

ARMDD

TUTORIAL ON USING ANALYSIS SERVICES

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Microsoft SQL Server Analysis Services

- Online analytical data engine used in decision support and Business Intelligence (BI) solutions
- Provides the analytical data for business reports and client applications such as Excel, PowerBI and other third-party BI tools
- Typical workflow includes building an OLAP or tabular data model, deploy the model as a database to an Analysis Services instance, and process the database to load it with data
- Data comes from external data systems, usually data warehouses hosted on a SQL Server or Oracle database engine

Analysis Services Tutorial

- Teaches the fundamental skills and concepts behind multidimensional modeling in SQL Server Data Tools
- When finished, you will have a cube database based on Adventure Works DW database that you can access from Excel, PowerBI or any other client application that connects to Analysis Services
- Partially based on the Analysis Services Tutorial “Multidimensional Modeling (Adventure Works Tutorial)” available at “<https://docs.microsoft.com/en-us/analysis-services/multidimensional-tutorial/multidimensional-modeling-adventure-works-tutorial?view=asallproducts-allversions>”

Analysis Services Tutorial

- Please check if Analysis Services is configured for multidimensional deployment mode:
 - ◆ Go to folder `C:\Program Files\Microsoft SQL Server\MSAS16.MSSQLSERVER\OLAP\Config`
 - ◆ Copy the `msmdsrv.ini` file to your desktop (or any other location)
 - ◆ Open the `msmdsrv.ini` file in a text editor (e.g., Notepad++)
 - ◆ If `DeploymentMode` property is set to 0 (multidimensional) no need to do anything else
 - ◆ If `DeploymentMode` property is set to 2 (tabular)
 - ★ Change the deployment mode property to 0 (multidimensional) and save the file
 - ★ Copy and replace the `msmdsrv.ini` file back to the `OLAP\Config` folder
 - ★ Run the `Services App`
 - ★ Restart the `SQL Server Analysis Services (MSSQLSERVER)`

Visual Studio 2022

Open recent

🔍▼

◀ This month

- Duplicates Detection Example.sln** 17/11/2023 16:13
C:\Temp\ARMDD\Duplicates Detection Example

- Data Mart.sln** 17/11/2023 12:08
C:\Temp\ARMDD\Data Mart

- SSIS ETL Tutorial.sln** 17/11/2023 11:43
C:\Temp\PL2\SSIS ETL Tutorial

◀ Older

- Create CSV Date Dimension.sln** 23/10/2023 11:06
C:\Temp\ARMDD\Create CSV Date Dimension

- Create Date Dimension.sln** 23/10/2023 10:32
C:\Temp\ARMDD\Create Date Dimension

- Data Mart.sln** 16/10/2023 14:55
C:\Temp\ARPAD\Data Mart

- Data Mart.sln** 09/10/2023 17:23

Start by creating a new project in *Visual Studio* for this tutorial.

Get started



Clone a repository

Get code from an online repository like GitHub or Azure DevOps



Open a project or solution

Open a local Visual Studio project or .sln file



Open a local folder

Navigate and edit code within any folder



Create a new project

Choose a project template with code scaffolding to get started

[Continue without code →](#)

Start by creating an *Analysis Services Multidimensional Project*.

Create a new project

Recent project templates

-  Integration Services Project
-  Analysis Services Multidimensional Project
-  Integration Services Import Project Wizard

All languages All platforms All project types

Visual Basic Windows Desktop



Analysis Services Multidimensional Project

An Analysis Services project for creating multidimensional models.



Analysis Services Multidimensional Project

An Analysis Services project for creating multidimensional models.



Import from Server (Multidimensional)

Creates a multidimensional project by extracting the metadata from an existing multidimensional on an Analysis Services server.



Integration Services Project (Azure-Enabled)

This project may be used for building high performance data integration and workflow solutions that can also be run/debugged on SSIS Platform-as-a-Service (PaaS) in Azure Data Factory.



Integration Services Project

This project may be used for building high performance data integration and workflow solutions that can be run on SSIS catalog, including extraction, transformation, and loading (ETL) operations for data warehousing.



Integration Services Import Project Wizard

A wizard that assists you in creating a new Integration Services (SSIS) project that is based on an existing one. Import from a project deployment file (.ispac extension) or

Back

Next

Named the project as *Analysis Services Tutorial* at any location you want.

