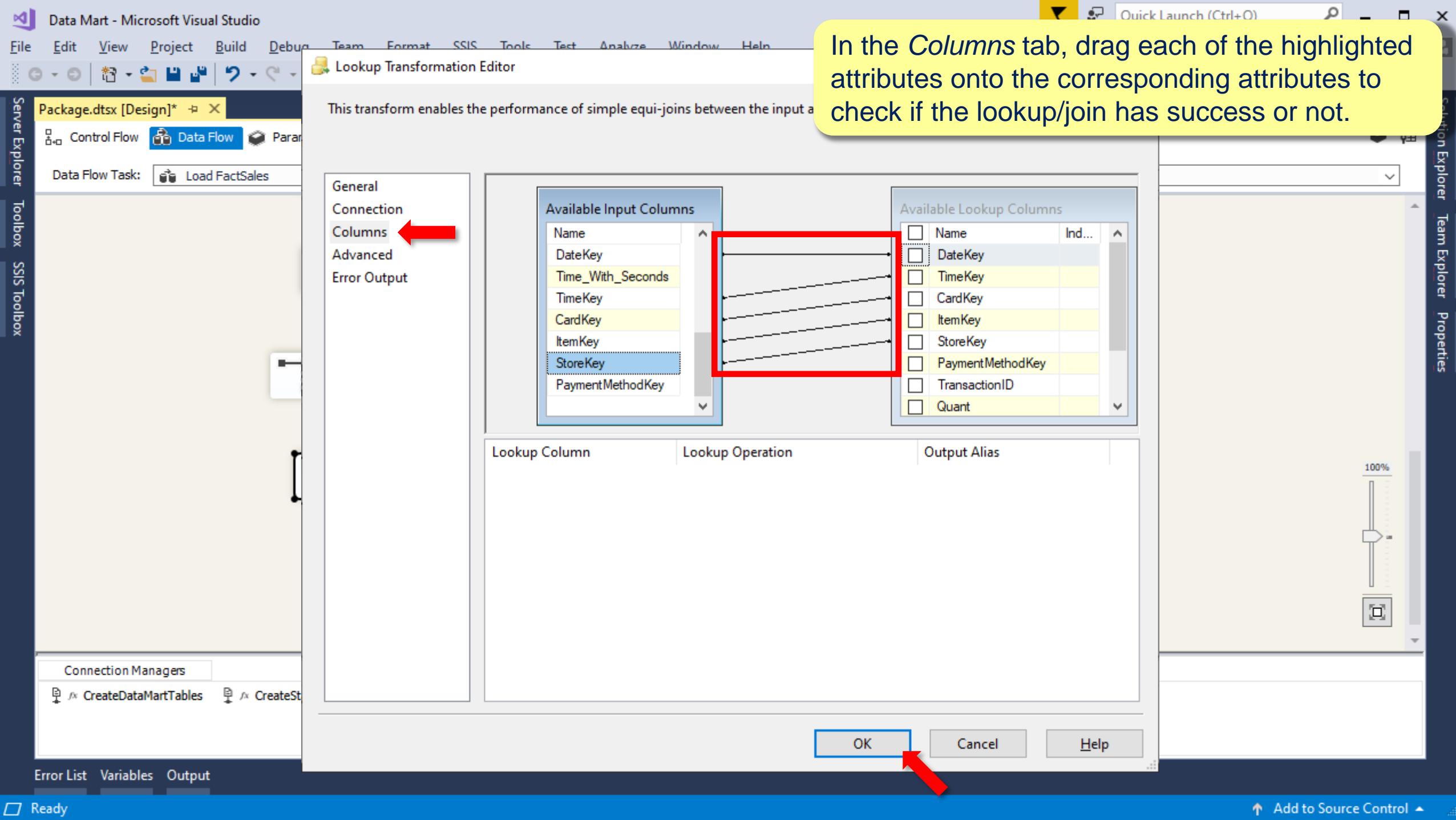
Server Explorer Solution Explorer Team Explorer Properties

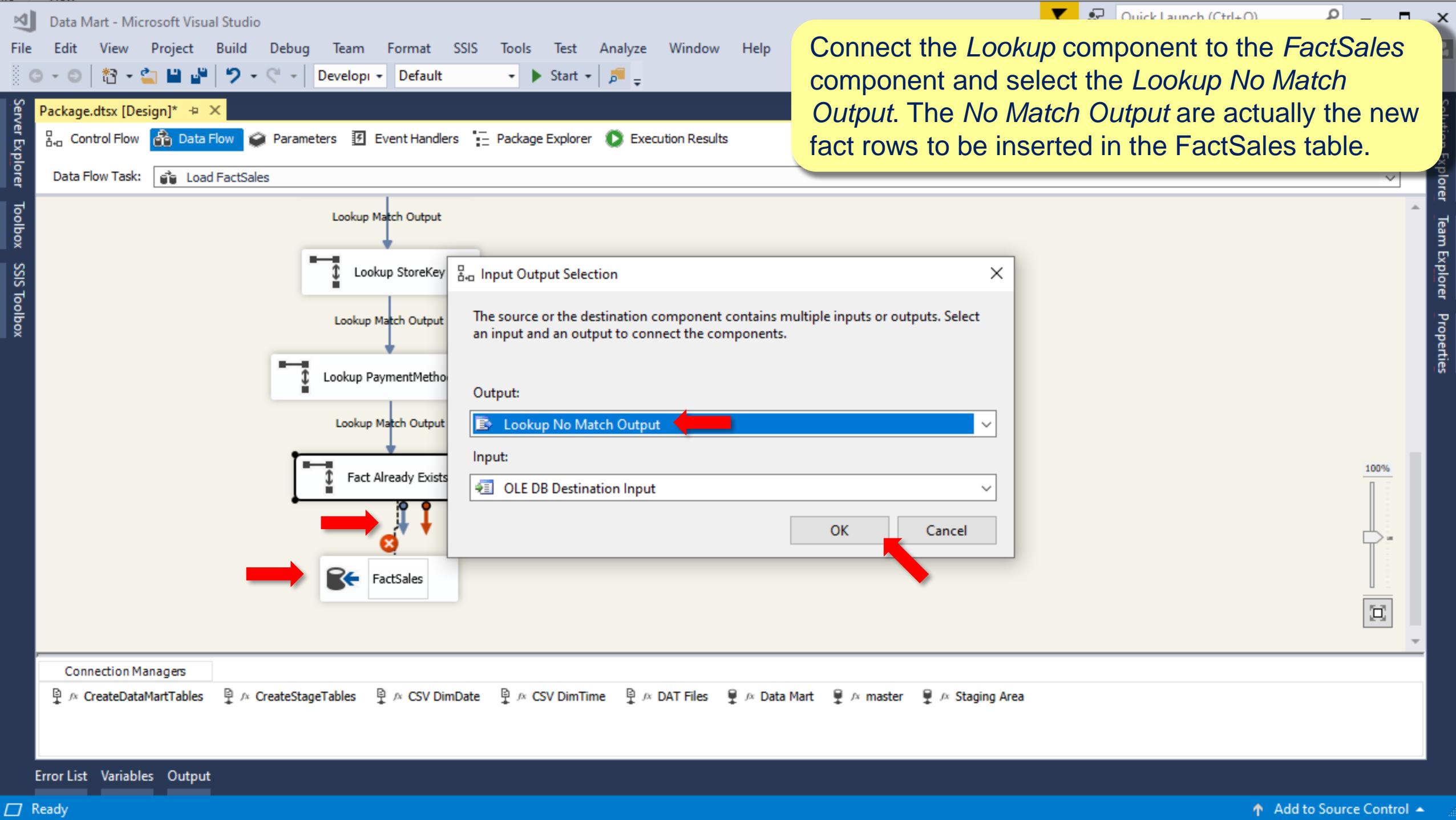
Connect the previous component to the *Lookup*, select the *Lookup Match Output* data flow (i.e., only the rows/records from the *Lookup* in which there was a match) and rename the *Lookup* to *Fact Already Exists?*

```
graph TD; L1[Lookup Match Output] --> L2[Lookup StoreKey]; L2 --> L3[Lookup Match Output]; L3 --> L4[Lookup PaymentMethodKey]; L4 --> L5[Lookup Match Output]; L5 --> DA[Fact Already Exists?]; DA --> FS[FactSales];
```









Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+Q)

Sign in

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup Match Output

Lookup StoreKey

Lookup Match Output

Lookup PaymentMethodKey

Lookup Match Output

Fact Already Exists?

Lookup No Match Output

FactSales

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

```
graph TD; Start(( )) --> L1[Lookup StoreKey]; L1 --> L2[Lookup PaymentMethodKey]; L2 --> Decision{Fact Already Exists?}; Decision --> FactSales1[FactSales]; Decision --> FactSales2[FactSales]; FactSales1 --> End(( )); FactSales2 --> End;
```

SQLQuery2.sql - localhost.ARMDDB\_DataMart (AzureAD\PauloOliveira (51))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

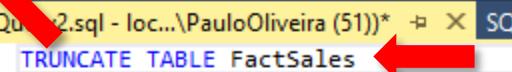
ARMDD\_DataMart  Execute 

Object Explorer

Connect 

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart 
  - ARMDD\_StagingArea
  - Database Diagrams
  - Tables
  - Views
  - External Resources
  - Synonyms
  - Programmability
  - Query Store
  - Service Broker
  - Storage
  - Security
- Security
- Server Objects
- Replication
- Always On High Availability
- Management
- Integration Services Catalogs
- SQL Server Agent (Agent XPs disabled) 
- XEvent Profiler

SQLQuery2.sql - loc...\\PauloOliveira (51)\*  TRUNCATE TABLE FactSales 

SQLQuery1.sql - loc...\\PauloOliveira (59)\*

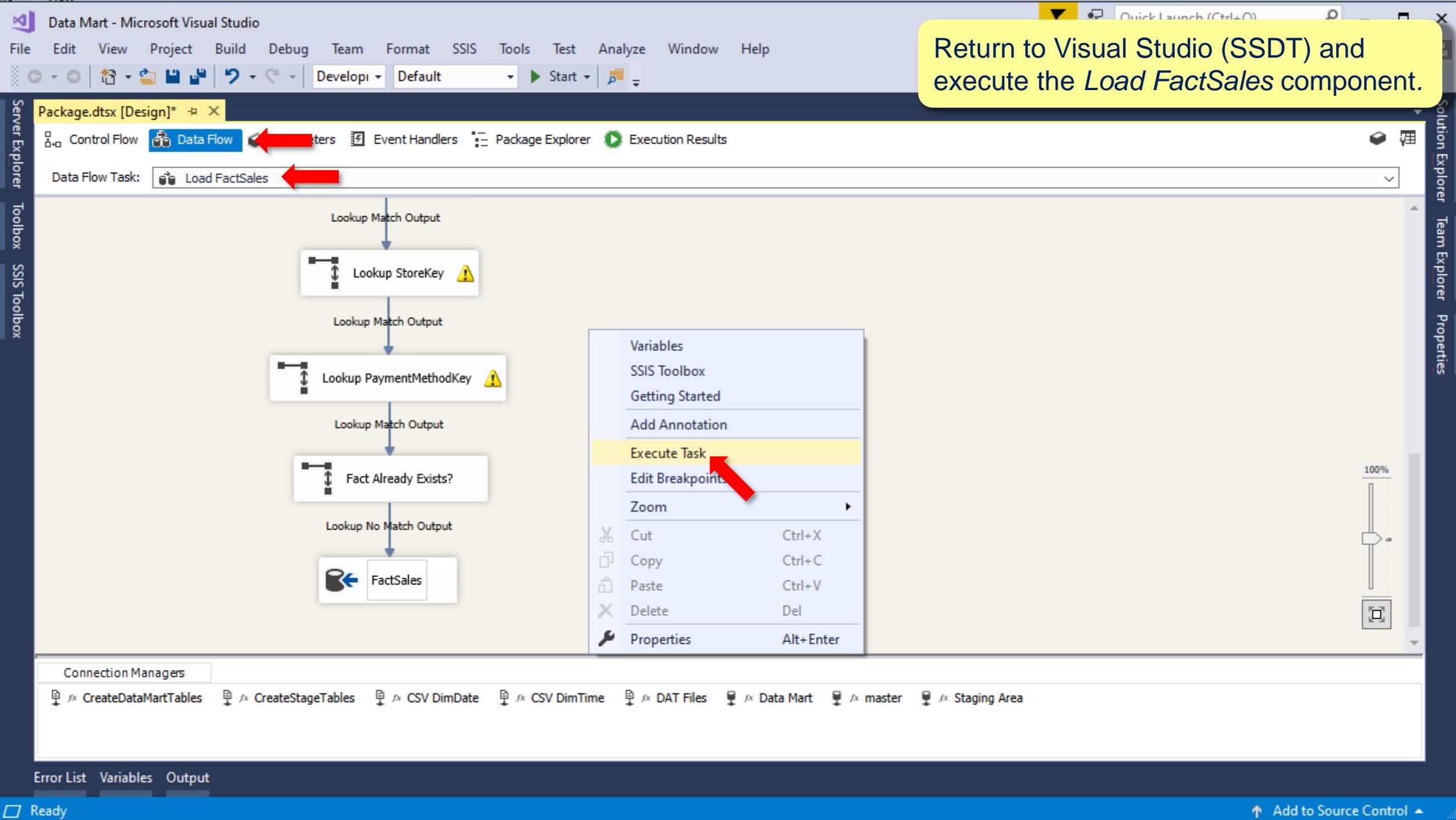
100 %

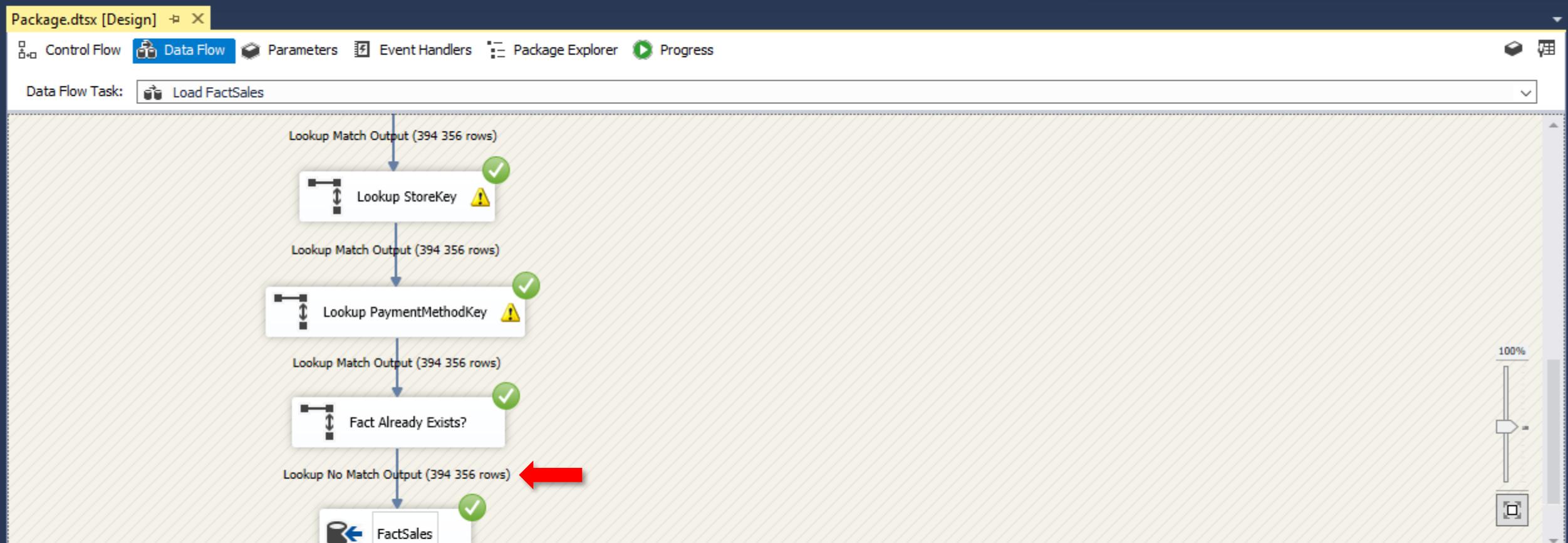
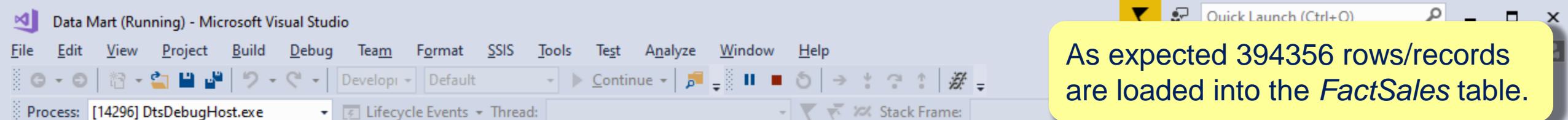
Connected. (1/1)

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

Ln 1 Col 25 Ch 25 INS

In SSMS delete all the data from the *FactSales* table in the *ARMDD\_DataMart* database.





#### Connection Managers

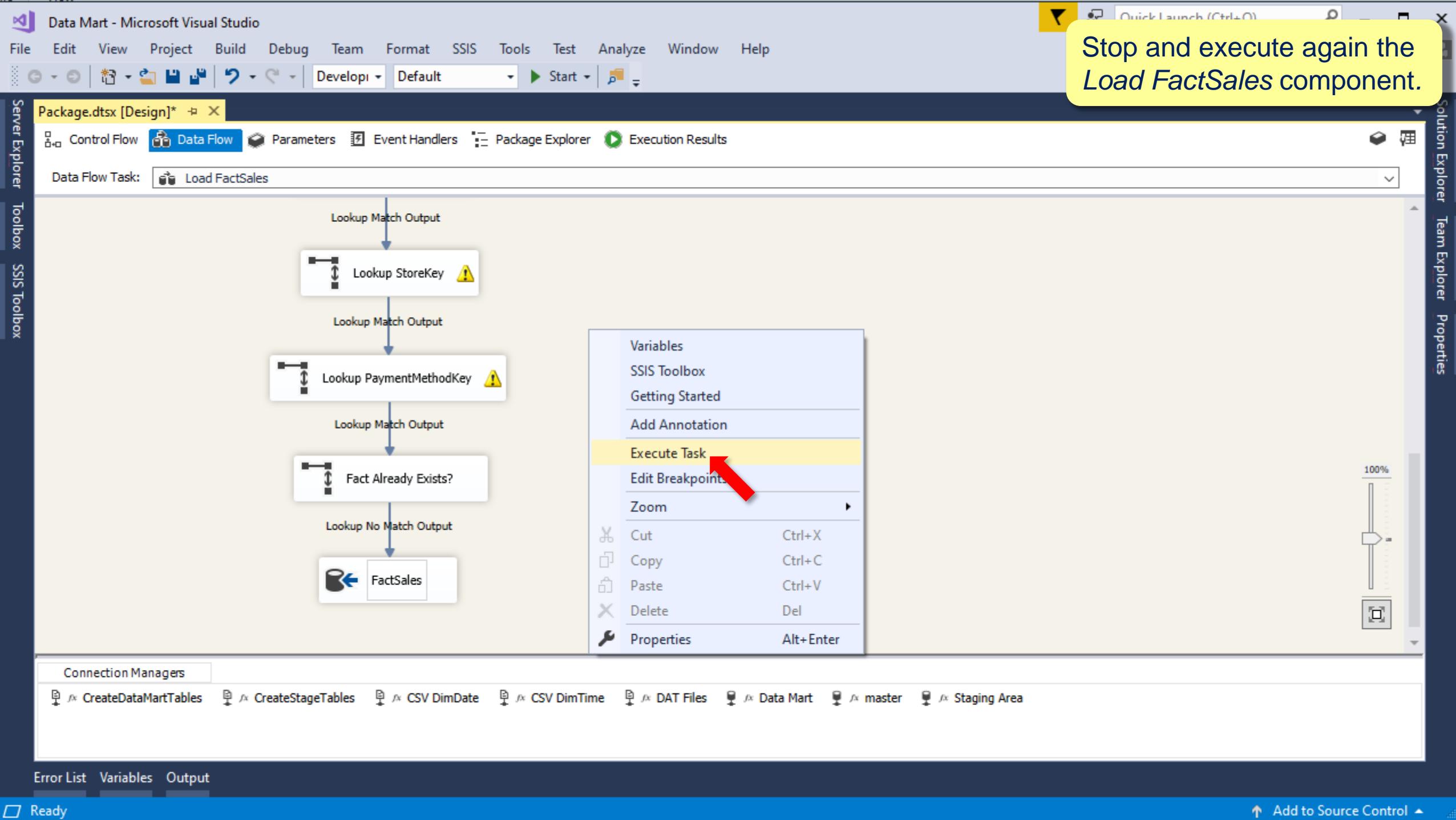
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Add to Source Control ▾



Data Mart (Running) - Microsoft Visual Studio

File Edit View Project Build Debug Team Format Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Process: [4064] DtsDebugHost.exe Lifecycle Events Thread: Stack Frame:

Package.dtsx [Design] X

Control Flow Data Flow Parameters Event Handlers Package Explorer Progress

Data Flow Task: Load FactSales

Lookup Match Output (394 356 rows)

Lookup StoreKey ✓

Lookup Match Output (394 356 rows)

Lookup PaymentMethodKey ✓

Lookup Match Output (394 356 rows)

Fact Already Exists? ✓

Lookup No Match Output ↙

FactSales ✓

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready Add to Source Control

The task execution succeeds but now no record is loaded into the *FactSales* table.

SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (51))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart

In SSMS select all the data from the *FactSales* table to confirm that the data was actually loaded.

Object Explorer

Connect

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
  - Database Diagrams
  - Tables
  - Views
  - External Resources
  - Synonyms
  - Programmability
  - Query Store
  - Service Broker
  - Storage
  - Security
- Security
- Server Objects
- Replication
- Always On High Availability
- Management
- Integration Services Catalogs
- SQL Server Agent (Agent XPs disabled)
- XEvent Profiler

SQLQuery2.sql - loc...\\PauloOliveira (51)\* | SQLQuery1.sql - loc...\\PauloOliveira (59)\*

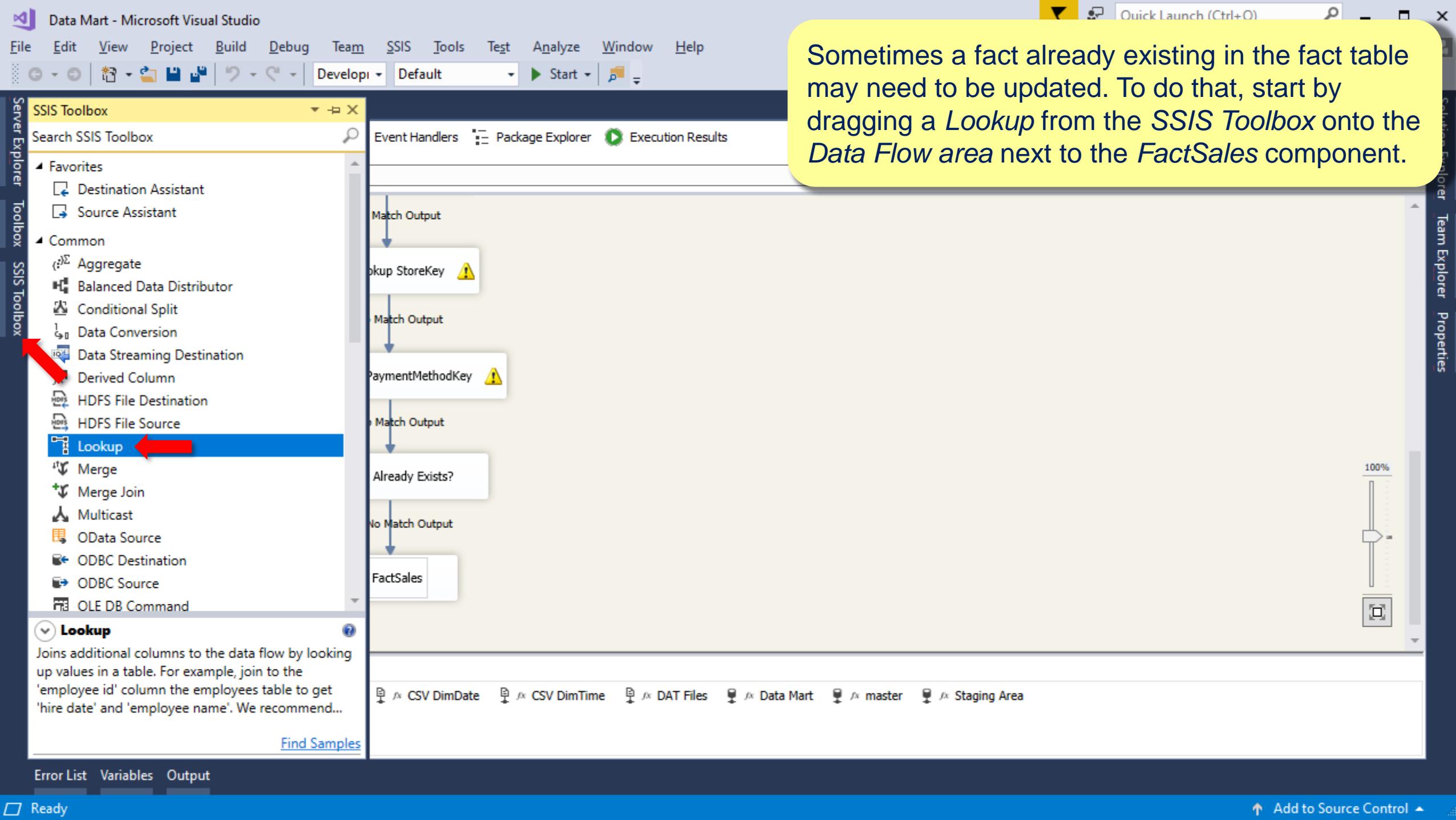
SELECT \*  
FROM FactSales

Results

	DateKey	TimeKey	CardKey	ItemKey	StoreKey	PaymentMethodKey	TransactionID	Quant	Amount	TotalAmount
1	36891	3661	47129	187	5	2	T10000002	1	6,99	6,99
2	36891	3661	88077	591	3	3	T10000004	1	299,00	299,00
3	36891	3721	22408	76	1	3	T10000003	1	13,99	13,99
4	36891	3721	22408	167	1	3	T10000003	1	5,99	5,99
5	36891	3721	33570	36	1	2	T10000002	1	3,99	3,99
6	36891	3721	79311	323	5	4	T10000004	1	34,95	34,95
7	36891	3721	116930	557	2	2	T10000004	1	109,00	109,00
8	36891	3781	131958	492	6	3	T10000001	1	59,00	59,00
9	36891	3841	5200	77	5	3	T10000007	1	26,99	26,99
10	36891	3901	81834	262	6	3	T10000004	1	189,00	189,00
11	36891	3961	119115	637	2	2	T10000006	1	34,99	34,99

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:03 | 394 356 rows



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup Match Output

Lookup StoreKey

Lookup Match Output

Lookup PaymentMethodKey

Lookup Match Output

Fact Already Exists?

FactSales

Fact Equal? ✗

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

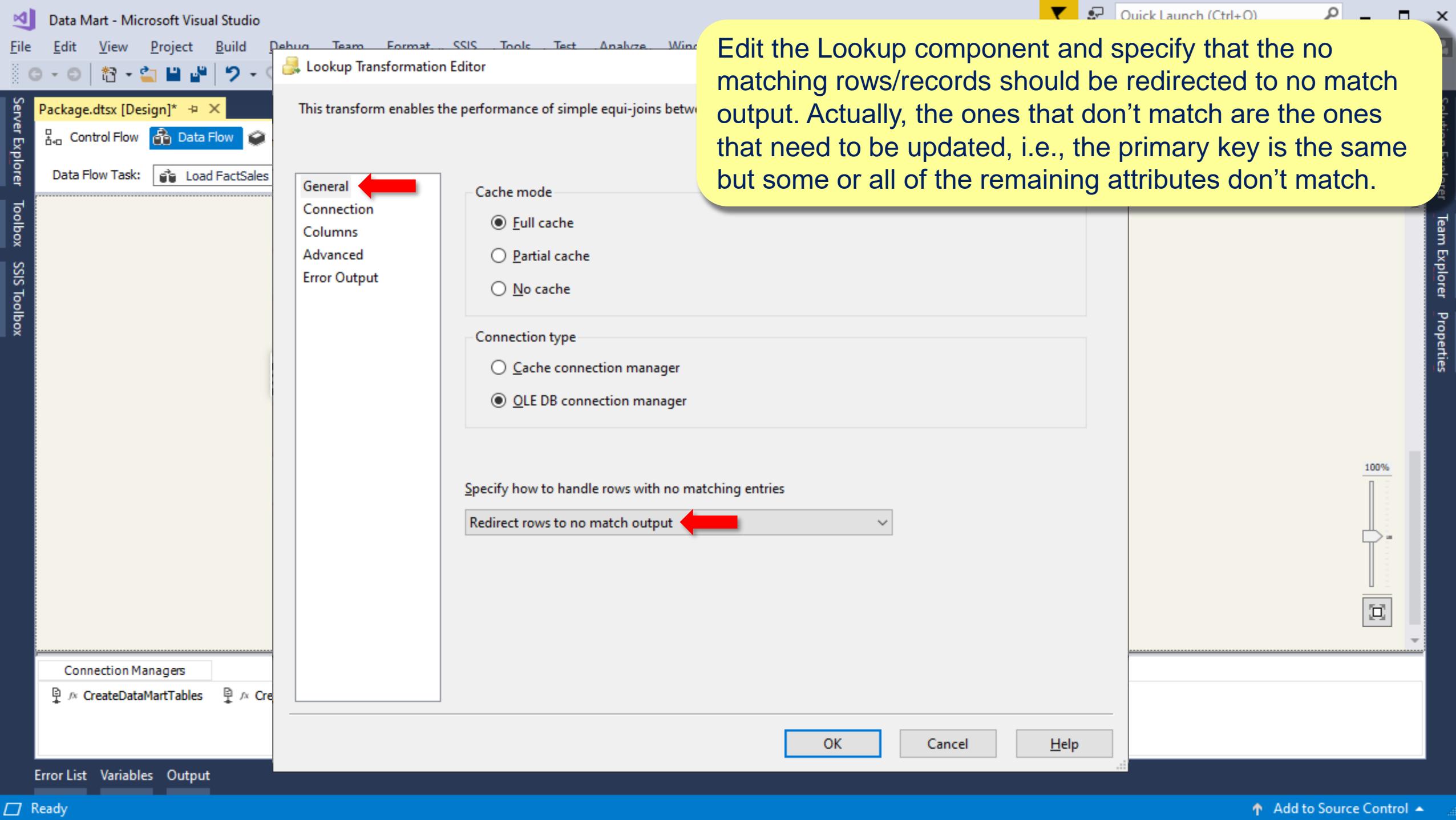
Add to Source Control

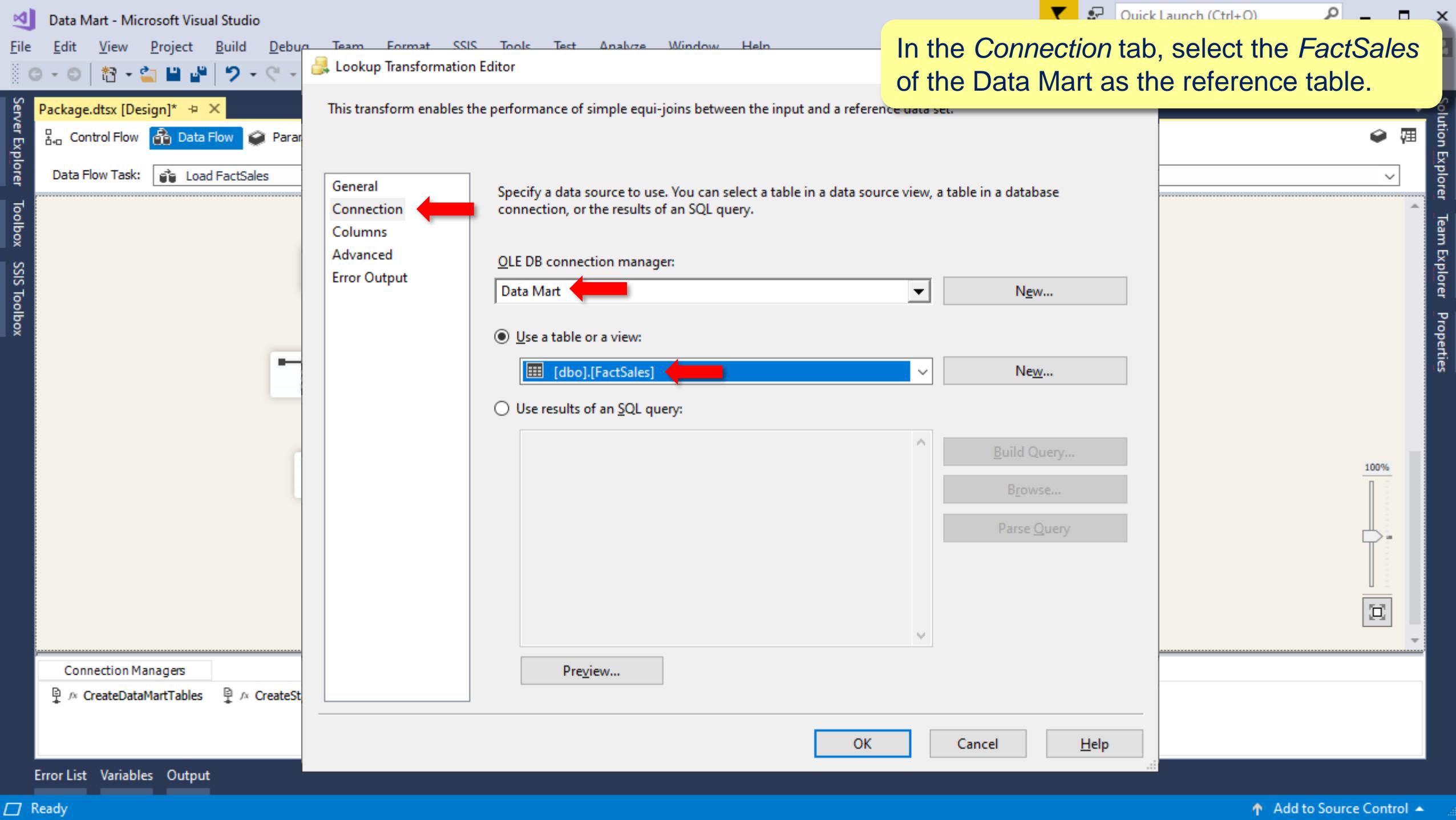
Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

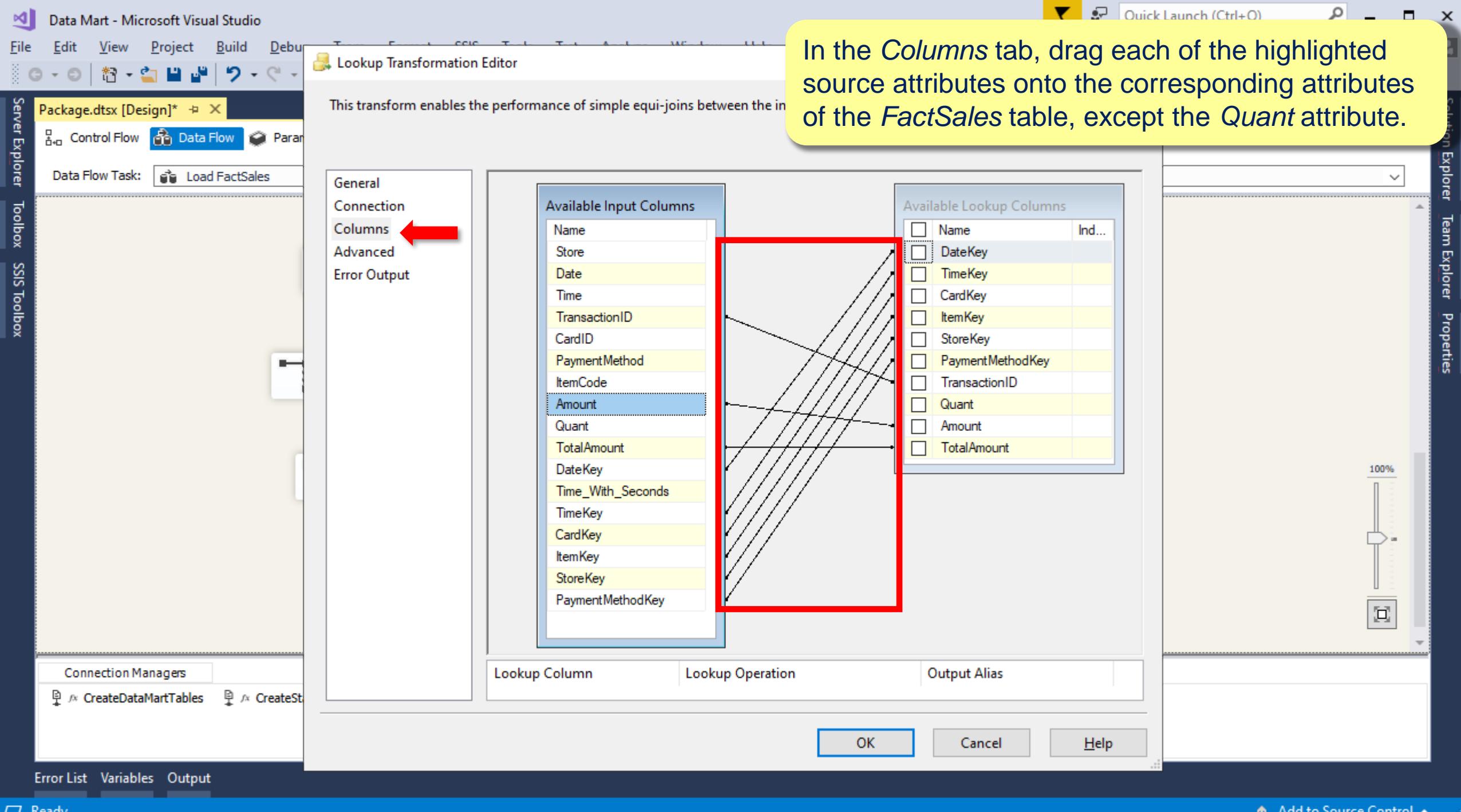
Connect the two *Lookups*, which automatically selects the *Lookup Match Output* data flow (i.e., only the rows/records from the previous Lookup in which there was a match) and rename the new *Lookup* to *Fact Equal?*

```
graph TD; Start(( )) --> L1[Lookup Match Output]; L1 --> L1Op[Lookup StoreKey]; L1Op --> L2[Lookup Match Output]; L2 --> L2Op[Lookup PaymentMethodKey]; L2Op --> L3[Lookup Match Output]; L3 --> L3Op[Fact Already Exists?]; L3Op --> NM[Lookup No Match Output]; L3Op --> MM[Lookup Match Output]; NM --> FactSales[FactSales]; MM --> FE[Fact Equal?];
```

A red arrow points down to the 'Fact Equal?' component, indicating where a connection needs to be made. Another red arrow points left from the 'Fact Equal?' component towards the 'Fact Already Exists?' component, indicating the flow of data from the previous lookup.







Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Server Explorer Solution Explorer Team Explorer Properties

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

General Connection Columns Advanced Error Output

Lookup Transformation Editor

This transform enables the performance of simple equi-joins between the input and a reference data set.

Available Input Columns

Name
Store
Date
Time
TransactionID
CardID
PaymentMethod
ItemCode
Amount
Quant
TotalAmount
DateKey
Time_With_Seconds
TimeKey
CardKey
ItemKey
StoreKey
PaymentMethodKey

Available Lookup Columns

Name	Ind...
DateKey	
TimeKey	
CardKey	
ItemKey	
StoreKey	
PaymentMethodKey	
Quant	
Amount	
TotalAmount	

Drag the source Quant attribute onto the destination FactSales Quant attribute.

OK Cancel Help

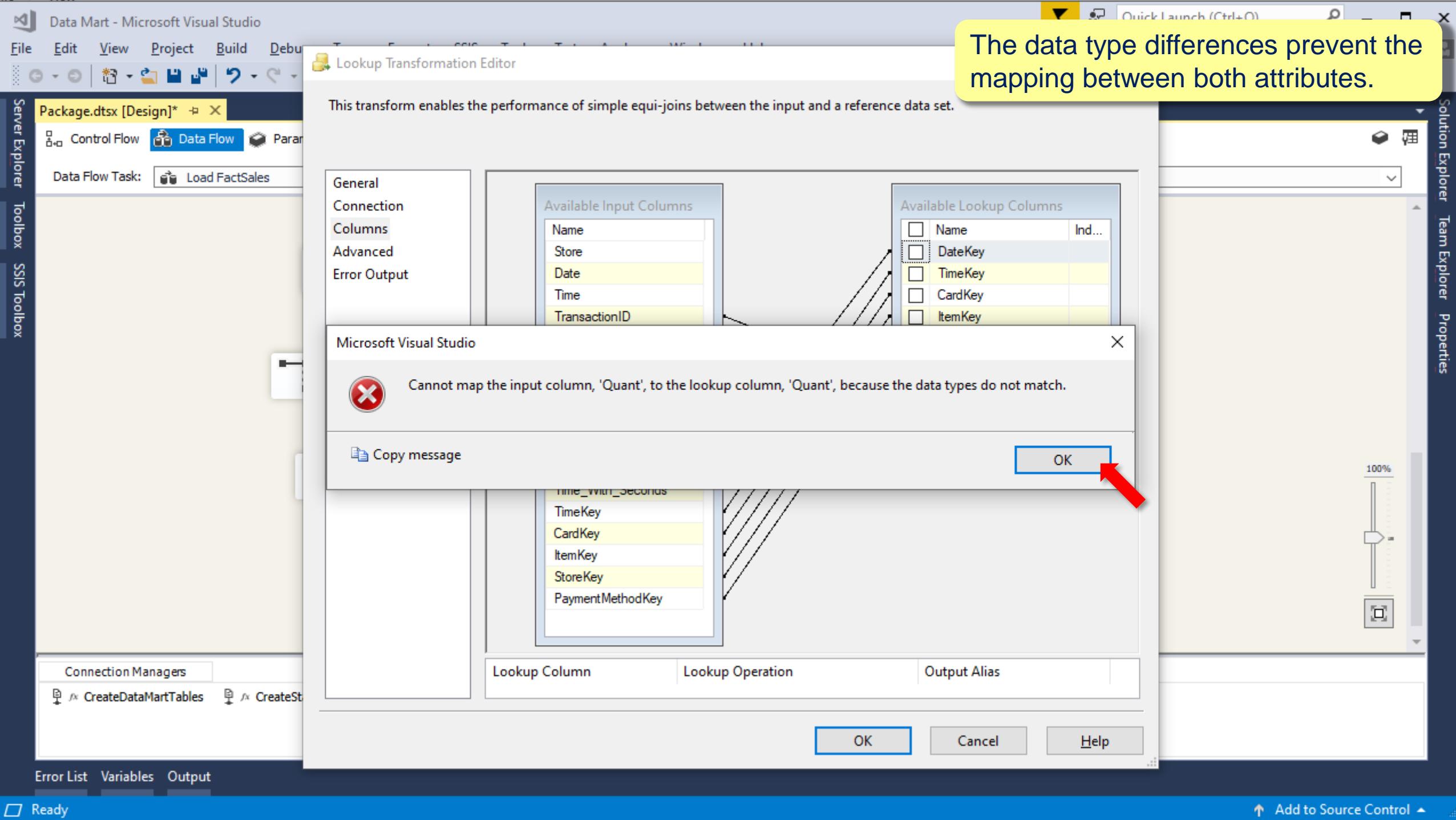
Connection Managers

CreateDataMartTables CreateSt

Error List Variables Output

Add to Source Control

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named 'Package.dtsx'. The 'Data Flow' tab is selected in the left sidebar. The main area displays the 'Lookup Transformation Editor'. The 'Available Input Columns' grid lists various columns like Store, Date, Time, TransactionID, etc., with 'Amount' and 'Quant' highlighted. The 'Available Lookup Columns' grid lists columns such as DateKey, TimeKey, CardKey, etc., with 'Quant' highlighted. A red arrow points from the 'Quant' column in the input grid to the 'Quant' column in the lookup grid. A yellow callout bubble with the text 'Drag the source Quant attribute onto the destination FactSales Quant attribute.' is positioned above the lookup grid. The bottom right corner of the screen shows a zoom control at 100%.



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Server Explorer Solution Explorer Team Explorer Properties

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

General Connection Columns Advanced Error Output

Available Input Columns

Name
Store
Date
Time
TransactionID
CardID
PaymentMethod
ItemCode
Amount
Quant
TotalAmount
DateKey
Time_With_Seconds
TimeKey
CardKey
ItemKey
StoreKey
PaymentMethodKey

Available Lookup Columns

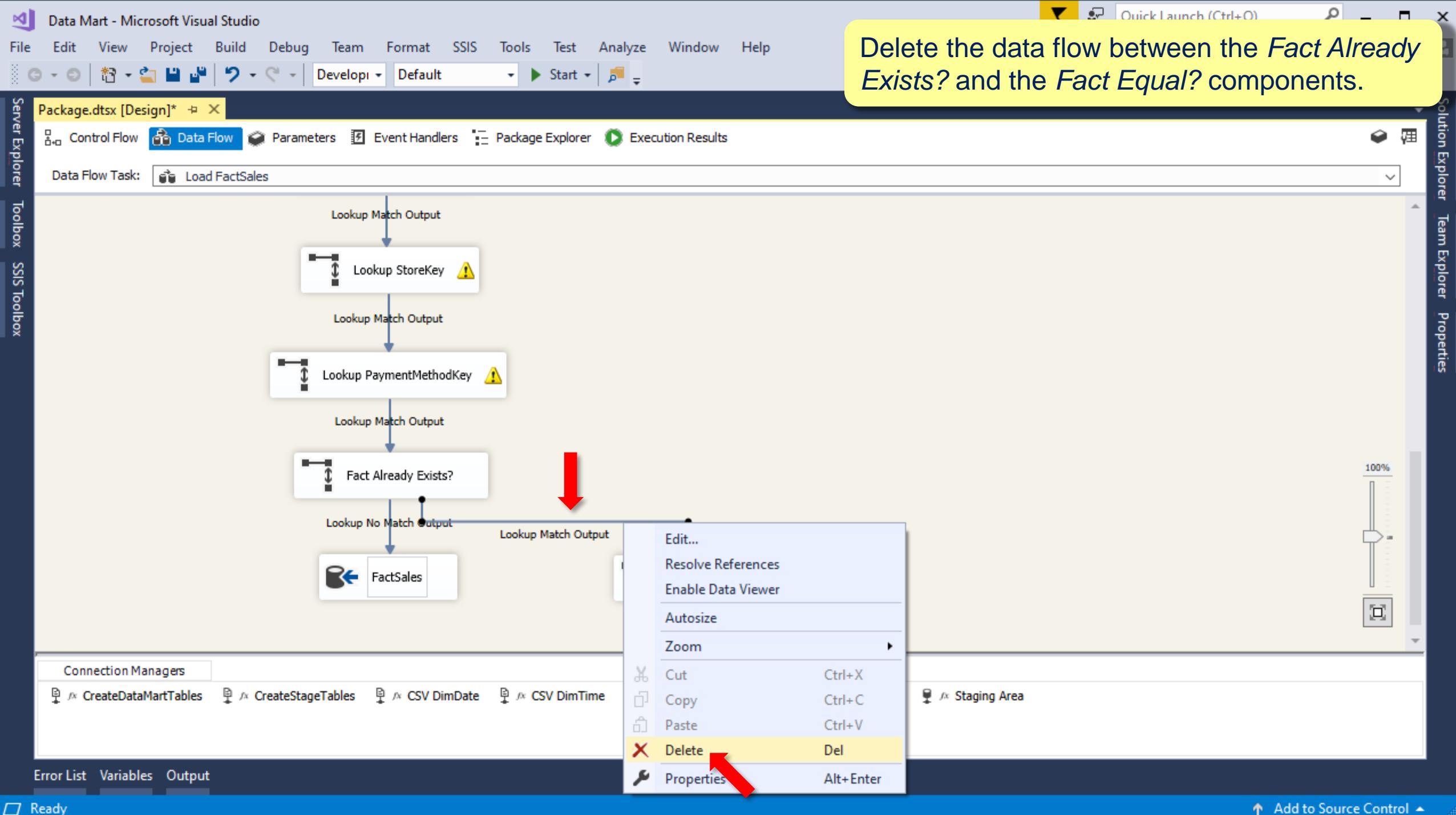
Name	Ind...
DateKey	
TimeKey	
CardKey	
ItemKey	
StoreKey	
PaymentMethodKey	
TransactionID	
Quant	
Amount	
TotalAmount	

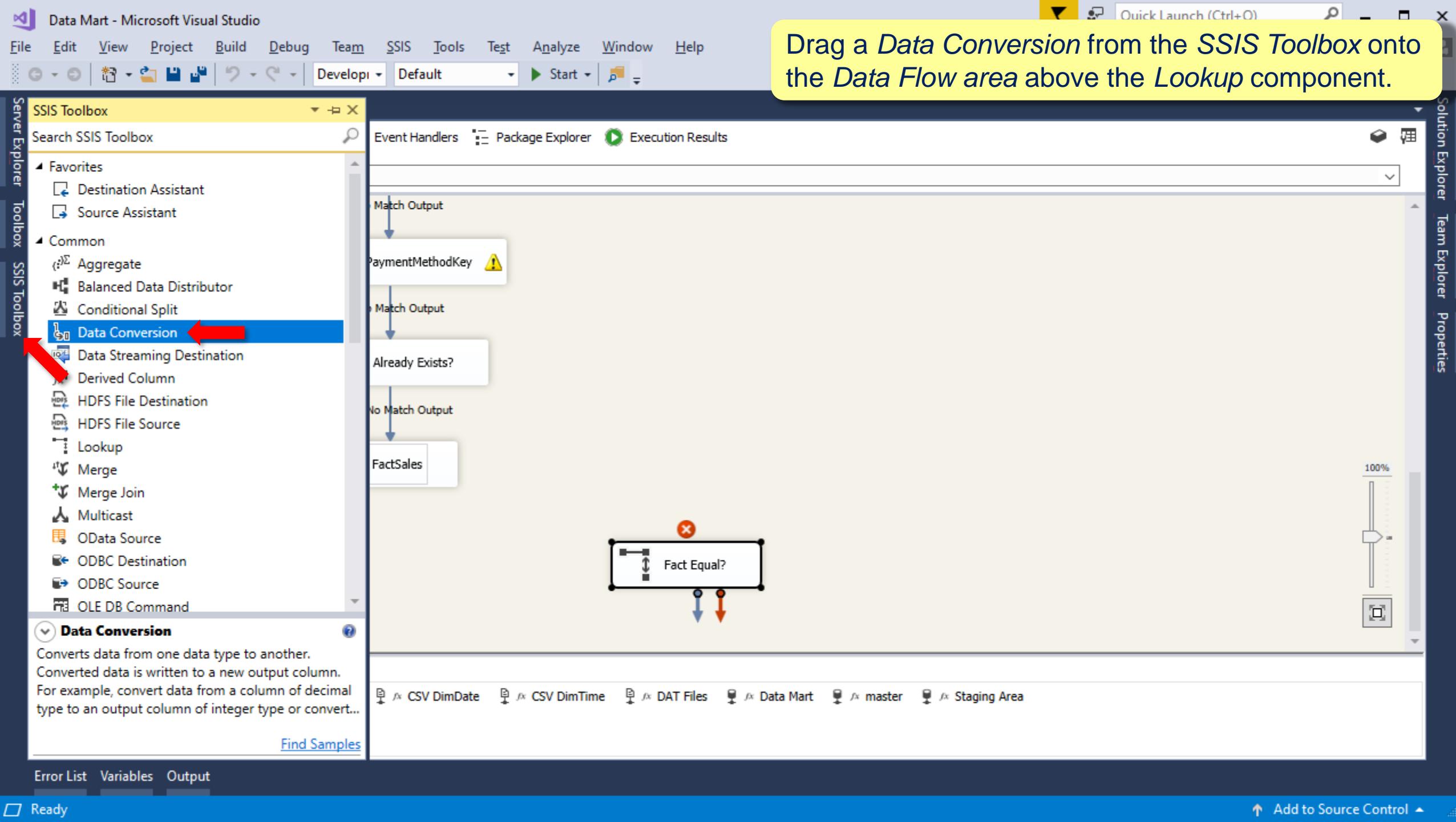
Lookup Column      Lookup Operation      Output Alias

OK Cancel Help

To establish the mapping between both attributes we need first to do a data type conversion.

The screenshot shows the SSIS Lookup Transformation Editor. On the left, there are tabs for General, Connection, Columns, Advanced, and Error Output. The Columns tab is selected. In the center, there are two lists: 'Available Input Columns' on the left and 'Available Lookup Columns' on the right. Numerous lines connect columns from the input list to columns in the lookup list, indicating mappings. The 'OK' button is highlighted with a red arrow. A yellow callout box in the top right corner contains the text: 'To establish the mapping between both attributes we need first to do a data type conversion.'





Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test A

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer

Data Flow Task: Load FactSales

Lookup Match Output

Lookup PaymentMethodKey

Lookup Match Output

Fact Already Exists?

Lookup No Match Output

FactSales

Lookup Match Output

Quant Data Conversion

Fact Equal?

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the *Lookup* to the *Data Conversion*, which automatically selects the *Lookup Match Output* data flow (i.e., only the rows/records from the *Lookup* in which there was a match) and rename the *Data Conversion* to *Quant Data Conversion*.

```
graph TD; L1[Lookup Match Output] --> L2[Lookup PaymentMethodKey]; L2 --> L3[Lookup Match Output]; L3 --> L4[Fact Already Exists?]; L4 --> L5[Lookup No Match Output]; L5 --> F1[FactSales]; L4 --> L6[Lookup Match Output]; L6 --> Q1[Quant Data Conversion]; Q1 --> F2[Fact Equal?];
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Package.dtsx [Design]\* Data Conversion Transformation Editor

Configure the properties used to convert the data type of an input column to a different type. When the column is converted, set the length, precision, scale, and code page of the column.

Available Input Columns

<input type="checkbox"/> Name
<input checked="" type="checkbox"/> Quant
<input type="checkbox"/> TotalAmount
<input type="checkbox"/> DateKey
<input type="checkbox"/> Time_With_Sec...
<input type="checkbox"/> TimeKey

Input Column Output Alias Data Type Length Precision Scale

Quant	Quant_Converted	single-byte unsigned integer [DT_UI1]			
-------	-----------------	---------------------------------------	--	--	--

Configure Error Output... OK Cancel Help

Server Explorer Toolbox SSIS Toolbox

Connection Managers CreateDataMartTables CreateSt

Error List Variables Output

Quick Launch (Ctrl+O) Add to Source Control

Edit the *Data Conversion* component and add a new attributed named *Quant\_Converted* based on the *Quant* attribute with the *single-byte unsigned integer* data type.

100%

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Solution Explorer Team Explorer Properties

SSIS Toolbox

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

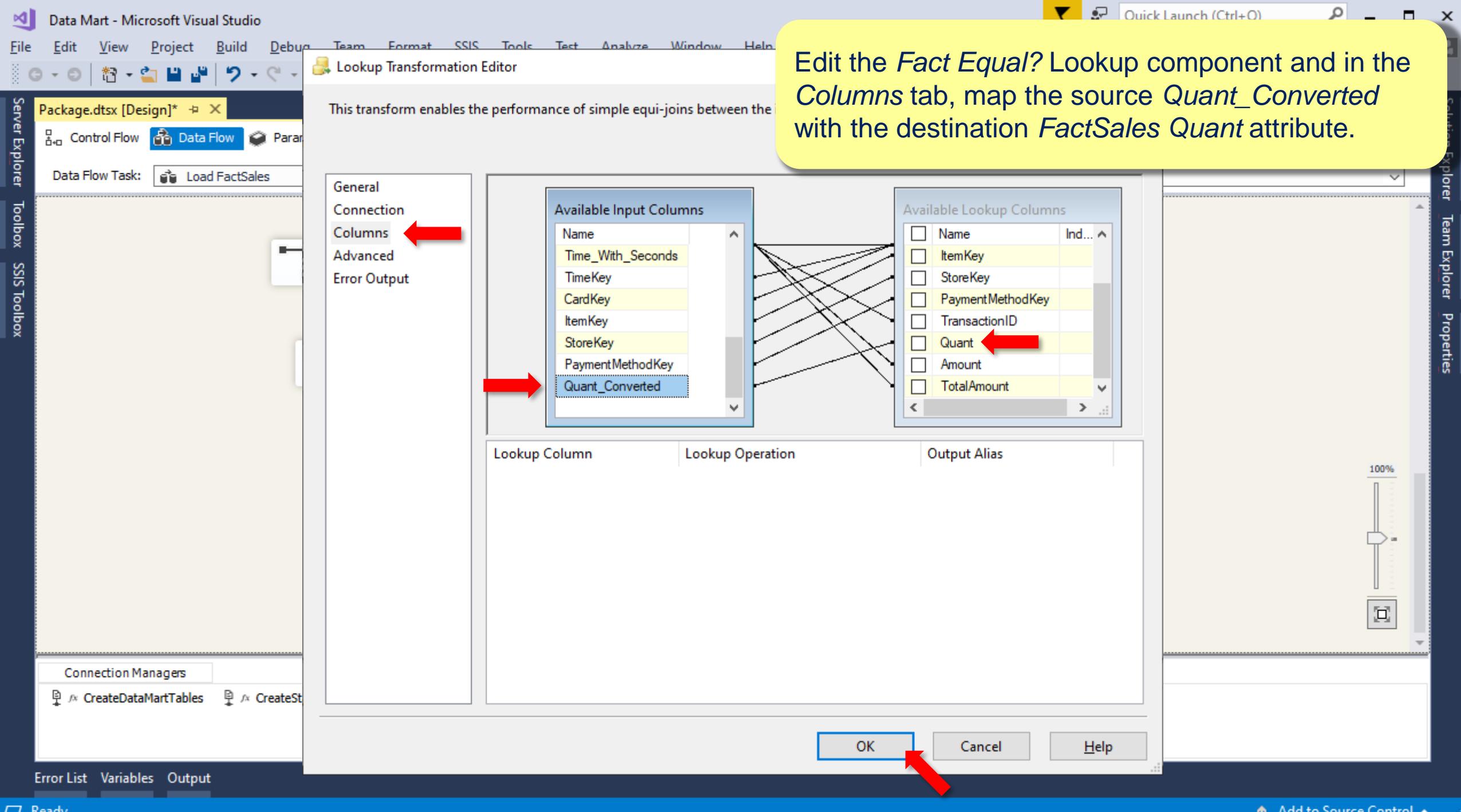
Ready Add to Source Control

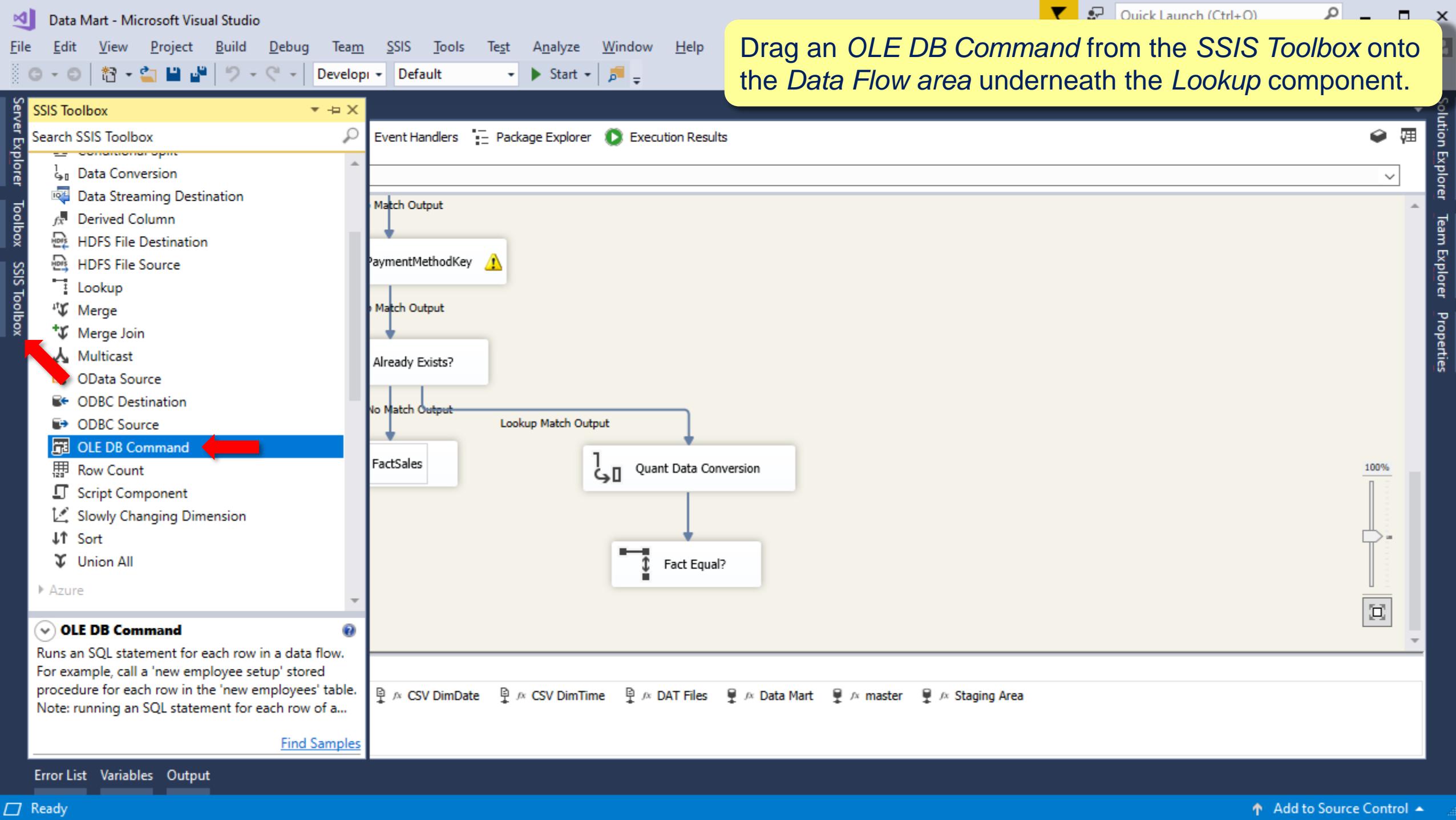
Connect the Quant Data Conversion component to the Fact Equal? component.

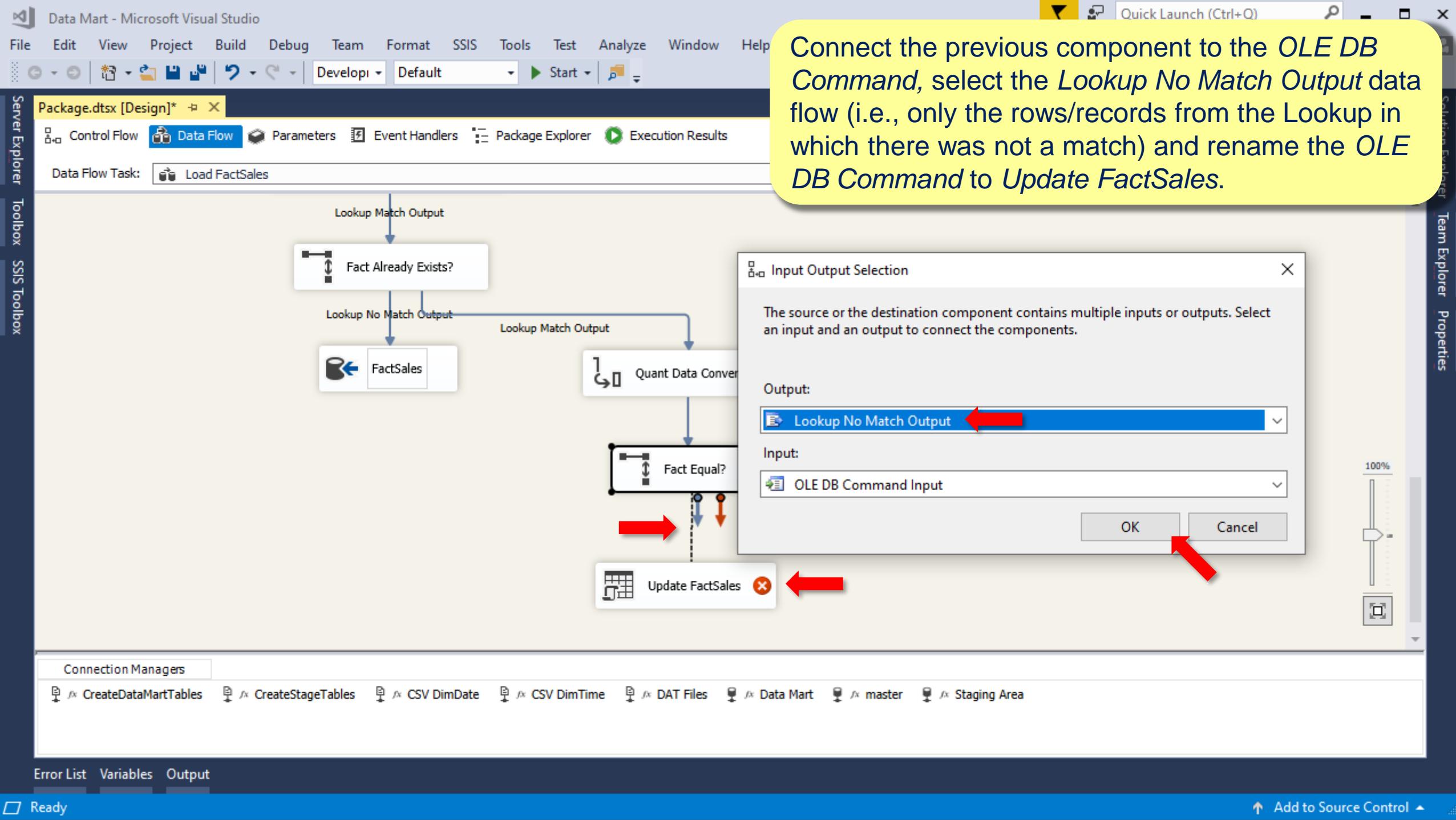
The diagram shows a Data Flow Task named 'Load FactSales'. It consists of the following components and flow:

- Lookup PaymentMethodKey**: An OLE DB Lookup component with 'Lookup Match Output' pointing to the 'Fact Already Exists?' decision component.
- Fact Already Exists?**: A Decision component with two outputs:
  - 'Lookup Match Output' leading back to the 'Lookup PaymentMethodKey' component.
  - 'Lookup No Match Output' leading to the 'FactSales' OLE DB Destination component.
- FactSales**: An OLE DB Destination component receiving data from the 'Fact Already Exists?' component's 'Lookup No Match Output' path.
- Quant Data Conversion**: A custom component represented by a white box with a blue icon, receiving data from the 'Fact Already Exists?' component's 'Lookup Match Output' path.
- Fact Equal?**: A Decision component receiving data from the 'Quant Data Conversion' component.

Two red arrows highlight the connection from the 'Quant Data Conversion' component to the 'Fact Equal?' component.







SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (51))\* - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query NDX DNX XMLA DAX Execute

ARMDD\_DataMart Object Explorer

SQLQuery2.sql - loc...\\PauloOliveira (51)\* SQLQuery1.sql - loc...\\PauloOliveira (59)\*

SELECT \*  
FROM FactSales

In SSMS, create an auxiliary **UPDATE** statement for the *FactSales* table.

Object Explorer details:

- ARMDD\_DataMart (selected)
- Tables
  - System Tables
  - FileTables
  - External Tables
  - Graph Tables
  - dbo.DimCard
  - dbo.DimDate
  - dbo.DimItem
  - dbo.DimPaymentMethod
  - dbo.DimStore
  - dbo.DimTime
  - dbo.FactSales (selected)
- Dropped Links
- Views
- External Resources
- Synonyms
- Programmability
- Query Store
- Service Broker
- Storage
- Security
- ARMDD\_StagingArea
- Database Diagrams
- Tables
- Views
- External Resources

Context menu for dbo.FactSales:

- New Table...
- Design
- Select Top 1000 Rows
- Edit Top 200 Rows
- Script Table as
  - CREATE To
  - ALTER To
  - CREATE OR ALTER To
  - DROP To
  - DROP And CREATE To
  - SELECT To
  - INSERT To
  - UPDATE To (selected)
  - DELETE To
  - EXECUTE To
- New Query Editor Window
- File ...
- Clipboard

Table Data:

CardKey	ItemKey	StoreKey	PaymentMethodKey	TransactionID	Quant	Amount	TotalAmount
47129	187	5	2	T10000002	1	6,99	6,99
88077	591	3	3	T10000004	1	299,00	299,00
				T10000003	1	13,99	13,99
				T10000003	1	5,99	5,99
				T10000002	1	3,99	3,99
				T10000004	1	34,95	34,95
				T10000004	1	109,00	109,00
				T10000001	1	59,00	59,00
				T10000007	1	26,99	26,99
				T10000004	1	189,00	189,00
				T10000006	1	34,99	34,99

Quick Launch (Ctrl+O) RTM | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:03 | 394 356 rows

SQLQuery3.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (72)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_DataMart SQLQuery3.sql - loc...\\PauloOliveira (72) SQLQuery2.sql - loc...\\PauloOliveira (51)\* SQLQuery1.sql - loc...\\PauloOliveira (59)\*

Object Explorer Connect

ARMDD\_DataMart

- Database Diagrams
- Tables
  - System Tables
  - FileTables
  - External Tables
  - Graph Tables
  - dbo.DimCard
  - dbo.DimDate
  - dbo.DimItem
  - dbo.DimPaymentMethod
  - dbo.DimStore
  - dbo.DimTime
  - dbo.FactSales
  - Dropped Ledger Tables
- Views
- External Resources
- Synonyms
- Programmability
- Query Store
- Service Broker
- Storage
- Security

ARMDD\_StagingArea

- Database Diagrams
- Tables
- Views
- External Resources

100 %

Connected. (1/1)

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

Ln 19 Col 1 Ch 1 INS

The image presents the auxiliary template  
**UPDATE** statement automatically generated.

```
USE [ARMDD_DataMart]
GO

UPDATE [dbo].[FactSales]
    SET [DateKey] = <DateKey, int,>
        ,[TimeKey] = <TimeKey, int,>
        ,[CardKey] = <CardKey, int,>
        ,[ItemKey] = <ItemKey, int,>
        ,[StoreKey] = <StoreKey, int,>
        ,[PaymentMethodKey] = <PaymentMethodKey, int,>
        ,[TransactionID] = <TransactionID, char(9),>
        ,[Quant] = <Quant, tinyint,>
        ,[Amount] = <Amount, money,>
        ,[TotalAmount] = <TotalAmount, money,>
    WHERE <Search Conditions,,>
GO
```

SQLQuery3.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (72))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_DataMart SQLQuery3.sql - loc...\\PauloOliveira (72)\* SQLQuery2.sql - loc...\\PauloOliveira (51)\* SQLQuery1.sql - loc...\\PauloOliveira (59)\*

Object Explorer

Connect ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Dropped Ledger Tables Views External Resources Synonyms Programmability Query Store Service Broker Storage Security ARMDD\_StagingArea Database Diagrams Tables Views External Resources

UPDATE [dbo].[FactSales]  
SET [PaymentMethodKey] = ?,  
[TransactionID] = ?,  
[Quant] = ?,  
[Amount] = ?,  
[TotalAmount] = ?  
WHERE [DateKey] = ? AND  
[TimeKey] = ? AND  
[CardKey] = ? AND  
[ItemKey] = ? AND  
[StoreKey] = ?

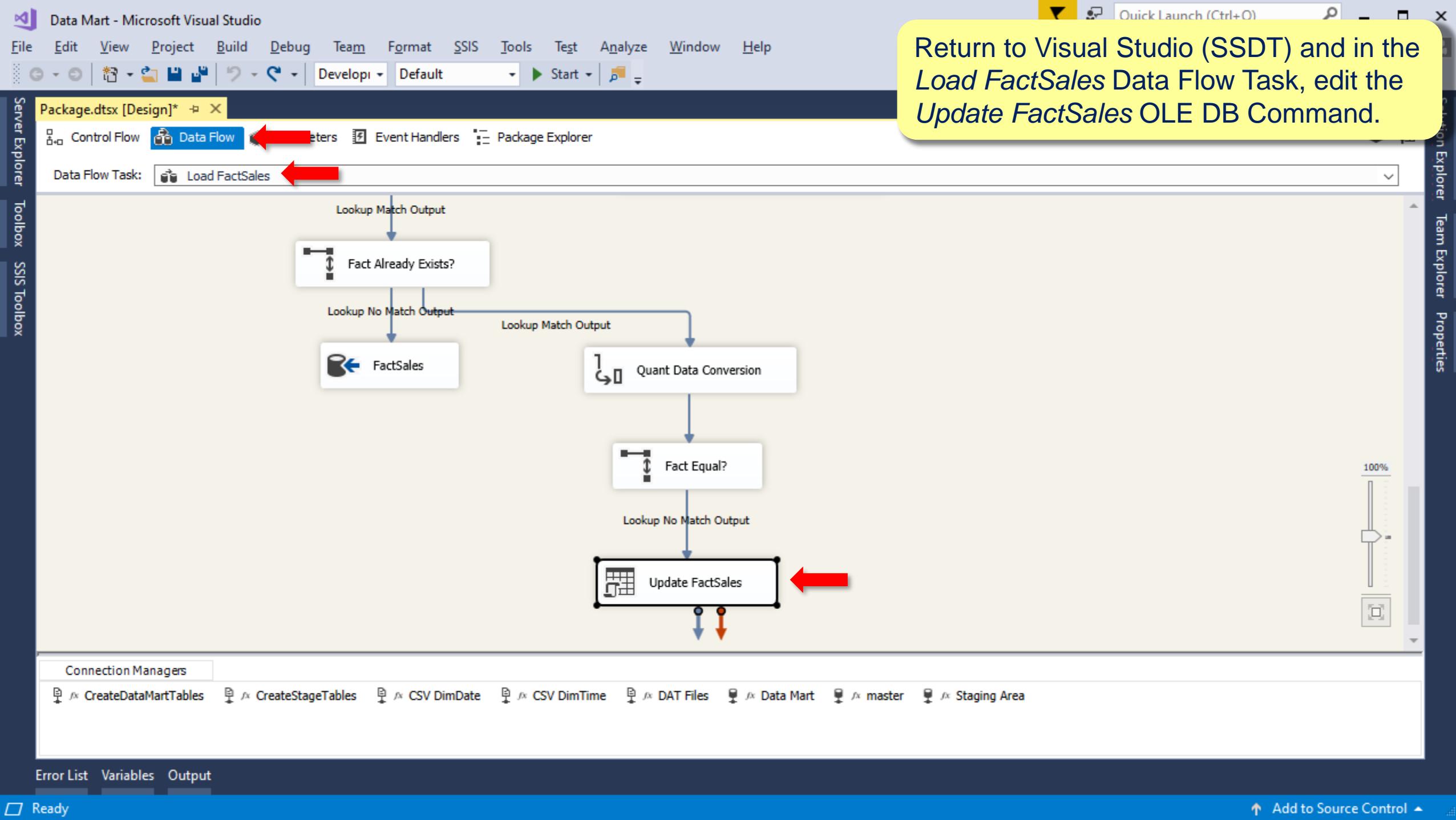
Cut Ctrl+X  
Copy Ctrl+C  
Paste Ctrl+V  
Insert Snippet... Ctrl+K, Ctrl+X  
Surround With... Ctrl+K, Ctrl+S  
Connection  
Open Server in Object Explorer Alt+F8  
Execute F5  
Display Estimated Execution Plan Ctrl+L  
IntelliSense Enabled Ctrl+B, Ctrl+I  
Trace Query in SQL Server Profiler Ctrl+Alt+P  
Analyze Query in Database Engine Tuning Advisor  
Design Query in Editor... Ctrl+Shift+Q  
Include Actual Execution Plan Ctrl+M  
Include Live Query Statistics  
Include Client Statistics Shift+Alt+S  
Results To F4  
Properties Window F4

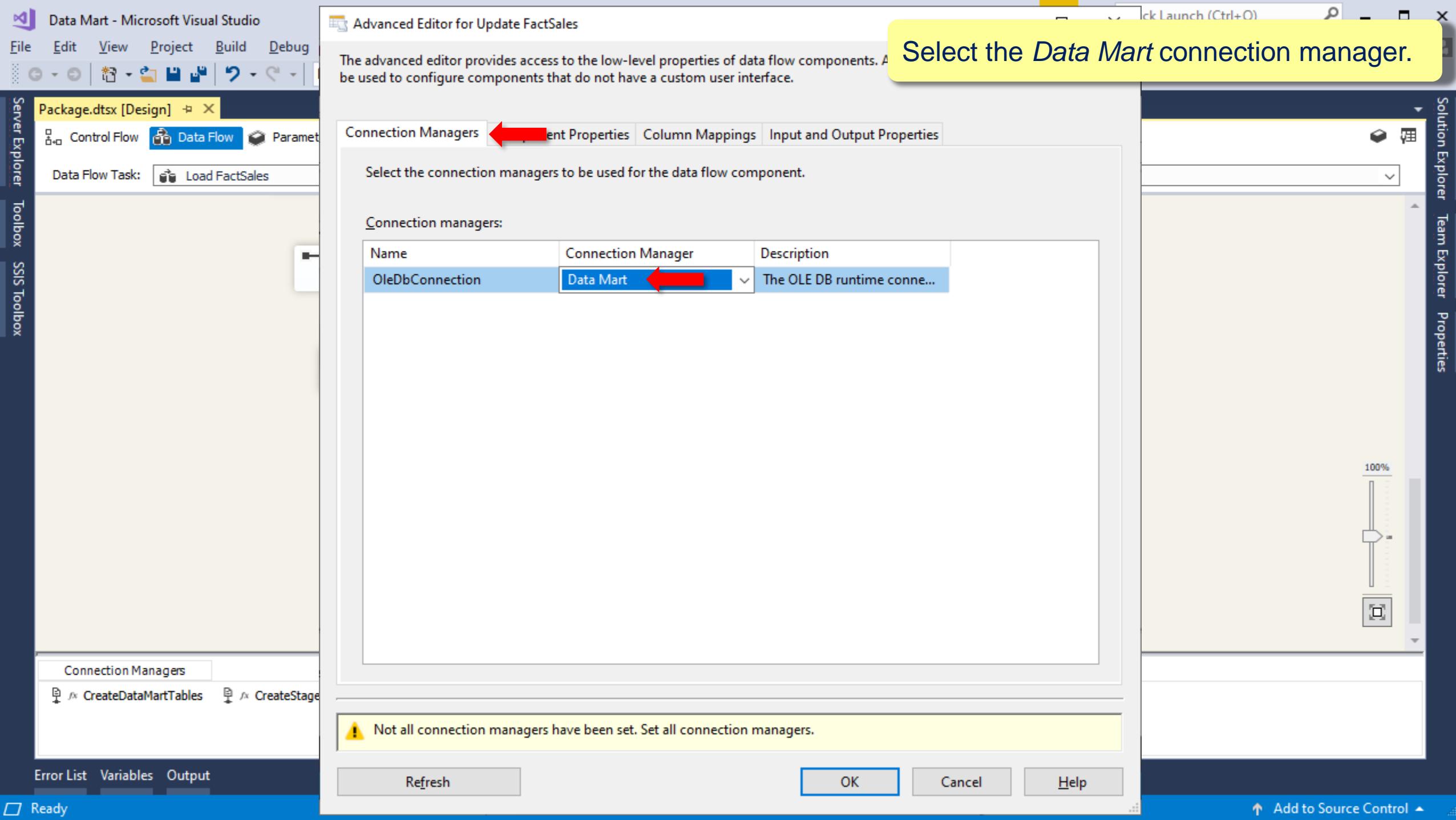
Connected. (1/1)

Quick Launch (Ctrl+O)

Transform the template *UPDATE* statement into a parameterized *UPDATE*, according to what is presented in the picture and copy it into the clipboard.

A red box highlights the UPDATE statement in the query editor. A red arrow points from the 'Copy' option in the context menu to the highlighted text.





Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Server Explorer Solution Explorer Team Explorer Properties

Package.dtsx [Design] Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Advanced Editor for Update FactSales

The advanced editor provides access to the low-level properties of data flow components. Additionally, the advanced editor can be used to configure components that do not have a custom user interface.

Connection Managers Component Properties Mappings Input and Output Properties

Specify advanced properties for the data flow component.

Properties:

ComponentClassID	{065EEED5-E779-4156-AA69-FE35A54915E6}
ContactInfo	OLE DB Command;Microsoft Corporation; Microsoft SQL Server
Description	Runs an SQL statement for each row in a data flow. For example, this component can be used to update a fact table based on rows in a dimension table.
ID	401
IdentificationString	Update FactSales
IsDefaultLocale	True
LocaleID	Portuguese (Portugal)
Name	<b>Update FactSales</b>
PipelineVersion	0
UsesDispositions	True
ValidateExternalMetadata	True
Version	2
Custom Properties	
CommandTimeout	0
DefaultCodePage	1252
SqlCommand	...

**SqlCommand**

The SQL command to be executed.

Refresh OK Cancel Help

Edit the **SQLCommand** property in the **Component Properties** tab.

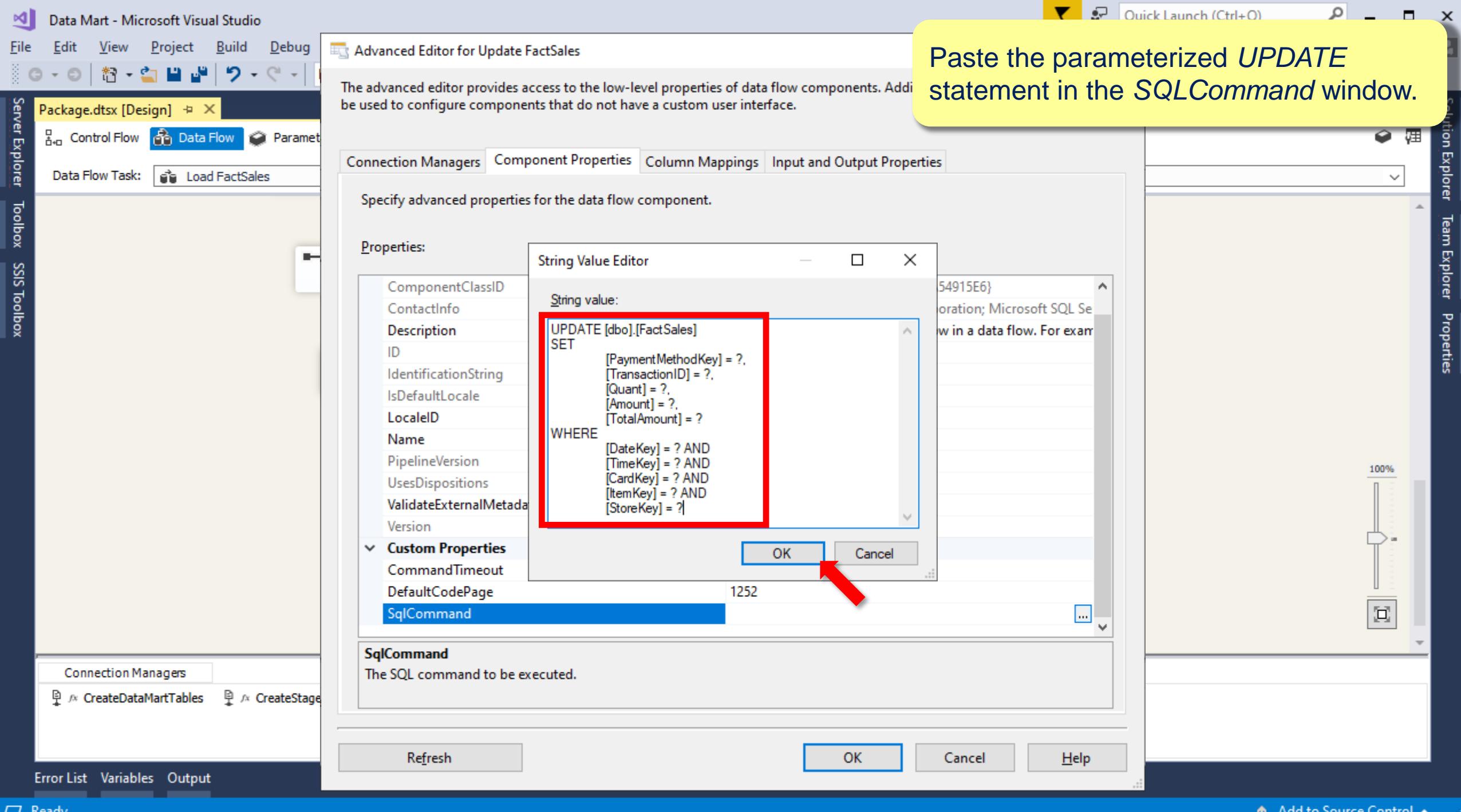
100%

Add to Source Control

Ready

Connection Managers CreateDataMartTables CreateStage

Error List Variables Output



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Server Explorer

Toolbox SSIS Toolbox

Package.dtsx [Design]

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Connection Managers Component Properties Column Mappings Input and Output Properties

Available Input Columns

Name
Store
Date
Time
TransactionID
CardID
PaymentMethod
ItemCode

Available Destination Columns

Name
Param_0
Param_1
Param_2
Param_3
Param_4
Param_5
Param_6

Input Column      Destination Column

Input Column	Destination Column
<ignore>	Param_0
<ignore>	Param_1
<ignore>	Param_2
<ignore>	Param_3
<ignore>	Param_4
<ignore>	Param_5
<ignore>	Param_6
<ignore>	Param_7
<ignore>	Param_8

Refresh OK Cancel Help

Access the *Column Mappings* tab.

Quick Launch (Ctrl+O)

Solution Explorer Team Explorer Properties

100%

Add to Source Control

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Package.dtsx [Design] X

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox

Advanced Editor for Update FactSales

The advanced editor provides access to the low-level properties of data flow components used to configure components that do not have a custom user interface.

Connection Managers Component Properties Column Mappings Input and Output

Available Input Columns

Name
Store
Date
Time
TransactionID
CardID
PaymentMethod
ItemCode

Destination Columns

Param_0
Param_1
Param_2
Param_3
Param_4
Param_5
Param_6

Input Column Destination Column

Input Column	Destination Column
PaymentMethodKey	Param_0
TransactionID	Param_1
Quant	Param_2
Amount	Param_3
TotalAmount	Param_4
DateKey	Param_5
TimeKey	Param_6
CardKey	Param_7
ItemKey	Param_8
StoreKey	Param_9

OK Cancel Help

Establish the mappings between the attributes and the parameters according to the picture. The first parameter (*Param\_0*) corresponds to the first ? in the parameterized UPDATE, the second parameter (*Param\_1*) corresponds to the second ? and so on.

Add to Source Control

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Execute the Load FactSales Data Flow Task.

Package.dtsx [Design] X

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup Match Output

Fact Already Exists?

Fact Sales

Quant Data Conversion

Fact Equal?

Update FactSales

Variables

SSIS Toolbox

Getting Started

Add Annotation

Execute Task

Edit Breakpoints...

Zoom

Cut Ctrl+X

Copy Ctrl+C

Paste Ctrl+V

Delete Del

Properties Alt+Enter

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

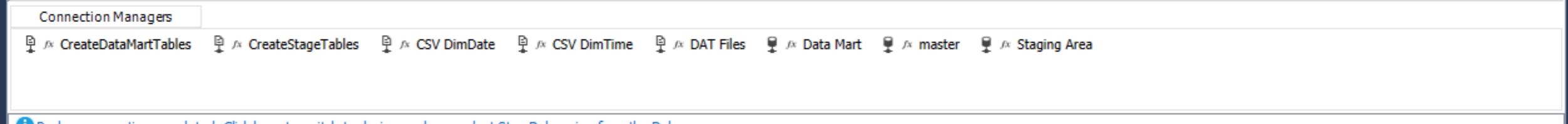
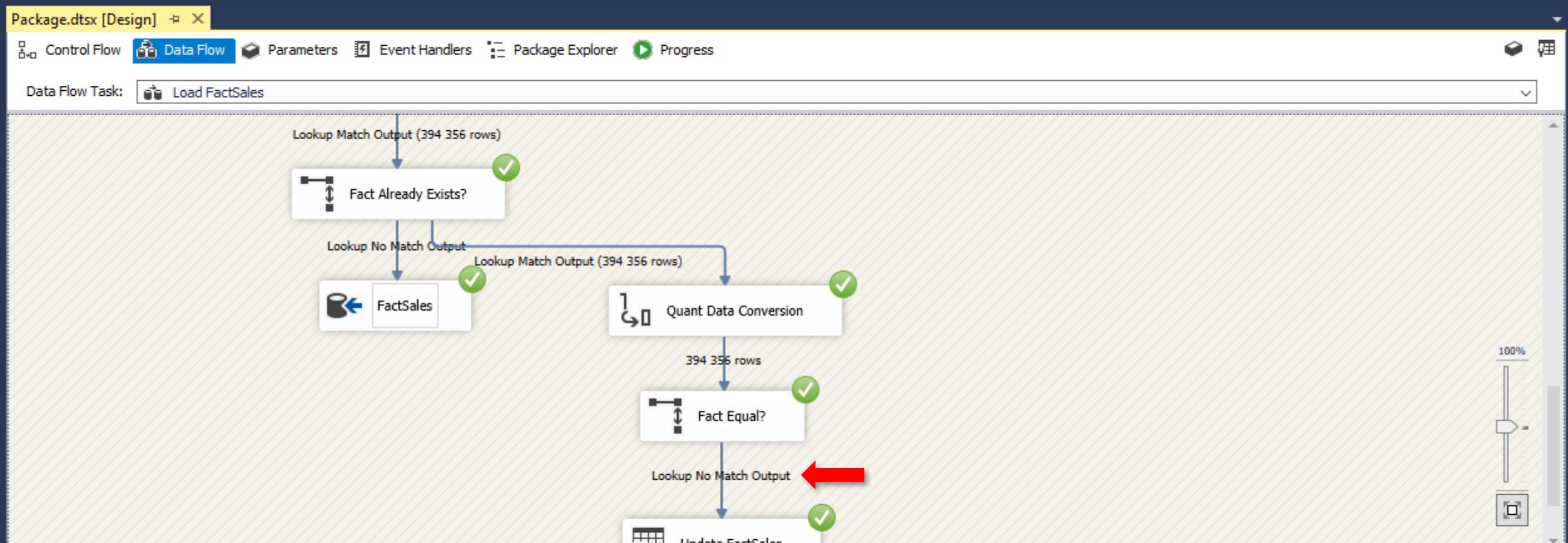
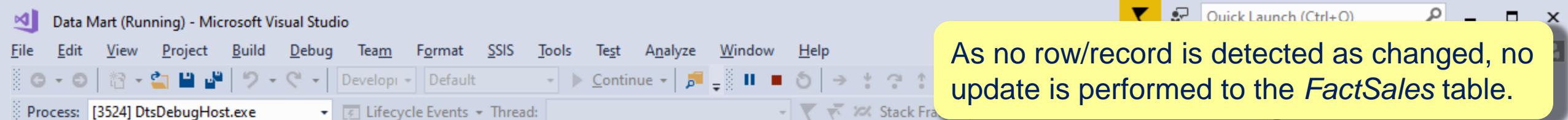
Error List Variables Output

Ready Add to Source Control

This screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The main area displays a Data Flow Task titled "Load FactSales" with the following flow:

- The process starts with a "Fact Already Exists?" decision component.
- If a match is found ("Match Output"), it proceeds to a "Quant Data Conversion" component.
- From "Quant Data Conversion", the flow goes to a second "Fact Equal?" decision component.
- If no match is found ("No Match Output"), it proceeds to an "Update FactSales" component.
- If the second "Fact Equal?" check fails ("No Match Output"), it also proceeds to the "Update FactSales" component.
- The "Fact Sales" source is connected to both the initial "Fact Equal?" and the "Quant Data Conversion" components.

A context menu is open on the "Execute Task" option, indicated by a red arrow. The menu includes options like Cut, Copy, Paste, Delete, and Properties.



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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Add to Source Control

SQLQuery1.sql - localhost.ARMDDB\_StagingArea (AzureAD\PauloOliveira (60))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_StagingArea  Execute 

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

SQLQuery1.sql - loc...\PauloOliveira (60)\*

```
SELECT *  
FROM [Transaction]  
WHERE TransactionID = 'T10000580'
```

Results

	Store	Date	Time	TransactionID	CardID	PaymentMethod
1	S0015	2001-06-22 00:00:00.000	1751	T10000580	C0103066224	CH

Query executed successfully.

In SSMS execute the highlighted query in the ARMDD\_StagingArea database. As result, it's possible to see that the PaymentMethod is Check (CH).

SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (52))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart

Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (52))\*

```
SELECT *  
FROM FactSales  
WHERE TransactionID = 'T10000580'
```

Results

	DateKey	TimeKey	CardKey	ItemKey	StoreKey	PaymentMethodKey	TransactionID	Quant	Amount	TotalAmount
1	37063	35461	94439	799	5	1	T10000580	1	349,00	349,00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 1 rows

Ln 3 Col 12 Ch 12 INS

Execute the highlighted query in the *ARMDD\_DataMart* database. As result, it's possible to see that the *PaymentMethodKey* is 1. Actually, this value can be different from yours, given that it depends on the order in which the payment methods were inserted into the *DimPaymentMetod* table.

SQLQuery1.sql - localhost.ARMDDB\_StagingArea (AzureAD\PauloOliveira (60))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_StagingArea Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

SQLQuery2.sql - loc...\\PauloOliveira (52)\* SQLQuery1.sql - loc...\\PauloOliveira (60)\*

```
SELECT *  
FROM [Transaction]  
WHERE TransactionID = 'T10000580'  
  
UPDATE [Transaction]  
SET PaymentMethod = 'CC'  
WHERE TransactionID = 'T10000580'
```

100 % Messages

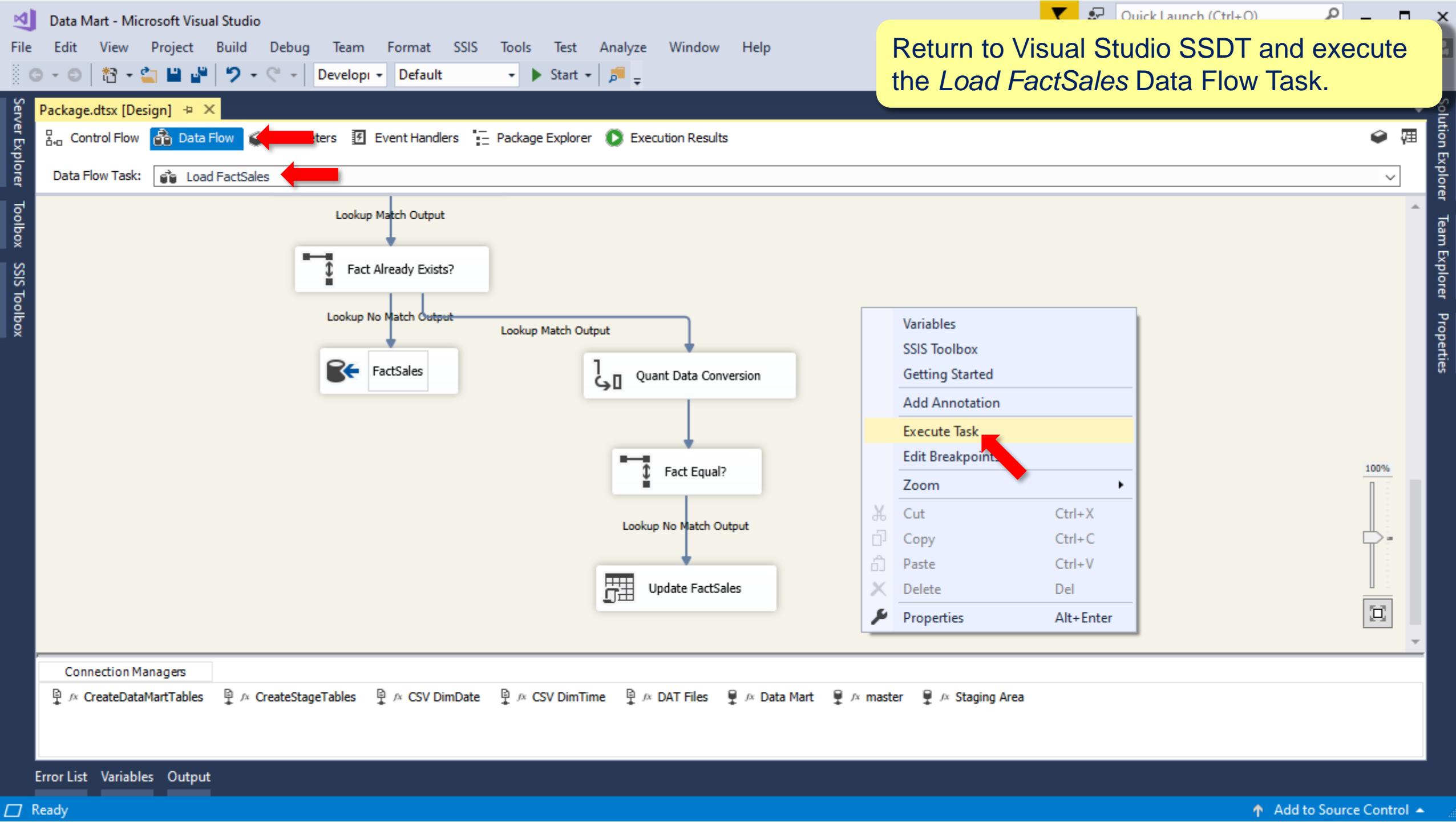
(1 row affected)  
Completion time: 2023-11-13T10:15:51.7726140+00:00

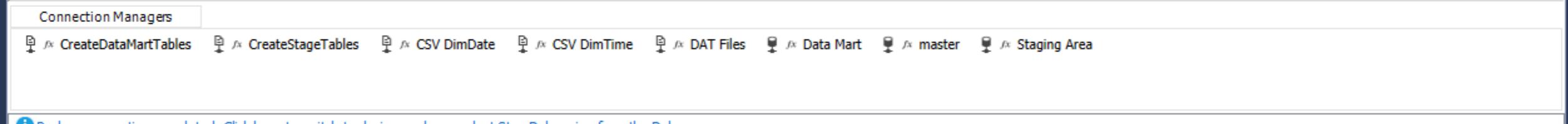
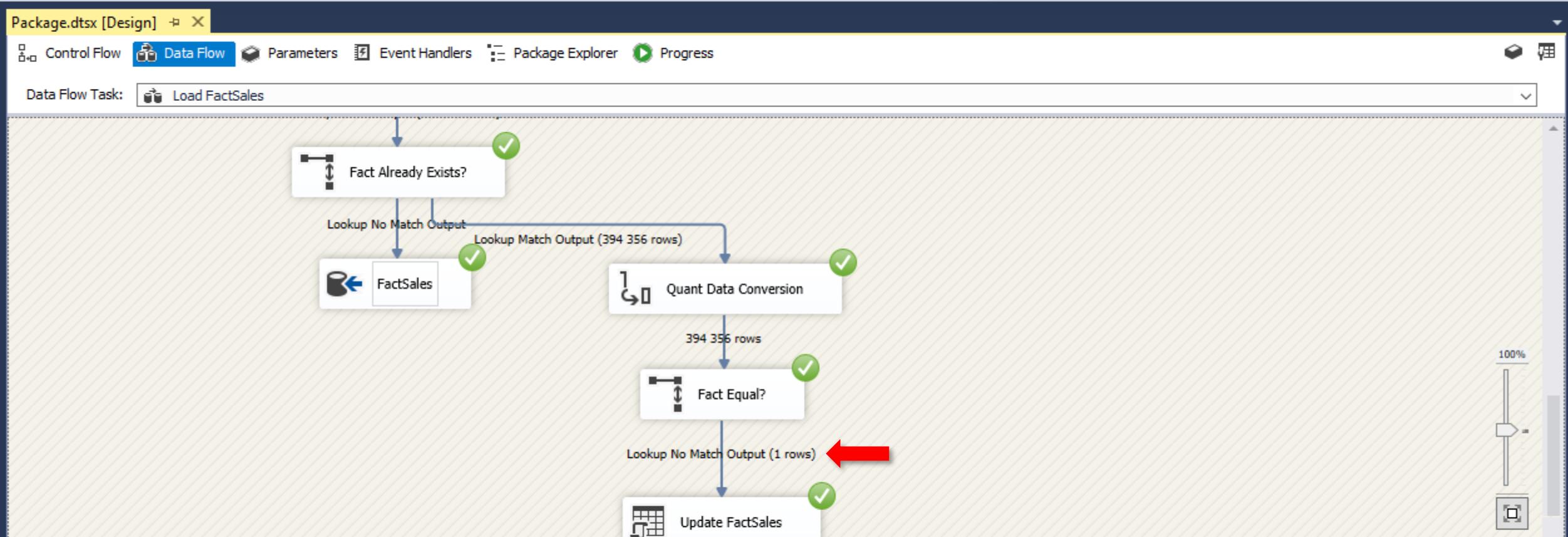
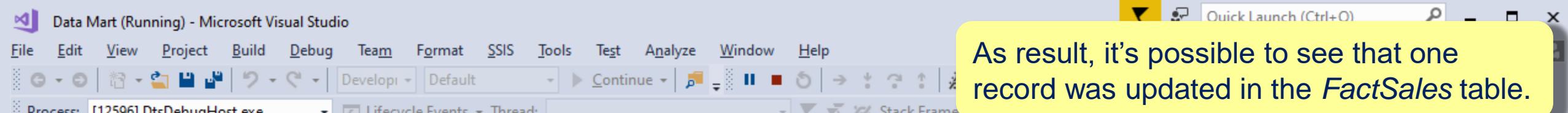
100 % Query executed successfully. | localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

Ln 5 Col 1 Ch 1 INS

Quick Launch (Ctrl+O)

Execute the highlighted *UPDATE* statement in the *ARMDD\_StagingArea* database to change the *PaymentMethod* to *Credit Card (CC)*. To execute just the *UPDATE* statement, we need to select it first.





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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Add to Source Control

SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (52))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

New Query MDX DMX XMLA DAX

Execute

SQLQuery2.sql - loc...\\PauloOliveira (52)\* SQLQuery1.sql - loc...\\Pa

```
SELECT *  
FROM FactSales  
WHERE TransactionID = 'T10000580'
```

Results Messages

	DateKey	TimeKey	CardKey	ItemKey	StoreKey	PaymentMethodKey	TransactionID	Quant	Amount	TotalAmount
1	37063	35461	94439	799	5	2	T10000580	1	349,00	349,00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 1 rows

Ln 4 Col 1 Ch 1 INS

In SSMS, execute again the previous query in the *ARMDD\_DataMart* database. It's now possible to see that the *PaymentMethodKey* is 2. Once again, this value can be different from yours, but it should be different from your previous value.

SQLQuery1.sql - localhost.ARMDDB\_StagingArea (AzureAD\PauloOliveira (60))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_StagingArea Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

SQLQuery2.sql - loc...\\PauloOliveira (52)\* SQLQuery1.sql

```
SELECT *  
FROM [Transaction]  
WHERE TransactionID = 'T10000580'  
  
UPDATE [Transaction]  
SET PaymentMethod = 'CH'  
WHERE TransactionID = 'T10000580'
```

100 % Messages

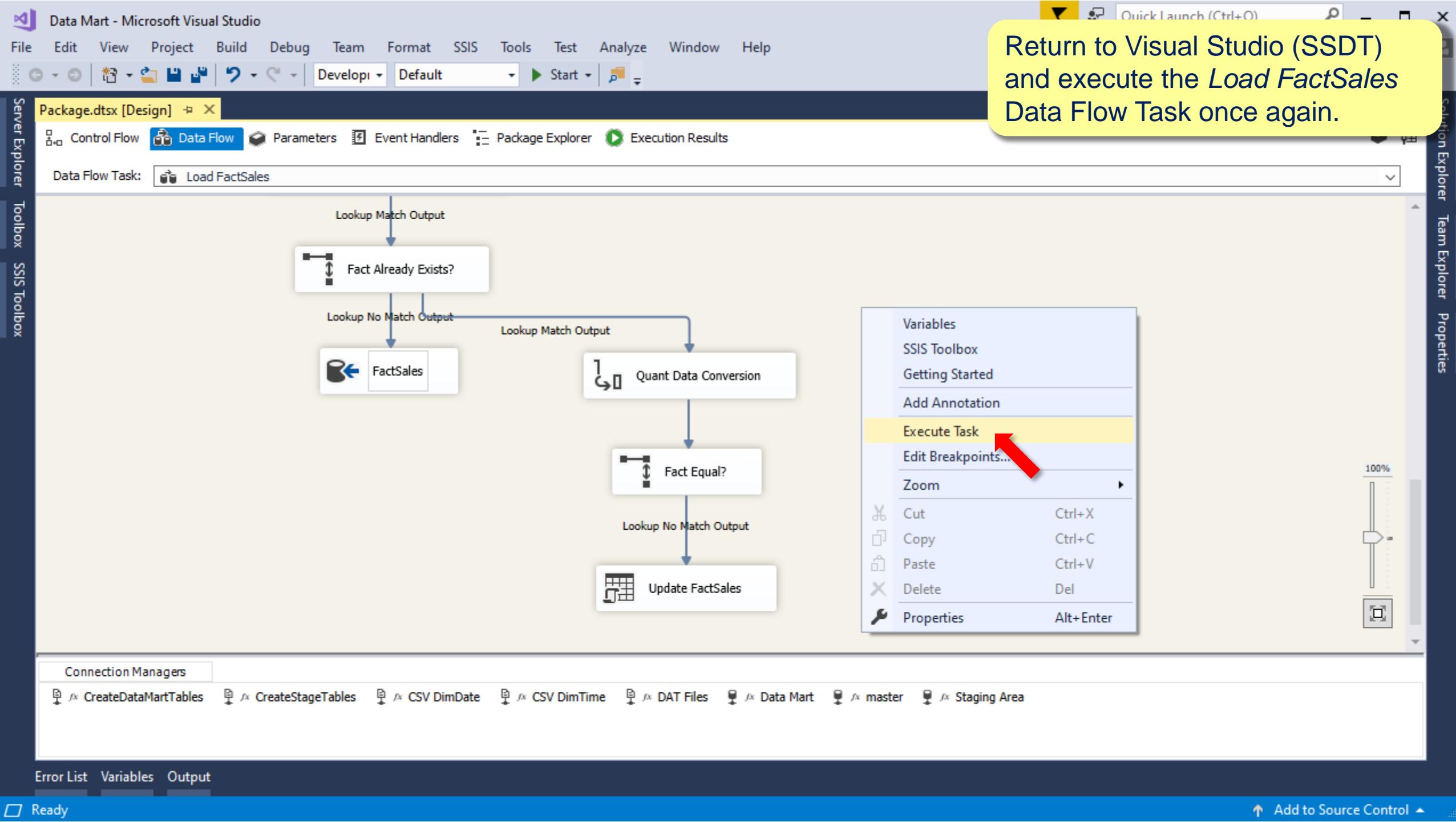
(1 row affected)  
Completion time: 2023-11-13T10:22:01.0615034+00:00

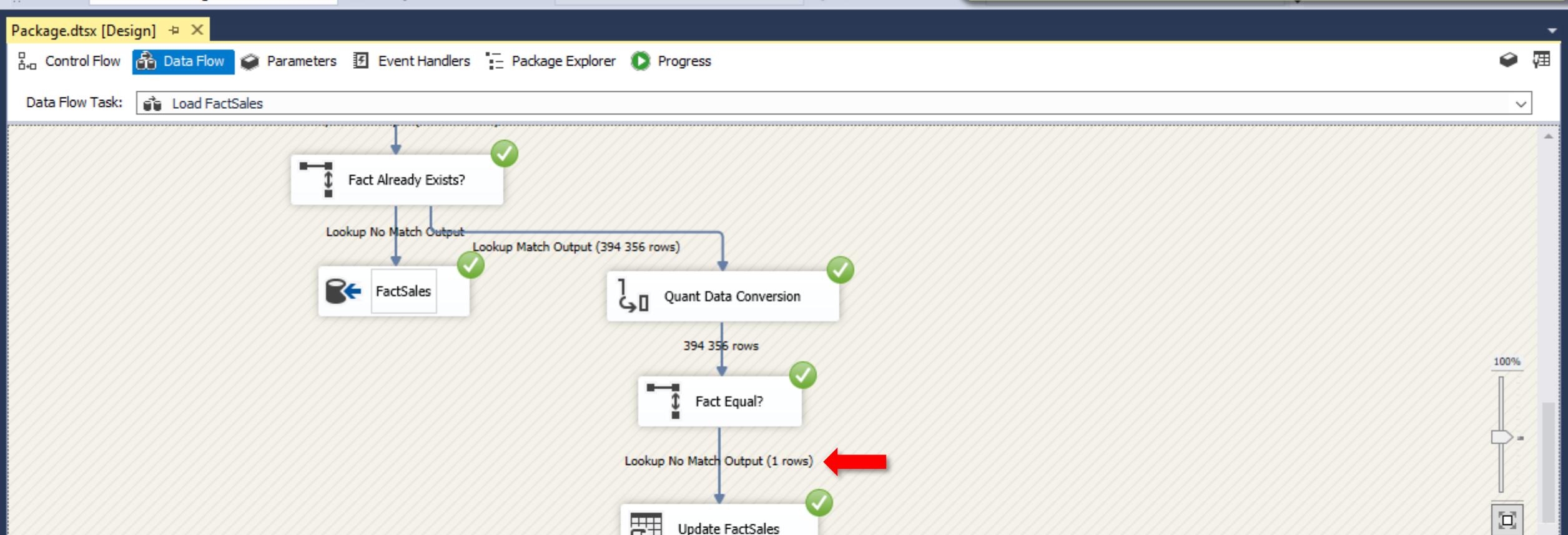
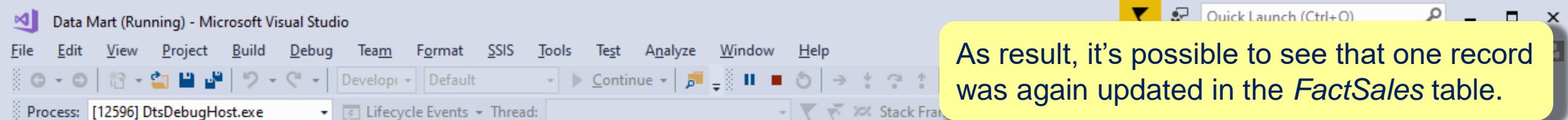
100 % Query executed successfully. | localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

Ln 7 Col 34 Ch 34 INS

Quick Launch (Ctrl+O)

Execute again the previous *UPDATE* statement in the *ARMDD\_StagingArea* database, but now to change the *PaymentMethod* to the original value (i.e., *Check - CH*).





Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready

Add to Source Control

SQLQuery2.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (52))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart  Execute

Object Explorer

Connect

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart 
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
- Security
- Server Objects
- Replication
- Always On High Availability
- Management
- Integration Services Catalogs
- SQL Server Agent (Agent XPs disabled)
- XEvent Profiler

SQLQuery2.sql - loc...\\PauloOliveira (52)\* SQLQuery1.sql - loc...\\PauloOliveira