Configure your new project

Analysis Services Multidimensional Project

Project name

Analysis Services Tutorial



Location

C:\Temp\ARMDD



Solution name 

Analysis Services Tutorial

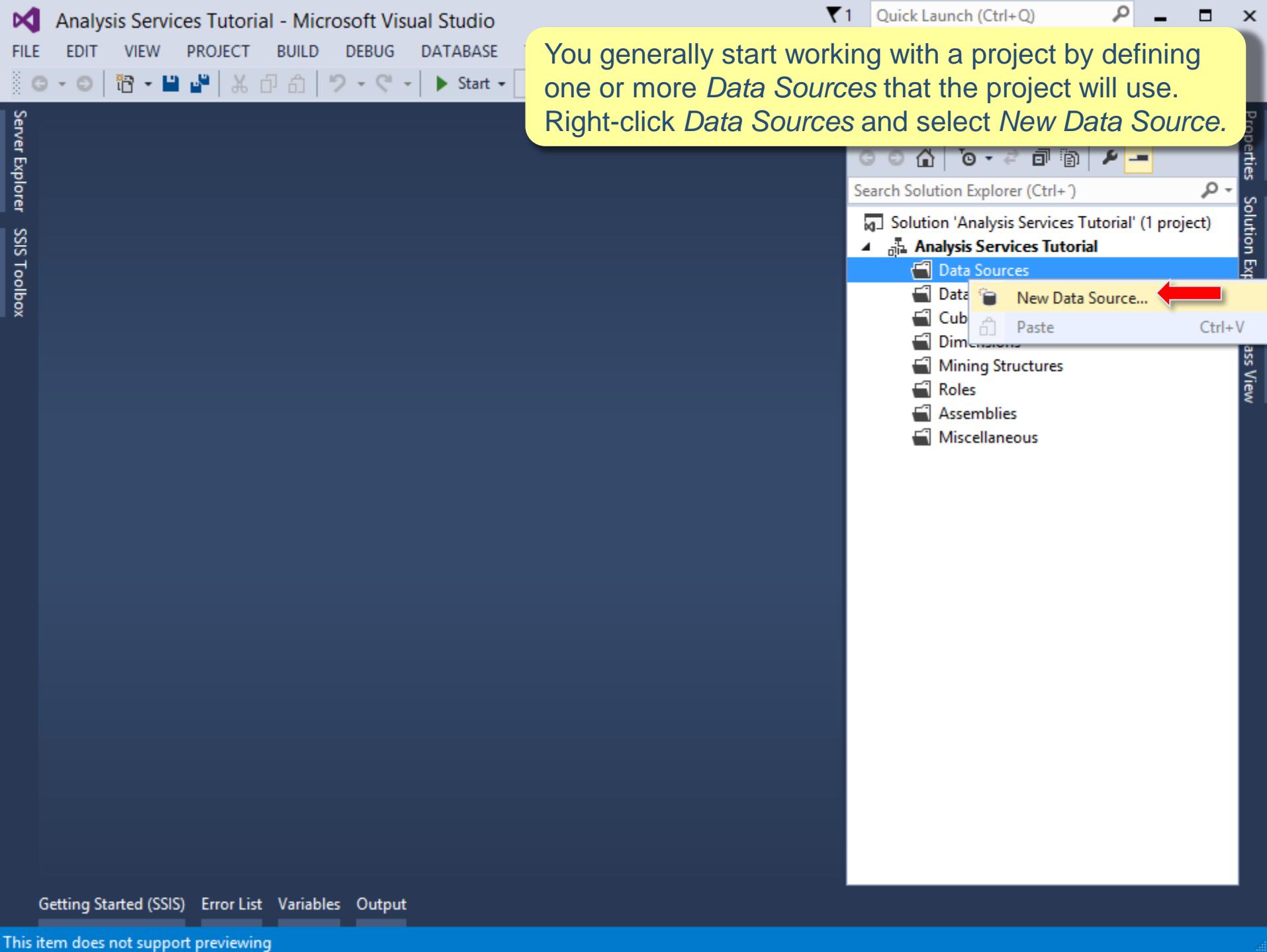
Place solution and project in the same directory

Project will be created in "C:\Temp\ARMDD\Analysis Services Tutorial\Analysis Services Tutorial\"

[Back](#)

[Create](#)





You generally start working with a project by defining one or more *Data Sources* that the project will use. Right-click *Data Sources* and select *New Data Source...*.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE TOOLS WINDOW HELP

Development

Solution Explorer

Explorer (Ctrl+)

Analysis Services Tutorial' (1 project)

Analysis Services Tutorial

Data Sources

Data Source Views

Dimensions

Mining Structures

Tables

Assemblies

Miscellaneous

Properties

Solution Explorer Class View

Data Source Wizard

Welcome to the Data Source Wizard

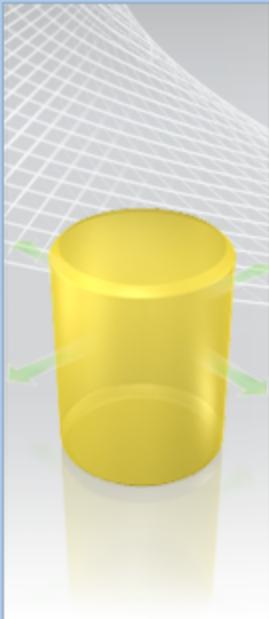
Use this wizard to create a new data source.

A data source represents a connection to your data.

A data source does not provide features such as caching metadata, adding relationships, adding calculations, and adding annotations. To apply these features to a data source, use this wizard to create the data source, and then use Data Source View Wizard to create a view that includes the appropriate features.

Don't show this page again

< Back Next > Finish >> Cancel



A red arrow points to the "Next >" button in the bottom right corner of the wizard window.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT B

Server Explorer SSIS Toolbox

Quick Launch (Ctrl+Q)

You can define a data source based on a new connection, based on an existing connection, or based on a previously defined data source object. In this tutorial, you define a data source based on a new connection. If the *AdventureWorksDW2022* data connection already exists there's no need to create a new one. You can skip the next slide.

Select how to define the connection

You can select from a number of ways in which your data source will define its connection string.

Create a data source based on another object

Create a data source based on an existing or new connection

Data connections: localhost.ARPAD_StagingArea

Data connection properties:

Property	Value
Data Source	localhost
Initial Catalog	ARPAD_StagingArea
Integrated Sec...	SSPI
Provider	SQLNCLI11.1

New... Delete

< Back Next > Finish >> Cancel

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Getting Started (SSIS) Error List Variables Output

This item does not support previewing

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE TOOLS

Connection Manager

Provider: Native OLE DB\Microsoft OLE DB Provider for SQL Server

Server name: (local)

Log on to the server

Authentication: Windows Authentication

User name:

Password:

Save my password

Connect to a database

Select or enter a database name: AdventureWorksDW2022

Attach a database file:

[Browse...](#)

Logical name:

Test Connection OK Cancel Help

You need to provide the server name and the database name to which you want to connect. To see if everything is OK you can test the connection.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE TOOLS WINDOW HELP

Development

Solution Explorer

Properties Solution Explorer Class View

Data Source Wizard

Select how to define the connection

You can select from a number of ways in which your data source will define its connection