```
SELECT *  
FROM FactSales  
WHERE TransactionID = 'T10000580'
```

Results Messages

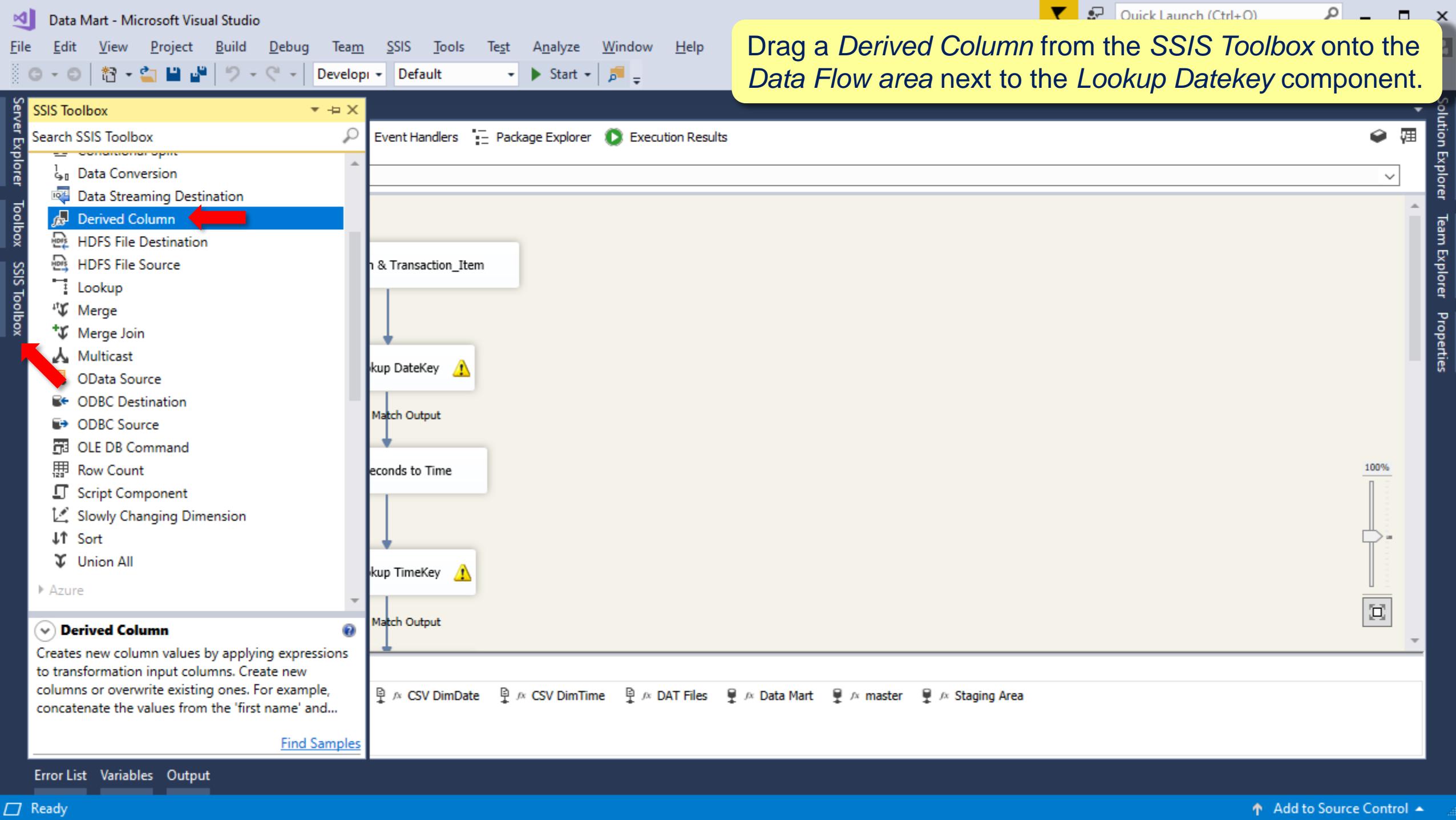
	DateKey	TimeKey	CardKey	ItemKey	StoreKey	PaymentMethodKey	TransactionID	Quant	Amount	TotalAmount
1	37063	35461	94439	799	5	1	T10000580	1	349,00	349,00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 1 rows

Ln 4 Col 1 Ch 1 INS

In SSMS, execute again the previous query in the *ARMDD\_DataMart* database. It's now possible to see that the *PaymentMethodKey* is back to the original value. Once again this value can be different from yours.



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Rename the Derived Column to Add Lookup DateKey Failure DQP.

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Add Lookup DateKey Failure DQP

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

```
graph TD; A[Transaction & Transaction_Item] --> B[Lookup DateKey]; B --> C[Add Seconds to Time]; C --> D[Lookup TimeKey];
```

A red arrow points to the 'Add Lookup DateKey Failure DQP' transformation icon.

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execute

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Configure Error Output

Specify how row-level error columns. Errors can fail the component.

Input or Output Column Error Truncation Description

Lookup Match... DateKey Redirect row Fail component Copy Column

Set this value to selected cells: Fail component Apply

OK Cancel

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime

Error List Variables Output

Ready Add to Source Control

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

Connect the red flow of the *Lookup* component to the *Derived Column* and select the *Redirect row* data flow (i.e., the rows/records in which there was a *Lookup* error are redirected).

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CS

Error List Variables Output

Derived Column

Specify the columns.

Variables and Parameters Columns

Mathematical Functions String Functions Date/Time Functions NULL Functions Type Casts Operators

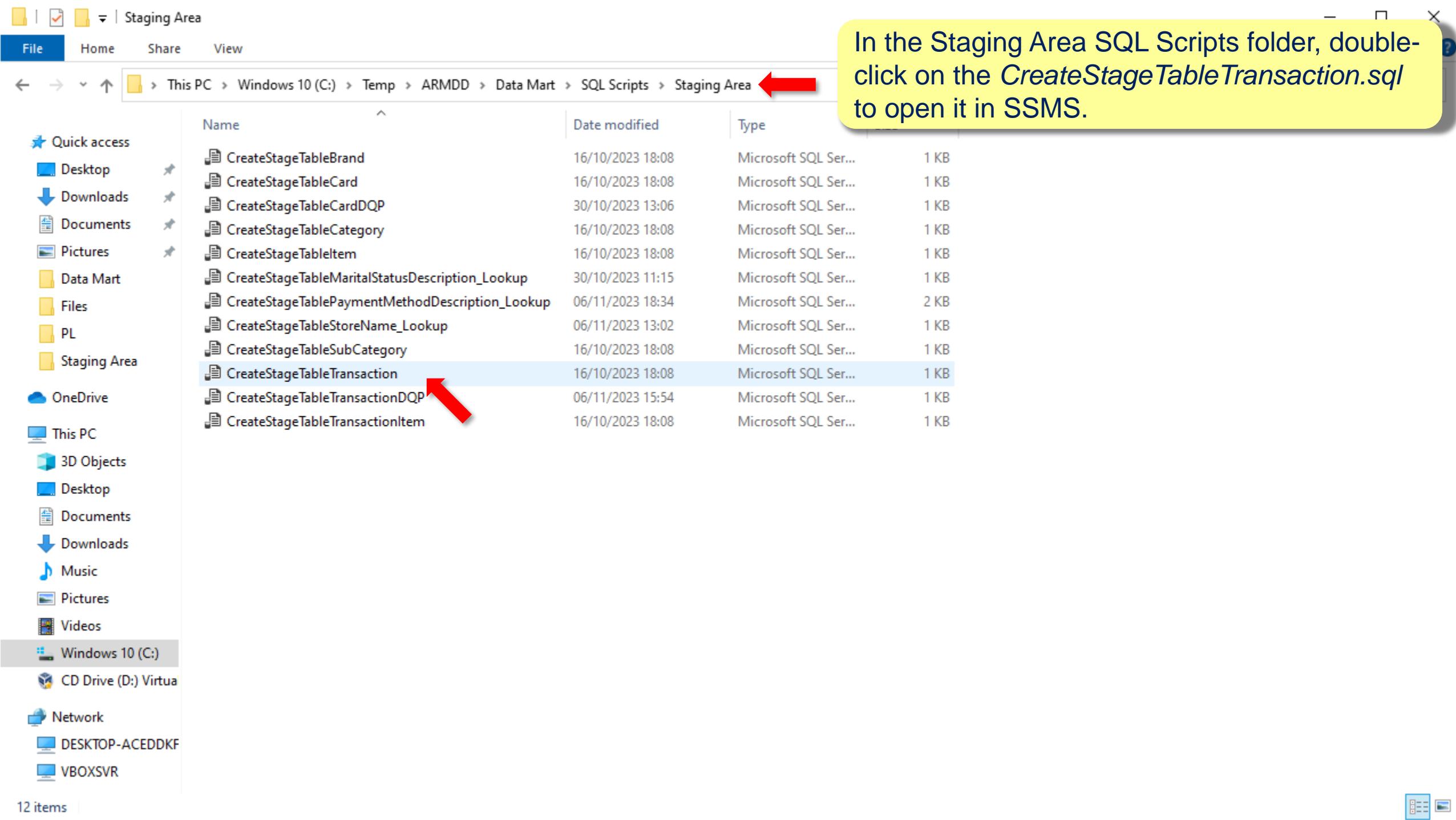
Description:

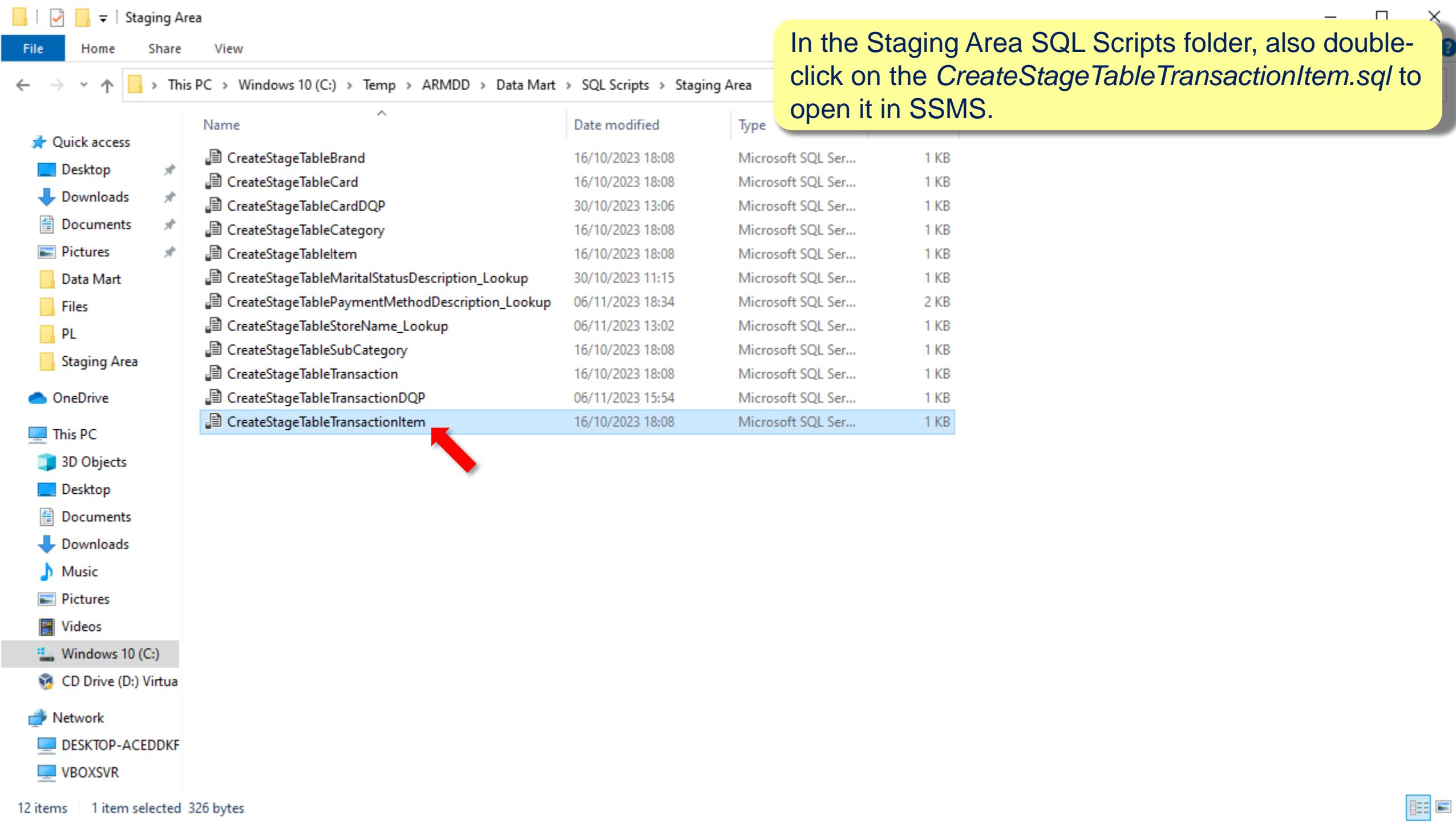
Derived Column Name	Derived Column	Expression	Data Type	Length
DQP	<add as new column>	"DateKey lookup failed on DimDate table"	Unicode string [DT_WSTR]	32767

Configure Error Output... OK Cancel Help

Edit the *Derived Column* component and add the new attribute DQP initialized with the error message presented in the image.

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The "Data Flow" tab is selected in the ribbon. On the left, the data flow diagram displays a sequence of components: "Transaction & Transaction\_Item" followed by a "Lookup DateKey" component, which has a yellow warning icon. An arrow points from this component to the "DQP" row in the "Derived Column" editor. Below it is an "Add Seconds to Time" component, followed by another "Lookup" component, "Lookup TimeKey", also with a yellow warning icon. This second "Lookup" component also has an arrow pointing to the "DQP" row. The "Derived Column" editor is open on the right, showing a table with one row. The "Derived Column Name" is "DQP", the "Expression" is set to the string "DateKey lookup failed on DimDate table", and the "Data Type" is "Unicode string [DT\_WSTR]" with a length of 32767. A red arrow highlights the "OK" button at the bottom right of the editor. A large yellow callout box contains the instruction: "Edit the *Derived Column* component and add the new attribute DQP initialized with the error message presented in the image." The status bar at the bottom indicates "Ready".





CreateStageTableTransactionItem.sql - localhost.ARMDD\_DataMart (AzureAD\PauloOliveira (59)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DAX XMLA DAX Execute Properties Window

ARMDD\_DataMart

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

100 % Connected. (1/1)

Quick Launch (Ctrl+O)

In SSMS, in the *Transaction\_Item* script window copy the highlighted attributes.

IF NOT EXISTS(SELECT name FROM sys.tables WHERE name = 'Transaction\_Item')  
CREATE TABLE [dbo].[Transaction\_Item]  
(  
    [Store] [char](5),  
    [Date] [datetime],  
    [Time] [int],  
    [TransactionID] [char](9),  
    [ItemNumber] [tinyint],  
    [ItemCode] [char](11),  
    [Amount] [money])  
ELSE  
TRUNCATE TABLE Transaction\_Item

Cut Ctrl+X  
Copy Ctrl+C  
Paste Ctrl+V  
Insert Snippet... Ctrl+K, Ctrl+X  
Surround With... Ctrl+K, Ctrl+S  
Connection  
Open Server in Object Explorer Alt+F8  
Execute F5  
Display Estimated Execution Plan Ctrl+L  
IntelliSense Enabled Ctrl+B, Ctrl+I  
Trace Query in SQL Server Profiler Ctrl+Alt+P  
Analyze Query in Database Engine Tuning Advisor  
Design Query in Editor... Ctrl+Shift+Q  
Include Actual Execution Plan Ctrl+M  
Include Live Query Statistics  
Include Client Statistics Shift+Alt+S  
Results To  
Properties Window F4

SQLQuery2.sql - loc...\\PauloOliveira (52)\*

ARMDD\\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

CreateStageTableTransaction.sql - localhost.ARMDP\_DataMart (AzureAD\PauloOliveira (57))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart Execute SQL

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

CreateStageTableTra...PauloOliveira (59) CreateStageTableTra...PauloOliveira (57)\* SQL

```
IF NOT EXISTS(SELECT name FROM sys.tables WHERE name = 'FactSalesDQP')
CREATE TABLE [dbo].[FactSalesDQP]
(
    [Store] [char](5),
    [Date] [datetime],
    [Time] [int],
    [TransactionID] [char](9),
    [CardID] [char](11),
    [PaymentMethod] [char](2),
    [ItemCode] [char](11),
    [Amount] [money],
    DQP nvarchar(100)
)
ELSE
    TRUNCATE TABLE FactSalesDQP
```

100 % Results

Commands completed successfully.

Completion time: 2023-11-13T10:38:03.9025350+00:00

100 %

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

Ln 15 Col 32 Ch 29 INS

Paste the copied attributes into the *Transaction* script window and perform the necessary changes according to the picture. Check the syntax to see if everything is correct.

CreateStageTableTransaction.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (57))\* - Microsoft SQL Server Management Studio

File View Query Project Tools Window Help

Connect Object Explorer...  
Disconnect Object Explorer  
New  
Open  
Add  
Close  
Close Solution  
Save CreateStageTableTransaction.sql Ctrl+S  
Save CreateStageTableTransaction.sql As... **Ctrl+Shift+S**   
Save All  
View in Browser  
Browse With...  
Page Setup...  
Print... Ctrl+P  
Recent Files  
Recent Projects and Solutions  
Exit Alt+F4

Completion time: 2023-11-13T10:38:03.9025350+00:00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDDataMart | 00:00:00 | 0 rows

INS

Save the changes as a new Staging Area SQL Script file.

CreateStageTableFactSalesDQP.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (57)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart

Save File As

Windows 10 (C:) <> Windows 10 (C:) > Temp > ARMDDataMart > Data Mart > SQL Scripts > Staging Area

Search Staging Area

Name Date modified Type Size

Name	Date modified	Type	Size
CreateStageTableBrand	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableCard	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableCardDQP	30/10/2023 13:06	Microsoft SQL Ser...	1 KB
CreateStageTableCategory	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableItem	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableMaritalStatusDescriptio...	30/10/2023 11:15	Microsoft SQL Ser...	1 KB
CreateStageTablePaymentMethodDescripti...	06/11/2023 18:34	Microsoft SQL Ser...	2 KB
CreateStageTableStoreName_Lookup	06/11/2023 13:02	Microsoft SQL Ser...	1 KB
CreateStageTableSubCategory	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableTransaction	16/10/2023 18:08	Microsoft SQL Ser...	1 KB
CreateStageTableTransactionDQP	06/11/2023 15:54	Microsoft SQL Ser...	1 KB
CreateStageTableTransactionItem	16/10/2023 18:08	Microsoft SQL Ser...	1 KB

File name: C:\Temp\ARMDDataMart\SQL Scripts\Staging Area\CreateStageTableFactSalesDQP

Save as type: SQL Files (\*.sql)

Save Cancel

100 %

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDDataMart | 00:00:00 | 0 rows

Ln 15 Col 32 Ch 29 INS

Save the new script file as  
CreateStageTableFactSalesDQP

CreateStageTableFactSalesDQP.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (57)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_StagingArea Execute

Object Explorer

localhost (SQL Server 16.0.1050.5 - AzureAD)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
    - Views
    - External Resources
    - Synonyms
    - Programmability
    - Query Store
    - Service Broker
    - Storage
    - Security
  - Security
  - Server Objects
  - Replication
  - Always On High Availability
  - Management
  - Integration Services Catalogs
  - SQL Server Agent (Agent XPs disabled)
  - XEvent Profiler

CreateStageTableTra...PauloOliveira (59) CreateStageTableFac...PauloOliveira (57) SQLQuery2.sql - loc...\\PauloOliveira (52)\*

```
IF NOT EXISTS(SELECT name FROM sys.tables WHERE name = 'FactSalesDQP')
CREATE TABLE [dbo].[FactSalesDQP]
(
    [Store] [char](5),
    [Date] [datetime],
    [Time] [int],
    [TransactionID] [char](9),
    [CardID] [char](11),
    [PaymentMethod] [char](2),
    [ItemCode] [char](11),
    [Amount] [money],
    DQP nvarchar(100)
)
ELSE
    TRUNCATE TABLE FactSalesDQP
```

100 %

Messages

Commands completed successfully.

Completion time: 2023-11-13T10:44:17.2443387+00:00

100 %

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

Ln 15 Col 32 Ch 29 INS

In the **ARMDD\_StagingArea** database execute the script to create the **FactSalesDQP** table.

CreateStageTableFactSalesDQP.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (57)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_StagingArea

The table is created in the ARMDD\_StagingArea database.

Object Explorer

localhost (SQL Server 16.0.2505.5 - Azure)

Databases

- System Databases
- Database Snapshots
- AdventureWorksDW2022
- ARMDD\_DataMart
- ARMDD\_StagingArea

Tables

- System Tables
- FileTables
- External Tables
- Graph Tables
- dbo.Brand
- dbo.Card
- dbo.CardDQP
- dbo.Category
- dbo.FactSalesDQP
- dbo.Item
- dbo.MaritalStatusDescriptor
- dbo.PaymentMethodDescriptor
- dbo.StoreName\_Lookup
- dbo.SubCategory
- dbo.Transaction
- dbo.Transaction\_Item
- dbo.TransactionDQP
- Dropped Ledger Tables

Views

Query executed successfully.

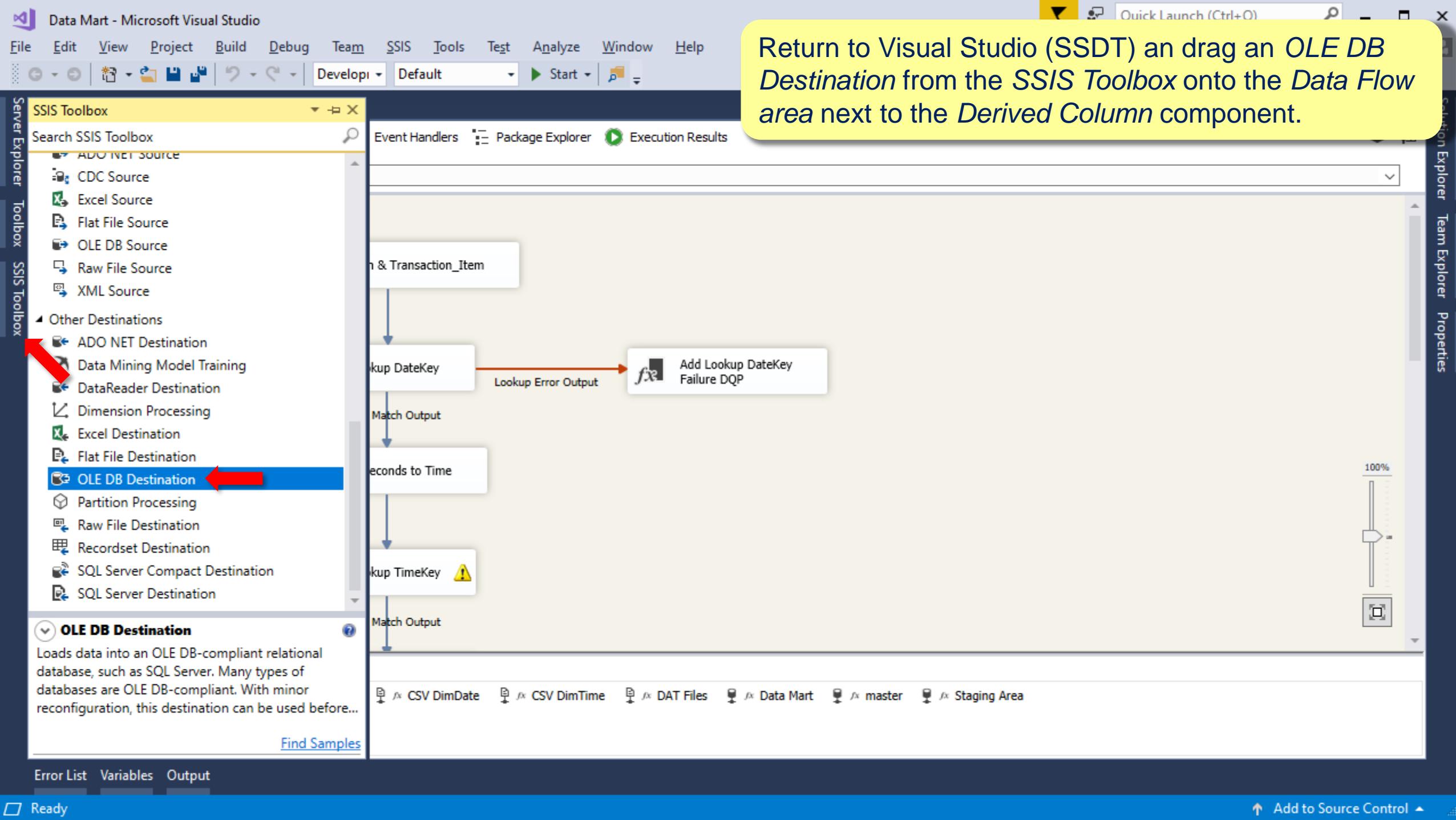
IF NOT EXISTS(SELECT name FROM sys.tables WHERE name = 'FactSalesDQP')  
CREATE TABLE [dbo].[FactSalesDQP]  
(  
[Store] [char](5),  
[Date] [datetime],  
[Time] [int],  
[TransactionID] [char](9),  
[CardID] [char](11),  
[PaymentMethod] [char](2),  
[ItemCode] [char](11),  
[Amount] [money],  
DQP nvarchar(100)  
)  
ELSE  
TRUNCATE TABLE FactSalesDQP

Messages

Commands completed successfully.  
Completion time: 2023-11-13T10:44:17.2443387+00:00

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

Ready



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Solution Explorer Team Explorer Properties

Transaction & Transaction\_Item

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Add Lookup DateKey Failure DQP

FactSalesDQP

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the previous component to the **OLE DB Destination** and rename it **FactSalesDQP**.

```
graph TD; A[Transaction & Transaction_Item] --> B[Lookup DateKey]; B --> C[Add Seconds to Time]; C --> D[Lookup TimeKey]; D --> E[Add Lookup DateKey Failure DQP]; E --> F[FactSalesDQP]; F --> F
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Server Explorer

Toolbox

SSIS Toolbox

OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB provider.

Connection Manager  
Mappings  
Error Output

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. For fast-load data access, set the table update options.

OLE DB connection manager:  
Staging Area

Data access mode:  
Table or view - fast load

Name of the table or the view:  
[dbo].[FactSalesDQP]

Keep identity       Table lock  
 Keep nulls       Check constraints  
Rows per batch:  
Maximum insert commit size: 2147483647

View Existing

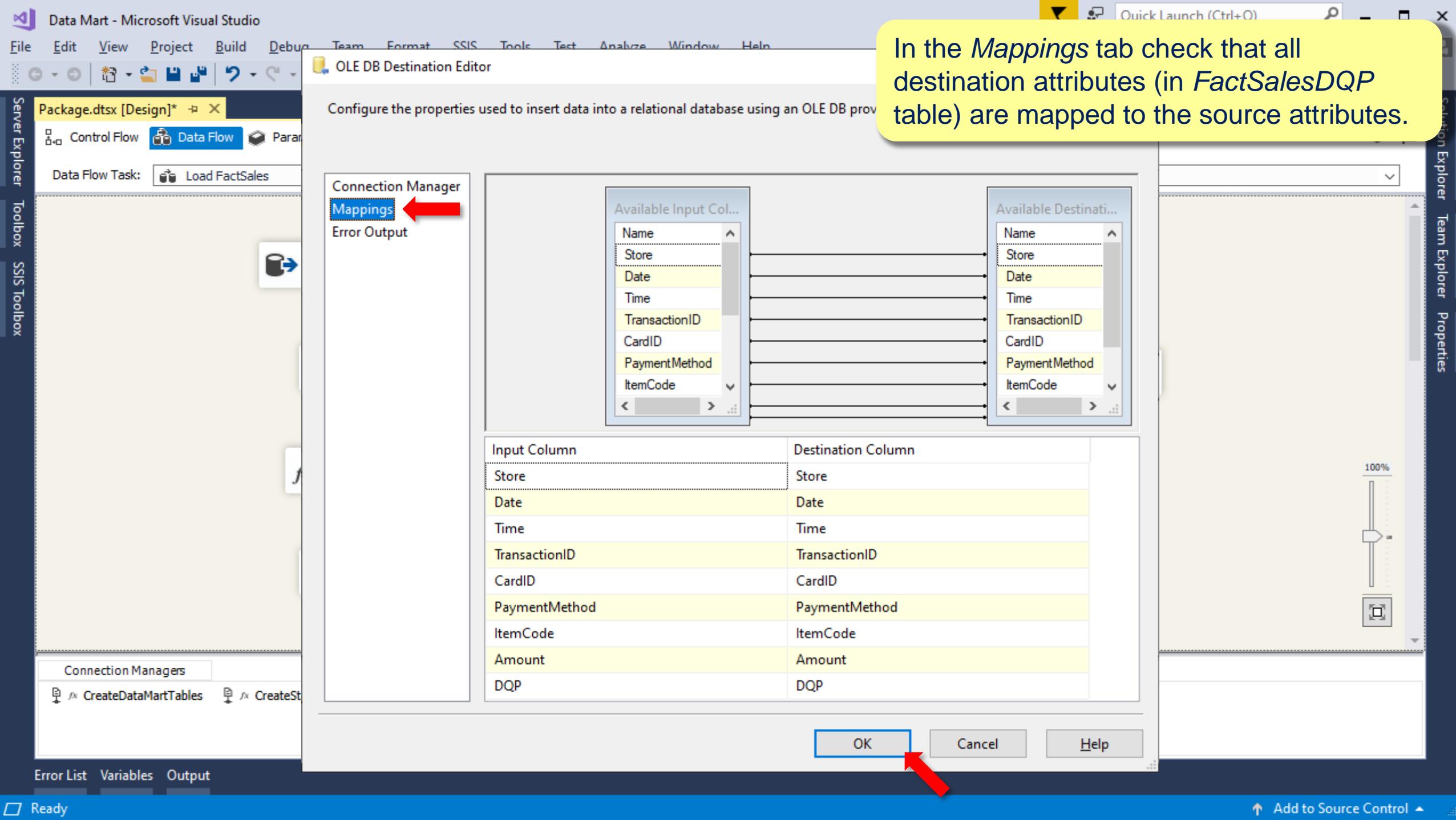
Map the columns on the Mappings page.

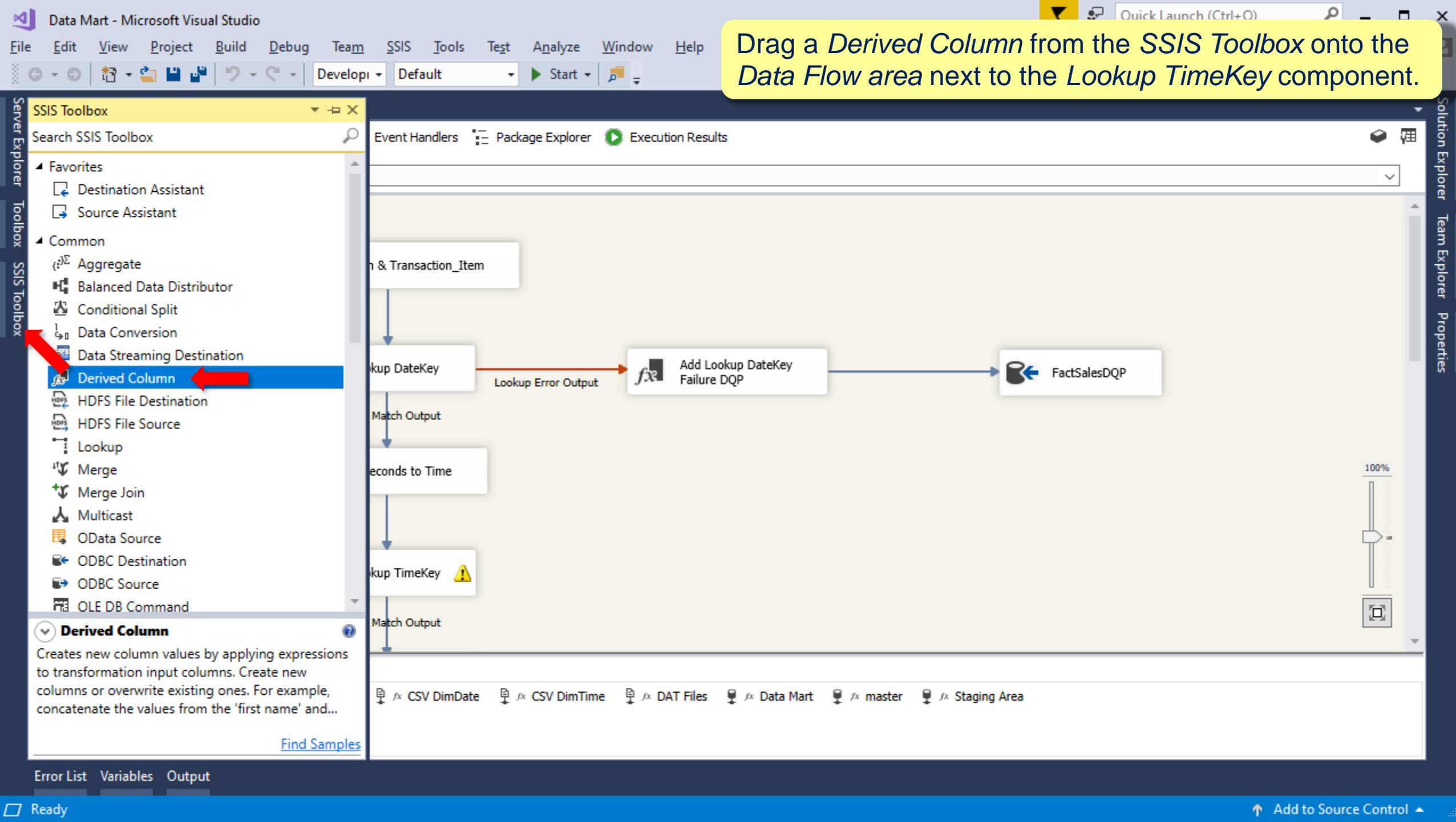
OK Cancel Help

Quick Launch (Ctrl+O)

Edit the component and select the *FactSalesDQP* table just created in the staging area.

Add to Source Control





Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Windows

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup DateKey → Add Lookup DateKey Failure DQP → FactSalesDQP

Add Seconds to Time

Lookup Match Output

Lookup DateKey → Add Lookup DateKey Failure DQP

Lookup Error Output

Lookup TimeKey → Add Lookup TimeKey Failure DQP

Lookup Error Output

Lookup Match Output

Lookup CardKey

Lookup Match Output

Connection Managers

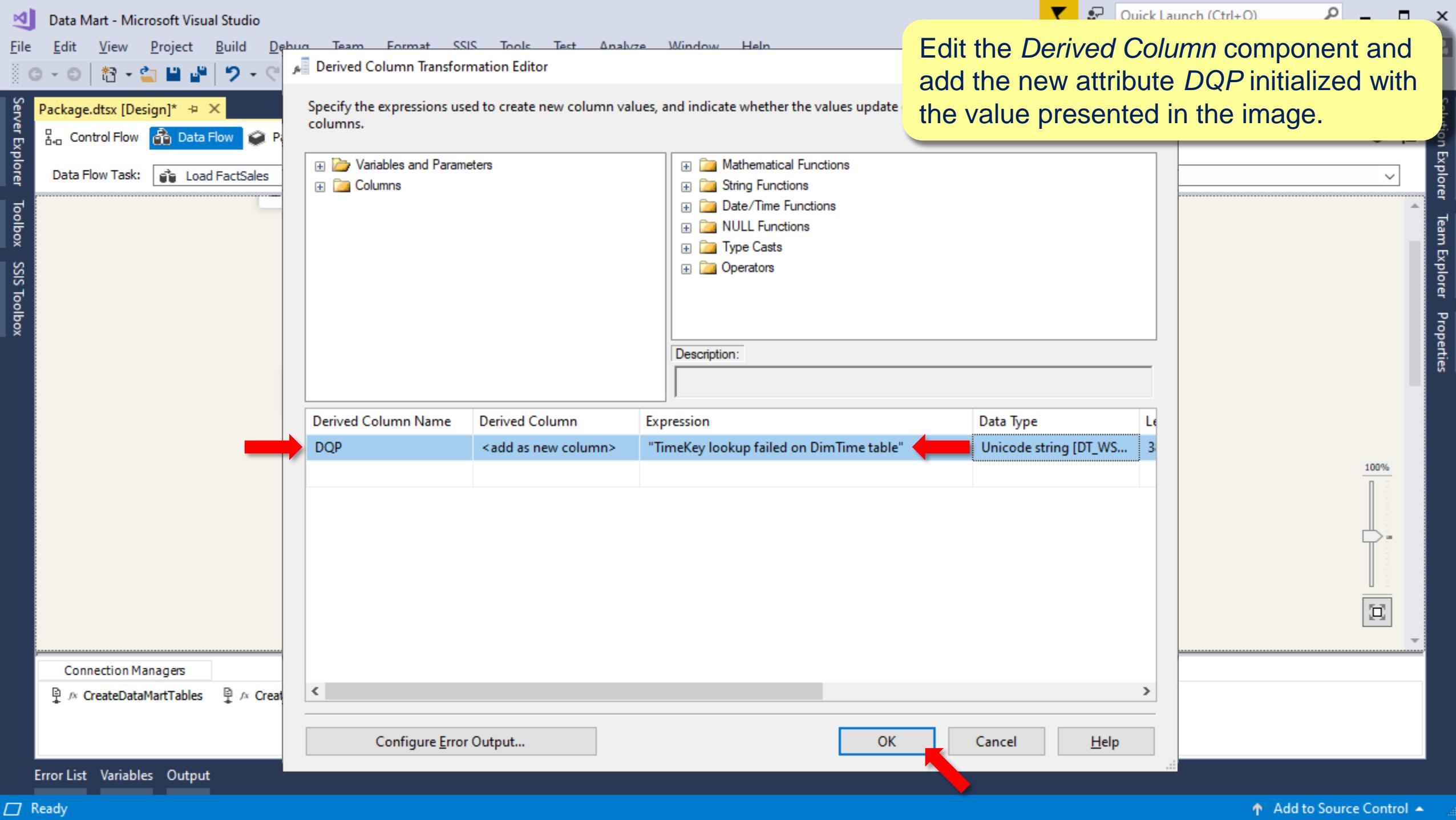
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the red flow of the *lookup* component to the *Derived Column*, select the *Redirect Row* data flow (i.e., the rows/records in which there was a *Lookup* error are redirected) and rename the *Derived Column* to *Add Lookup TimeKey Failure DQP*.

```
graph TD; Start(( )) --> L1[Lookup DateKey]; L1 --> DS1[Add Seconds to Time]; DS1 --> L2[Lookup TimeKey]; L2 --> DS2[Add Lookup TimeKey Failure DQP]; DS2 --> FactSalesDQP[FactSalesDQP]; L2 --> L3[Lookup CardKey]; L3 --> DS3[Add Lookup DateKey Failure DQP]; DS3 --> FactSalesDQP;
```



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Lookup DateKey → Add Lookup DateKey Failure DQP → FactSalesDQP

Add Seconds to Time → Lookup TimeKey → Add Lookup TimeKey Failure DQP

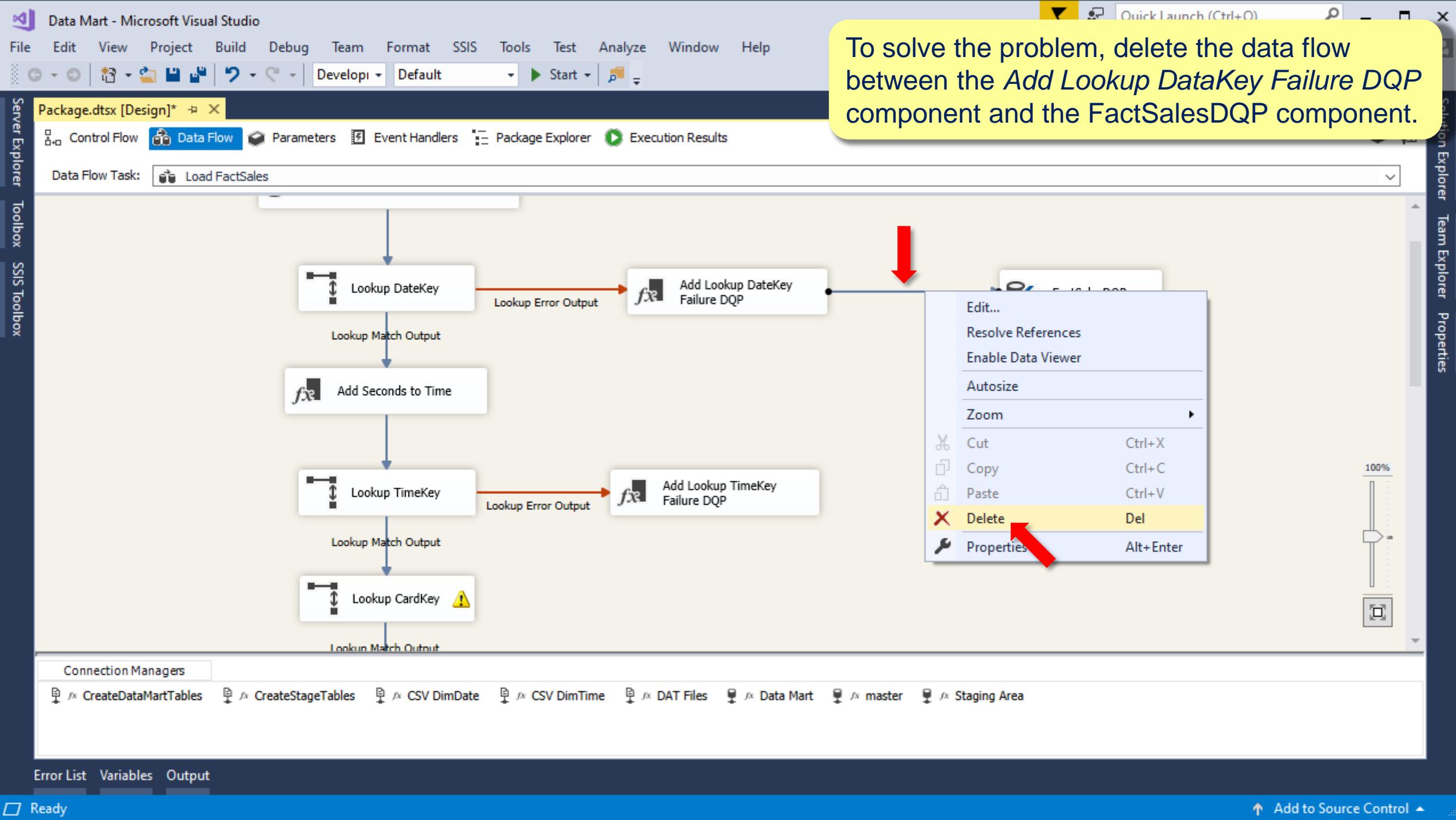
Lookup CardKey → Lookup Match Output

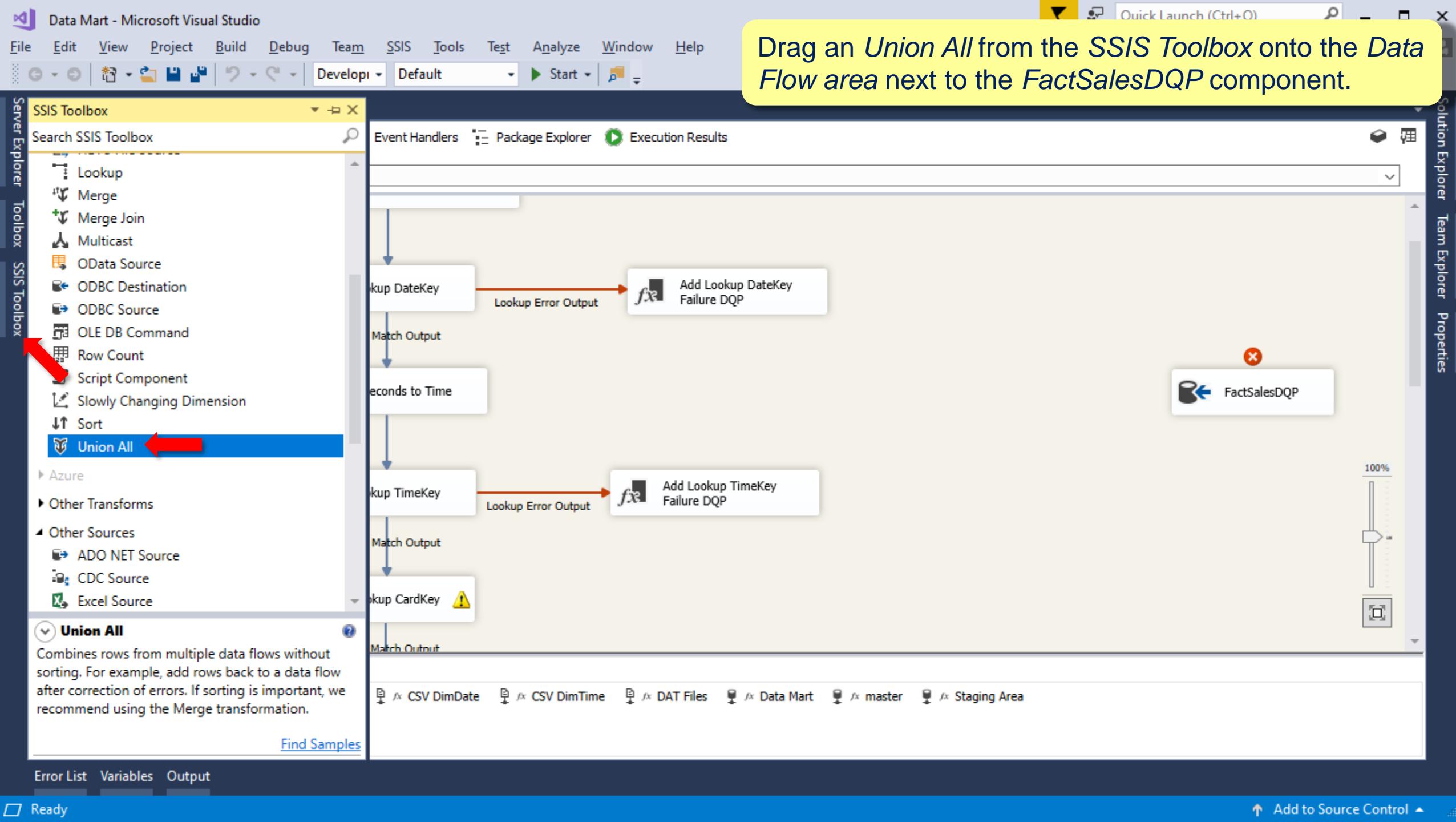
Operation Failure: All the available inputs on the target component are connected to outputs. Edit this component to define new inputs before proceeding.

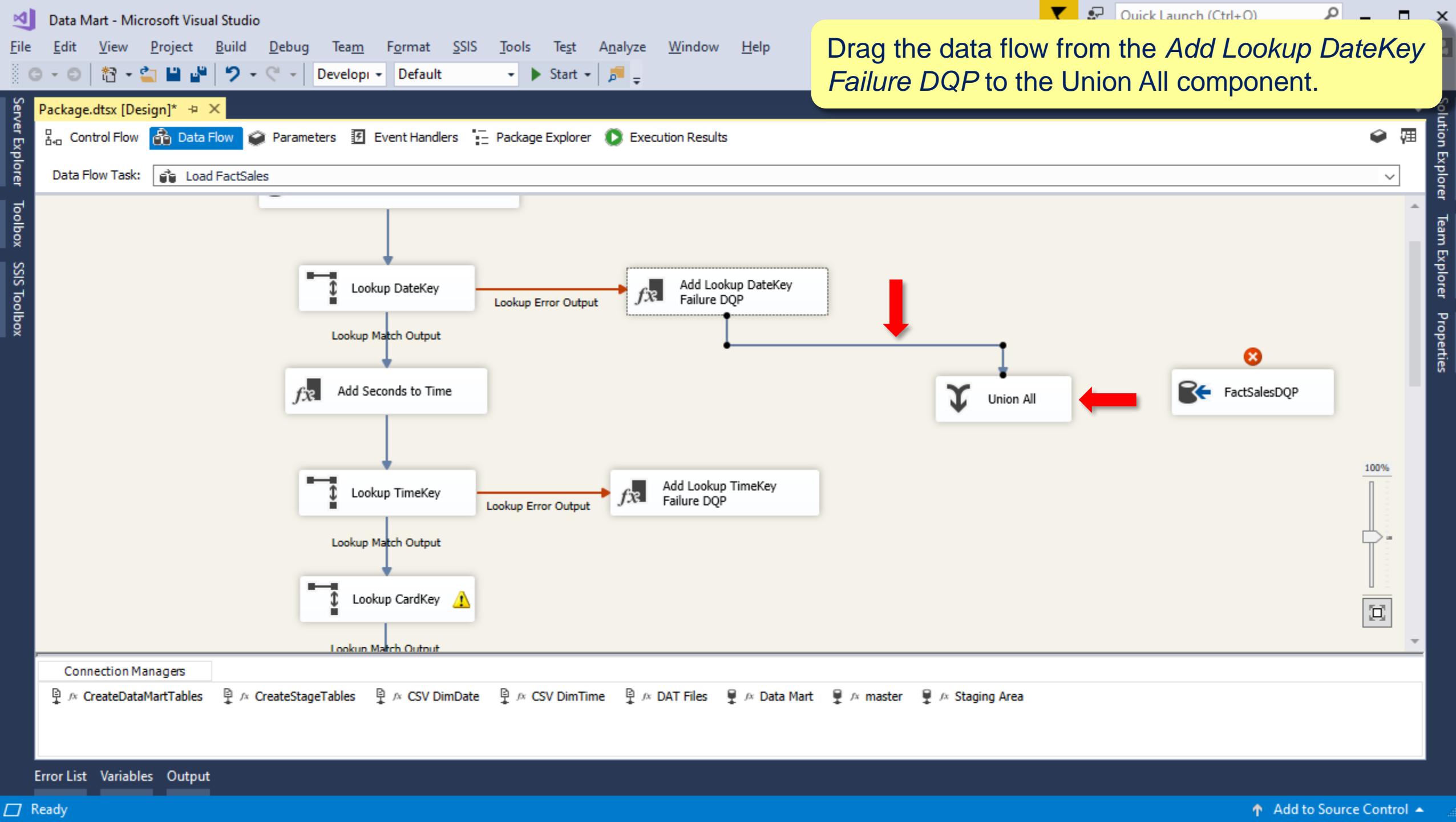
OK

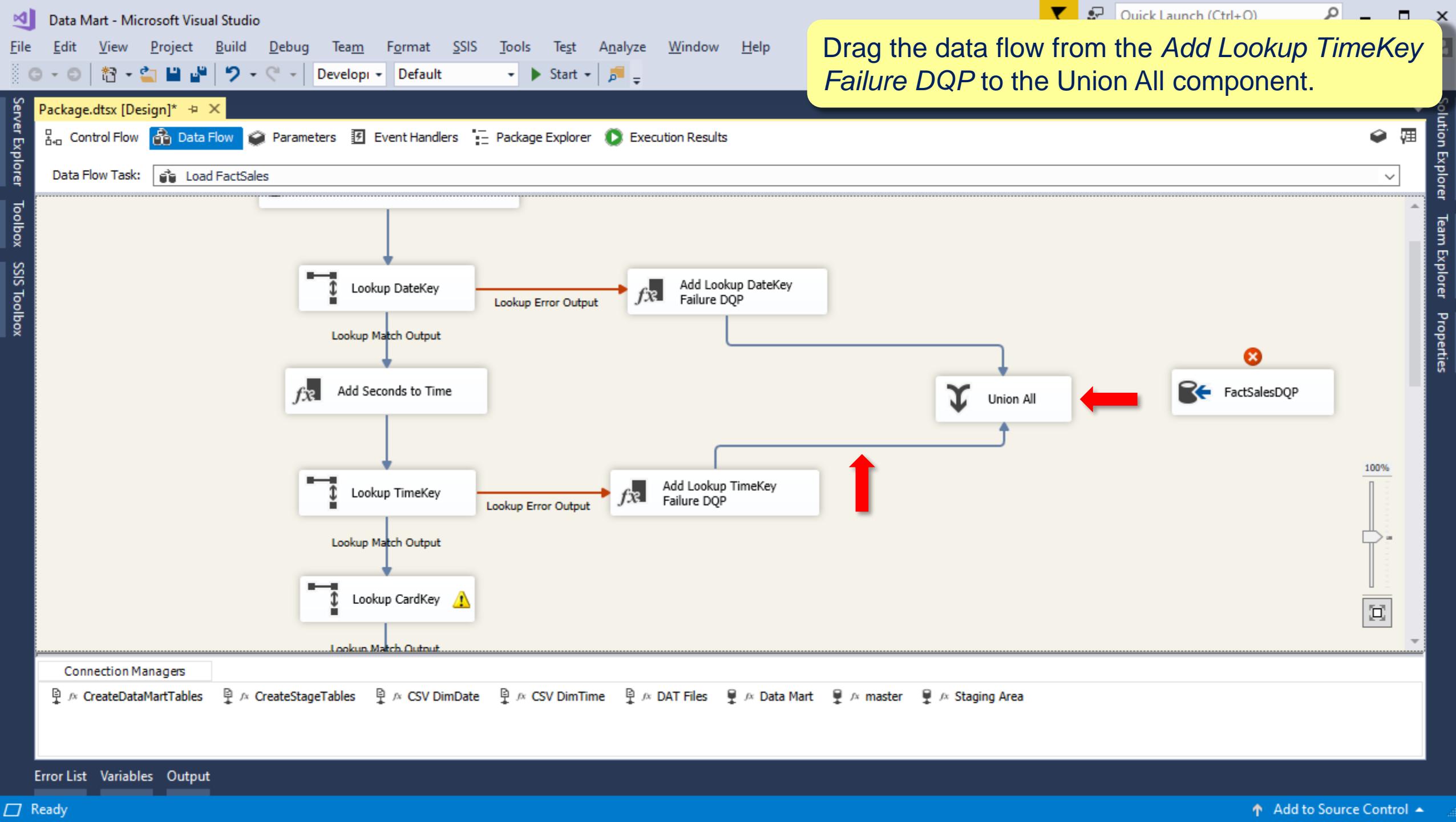
Try to connect the data flow from the *Derived Column* component to the *FactSalesDQP OLE DB Destination*. Given that an *OLE DB Destination* accepts just a single input data flow, an error message appears.

A screenshot of the Microsoft Visual Studio interface, specifically the SSIS Data Flow Task designer. The main area shows a data flow with four main components: a 'Lookup DateKey' component, an 'Add Seconds to Time' component, a 'Lookup TimeKey' component, and a 'Lookup CardKey' component. Arrows indicate data flow from 'Lookup DateKey' to 'Add Seconds to Time', 'Add Seconds to Time' to 'Lookup TimeKey', and 'Lookup TimeKey' to 'Lookup CardKey'. Each lookup component has an associated 'Failure DQP' component (e.g., 'Add Lookup DateKey Failure DQP', 'Add Lookup TimeKey Failure DQP') connected to it via an 'Error Output' arrow. The 'FactSalesDQP' component is the final destination, receiving data from the 'Add Lookup DateKey Failure DQP' component. A yellow callout box with black text provides instructions: 'Try to connect the data flow from the Derived Column component to the FactSalesDQP OLE DB Destination. Given that an OLE DB Destination accepts just a single input data flow, an error message appears.' A red arrow points from this callout to a tooltip window titled 'Operation Failure'. The tooltip contains the text: 'All the available inputs on the target component are connected to outputs. Edit this component to define new inputs before proceeding.' A red arrow also points from the 'OK' button of the tooltip to the 'OK' button at the bottom of the tooltip window. The bottom of the screen shows the 'Connection Managers' tab with several entries like 'CreateDataMartTables', 'CreateStageTables', 'CSV DimDate', etc., and the 'Error List', 'Variables', and 'Output' tabs at the bottom.









Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Union All Transformation Editor

Configure the properties used to merge multiple inputs into one output by creating mappings between columns.

Output Column Name	Union All Input 1	Union All Input 2
Store	Store	Store
Date	Date	Date
Time	Time	Time
TransactionID	TransactionID	TransactionID
CardID	CardID	CardID
PaymentMethod	PaymentMethod	PaymentMethod
ItemCode	ItemCode	ItemCode
Amount	Amount	Amount
Quant	Quant	Quant
TotalAmount	TotalAmount	TotalAmount
ErrorCode	ErrorCode	ErrorCode
ErrorColumn	ErrorColumn	ErrorColumn
DQP	DQP	DQP

OK Cancel Help

Edit the *Union All* to check that all input flows are mapped to the output flow attributes.

Solution Explorer Team Explorer Properties

Server Explorer

Toolbox

SSIS Toolbox

Connection Managers

CreateDataMartTables CreateSt

Error List Variables Output

Add to Source Control

```
graph TD; Callout[Edit the Union All to check that all input flows are mapped to the output flow attributes.] --> TableHeader[Union All Transformation Editor]; TableHeader --> OKButton[OK]
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

100%

Union All

Add Seconds to Time

Lookup DateKey

Lookup Error Output

Lookup Match Output

FactSalesDQP

Lookup TimeKey

Lookup Error Output

Lookup Match Output

Lookup CardKey

Lookup Match Output

Add Lookup DateKey Failure DQP

Add Lookup TimeKey Failure DQP

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the data flow from the Union All to the FactSalesDQP.

```
graph TD; Start([Start]) --> L1[Lookup DateKey]; L1 --> AS[Add Seconds to Time]; AS --> LT[Lookup TimeKey]; LT --> LC[Lookup CardKey]; LC --> UA[Union All]; UA <--> FS[FactSalesDQP]; L1 --> DLDFDQ[Add Lookup DateKey Failure DQP]; LT --> ALTDQ[Add Lookup TimeKey Failure DQP]; LC --> ALCDQ[Add Lookup CardKey Failure DQP];
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

100%

Using the approach presented, add the components to handle the errors that can occur in the remaining Lookup components.

```
graph TD; L1[Lookup TimeKey] -- "Lookup Match Output" --> L2[Lookup CardKey]; L1 -- "Lookup Error Output" --> A1[Add Lookup TimeKey Failure DQP]; L2 -- "Lookup Match Output" --> L3[Lookup ItemKey]; L2 -- "Lookup Error Output" --> A2[Add Lookup CardKey Failure DQP]; L3 -- "Lookup Match Output" --> L4[Lookup StoreKey]; L3 -- "Lookup Error Output" --> A3[Add Lookup ItemKey Failure DQP]; L4 -- "Lookup Match Output" --> L5[Lookup PaymentMethodKey]; L4 -- "Lookup Error Output" --> A4[Add Lookup StoreKey Failure DQP]; L5 -- "Lookup Match Output" --> A5[Add Lookup PaymentMethodKey Failure DQP]; A1 --> U[Union All]; A2 --> U; A3 --> U; A4 --> U; A5 --> U; U --> FS[FactSalesDQP]
```

Connection Managers

- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Ready Add to Source Control

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Union All Transformation Editor

Configure the properties used to merge multiple inputs into one output by creating mappings between columns.

Edit the *Union All* to check that all input flows are mapped to the output flow attributes.

Output Column Name	Union All Input 1	Union All Input 2	Union All Input 3	Union All Input 4	Union All Input
Store	Store	Store	Store	Store	Store
Date	Date	Date	Date	Date	Date
Time	Time	Time	Time	Time	Time
TransactionID	TransactionID	TransactionID	TransactionID	TransactionID	TransactionID
CardID	CardID	CardID	CardID	CardID	CardID
PaymentMethod	PaymentMethod	PaymentMethod	PaymentMethod	PaymentMethod	PaymentMethod
ItemCode	ItemCode	ItemCode	ItemCode	ItemCode	ItemCode
Amount	Amount	Amount	Amount	Amount	Amount
Quant	Quant	Quant	Quant	Quant	Quant
TotalAmount	TotalAmount	TotalAmount	TotalAmount	TotalAmount	TotalAmount
ErrorCode	ErrorCode	ErrorCode	ErrorCode	ErrorCode	ErrorCode
ErrorColumn	ErrorColumn	ErrorColumn	ErrorColumn	ErrorColumn	ErrorColumn
DQP	DQP	DQP	DQP	DQP	DQP

OK Cancel Help

Error List Variables Output

Ready Add to Source Control

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Windows

Package.dtsx [Design]\* Default Start

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox

Transaction & Transaction\_Item

Lookup

Add Second

Lookup

Properties

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

We can add another data quality validation to the *Amount* attribute before loading the data into the *FactSales*. For that, delete the data flow from the *OLE DB Source* component and the *Lookup DateKey* component.

```
graph TD; Transaction[Transaction & Transaction_Item] --> Lookup1[Lookup]; Transaction --> AddSecond[Add Second]; AddSecond --> Lookup2[Lookup];
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Drag the OLE DB Source upwards.

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Transaction & Transaction\_Item

Lookup DateKey

Lookup Error Output

Add Lookup DateKey Failure DQP

Lookup Match Output

Add Seconds to Time

Lookup TimeKey

Lookup\_Error\_Output

Add Lookup TimeKey Failure DQP

100%

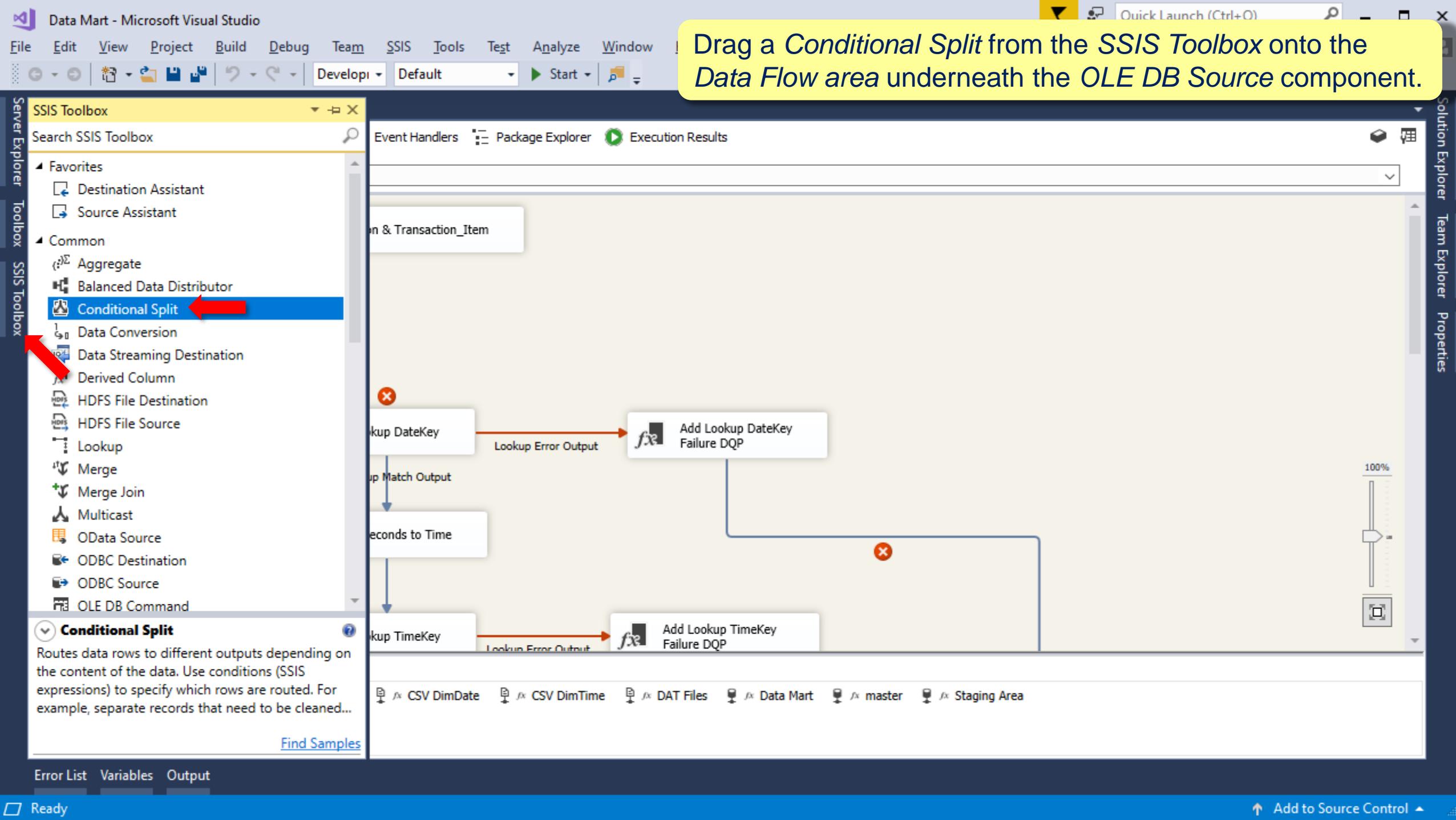
Connection Managers

- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Ready Add to Source Control

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named 'Package.dtsx'. The main area displays a 'Data Flow Task' titled 'Load FactSales'. The data flow consists of two parallel paths. The top path starts with a 'Lookup DateKey' component, which has a red 'X' icon indicating it is disabled or failed. An orange arrow labeled 'Lookup Error Output' points from this component to a 'fx' icon representing a failure destination named 'Add Lookup DateKey Failure DQP'. The bottom path starts with an 'fx' icon representing a source component, followed by a 'Add Seconds to Time' component, and then a 'Lookup TimeKey' component. An orange arrow labeled 'Lookup\_Error\_Output' points from the 'Lookup TimeKey' component to another 'fx' icon representing a failure destination named 'Add Lookup TimeKey Failure DQP'. A large yellow callout box in the top right corner contains the text 'Drag the OLE DB Source upwards.' A vertical scroll bar on the right side of the main workspace indicates that the workspace can be scrolled. The bottom navigation bar includes tabs for 'Error List', 'Variables', and 'Output', along with status indicators for 'Ready' and 'Add to Source Control'.



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Solution Explorer Team Explorer Properties

Transaction & Transaction\_Item

Valid Amount?

Lookup DateKey

Add Seconds to Time

Lookup TimeKey

Add Lookup DateKey Failure DQP

Add Lookup TimeKey Failure DQP

100%

Connection Managers

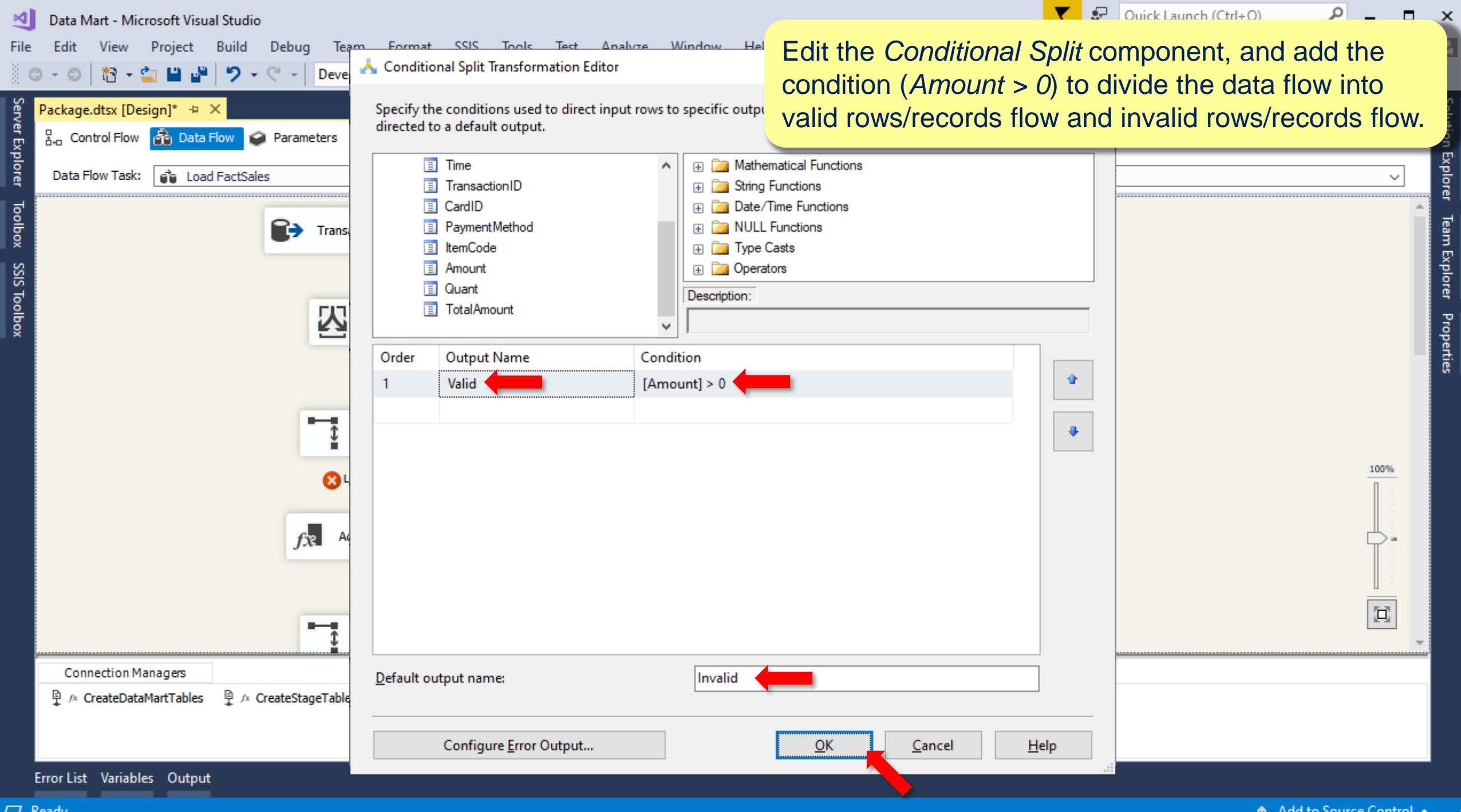
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the OLE DB Source component to the Conditional Split and rename it Valid Amount?

```
graph TD; A[Transaction & Transaction_Item] --> B{Valid Amount?}; B --> C[Lookup DateKey]; B --> D[Lookup TimeKey]; C --> E[Add Seconds to Time]; C --> F[Add Lookup DateKey Failure DQP]; D --> G[Add Seconds to Time]; D --> H[Add Lookup TimeKey Failure DQP];
```



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Solution Explorer Team Explorer Properties

Transaction & Transaction\_Item

Valid Amount?

Lookup DateKey

Lookup Match Output

Add Seconds to Time

Lookup TimeKey

Lookup Error Output

Add Lookup TimeKey Failure DQP

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:

Valid

Input:

Lookup Input

OK Cancel

Connection Managers

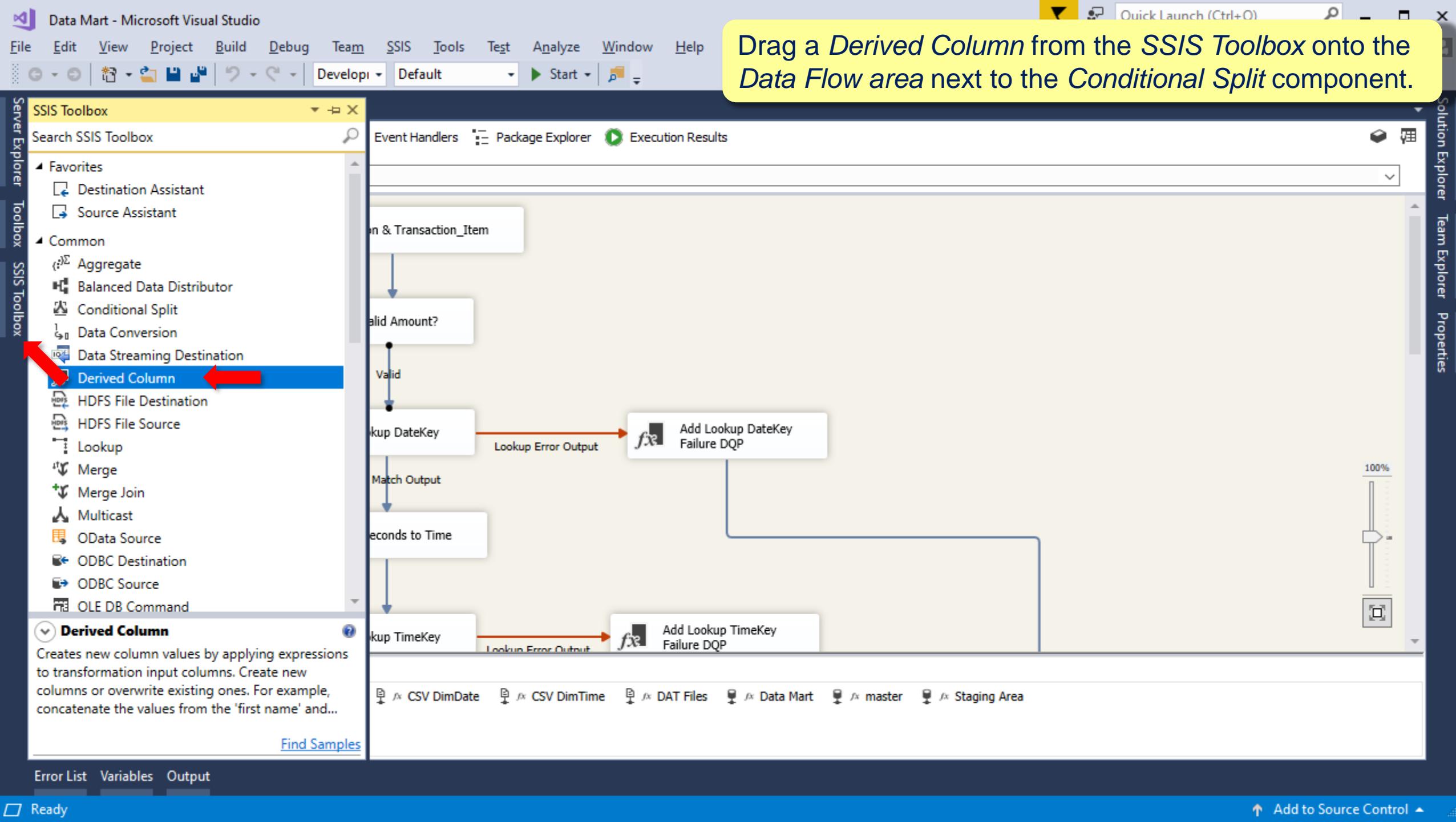
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Ready Add to Source Control

Connect the *Conditional Split* component to the *Lookup* component and select the *Valid* data flow.