Create a data source based on another object

Create a data source based on an existing or new connection

Data connections:

(local).AdventureWorksDW2022
(local).ARMDD_StagingArea

Data connection properties:

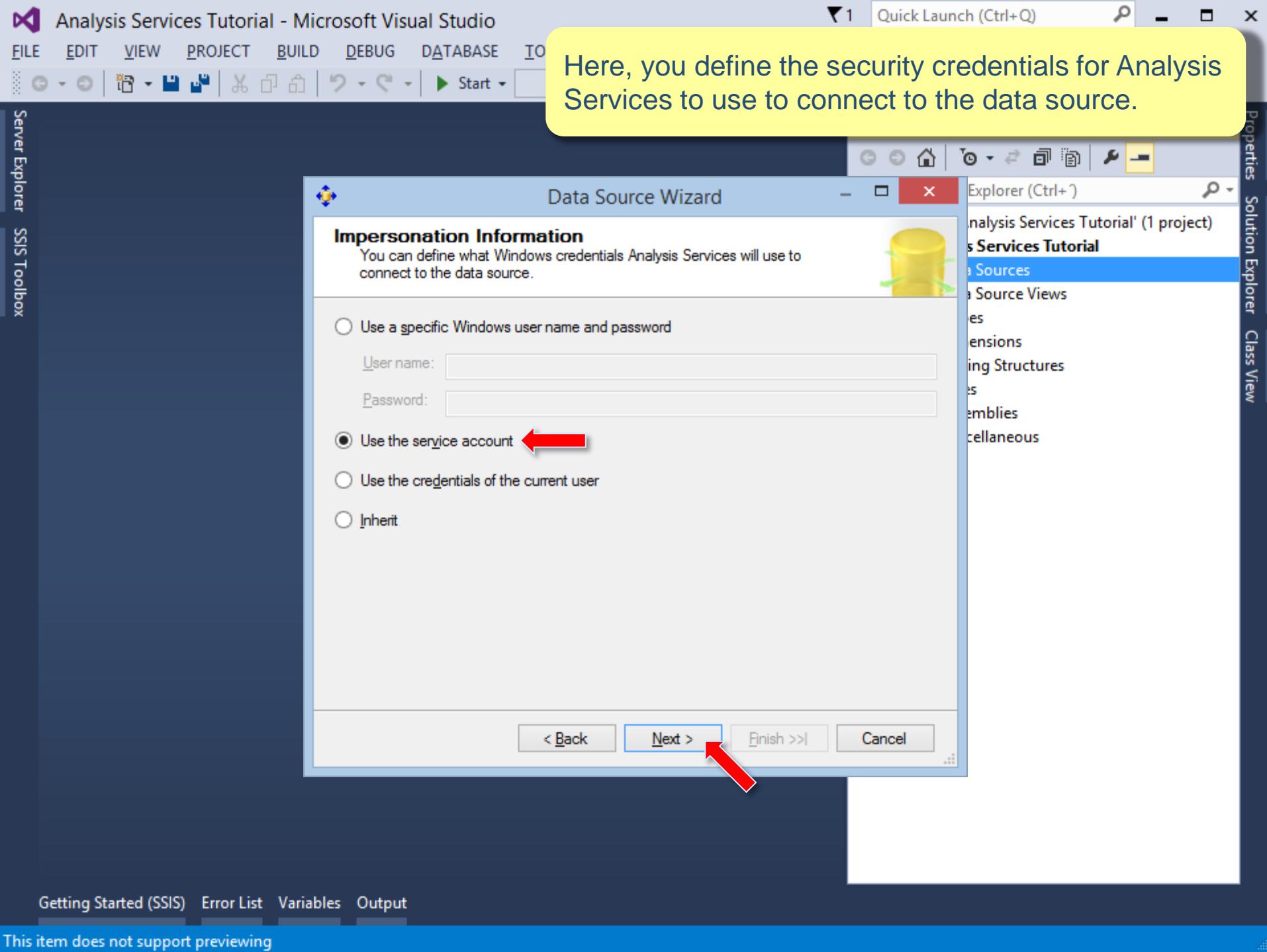
Property	Value
Data Source	(local)
Initial Catalog	AdventureWorksDW20...
Integrated Se...	SSPI
Provider	SQLOLEDB.1