```
graph TD; A[Valid Amount?] --> B[Lookup DateKey]; B --> C[Add Seconds to Time]; C --> D[Lookup TimeKey]; E[Conditional Split] --> F[Lookup]; F --> G[Add]; G --> H[Failure];
```



Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Rename the Derived Column to Add Invalid Amount DQP.

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Transaction & Transaction\_Item → Valid Amount? (Icon: Exclamation mark) → Valid → Lookup DateKey (Icon: Double-headed arrow) → Add Invalid Amount DQP (Icon: Exclamation mark)

Valid Amount? (Icon: Exclamation mark) → Invalid (Icon: Red circle)

Lookup DateKey (Icon: Double-headed arrow) → Add Lookup DateKey Failure DQP (Icon: Exclamation mark)

Lookup DateKey (Icon: Double-headed arrow) → Add Seconds to Time (Icon: Exclamation mark)

Add Seconds to Time (Icon: Exclamation mark) → Lookup TimeKey (Icon: Double-headed arrow)

Lookup TimeKey (Icon: Double-headed arrow) → Add Lookup TimeKey Failure DQP (Icon: Exclamation mark)

Red arrow points from the "Add Invalid Amount DQP" task to the "Invalid" output of the "Valid Amount?" component.

100%

Connection Managers

- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Ready Add to Source Control

```
graph TD; Transaction[Transaction & Transaction_Item] --> Valid{Valid Amount?}; Valid -- Valid --> LookupDate[Lookup DateKey]; Valid -- Invalid --> InvalidDQP[Add Invalid Amount DQP]; LookupDate --> AddSeconds[Add Seconds to Time]; LookupDate --> AddDateFailureDQP[Add Lookup DateKey Failure DQP]; AddSeconds --> LookupTime[Lookup TimeKey]; AddSeconds --> AddTimeFailureDQP[Add Lookup TimeKey Failure DQP]; LookupTime --> AddTimeFailureDQP;
```

Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Data Flow Task: Load FactSales

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Properties

Transaction & Transaction\_Item

Valid Amount?

Add Invalid Amount DQP

Lookup DateKey

Add Lookup DateKey Failure DQP

Add Seconds to Time

Lookup TimeKey

Add Lookup TimeKey Failure DQP

100%

Connection Managers

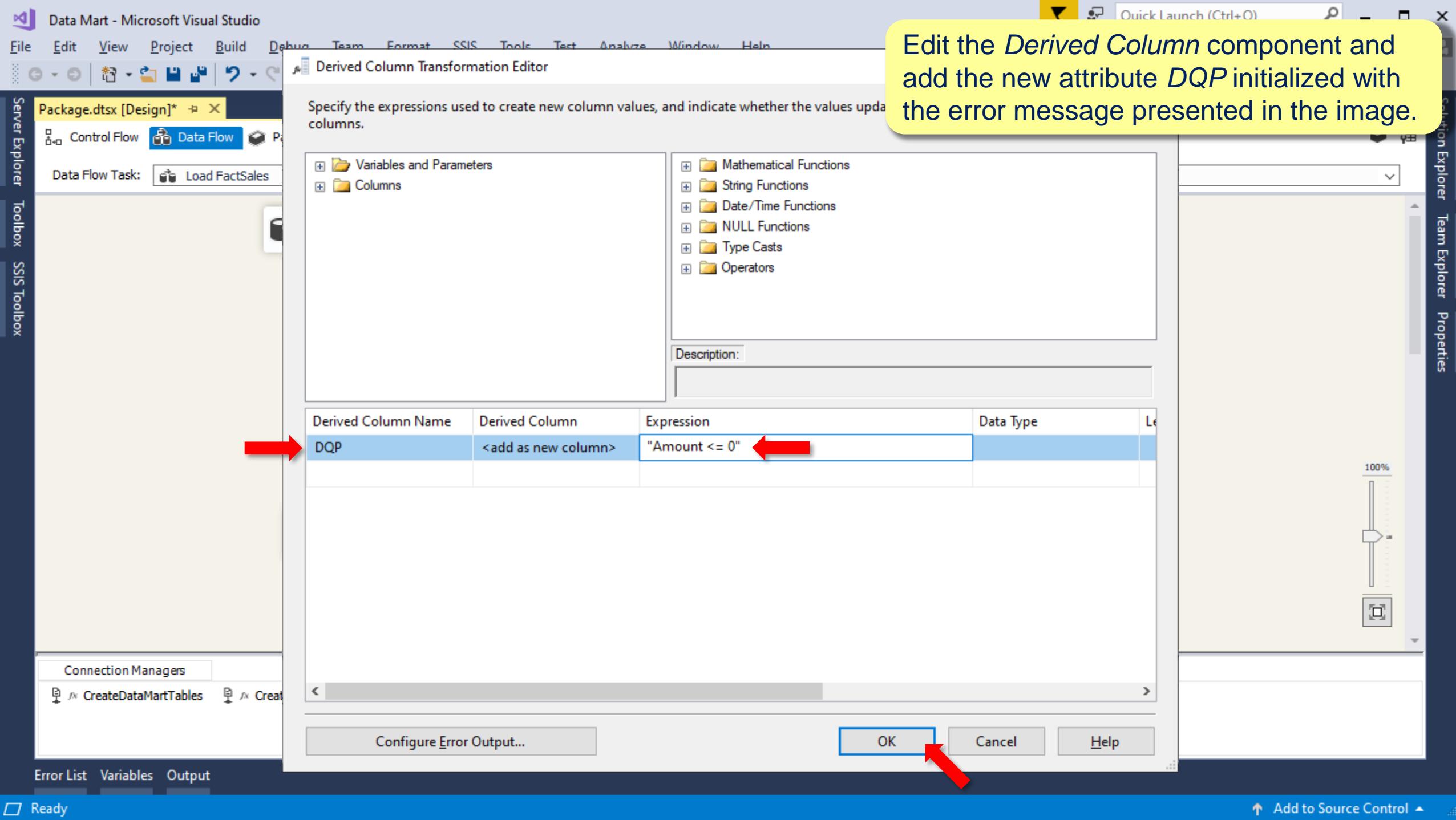
CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

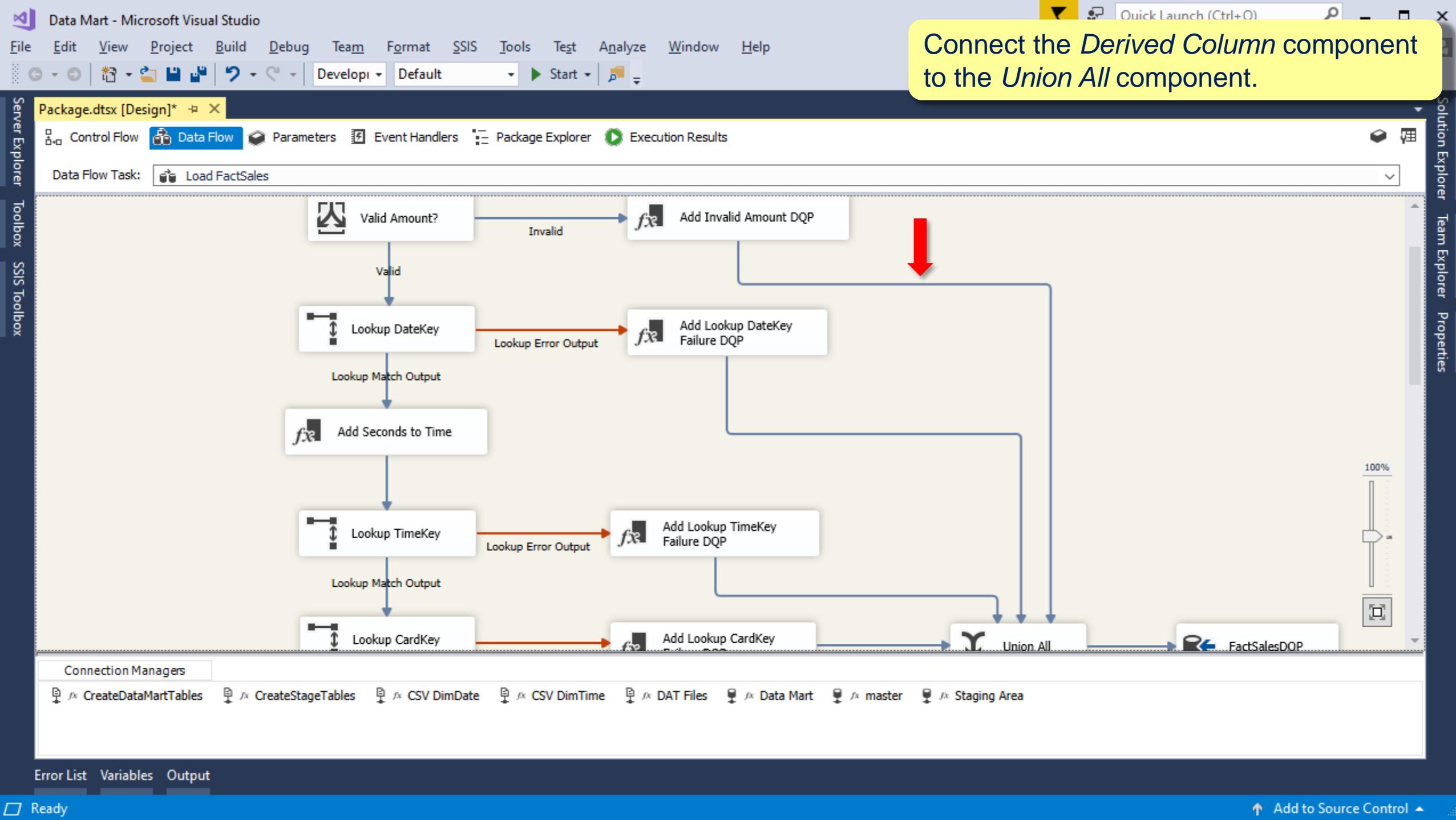
Error List Variables Output

Ready Add to Source Control

Drag the data flow from the *Conditional Split* component to *Derived Column* component (i.e., now the *Invalid* data flow).

```
graph TD; TS[Transaction & Transaction_Item] --> VA[Valid Amount?]; VA -- Invalid --> AIADQ[Add Invalid Amount DQP]; VA -- Valid --> LDK[Lookup DateKey]; LDK --> AST[Add Seconds to Time]; AST --> LTK[Lookup TimeKey]; AIADQ --> ALDFDQ[Add Lookup DateKey Failure DQP]; LTK --> ALTFDQ[Add Lookup TimeKey Failure DQP]; ALDFDQ -- Error --> ALTFDQ
```





Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test

Quick Launch (Ctrl+O)

Server Explorer

Toolbox

SSIS Toolbox

Package.dtsx [Design]\*

Control Flow Data Flow Parameters

Data Flow Task: Load FactSales

Union All Transformation Editor

Configure the properties used to merge multiple inputs.

Union All Input 5 Union All Input 6 Union All Input 7

Union All Input 5	Union All Input 6	Union All Input 7
Store	Store	Store
Date	Date	Date
Time	Time	Time
TransactionID	TransactionID	TransactionID
CardID	CardID	CardID
PaymentMethod	PaymentMethod	PaymentMethod
ItemCode	ItemCode	ItemCode
Amount	Amount	Amount
Quant	Quant	Quant
TotalAmount	TotalAmount	TotalAmount
ErrorCode	ErrorCode	<ignore>
ErrorColumn	ErrorColumn	<ignore>
DQP	DQP	DQP

OK Cancel Help

FactSalesDOP

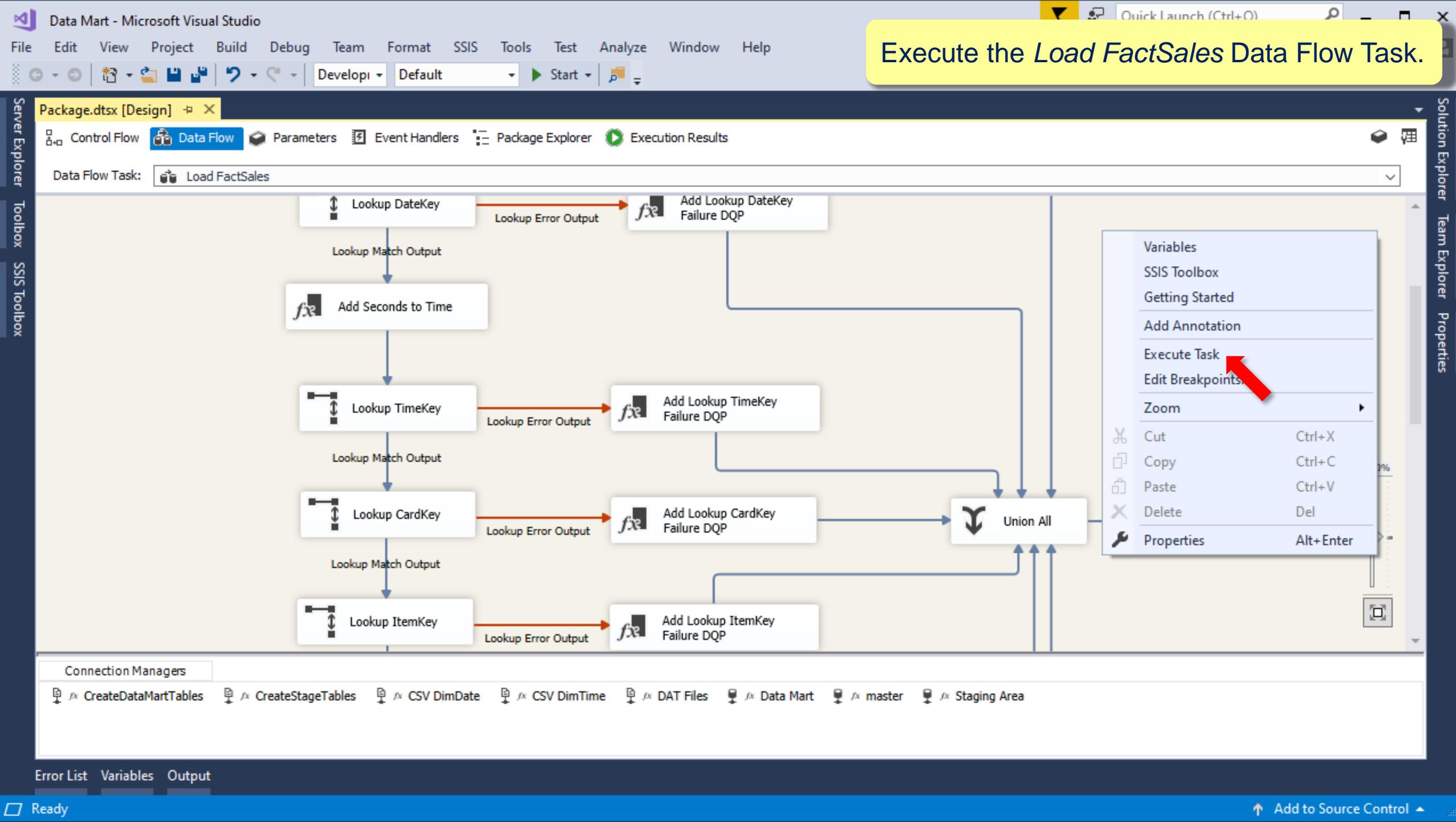
Connection Managers

CreateDataMartTables CreateSt

Error List Variables Output

Ready Add to Source Control

Edit the *Union All* to check that all input flows are mapped to the output flow attributes. The *ErrorCode* and *ErrorColumn* attributes are specific of the *Lookup* components so they are meaningless in the *Conditional Split* component (*Union All Input 7*).



Data Mart (Running) - Microsoft Visual Studio

File Edit View Project Build Debug Team Format Tools Test Analyze Windows

Quick Launch (Ctrl+O)

Process: [8100] DtsDebugHost.exe Lifecycle Events Thread:

Package.dtsx [Design] x

Control Flow Data Flow Parameters Event Handlers Package Explorer Progress

Data Flow Task: Load FactSales

Lookup DateKey  
Add Seconds to Time  
Lookup TimeKey  
Lookup CardKey  
Union All  
FactSalesDQP

11 rows/records fail the Lookup of the *CardKey*. These rows correspond to *Card* records which were not loaded into the *DimCard* dimension due to data quality problems in the *NumChildren* attribute (i.e., a value of 255).

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Add to Source Control

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named 'Package.dtsx'. The main window displays the 'Data Flow' tab, specifically the 'Load FactSales' task. The data flow consists of four sequential lookup operations:

- Lookup DateKey:** Returns 'Lookup Match Output (394 367 rows)'.
- Add Seconds to Time:** A transformation step that follows the DateKey lookup.
- Lookup TimeKey:** Returns 'Lookup Match Output (394 367 rows)'.
- Lookup CardKey:** Returns 'Lookup Match Output (394 356 rows)'.

Each lookup operation has an associated 'Failure DQP' output, which is connected to a final 'Union All' aggregate component. The 'Union All' component then feeds into a destination component labeled 'FactSalesDQP'. A red arrow points to the 'Union All' component, highlighting the 11 rows that failed the CardKey lookup. The status bar at the bottom indicates that the package execution completed successfully.

CreateStageTableFactSalesDQP.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (57)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
  - ARMDD\_StagingArea
    - Database Diagrams
    - Tables
      - System Tables
      - FileTables
      - External Tables
      - Graph Tables
      - dbo.Brand
      - dbo.Card
      - dbo.CardDQP
      - dbo.Category
      - dbo.FactSalesDQP
      - dbo.Item
      - dbo.MaritalStatus
      - dbo.PaymentMet
      - dbo.StoreName\_L
      - dbo.SubCategory
      - dbo.Transaction
      - dbo.Transaction\_I
      - dbo.TransactionD
      - Dropped Ledger T
    - Views
    - Extended P

Quick Launch (Ctrl+O)

In SSMS select the top 1000 rows from the *FactSalesDQP* staging table.

IF NOT EXISTS(SELECT name FROM sys.tables WHERE name = 'FactSalesDQP')  
CREATE TABLE [dbo].[FactSalesDQP]  
(  
    [Store] [char](5),  
    [Date] [datetime],  
    [Time] [int],  
    [TransactionID] [char](9),  
    [CardID] [char](11),  
    [PaymentMethod] [char](2),  
    [ItemCode] [char](11),  
    [Amount] [money],  
    DQP nvarchar(100)  
)  
ELSE  
    TRUNCATE TABLE FactSalesDQP

100 %

Messages

Commands completed successfully.

Completion time: 2023-11-13T10:44:17.2443387+00:00

dbo.FactSalesDQP

- New Table...
- Design
- Select Top 1000 Rows
- Edit Top 200 Rows
- Script Table as
- View Dependencies
- Memory Optimization Advisor
- Encrypt Columns...
- Full-Text index

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 0 rows

SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_StagingArea CreateStageTable

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure) Databases AdventureWorksDW2022 ARMDD\_DataMart ARMDD\_StagingArea Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.Brand dbo.Card dbo.CardDQP dbo.Category dbo.FactSalesDQP dbo.Item dbo.MaritalStatusDescriptor dbo.PaymentMethodDescriptor dbo.StoreName\_Lookup dbo.SubCategory dbo.Transaction dbo.Transaction\_Item dbo.TransactionDQP Dropped Ledger Tables Views

SQLQuery3.sql - loc...\\PauloOliveira (61)

```
SELECT TOP (1000) [Store]
      ,[Date]
      ,[Time]
      ,[TransactionID]
      ,[CardID]
      ,[PaymentMethod]
      ,[ItemCode]
      ,[Amount]
      ,[DQP]
  FROM [ARMDD_StagingArea].[dbo].[FactSalesDQP]
```

100 %

Results Messages

	Store	Date	Time	TransactionID	CardID	PaymentMethod	ItemCode	Amount	DQP
1	S0006	2001-07-21 00:00:00.000	1555	T10000272	C0103994145	DC	I0000000705	299,00	CardKey lookup failed on DimCard table
2	S0006	2001-07-26 00:00:00.000	1031	T10000047	C0103994145	DC	I0000000204	299,00	CardKey lookup failed on DimCard table
3	S0015	2001-11-20 00:00:00.000	1109	T10000105	C0103994145	DC	I0000000557	109,00	CardKey lookup failed on DimCard table
4	S0040	2001-03-17 00:00:00.000	1529	T10000368	C0102982878	CA	I0000000492	59,00	CardKey lookup failed on DimCard table
5	S0040	2001-10-26 00:00:00.000	1726	T10000363	C0102982878	CH	I0000000557	109,00	CardKey lookup failed on DimCard table
6	S0006	2001-06-26 00:00:00.000	1626	T10000430	C0103994145	DC	I0000000479	499,00	CardKey lookup failed on DimCard table
7	S0006	2001-06-01 00:00:00.000	1654	T10000375	C0102722488	CC	I0000000054	1,49	CardKey lookup failed on DimCard table
8	S0040	2001-04-09 00:00:00.000	920	T10000010	C0102982878	CA	I0000000026	69,99	CardKey lookup failed on DimCard table
9	S0006	2001-08-22 00:00:00.000	1748	T10000393	C0102722488	CA	I0000000117	34,99	CardKey lookup failed on DimCard table
10	S0006	2001-07-14 00:00:00.000	1407	T10000186	C0103994145	DC	I0000000114	24,99	CardKey lookup failed on DimCard table
11	S0006	2001-11-16 00:00:00.000	1632	T10000300	C0102722488	CA	I0000000488	69,00	CardKey lookup failed on DimCard table

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

Ln 1 Col 1 Ch 1 INS

The execution of the query presents the 11 rows/records not loaded into the *FactSales* table, as result of a *Lookup* failure in the *DimCard* table.

SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query NDX DMX XMLA DAX Execute

Object Explorer Connect

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys Reports Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery3.sql - loc...\\PauloOliveira (61)

```
SELECT TOP (1000) [Store]
      ,[Date]
      ,[Time]
      ,[TransactionID]
      ,[CardID]
      ,[PaymentMethod]
      ,[ItemCode]
      ,[Amount]
      ,[DQP]
  FROM [ARMDD_StagingArea].[dbo].[FactSalesDQP]
```

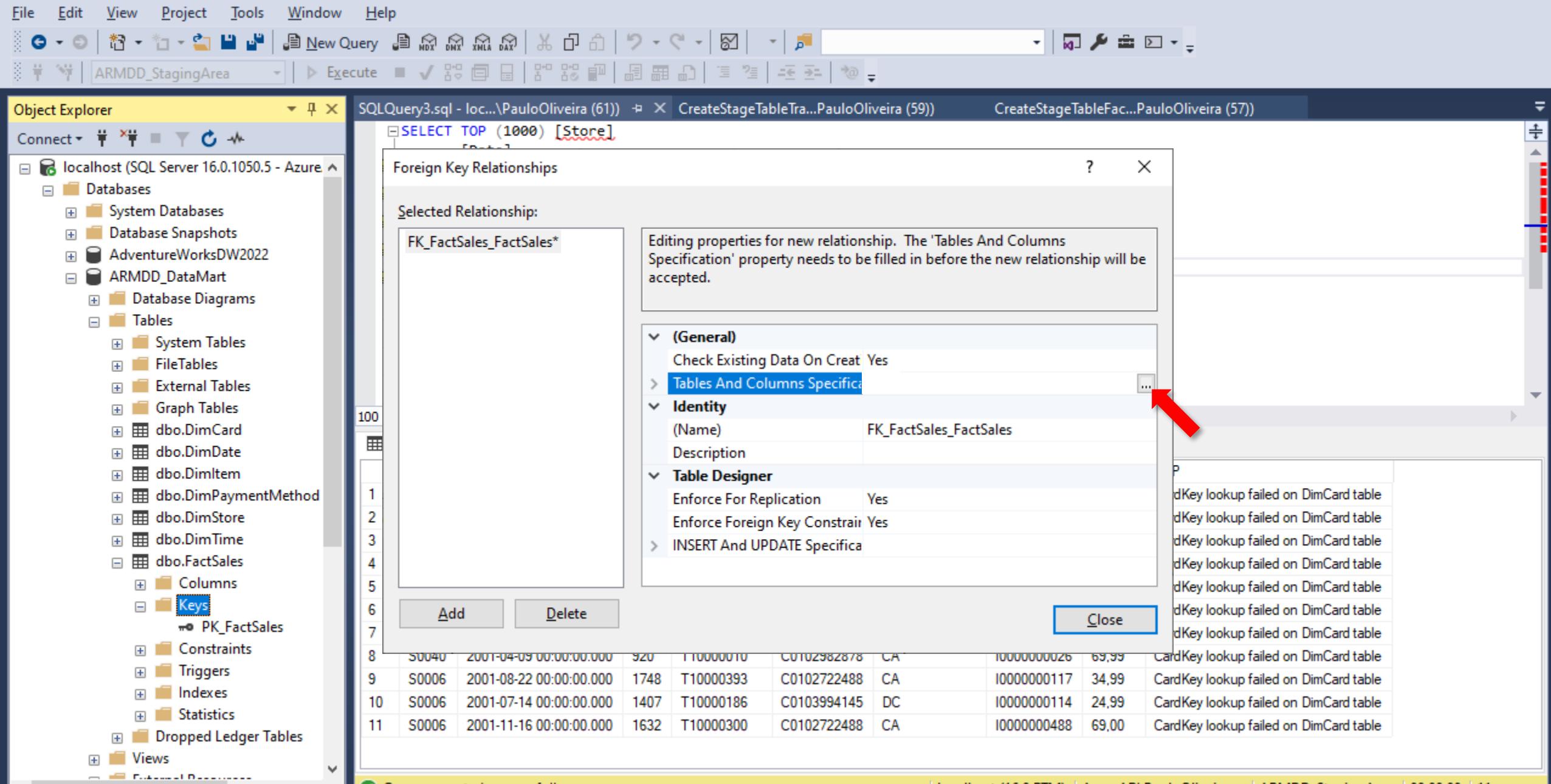
Results Messages

	Store	Date	Time	TransactionID	CardID	PaymentMethod	ItemCode	Amount	DQP
1	S0006	2001-07-21 00:00:00.000	1555	T10000272	C0103994145	DC	I0000000705	299,00	CardKey lookup failed on DimCard table
2	S0006	2001-07-26 00:00:00.000	1031	T10000047	C0103994145	DC	I0000000204	299,00	CardKey lookup failed on DimCard table
3	S0015	2001-11-20 00:00:00.000	1109	T10000105	C0103994145	DC	I0000000557	109,00	CardKey lookup failed on DimCard table
4	S0040	2001-03-17 00:00:00.000	1529	T10000368	C0102982878	CA	I0000000492	59,00	CardKey lookup failed on DimCard table
5	S0040	2001-10-26 00:00:00.000	1726	T10000363	C0102982878	CH	I0000000557	109,00	CardKey lookup failed on DimCard table
6	S0006	2001-06-26 00:00:00.000	1626	T10000430	C0103994145	DC	I0000000479	499,00	CardKey lookup failed on DimCard table
7	S0006	2001-06-01 00:00:00.000	1654	T10000375	C0102722488	CC	I0000000054	1,49	CardKey lookup failed on DimCard table
8	S0040	2001-04-09 00:00:00.000	920	T10000010	C0102982878	CA	I0000000026	69,99	CardKey lookup failed on DimCard table
9	S0006	2001-08-22 00:00:00.000	1748	T10000393	C0102722488	CA	I0000000117	34,99	CardKey lookup failed on DimCard table
10	S0006	2001-07-14 00:00:00.000	1407	T10000186	C0103994145	DC	I0000000114	24,99	CardKey lookup failed on DimCard table
11	S0006	2001-11-16 00:00:00.000	1632	T10000300	C0102722488	CA	I0000000488	69,00	CardKey lookup failed on DimCard table

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

Creating the primary key – foreign key constraints among the dimensions and the fact table is important to assure the integrity of the dimensional model.  
In SSMS, right-click the *Keys* folder of the FactSales table to create a *New Foreign Key*.



SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

Object Explorer Connect

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery3.sql - loc...\\PauloOliveira (61) CreateStageTable

SELECT TOP (1000) [Store]

Foreign K Tables and Columns Relationship name: FK\_FactSales\_DimDate Primary key table: DimDate Foreign key table: FactSales DateKey DateKey

OK Cancel

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

Select *DimDate* as the primary key table and *DateKey* as its primary key attribute. In the foreign key table (*FactSales*) select the corresponding foreign key attribute (also *DateKey*) and delete all the others.

Add another primary key – foreign key constraint.

Object Explorer

Connect ▾

localhost (SQL Server 16.0.1050.5 - Azure)

Databases

- System Databases
- Database Snapshots
- AdventureWorksDW2022
- ARMDD\_DataMart

Tables

- System Tables
- FileTables
- External Tables
- Graph Tables
- dbo.DimCard
- dbo.DimDate
- dbo.DimItem
- dbo.DimPaymentMethod
- dbo.DimStore
- dbo.DimTime
- dbo.FactSales

  - Columns
  - Keys
    - PK\_FactSales
  - Constraints
  - Triggers
  - Indexes
  - Statistics

- Dropped Ledger Tables
- Views

SQLQuery3.sql - loc...\\PauloOliveira (61) | CreateStageTableTra...PauloOliveira (59) | CreateStageTableFac...PauloOliveira (57)

Foreign Key Relationships

Selected Relationship: FK\_FactSales\_DimDate\*

Editing properties for new relationship. The 'Tables And Columns Specification' property needs to be filled in before the new relationship will be accepted.

(General)

- Check Existing Data On Create Yes
- Tables And Columns Specification

Identity

- (Name) FK\_FactSales\_DimDate
- Description

Table Designer

- Enforce For Replication Yes
- Enforce Foreign Key Constraint Yes

INSERT And UPDATE Specification

Add Delete Close

100

1 2 3 4 5 6 7 8 9 10 11

	S0040	2001-04-01 00:00:00.000	920	T10000010	C0102982878	CA	I0000000026	69,99	CardKey lookup failed on DimCard table
8	S0006	2001-08-22 00:00:00.000	1748	T10000393	C0102722488	CA	I00000000117	34,99	CardKey lookup failed on DimCard table
9	S0006	2001-07-14 00:00:00.000	1407	T10000186	C0103994145	DC	I00000000114	24,99	CardKey lookup failed on DimCard table
10	S0006	2001-11-16 00:00:00.000	1632	T10000300	C0102722488	CA	I00000000488	69,00	CardKey lookup failed on DimCard table
11									

Query executed successfully. | localhost (16.0 RTM) | AzureAD\\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_StagingArea CreateStageTableTra...PauloOliveira (59) CreateStageTableFac...PauloOliveira (57)

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SELECT TOP (1000) [Store]

Foreign Key Relationships

Selected Relationship: FK\_FactSales\_DimDate\* FK\_FactSales\_FactSales\*

Editing properties for new relationship. The 'Tables And Columns Specification' property needs to be filled in before the new relationship will be accepted.

(General) Check Existing Data On Create Yes  
Tables And Columns Specification...  
Identity (Name) FK\_FactSales\_FactSales Description  
Table Designer Enforce For Replication Yes  
Enforce Foreign Key Constraint Yes  
INSERT And UPDATE Specification

Add Delete Close

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

Quick Launch (Ctrl+Q)

Ready

SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

Object Explorer Connect

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery3.sql - loc...\\PauloOliveira (61) CreateStageTable

SELECT TOP (1000) [Store]

Foreign K Tables and Columns Relationship name: FK\_FactSales\_DimTime Primary key table: DimTime Foreign key table: FactSales TimeKey TimeKey OK Cancel

Select *DimTime* as the primary key table and *TimeKey* as its primary key attribute. In the foreign key table (*FactSales*) select the corresponding foreign key attribute (also *TimeKey*) and delete all the others.

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

SQLQuery3.sql - localhost.ARMDD\_StagingArea (AzureAD\PauloOliveira (61)) - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_StagingArea

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery3.sql - loc...\\PauloOliveira (61) CreateStageTableTra...PauloOliveira (59) CreateStageTableFac...PauloOliveira (57)

SELECT TOP (1000) [Store]

Foreign Key Relationships

Selected Relationship:

- FK\_FactSales\_DimCard
- FK\_FactSales\_DimDate
- FK\_FactSales\_DimItem
- FK\_FactSales\_DimPaymentMethod
- FK\_FactSales\_DimStore
- FK\_FactSales\_DimTime

Editing properties for new relationship. The 'Tables And Columns Specification' property needs to be filled in before the new relationship will be accepted.

(General)  
Check Existing Data On Create Yes  
Tables And Columns Specification

Identity  
(Name) FK\_FactSales\_DimPaymentMethod  
Description

Table Designer  
Enforce For Replication Yes  
Enforce Foreign Key Constraint Yes  
INSERT And UPDATE Specification

Add Delete Close

Query executed successfully.

localhost (16.0 RTM) | AzureAD\\PauloOliveira ... | ARMDD\_StagingArea | 00:00:00 | 11 rows

Using the same steps, create the remaining primary key – foreign key constraints.

CardKey	CardNumber	CardType	CardHolderName	ExpiryDate	CardBalance	LastUpdate	CardStatus
S0040	2001-04-09 00:00:00.000	920	T10000010	C0102982878	CA	10000000026	69,99
S0006	2001-08-22 00:00:00.000	1748	T10000393	C0102722488	CA	10000000117	34,99
S0006	2001-07-14 00:00:00.000	1407	T10000186	C0103994145	DC	10000000114	24,99
S0006	2001-11-16 00:00:00.000	1632	T10000300	C0102722488	CA	10000000488	69,00

DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales\* - Microsoft SQL Server Management Studio

File Edit View Project Table Designer Tools Window Help

Quick Launch (Ctrl+O)

Save the changes to the *FactSales* table.

ARMDD\_StagingArea Save FactSales (Ctrl+S)

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure) Databases System Databases Database Snapshots AdventureWorksDW2022 ARMDD\_DataMart Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

Column Name Data Type Allow Nulls

Column Name	Data Type	Allow Nulls
DateKey	int	<input type="checkbox"/>
TimeKey	int	<input type="checkbox"/>
CardKey	int	<input type="checkbox"/>
ItemKey	int	<input type="checkbox"/>
StoreKey	int	<input type="checkbox"/>
PaymentMethodKey	int	<input type="checkbox"/>
TransactionID	char(9)	<input type="checkbox"/>
Quant	tinyint	<input type="checkbox"/>
Amount	money	<input type="checkbox"/>
TotalAmount	money	<input type="checkbox"/>

Column Properties

(General)

Name	DateKey
Allow Nulls	No
Data Type	int
Default Value or Binding	

Table Designer

(General)

Item(s) Saved

The screenshot displays the Microsoft SQL Server Management Studio interface. The title bar shows the connection details: DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales\* - Microsoft SQL Server Management Studio. The menu bar includes File, Edit, View, Project, Table Designer, Tools, Window, and Help. The toolbar features various icons for database management tasks. The Object Explorer on the left lists the database structure, including databases like localhost (SQL Server 16.0.1050.5 - Azure), tables such as DimCard, DimDate, DimItem, DimPaymentMethod, DimStore, DimTime, and FactSales, and other objects like keys, constraints, and triggers. The main workspace shows the Table Designer for the FactSales table. The 'Columns' tab is selected, displaying a grid of columns with their names, data types (e.g., int, char(9), tinyint, money), and nullability. The 'DateKey' column is currently selected. Below the grid, the 'Column Properties' pane provides detailed settings for the selected column, specifically for the General properties. A red arrow points to the 'Save' icon in the toolbar, and a yellow callout box highlights the 'Save FactSales (Ctrl+S)' button. A status bar at the bottom indicates 'Item(s) Saved'. A yellow box in the top right corner contains the text 'Save the changes to the FactSales table.'.

DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales - Microsoft SQL Server Management Studio

File Edit View Project Table Designer Tools Window Help

New Query MDX DMX XMLA DAX Execute

ARMDD\_StagingArea Spatial Indexes...

Object Explorer

localhost (SQL Server 16.0.1050.5 - Azure)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
- ARMDD\_DataMart
  - Database Diagrams
  - Tables
    - System Tables
    - FileTables
    - External Tables
    - Graph Tables
    - dbo.DimCard
    - dbo.DimDate
    - dbo.DimItem
    - dbo.DimPaymentMethod
    - dbo.DimStore
    - dbo.DimTime
  - dbo.FactSales
    - Columns
    - Keys
      - PK\_FactSales
    - Constraints
    - Triggers
    - Indexes
    - Statistics
    - Dropped Ledger Tables
  - Views

Column Name Data Type Allow Nulls

DateKey Save ? X

The following tables will be saved to your database. Do you want to continue?

DimStore DimItem DimCard DimTime DimDate FactSales

Column Prop

Warn about Tables Affected

Yes No Save Text File

Item(s) Saved

DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales - Microsoft SQL Server Management Studio

File Edit View Project Table Designer Tools Window Help

Quick Launch (Ctrl+O)

Refresh the Keys so the PK-FK constraints just created can appear.

Object Explorer

Connect ▾ Refresh (F5)

localhost (SQL Server 16.0.2505.5 - Azure) ▾

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
- ARMDD\_DataMart
  - Database Diagrams
  - Tables
    - System Tables
    - FileTables
    - External Tables
    - Graph Tables
    - dbo.DimCard
    - dbo.DimDate
    - dbo.DimItem
    - dbo.DimPaymentMethod
    - dbo.DimStore
    - dbo.DimTime
  - dbo.FactSales
    - Columns
    - Keys
      - PK\_FactSales
    - Constraints
    - Triggers
    - Indexes
    - Statistics
  - Dropped Ledger Tables
  - Views

DESKTOP-ACEDDKF.A...rt - dbo.FactSales SQLQuery3.sql - loc...\PauloOliveira (61) CreateStageTableTra...PauloOliveira (59)

Column Name	Data Type	Allow Nulls
DateKey	int	<input type="checkbox"/>
TimeKey	int	<input type="checkbox"/>
CardKey	int	<input type="checkbox"/>
ItemKey	int	<input type="checkbox"/>
StoreKey	int	<input type="checkbox"/>
PaymentMethodKey	int	<input type="checkbox"/>
TransactionID	char(9)	<input type="checkbox"/>
Quant	tinyint	<input type="checkbox"/>
Amount	money	<input type="checkbox"/>
TotalAmount	money	<input type="checkbox"/>
		<input type="checkbox"/>

Column Properties

(General)

(Name)	DateKey
Allow Nulls	No
Data Type	int
Default Value or Binding	

Table Designer

(General)

Item(s) Saved

DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales - Microsoft SQL Server Management Studio

File Edit View Project Table Designer Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_StagingArea

Object Explorer

Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaymentMethod FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

DESKTOP-ACEDDKF.ARMDDB\_DataMart - dbo.FactSales

SQLQuery3.sql - loc...\\PauloOliveira (61)

CreateStageTableTra...PauloOliveira (59)

The primary key – foreign key constraints are now visible.

Column Name	Data Type	Allow Nulls
DateKey	int	<input type="checkbox"/>
TimeKey	int	<input type="checkbox"/>
CardKey	int	<input type="checkbox"/>
ItemKey	int	<input type="checkbox"/>
StoreKey	int	<input type="checkbox"/>
PaymentMethodKey	int	<input type="checkbox"/>
TransactionID	char(9)	<input type="checkbox"/>
Quant	tinyint	<input type="checkbox"/>
Amount	money	<input type="checkbox"/>
TotalAmount	money	<input type="checkbox"/>
		<input type="checkbox"/>

Column Properties

(General) DateKey No int

Table Designer

(General)

Item(s) Saved

DESKTOP-ACEDDKF.ARMDDataMart - dbo.FactSales - Microsoft SQL Server Management Studio

File Edit View Project Table Designer Tools Window Help

Quick Launch (Ctrl+O)

Create a script for creating the first primary key – foreign key constraint.

Object Explorer

Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaym FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

DESKTOP-ACEDDKF.A...rt - dbo.FactSales SQLQuery3.sql - loc...\\PauloOliveira (61) CreateStageTableTra...PauloOliveira (59)

Column Name Data Type Allow Nulls

Column Name	Data Type	Allow Nulls
DateKey	int	<input type="checkbox"/>
TimeKey	int	<input type="checkbox"/>
CardKey	int	<input type="checkbox"/>
ItemKey	int	<input type="checkbox"/>
StoreKey	int	<input type="checkbox"/>
PaymentMethodKey	int	<input type="checkbox"/>
TransactionID	char(9)	<input type="checkbox"/>
Quant	tinyint	<input type="checkbox"/>
Amount	money	<input type="checkbox"/>
TotalAmount	money	<input type="checkbox"/>
		<input type="checkbox"/>

Column Properties

New Foreign Key... Script Key as Modify Reports Rename Delete Refresh

CREATE To ALTER To CREATE OR ALTER To DROP To DROP And CREATE To SELECT To INSERT To UPDATE To DELETE To EXECUTE To

New Query Editor Window File ... Clipboard

Ready