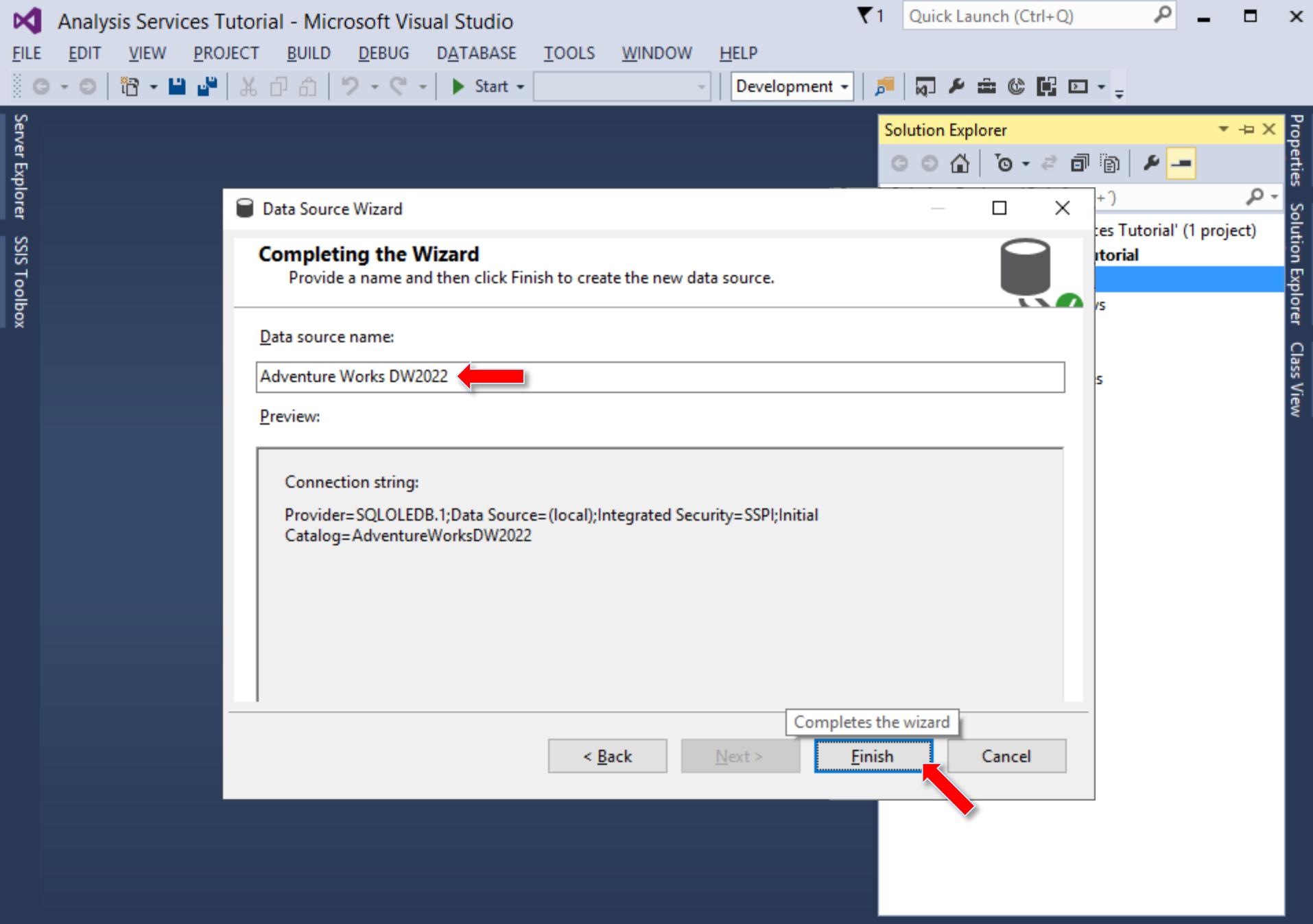
New... Delete

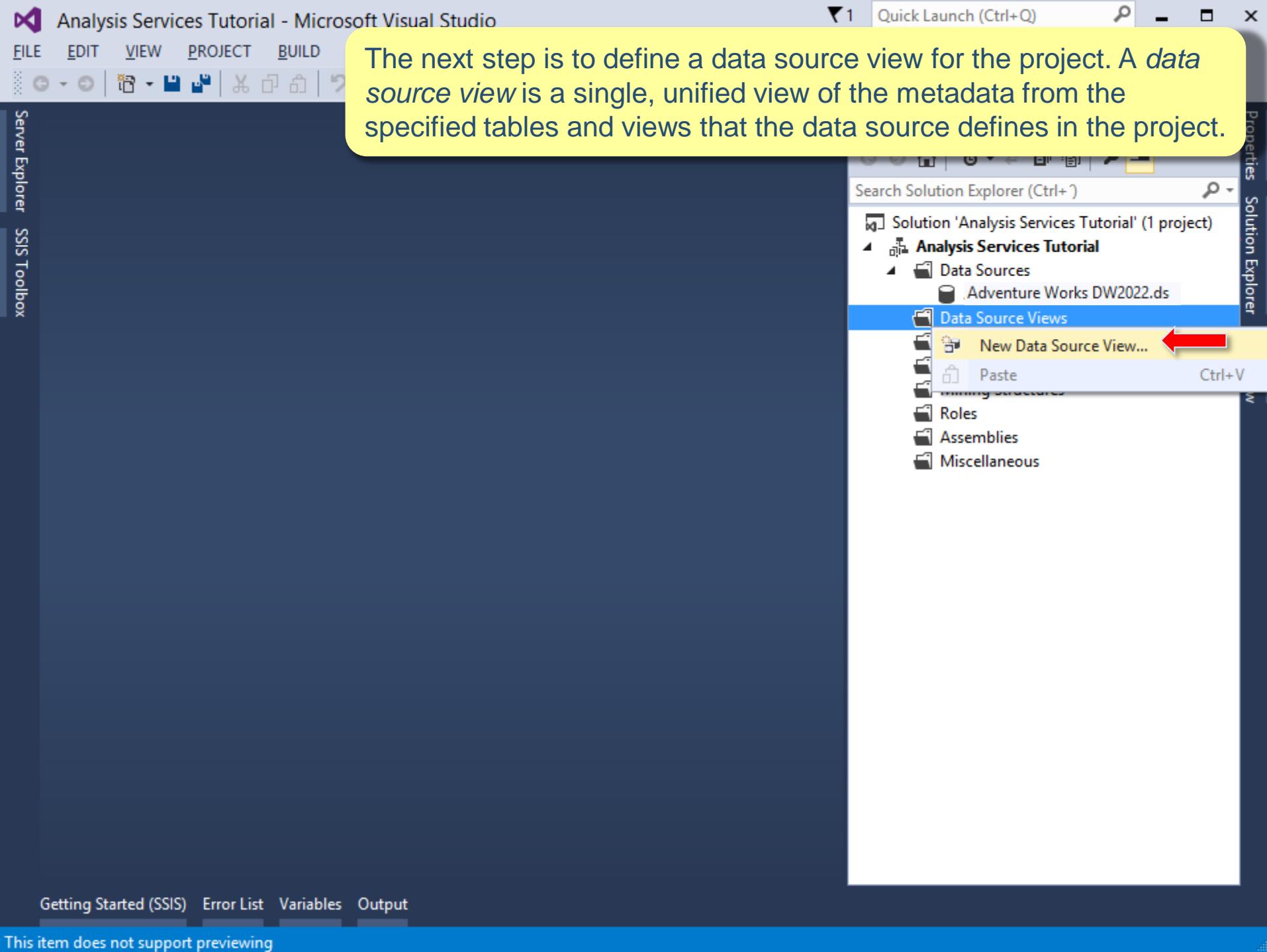
< Back Next > Finish >> Cancel

Getting Started (SSIS) Error List Variables Output

This item does not support previewing







File Edit View Git Project Build Debug Test Analyze Tools Extensions Window | Analysis Services Tutorial - X

Develop Default Start | Solution Explorer Properties Solution Explorer Notifications

SSIS Toolbox

Solution Explorer

Explorer (Ctrl+Shift+E)

Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
- Data Sources
- Adventure Works DW2022.ds
- Data Source Views
- Tables
- Dimensions
- Assemblies
- Miscellaneous

Data Source View Wizard

Welcome to the Data Source View Wizard

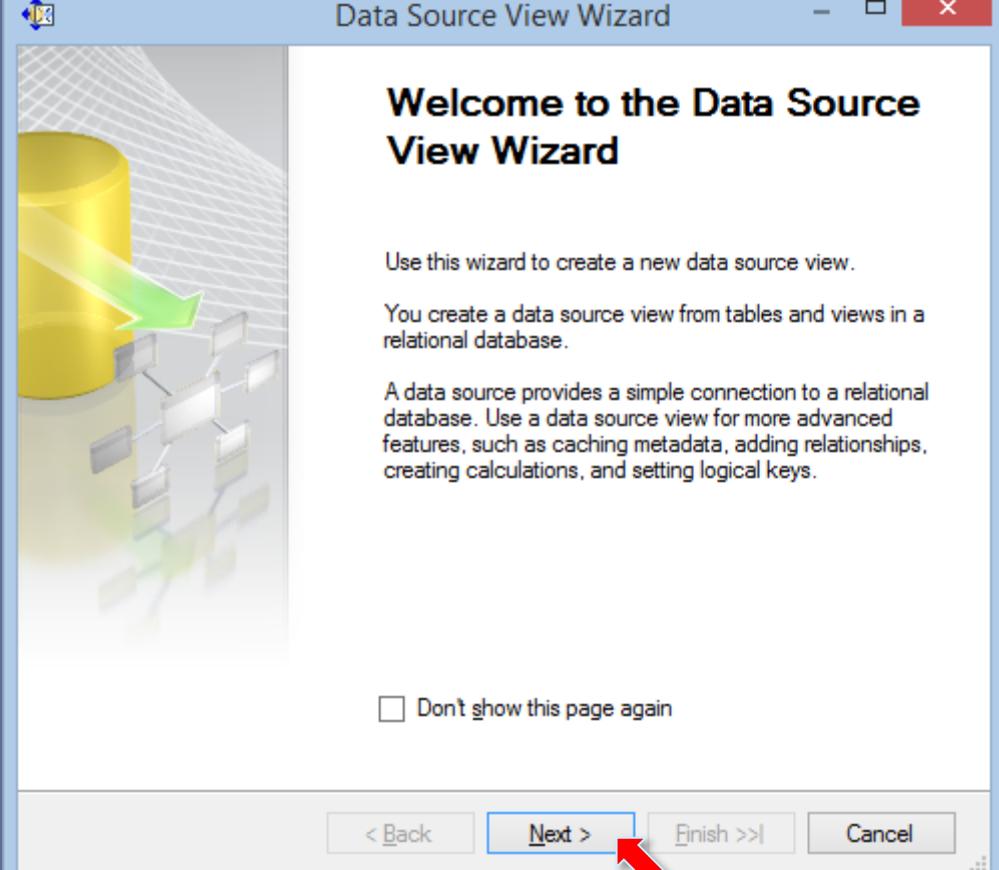
Use this wizard to create a new data source view.

You create a data source view from tables and views in a relational database.

A data source provides a simple connection to a relational database. Use a data source view for more advanced features, such as caching metadata, adding relationships, creating calculations, and setting logical keys.

Don't show this page again

< Back Next > Finish >> Cancel



Solution Explorer

Properties

Source Views

Notifications

Output Error List Variables

Add to Source Control Select Repository

This item does not support previewing

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Analysi...utorial

SSIS Toolbox

Develop Default Start

Data Source View Wizard

Select a Data Source

Select an existing relational data source or create a new one.

Relational data sources:

Adventure Works DW2022

Data source properties:

Property	Value
Data Source	(local)
Initial Catalog	AdventureWorksDW20...
Integrated Se...	SSPI
Provider	SQLOLEDB.1

New Data Source... Advanced...

< Back Next > Finish >> Cancel

The screenshot shows the 'Data Source View Wizard' window in Microsoft SQL Server Integration Services (SSIS). The title bar says 'Data Source View Wizard'. The main area is titled 'Select a Data Source' with the sub-instruction 'Select an existing relational data source or create a new one.' Below this, there's a section for 'Relational data sources:' which lists 'Adventure Works DW2022'. To the right, there's a 'Data source properties:' table with the following rows:

Property	Value
Data Source	(local)
Initial Catalog	AdventureWorksDW20...
Integrated Se...	SSPI
Provider	SQLOLEDB.1

At the bottom of the wizard, there are four buttons: '< Back', 'Next >', 'Finish >>', and 'Cancel'. A red arrow points to the 'Adventure Works DW2022' entry in the list, and another red arrow points to the 'Next >' button.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Inalvsi...tutorial

Help

SSIS Toolbox

Select Tables and Views

Select objects from the results of the previous step.