```
graph LR; A[FK_FactSales_DimCard] --> B[New Foreign Key...]; B --> C[Script Key as]; C --> D[Modify]; D --> E[Reports]; E --> F[Rename]; F --> G[Delete]; G --> H[Refresh]; H --> I[CREATE To]; I --> J[ALTER To]; J --> K[CREATE OR ALTER To]; K --> L[DROP To]; L --> M[DROP And CREATE To]; M --> N[SELECT To]; N --> O[INSERT To]; O --> P[UPDATE To]; P --> Q[DELETE To]; Q --> R[EXECUTE To]; R --> S[New Query Editor Window]; S --> T[File ...]; T --> U[Clipboard]
```

SQLQuery4.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (66))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

ARMDD\_DataMart Execute

Object Explorer

Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaymentMethod FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery4.sql - loc...\\PauloOliveira (66)\* DESKTOP-ACEDDKF.A...rt - dbo.FactSales SQLQuery3.sql - loc...\\PauloOliveira (61)

```
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimCard] FOREIGN KEY([CardKey])
REFERENCES [dbo].[DimCard] ([CardKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimCard]
```

100 % Connected. (1/1) localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

Ready

Ln 5 Col 1 Ch 1 INS

Change the automatically generated script to be as presented in the picture.

SQLQuery4.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (66)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window

New Query Execute

ARMDD\_DataMart

Object Explorer

Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaymentMethod FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery4.sql - loc...\\PauloOliveira (66) DESKTOP-ACEDDKF\\A...LT - dbo.FactSales SQLQuery3.sql - loc...\\PauloOliveira (61)

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimCard] FOREIGN KEY([CardKey]) REFERENCES [dbo].[DimCard] ([CardKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimCard]  
  
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimDate] FOREIGN KEY([DateKey]) REFERENCES [dbo].[DimDate] ([DateKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimDate]  
  
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimItem] FOREIGN KEY([ItemKey]) REFERENCES [dbo].[DimItem] ([ItemKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimItem]  
  
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimPaymentMethod] FOREIGN KEY([PaymentMethodKey]) REFERENCES [dbo].[DimPaymentMethod] ([PaymentMethodKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimPaymentMethod]  
  
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimStore] FOREIGN KEY([StoreKey]) REFERENCES [dbo].[DimStore] ([StoreKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimStore]  
  
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK\_FactSales\_DimTime] FOREIGN KEY([TimeKey]) REFERENCES [dbo].[DimTime] ([TimeKey])  
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK\_FactSales\_DimTime]

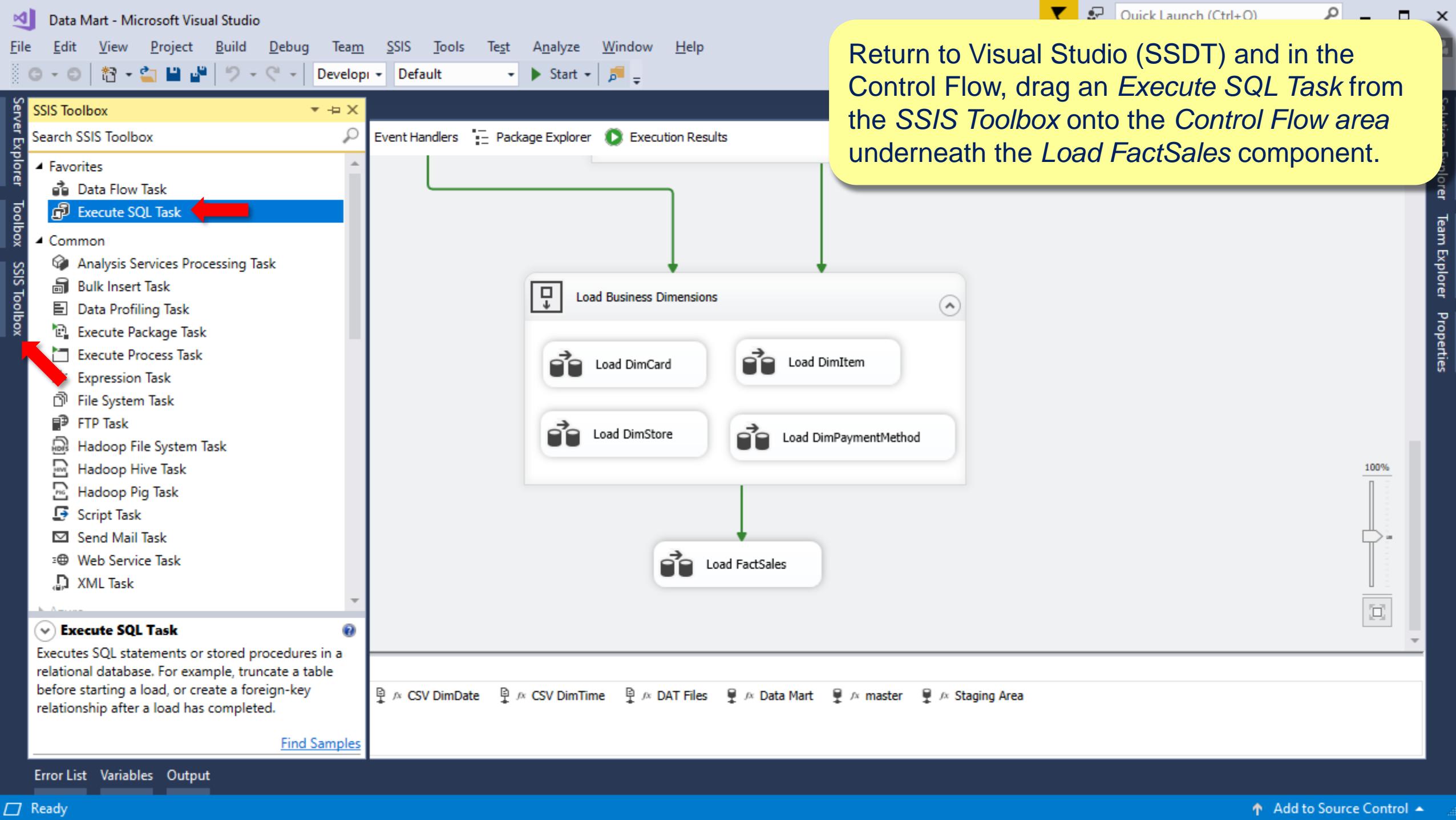
Cut Copy Paste Insert Snippet... Surround With... Connection Open Server in Obj... Execute Display Estimated E... IntelliSense Enabled Trace Query in SQL Analyze Query in D... Design Query in Ed... Include Actual Exec... Include Live Query... Include Client Stat... Results To Properties Window Query Options...

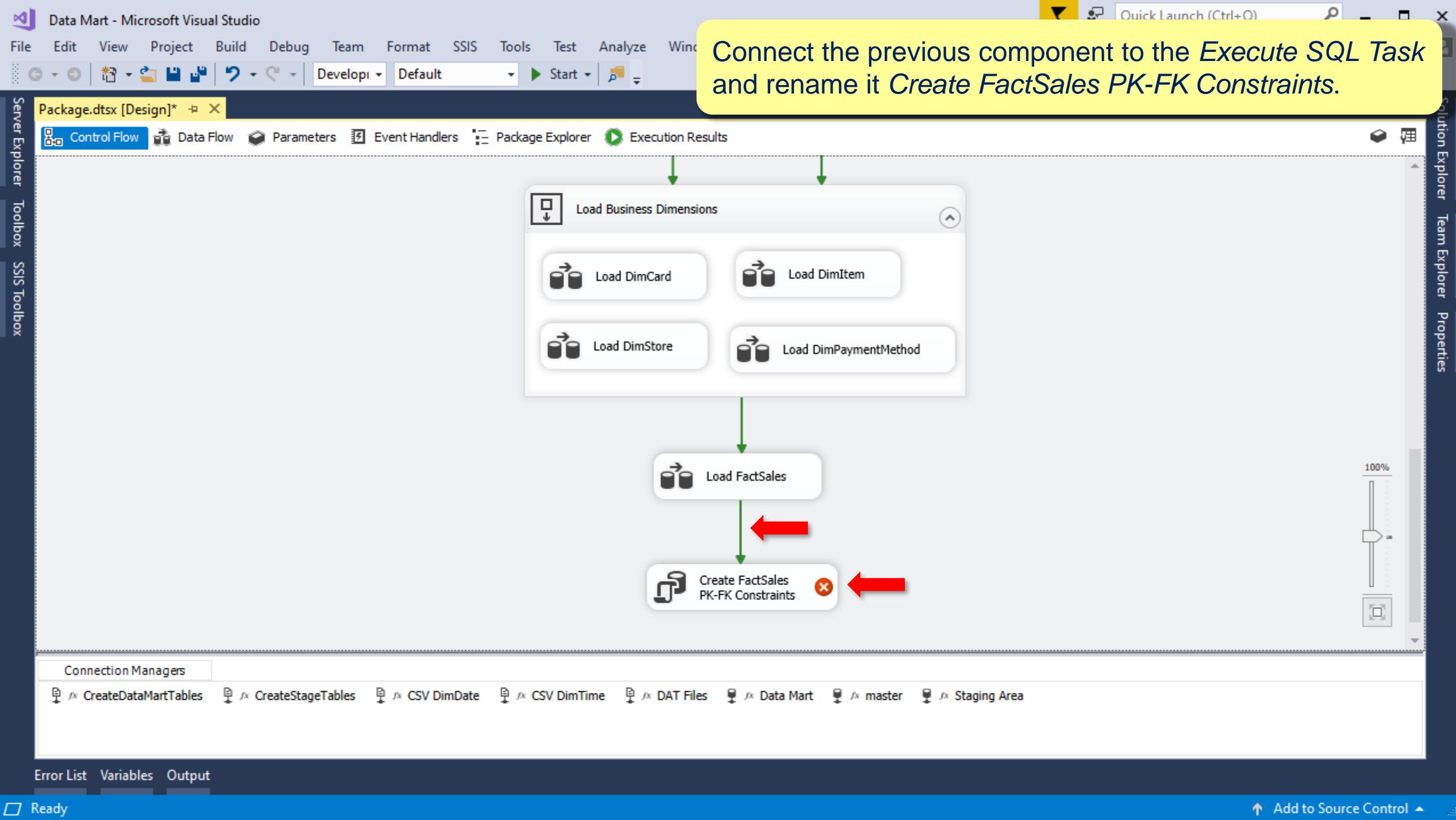
Connected. (1/1) | localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

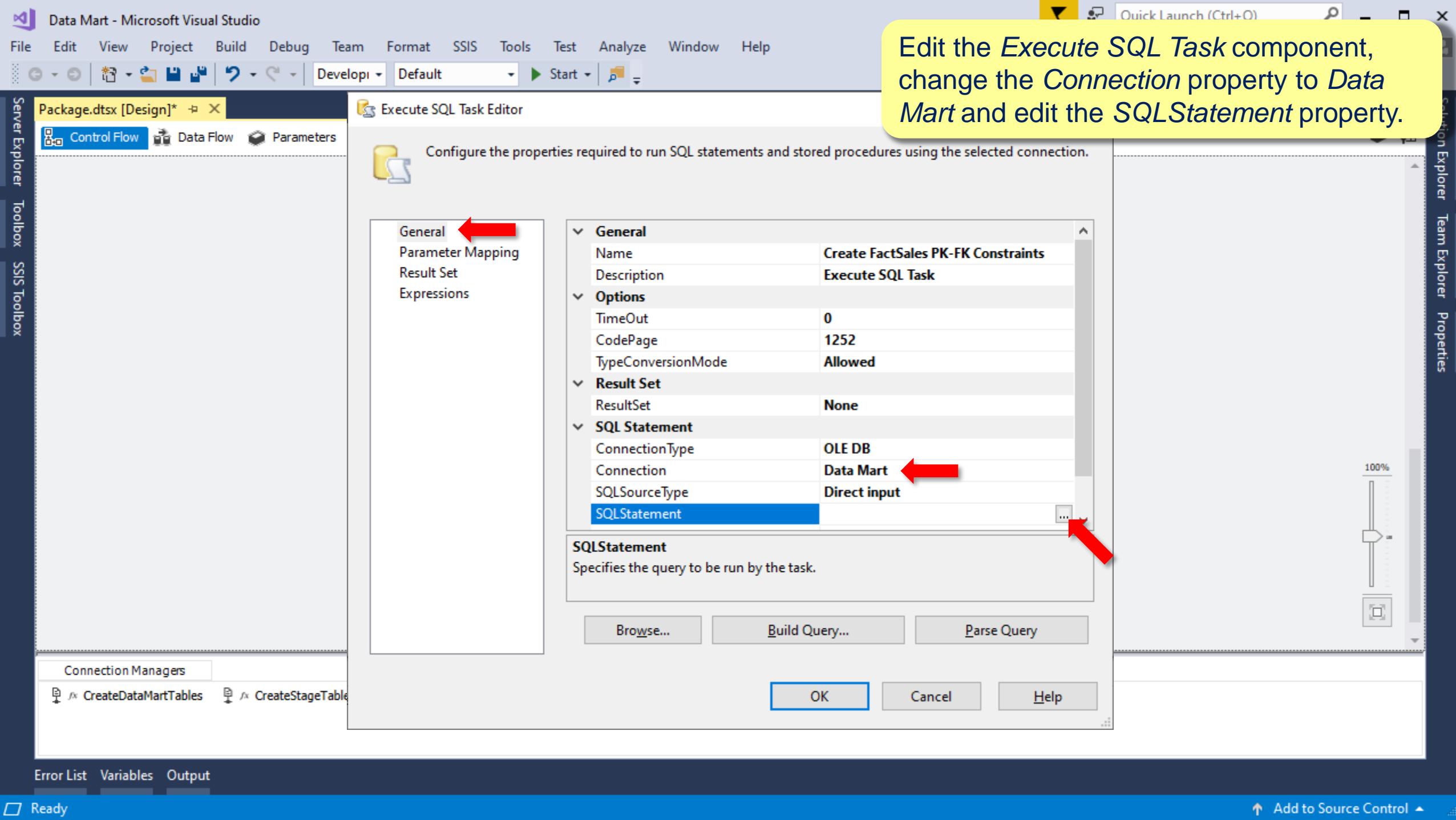
Ln 2 Col 1 Ch 1 INS

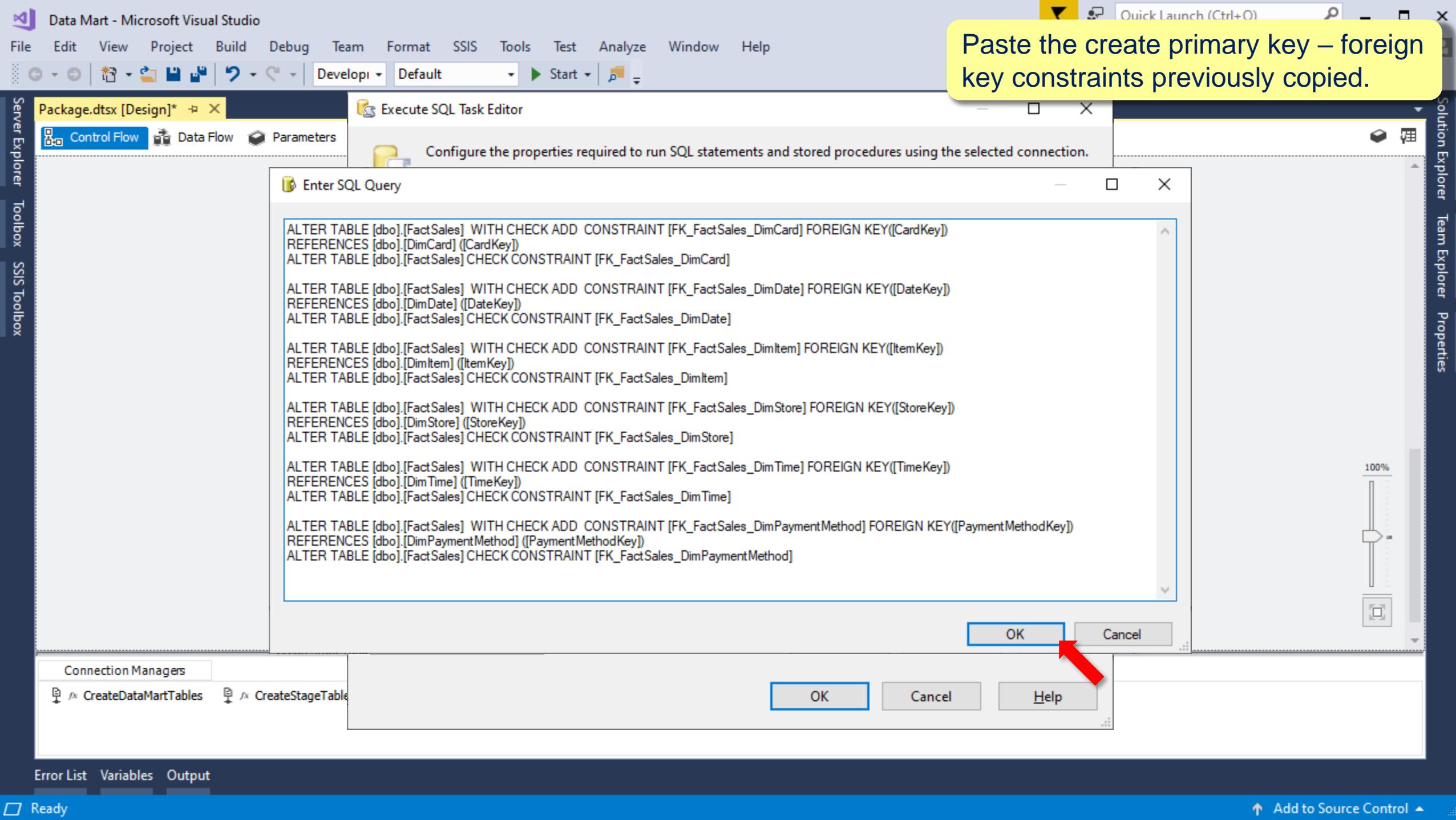
Ready

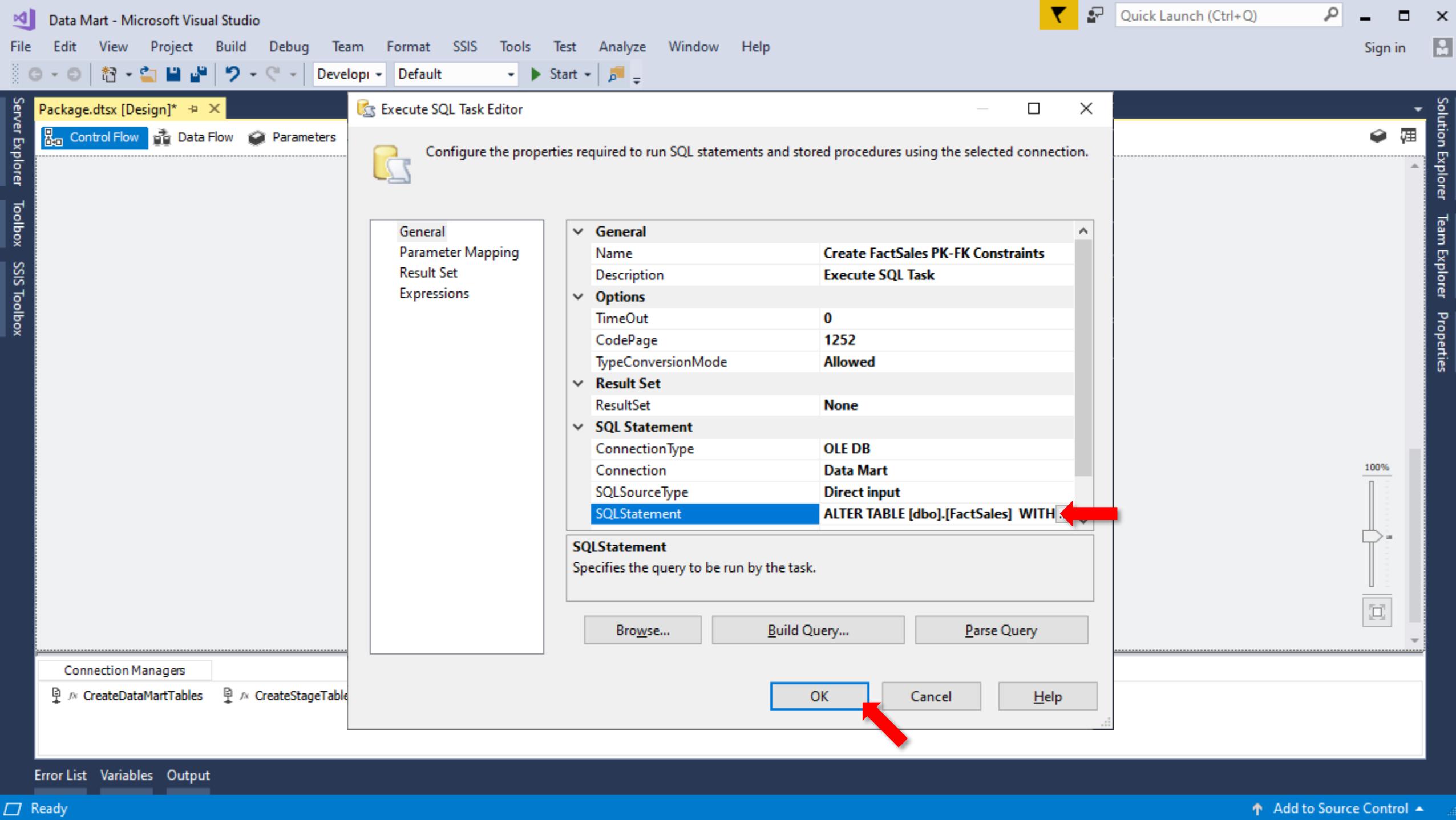
Generate the scripts for creating all the other primary key – foreign key constraints, put them together in a single query window and copy them to the clipboard.

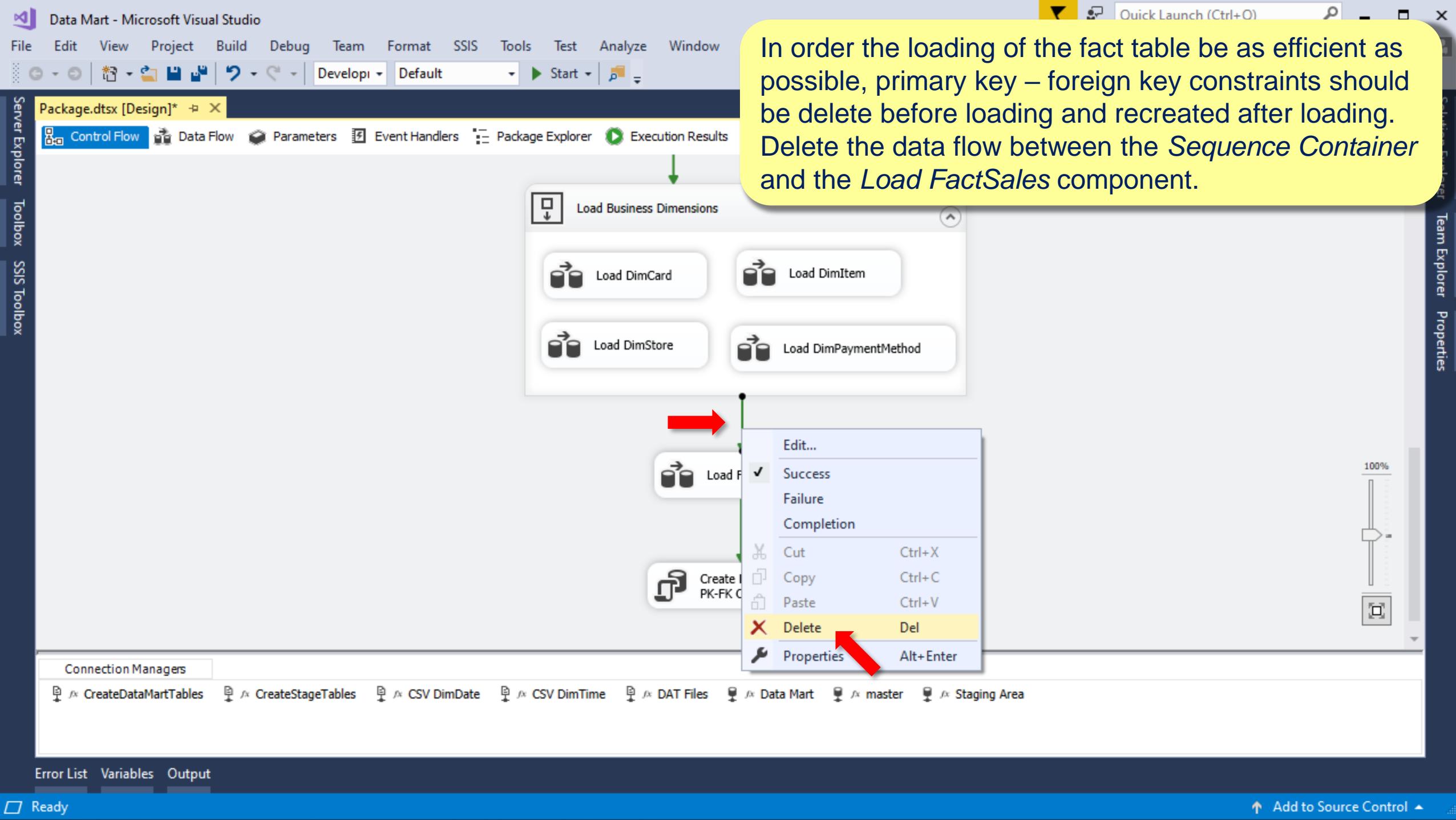


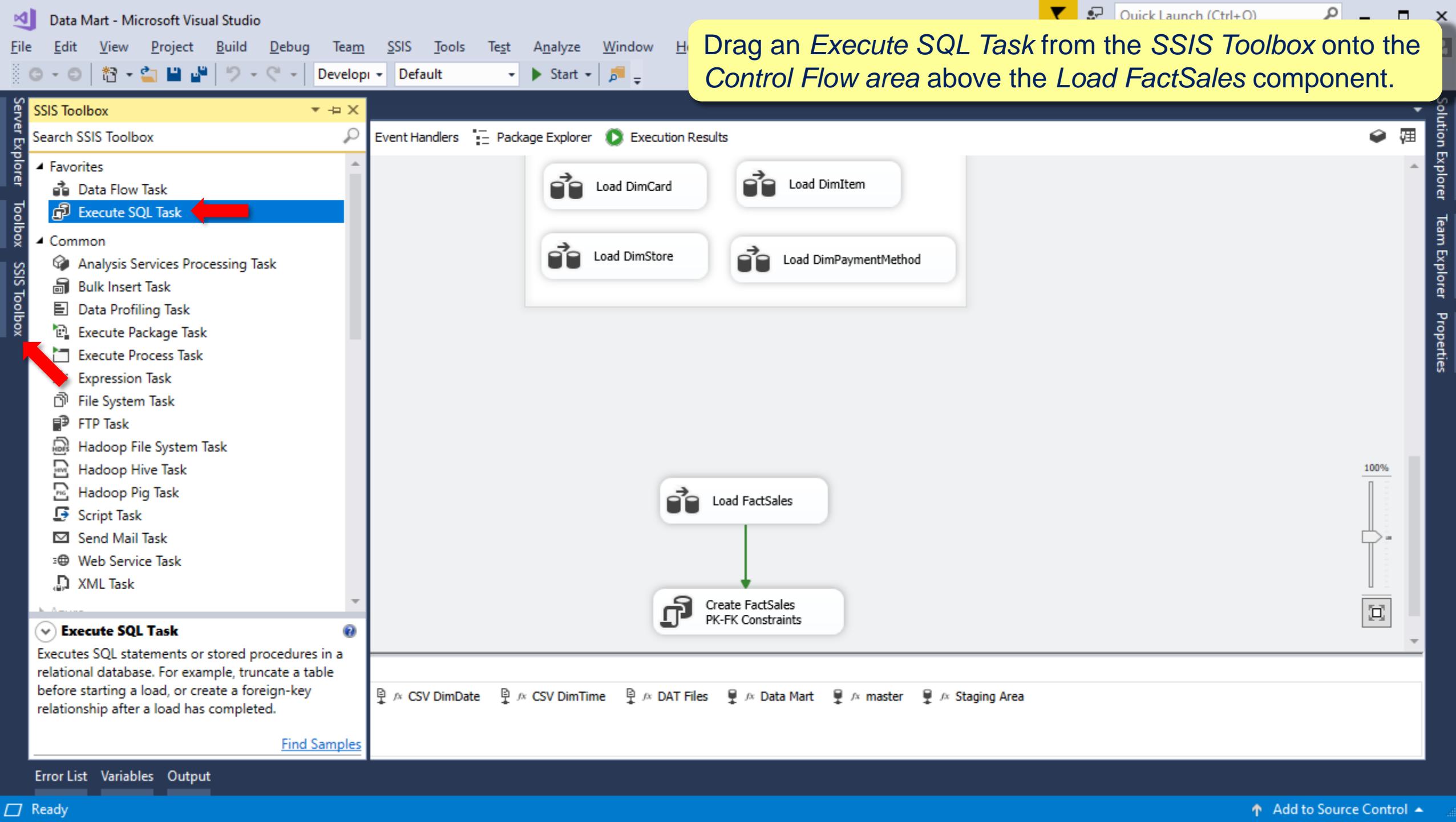












Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window

Quick Launch (Ctrl+O)

Package.dtsx [Design]\*

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

Server Explorer Solution Explorer Team Explorer Properties

SSIS Toolbox

Load DimCard Load DimItem  
Load DimStore Load DimPaymentMethod

Drop FactSales PK-FK Constraints

Load FactSales

Create FactSales PK-FK Constraints

100%

Connection Managers

CreateDataMartTables CreateStageTables CSV DimDate CSV DimTime DAT Files Data Mart master Staging Area

Error List Variables Output

Add to Source Control

Connect the previous component to the **Execute SQL Task**, rename it to *Drop FactSales PK-FK Constraints* and connect it to the *Load FactSales* component.