Available objects:

Name	Type
AdventureWorksD...	Table
DatabaseLog (dbo)	Table
DimAccount (dbo)	Table
DimCurrency (dbo)	Table
DimCustomer (dbo)	Table
DimDate (dbo)	Table
DimDepartmentGro...	Table
DimEmployee (dbo)	Table
DimGeography (dbo)	Table
DimOrganization (d...	Table
DimProduct (dbo)	Table
DimProductCatego...	Table
DimProductSubcat...	Table
DimPromotion (dbo)	Table
DimReseller (dbo)	Table
DimSalesReason (...)	Table
DimSalesTerritory (...)	Table
DimScenario (dbo)	Table
FactAdditionalallInter...	Table
FactCallCenter (dbo)	Table
FactCurrencyRate ...	Table
FactFinance (dbo)	Table
FactInternetSales (...)	Table
FactInternetSales...	Table
FactProductInventor...	Table

Included objects:

Name	Type
------	------

>> <<

Filter:

Add Related Tables

Show system objects

< Back Next > Finish >> Cancel

Explorer (Ctrl + E)

'Analysis Services Tutorial' (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Dimensions

Measures

Assemblies

Cellaneous

Properties

Solution Explorer

Notifications

This item does not support previewing

Add to Source Control Select Repository

1

Here, select the tables that are going to be included in the *data source view*. You can select multiple tables by clicking each while holding down the CTRL key.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Analysis Services Tutorial

SSIS Toolbox

Properties

Source Views

Dimensions

Assemblies

Cellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

1

Data Source View Wizard

Select Tables and Views

Select objects from the relational database to be included in the data source view.

Available objects:

Name	Type
AdventureWorksD...	Table
DatabaseLog (dbo)	Table
DimAccount (dbo)	Table
DimCurrency (dbo)	Table
DimDepartmentGro...	Table
DimEmployee (dbo)	Table
DimOrganization (d...	Table
DimProductCatego...	Table
DimProductSubcat...	Table
DimPromotion (dbo)	Table
DimReseller (dbo)	Table
DimSalesReason (...	Table
DimSalesTerritory (...	Table
DimScenario (dbo)	Table
FactAdditionalInter...	Table
FactCallCenter (dbo)	Table
FactCurrencyRate ...	Table
FactFinance (dbo)	Table
FactInternetSales...	Table
FactProductInvent...	Table
FactResellerSales ...	Table
FactSalesQuota (d...	Table
FactSurveyRespo...	Table
NewFactCurrency...	Table
NewFactCurrency...	Table

Included objects:

Name	Type
DimCustomer (dbo)	Table
DimDate (dbo)	Table
DimGeography (d...	Table
DimProduct (dbo)	Table
FactInternetSales ...	Table

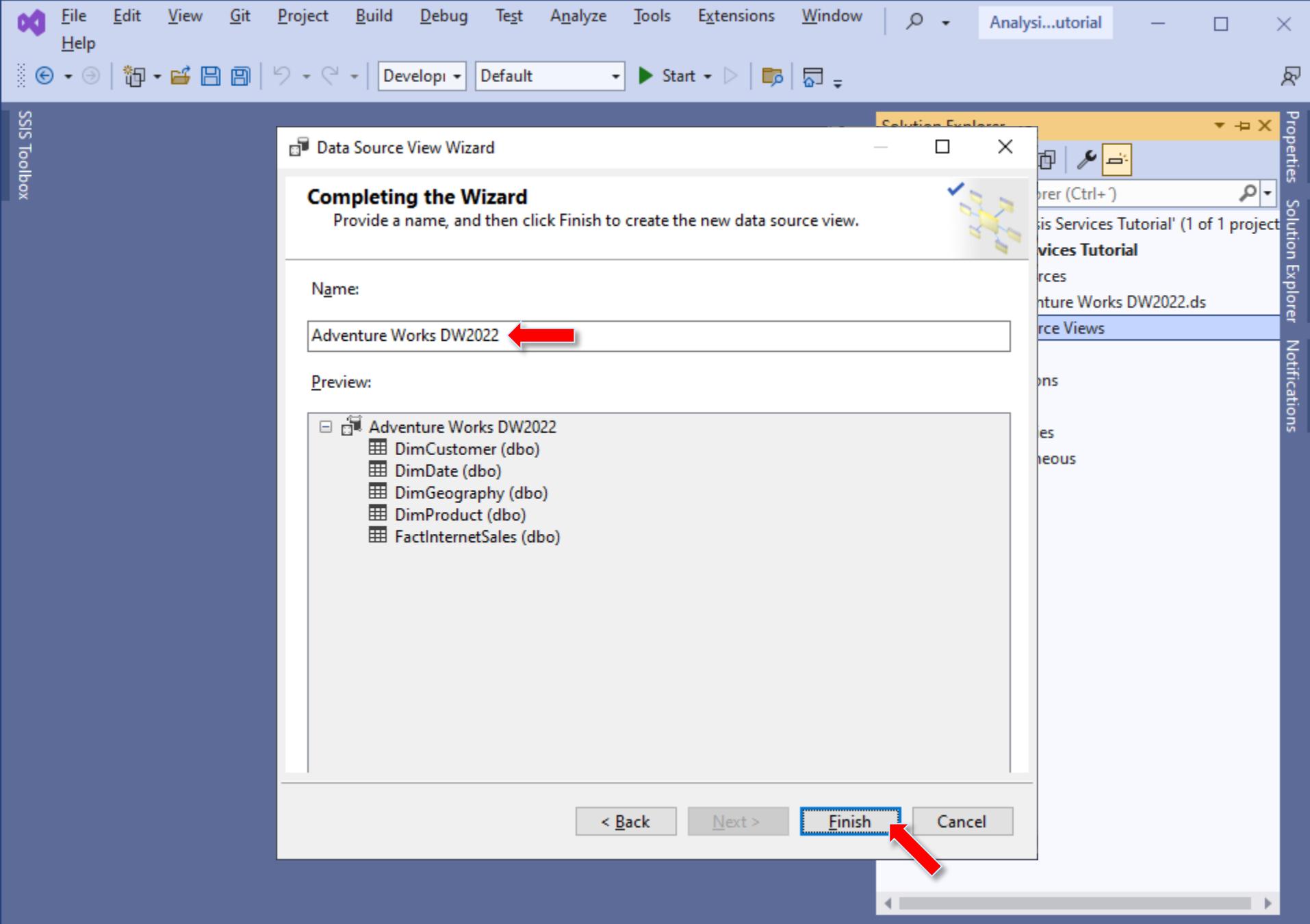
> < >> <<

Filter: Add Related Tables

Show system objects

< Back Next > Finish >> Cancel

The screenshot shows the 'Select Tables and Views' step of the Data Source View Wizard. On the left, under 'Available objects:', there is a large list of tables from the AdventureWorksDW database. On the right, under 'Included objects:', there is a smaller list of tables that have been selected. Between the two lists are four buttons: '>', '<', '>>', and '<<'. A red arrow points to the top-left button ('>'). At the bottom of the wizard window, there are buttons for '< Back', 'Next >', 'Finish >>', and 'Cancel'. A second red arrow points to the 'Next >' button.



Output Error List Variables

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG

Server Explorer SSIS Toolbox

Adventure Works DW2012.dsv [Design]*

Diagram Organizer

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

If necessary, double click on *Adventure Works 2022.dsv* (in Solution Explorer) to open it. The content of the data source is displayed in *Data Source View Designer*. This designer contains the following elements:

- A *Diagram Pane* in which the tables and their relationships are represented graphically;
- A *Tables Pane* in which the tables and their schema elements are displayed in a tree view;
- A *Diagram Organizer* pane in which you can create sub-diagrams so that you can view subsets of the data source view;
- A *Toolbar* that is specific to *Data Source View Designer*.

```
graph TD; SalesOrderNumber --> DateKey; SalesOrderNumber --> DimProduct; DimProduct
```

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG

Adventure Works DW2012.dsv [Design]

Diagram Organizer

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

BirthDate
MaritalStatus

FactInternetSales

- SalesOrderNumber
- SalesOrderLineN...
- ProductKey
- OrderDateKey
- DueDateKey
- ShipDateKey
- CustomerKey
- PromotionKey
- CurrencyKey
- SalesTerritoryKey

DimDate

- Date
- FullD...
- DayN...
- Engli...
- Span...
- Fren...
- DayN...
- DayN...
- Week...
- Engli...

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategor...
- WeightUnitMeasure...
- SizeUnitMeasureC...
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag

Cubes

Dimensions

- New Dimension...
- New Linked Dimension...
- Paste

Ctrl+V

Getting Started (SSIS) Error List Variables Output

This item does not support previewing

Next you'll use the *Dimension Wizard* to build a *Date dimension*. *Date dimensions* are attached to virtually every fact table to allow navigation of the fact table through familiar dates, months, fiscal periods, and special days on the calendar. You would never want to compute Easter in SQL, but rather want to look it up in the date dimension. The date dimension typically has many attributes describing characteristics such as week number, month name, fiscal period, and national holiday indicator.

```
graph TD; FactInternetSales --> DimDate; FactInternetSales --> DimProduct; DimCustomer --> BirthDate; DimCustomer --> MaritalStatus;
```

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window | Analysis Services Tutorial

Adventure WorksDW2022.dsv [Design]

SSIS Toolbox

Diagram Organizer

<All Tables>

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

Dimension Wizard

Welcome to the Dimension Wizard

Use this wizard to create a new dimension. You first select a data source view and tables for the dimension, and then set its properties. You can also opt to build a dimension without using an underlying data source.

Don't show this page again

< Back Next > Finish >> Cancel

Solution Explorer

Explorer (Ctrl + E)

Analysis Services Tutorial (1 of 1 project)

Analysis Services Tutorial

Source

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

Properties

Solution Explorer

Notifications

Add to Source Control Select Repository

This item does not support previewing

Output Error List Variables

A red arrow points to the "Next >" button in the Dimension Wizard dialog box.

Date dimension will be based on an existing table.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Adventure WorksDW2022.dsv [Design]

Diagram Organizer <All Tables>

Tables DimCustomer DimDate DimGeography DimProduct FactInternetSales

Dimension Wizard

Select Creation Method

You can base the dimension on an existing table or generate a new table as the source.

How would you like to create the dimension?

Use an existing table

Generate a time table in the data source

Generate a time table on the server

Generate a non-time table in the data source

Template: (None)

Description:

Create a dimension based on one or more tables in a data source. The attributes that are available for the dimension will depend on the structure of the data in the table.

< Back Next > Finish >> Cancel

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

Screenshot of Microsoft Visual Studio showing the SSIS Toolbox and Dimension Wizard.

The SSIS Toolbox is visible on the left, showing the **Diagram Organizer** and a list of tables: DimCustomer, DimDate, DimGeography, DimProduct, and FactInternetSales.

The main area displays the **Dimension Wizard** with the title **Specify Source Information**. It asks to "Select a data source and specify how the dimension is bound to it." A 3D cube icon is present.

The **Main table:** dropdown contains "DimDate" (highlighted with a red arrow).

The **Key columns:** section shows "DateKey" and "(Add key column)".

At the bottom, there are buttons: < Back, **Next >** (highlighted with a red arrow), Finish >>, and Cancel.

The Solution Explorer on the right shows a project named "Adventure Works DW2022" with files like "Adventure Works DW2022.dsv" and "Adventure Works DW2022.ds".