```
graph TD; A[Load DimCard] --> B[Load DimItem]; A --> C[Load DimStore]; A --> D[Load DimPaymentMethod]; D --> E[Drop FactSales PK-FK Constraints]; E --> F[Load FactSales]; F --> G[Create FactSales PK-FK Constraints]
```

SQLQuery4.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (66))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

New Query MDX DAX XMLA DAX Execute

ARMDD\_DataMart

Object Explorer

Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaym FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery4.sql - loc...\\PauloOliveira (66)\* DESKTOP-ACEDDKF.A...rt - dbo.FactSales SQLQuery3.sql - loc...\\PauloOliveira (61)

```
ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimCard] FOREIGN KEY([CardKey])
REFERENCES [dbo].[DimCard] ([CardKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimCard]

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimDate] FOREIGN KEY([DateKey])
REFERENCES [dbo].[DimDate] ([DateKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimDate]

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimItem] FOREIGN KEY([ItemKey])
REFERENCES [dbo].[DimItem] ([ItemKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimItem]

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimPaymentMethod] FOREIGN KEY([PaymentMethodKey])
REFERENCES [dbo].[DimPaymentMethod] ([PaymentMethodKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimPaymentMethod]

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimStore] FOREIGN KEY([StoreKey])
REFERENCES [dbo].[DimStore] ([StoreKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimStore]

ALTER TABLE [dbo].[FactSales] WITH CHECK ADD CONSTRAINT [FK_FactSales_DimTime] FOREIGN KEY([TimeKey])
REFERENCES [dbo].[DimTime] ([TimeKey])
ALTER TABLE [dbo].[FactSales] CHECK CONSTRAINT [FK_FactSales_DimTime]
```

In SSMS, create a script for dropping the first primary key – foreign key constraint.

Quick Launch (Ctrl+O)

Object Explorer Context Menu:

- New Foreign Key...
- Script Key as
- Modify
- Reports
- Rename
- Delete
- Refresh

TABLE [dbo].[FactSales] Context Menu:

- CREATE To
- ALTER To
- CREATE OR ALTER To
- DROP To
- DROP And CREATE To
- SELECT To
- INSERT To
- UPDATE To
- DELETE To
- EXECUTE To

New Query Editor Window

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

SQLQuery10.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (56))\* - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

Quick Launch (Ctrl+O)

Change the automatically generated script to be as presented in the picture.

Object Explorer

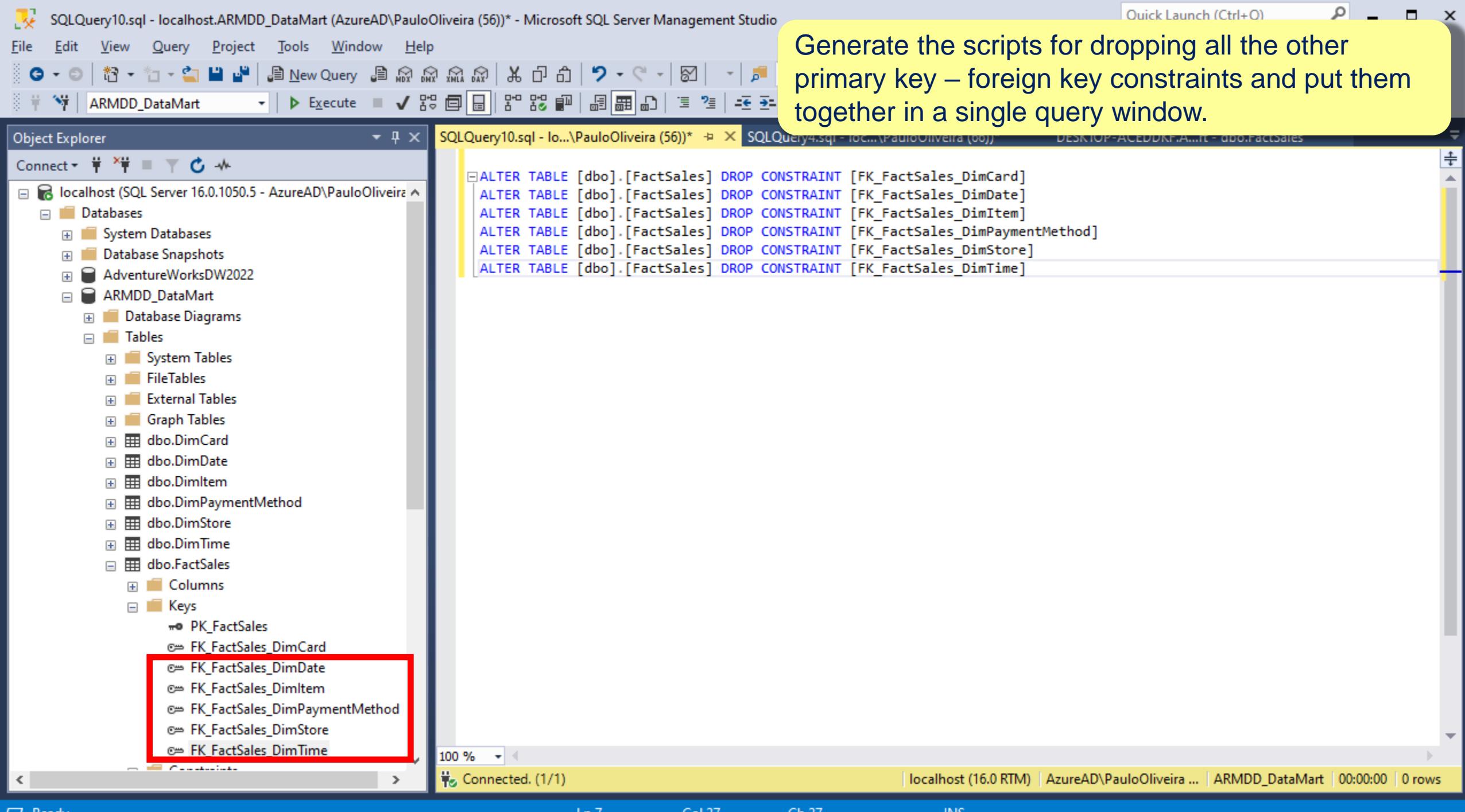
Connect Database Diagrams Tables System Tables FileTables External Tables Graph Tables dbo.DimCard dbo.DimDate dbo.DimItem dbo.DimPaymentMethod dbo.DimStore dbo.DimTime dbo.FactSales Columns Keys PK\_FactSales FK\_FactSales\_DimCard FK\_FactSales\_DimDate FK\_FactSales\_DimItem FK\_FactSales\_DimPaymentMethod FK\_FactSales\_DimStore FK\_FactSales\_DimTime Constraints Triggers Indexes Statistics Dropped Ledger Tables Views

SQLQuery10.sql - loc...\\PauloOliveira (56)\* SQLQuery4.sql - loc...\\PauloOliveira (66)\* DESKTOP-ACEDDKF.A...rt - dbo.FactSales

```
ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimCard]
```

100 % Connected. (1/1) localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

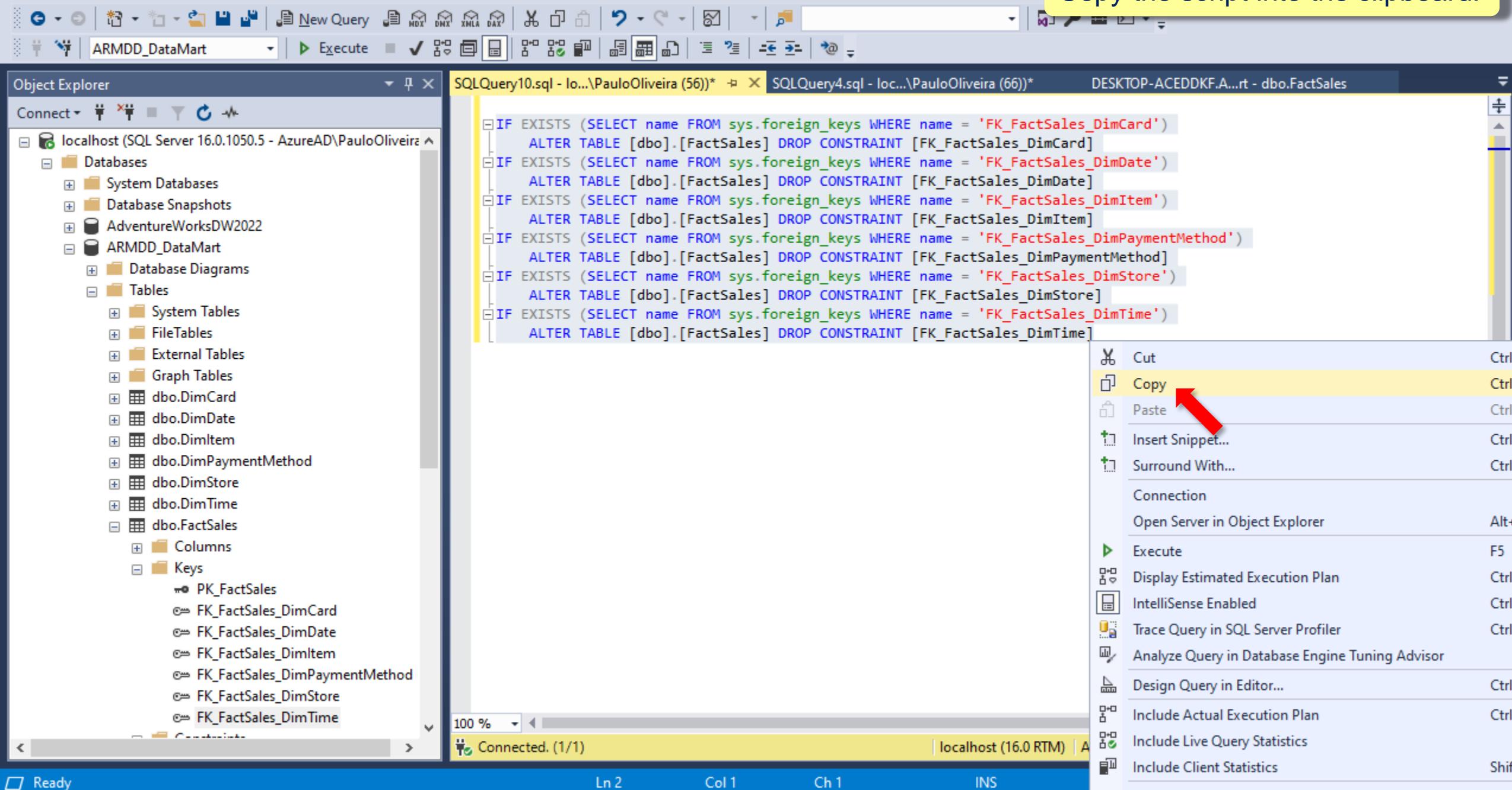
Ready

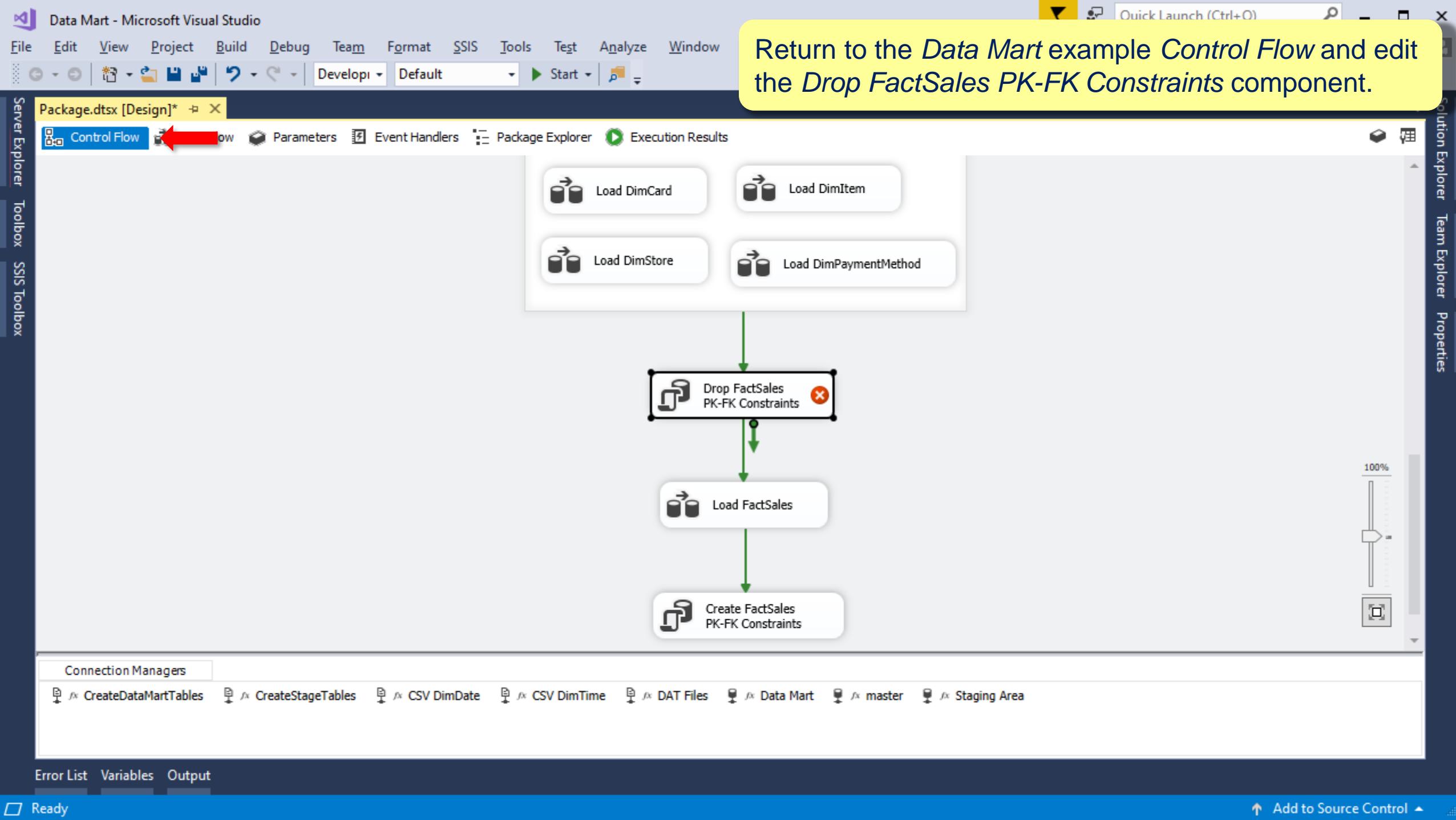


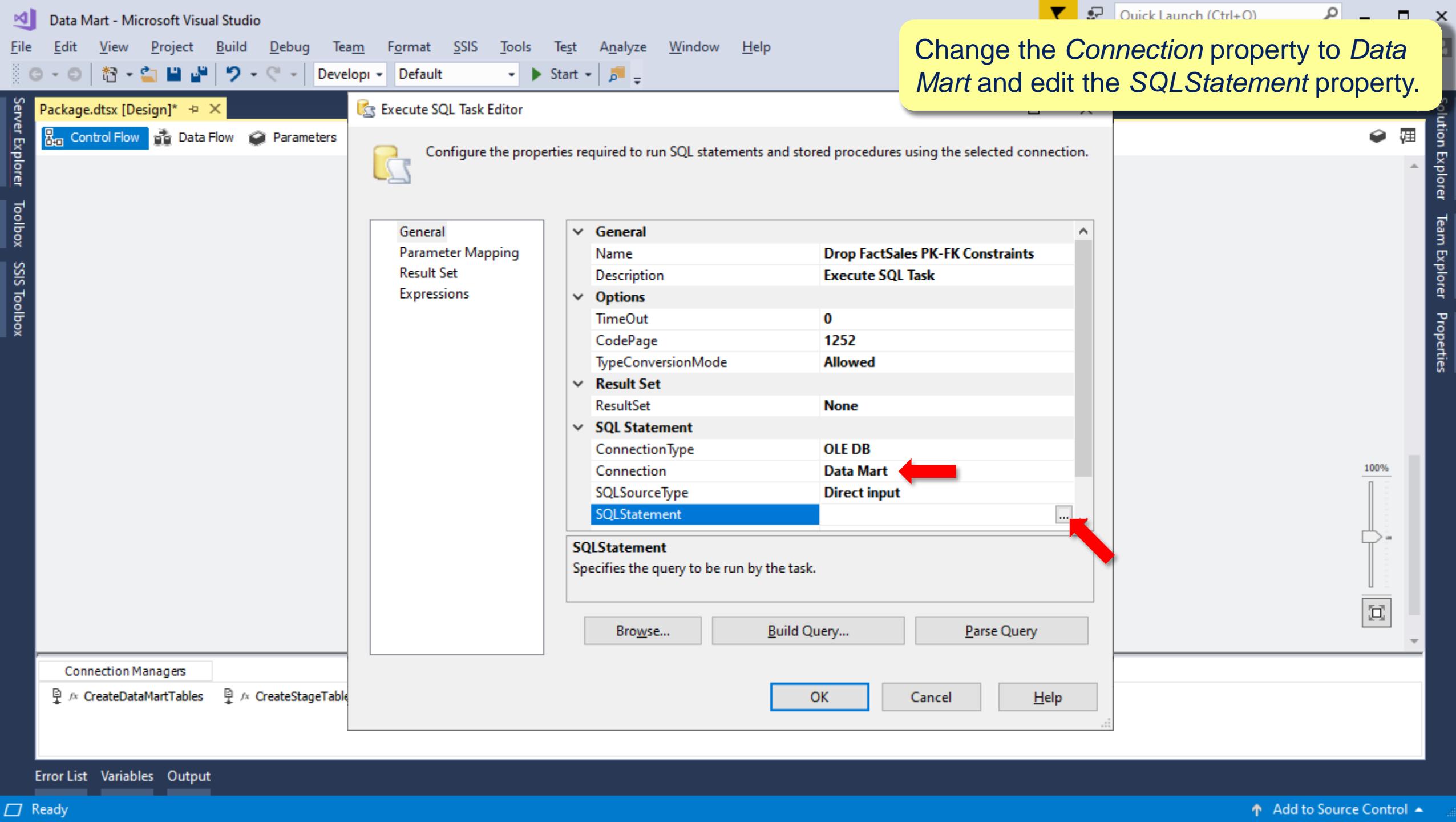
Generate the scripts for dropping all the other primary key – foreign key constraints and put them together in a single query window.

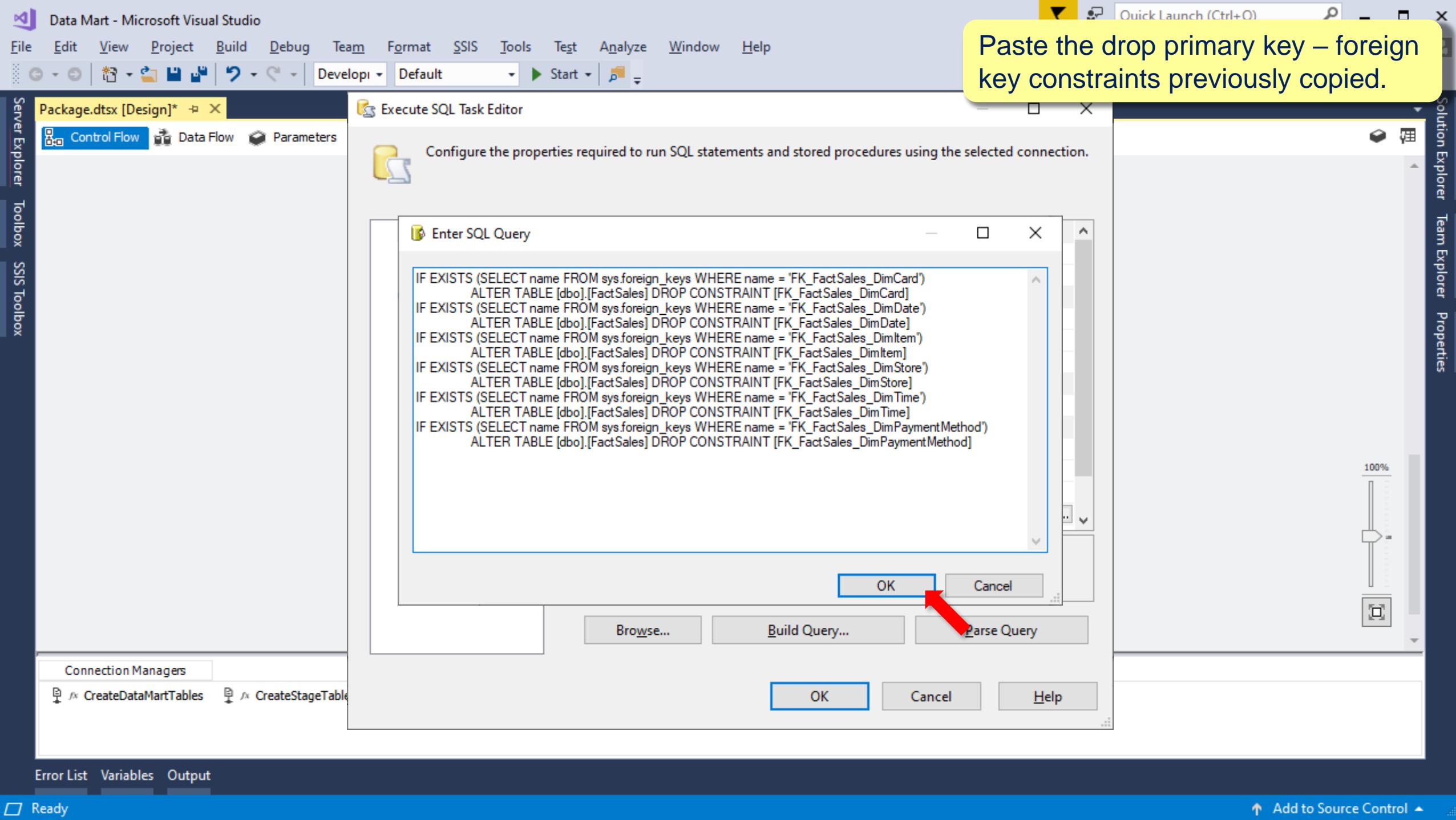


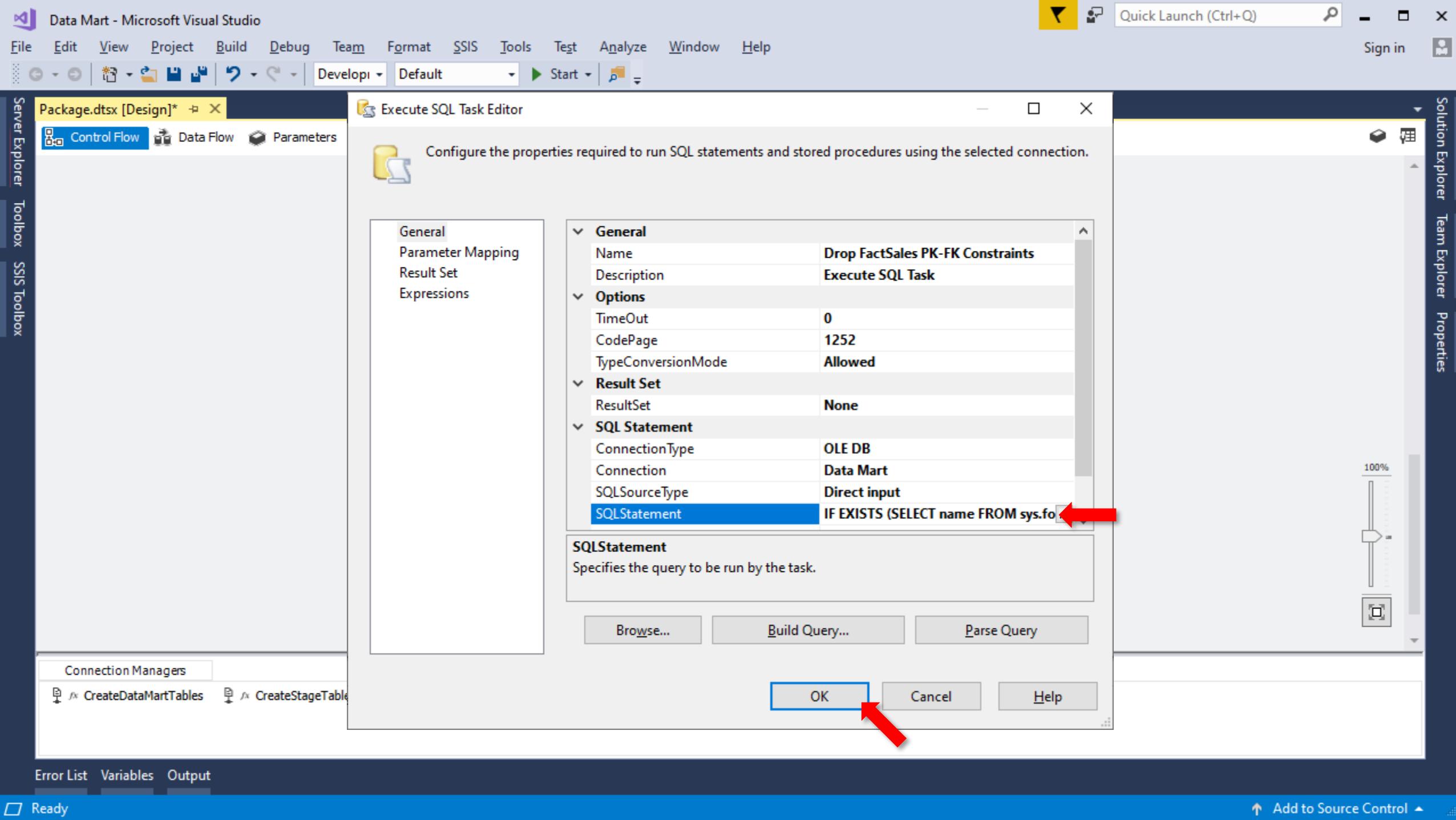
**Copy the script into the clipboard.**











Data Mart - Microsoft Visual Studio

File Edit View Project Build Debug Team Format SSIS Tools Test Analyze Window Help

Quick Launch (Ctrl+O)

The *Drop FactSales PK-FK Constraints* is now properly configured.

Package.dtsx [Design]

Control Flow Data Flow Parameters Event Handlers Package Explorer Execution Results

The diagram illustrates the Control Flow of an SSIS package named 'Package.dtsx'. It consists of the following sequence of tasks:

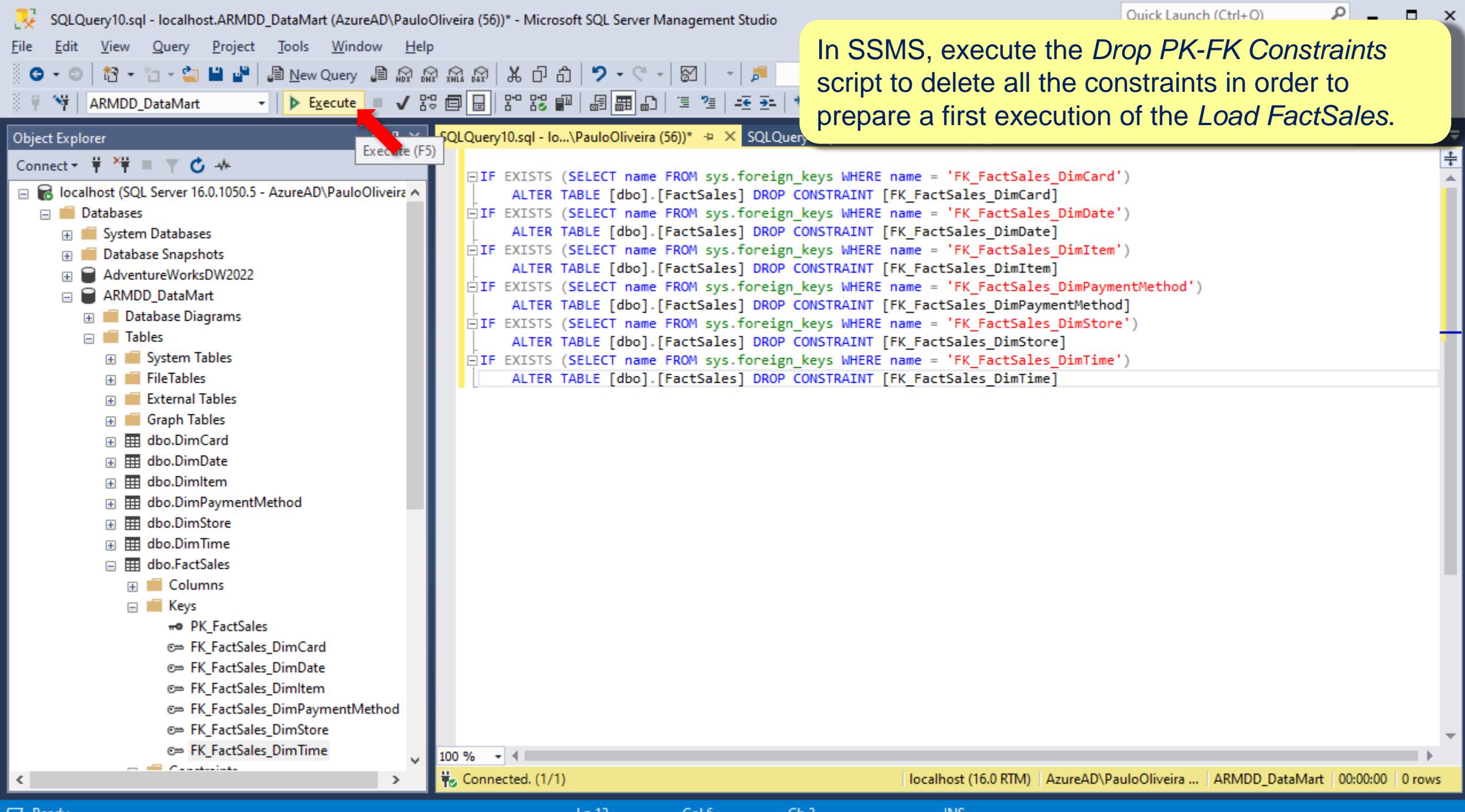
- Four initial tasks (Load DimCard, Load DimItem, Load DimStore, Load DimPaymentMethod) are grouped together in a single container.
- An arrow points from this container down to a 'Drop FactSales PK-FK Constraints' task.
- From this 'Drop FactSales PK-FK Constraints' task, an arrow points down to a 'Load FactSales' task.
- Finally, an arrow points from the 'Load FactSales' task down to a 'Create FactSales PK-FK Constraints' task.

Connection Managers

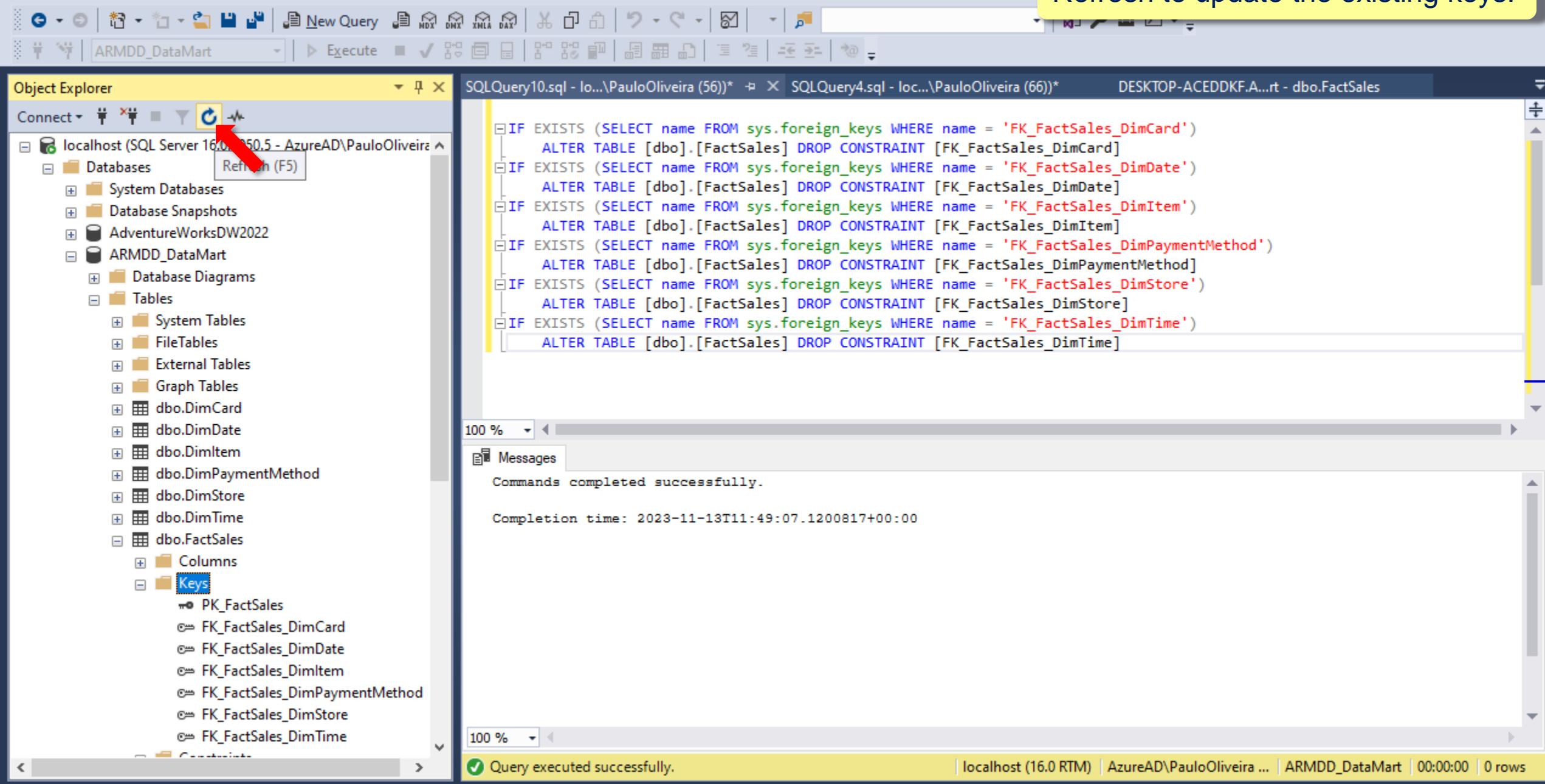
- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

Error List Variables Output

Item(s) Saved Add to Source Control



Refresh to update the existing keys.



SQLQuery10.sql - localhost.ARMDDataMart (AzureAD\PauloOliveira (56))\* - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

Quick Launch (Ctrl+O)

Now, only the *FactSales* primary key exists.

Object Explorer

Connect ▾

localhost (SQL Server 16.0.1050.5 - AzureAD\PauloOliveira)

- Databases
  - System Databases
  - Database Snapshots
  - AdventureWorksDW2022
  - ARMDD\_DataMart
    - Database Diagrams
    - Tables
      - System Tables
      - FileTables
      - External Tables
      - Graph Tables
      - dbo.DimCard
      - dbo.DimDate
      - dbo.DimItem
      - dbo.DimPaymentMethod
      - dbo.DimStore
      - dbo.DimTime
    - dbo.FactSales
      - Columns
      - Keys
        - PK\_FactSales
      - Constraints
      - Triggers
      - Indexes
      - Statistics
    - Dropped Ledger Tables
- Views

SQLQuery10.sql - Io...\\PauloOliveira (56)\* SQLQuery4.sql - Io...\\PauloOliveira (66)\* DESKTOP-ACEDDKF.A...rt - dbo.FactSales

```
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimCard')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimCard]
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimDate')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimDate]
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimItem')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimItem]
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimPaymentMethod')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimPaymentMethod]
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimStore')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimStore]
IF EXISTS (SELECT name FROM sys.foreign_keys WHERE name = 'FK_FactSales_DimTime')
    ALTER TABLE [dbo].[FactSales] DROP CONSTRAINT [FK_FactSales_DimTime]
```

100 %

Messages

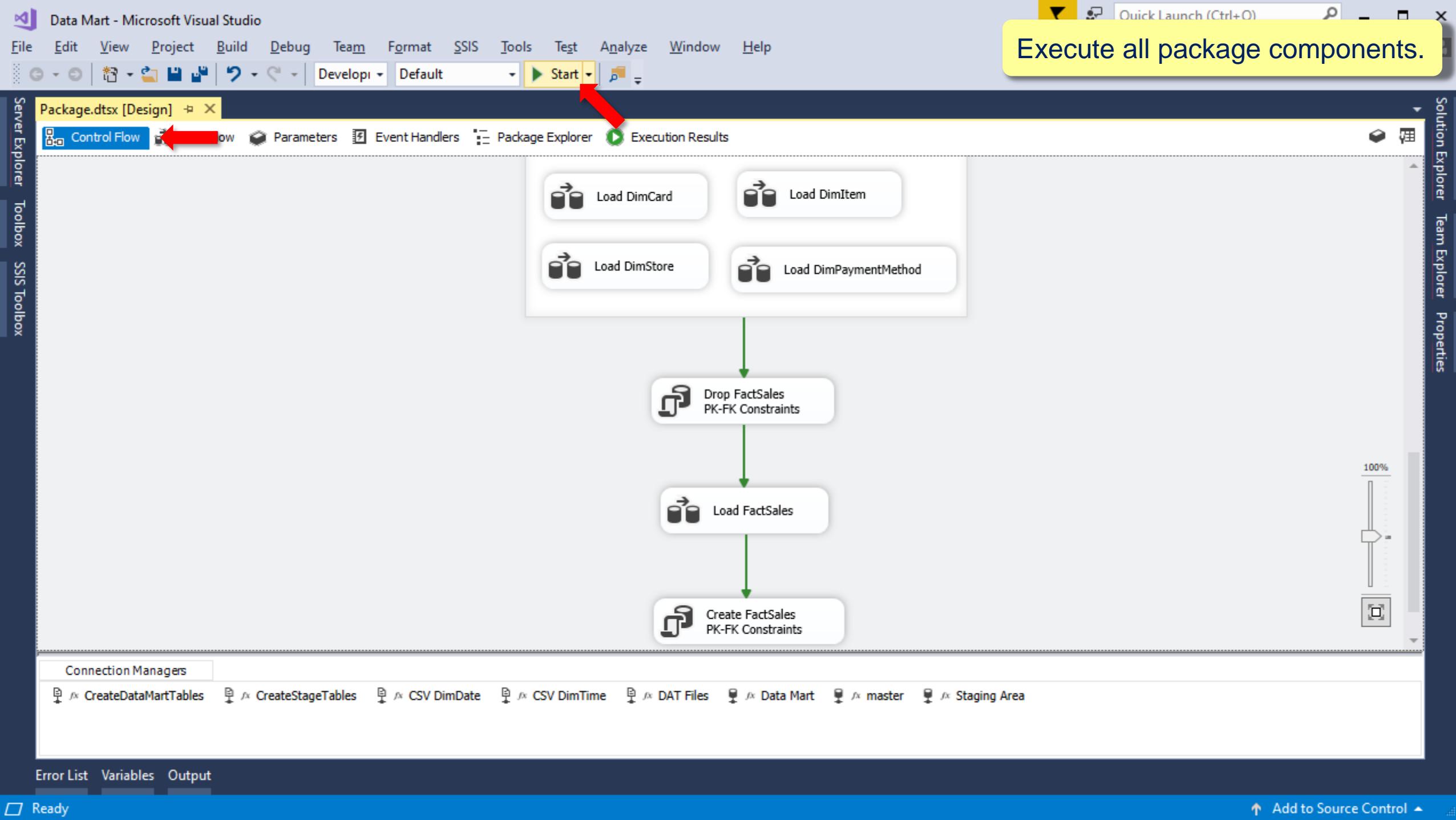
Commands completed successfully.

Completion time: 2023-11-13T11:49:07.1200817+00:00

Query executed successfully.

localhost (16.0 RTM) | AzureAD\PauloOliveira ... | ARMDD\_DataMart | 00:00:00 | 0 rows

Ready



Data Mart (Running) - Microsoft Visual Studio

All components successfully execute, specifically the ones developed during this tutorial (i.e., *Drop FactSales PK-FK Constraints*, *Load FactSales* and *Create FactSales PK-FK Constraints*).

Control Flow Data Flow Parameters Event Handlers Package Explorer Progress

The screenshot shows the Microsoft Visual Studio interface for an SSIS package named "Package.dtsx". The "Control Flow" tab is selected. The flowchart consists of several tasks connected by arrows: "Load DimCard", "Load DimItem", "Load DimStore", "Load DimPaymentMethod", "Drop FactSales PK-FK Constraints", "Load FactSales", and "Create FactSales PK-FK Constraints". Each task is represented by a green rounded rectangle with a checkmark icon. Red arrows point from the bottom right towards each task, indicating they have been executed. The "Package Explorer" and "Progress" tabs are also visible at the top.

Load DimCard Load DimItem  
Load DimStore Load DimPaymentMethod

Drop FactSales PK-FK Constraints

Load FactSales

Create FactSales PK-FK Constraints

Connection Managers

- CreateDataMartTables
- CreateStageTables
- CSV DimDate
- CSV DimTime
- DAT Files
- Data Mart
- master
- Staging Area

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

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Autos Locals Watch 1

Ready Add to Source Control