Output, Error List, and Variables tabs are visible at the bottom.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Analysi...utorial

SSIS Toolbox

Adventure Wo....dsv [Design]

Diagram Organizer

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

Output Error List Variables

Develop Default Start

Dimension Wizard

Select Dimension Attributes

Specify dimension attributes and select Enable Browsing to surface them as hierarchies.

Available attributes:

Attribute Name	Enable Browsing	Attribute Type
<input type="checkbox"/> Attribute Name	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/> Date Key	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/> Full Date Alternate Key	<input checked="" type="checkbox"/>	Regular
<input type="checkbox"/> Day Number Of Week	<input type="checkbox"/>	Regular
<input type="checkbox"/> English Day Name Of Week	<input type="checkbox"/>	Regular
<input type="checkbox"/> Spanish Day Name Of Week	<input type="checkbox"/>	Regular
<input type="checkbox"/> French Day Name Of Week	<input type="checkbox"/>	Regular
<input type="checkbox"/> Day Number Of Month	<input type="checkbox"/>	Regular
<input type="checkbox"/> Day Number Of Year	<input type="checkbox"/>	Regular
<input type="checkbox"/> Week Number Of Year	<input type="checkbox"/>	Regular
<input checked="" type="checkbox"/> English Month Name	<input checked="" type="checkbox"/>	Regular
<input type="checkbox"/> Spanish Month Name	<input type="checkbox"/>	Regular
<input type="checkbox"/> French Month Name	<input type="checkbox"/>	Regular
<input type="checkbox"/> Month Number Of Year	<input type="checkbox"/>	Regular
<input checked="" type="checkbox"/> Calendar Quarter	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/> Calendar Year	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/> Calendar Semester	<input checked="" type="checkbox"/>	Regular
<input type="checkbox"/> Fiscal Quarter	<input type="checkbox"/>	Regular
<input type="checkbox"/> Fiscal Year	<input type="checkbox"/>	Regular
<input type="checkbox"/> Fiscal Semester	<input type="checkbox"/>	Regular

< Back Next > Finish >> Cancel

Here, you select the table attributes to be included in the *Date* dimension.

Properties

Analysis Services Tutorial (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

Add to Source Control Select Repository

This item does not support previewing

1

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window | Analysis Tutorial

Help

Dim Customer.dim [Design] Analysis Servic...l.cube [Design] Dim Date.dim

SSIS Toolbox

Diagram Organizer <All Tables>

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

Output Error List Variables

This item does not support previewing

Develop Default Start

Change the semantic meaning (Attribute Type) of the *Full Date Alternate Key* attribute from *Regular* to *Date*.

Dimension Wizard

Select Dimension Attributes

Specify dimension attributes and select Enable Browsing to surface them as hierarchies.

Available attributes:

<input type="checkbox"/>	Attribute Name	<input checked="" type="checkbox"/> Enable Browsing	Attribute Type
<input checked="" type="checkbox"/>	Date Key	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/>	Full Date Alternate Key	<input checked="" type="checkbox"/>	Regular
<input type="checkbox"/>	Day Number Of Week	<input type="checkbox"/>	
<input type="checkbox"/>	English Day Name Of Week	<input type="checkbox"/>	
<input type="checkbox"/>	Spanish Day Name Of Week	<input type="checkbox"/>	
<input type="checkbox"/>	French Day Name Of Week	<input type="checkbox"/>	
<input type="checkbox"/>	Day Number Of Month	<input type="checkbox"/>	
<input type="checkbox"/>	Day Number Of Year	<input type="checkbox"/>	
<input type="checkbox"/>	Week Number Of Year	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	English Month Name	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	Spanish Month Name	<input type="checkbox"/>	
<input type="checkbox"/>	French Month Name	<input type="checkbox"/>	
<input type="checkbox"/>	Month Number Of Year	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	Calendar Quarter	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/>	Calendar Year	<input checked="" type="checkbox"/>	Regular
<input checked="" type="checkbox"/>	Calendar Semester	<input checked="" type="checkbox"/>	Regular
<input type="checkbox"/>	Fiscal Quarter	<input type="checkbox"/>	Regular
<input type="checkbox"/>	Fiscal Year	<input type="checkbox"/>	Regular
<input type="checkbox"/>	Fiscal Semester	<input type="checkbox"/>	Regular

Attribute Type dropdown menu:

- Calendar
- Date
- Day of Half Year
- Day of Month
- Day of Quarter
- Day of Ten Days
- Day of Trimester
- Day of Week
- Day of Year
- Date

OK Cancel

Properties Solution Explorer Notifications

Select Repository

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Analysi...utorial

SSIS Toolbox

Adventure Wo....dsv [Design]

Diagram Organizer

Tables

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

Output Error List Variables

Develop Default Start

Dimension Wizard

Select Dimension Attributes

Specify dimension attributes and select Enable Browsing to surface them as hierarchies.

Available attributes:

Attribute Name	Enable Browsing	Attribute Type
Date Key	<input checked="" type="checkbox"/>	Regular
Full Date Alternate Key	<input checked="" type="checkbox"/>	Date
Day Number Of Week	<input type="checkbox"/>	Regular
English Day Name Of Week	<input type="checkbox"/>	Regular
Spanish Day Name Of Week	<input type="checkbox"/>	Regular
French Day Name Of Week	<input type="checkbox"/>	Regular
Day Number Of Month	<input type="checkbox"/>	Regular
Day Number Of Year	<input type="checkbox"/>	Regular
Week Number Of Year	<input type="checkbox"/>	Regular
English Month Name	<input checked="" type="checkbox"/>	Month
Spanish Month Name	<input type="checkbox"/>	Regular
French Month Name	<input type="checkbox"/>	Regular
Month Number Of Year	<input type="checkbox"/>	Regular
Calendar Quarter	<input checked="" type="checkbox"/>	Quarter
Calendar Year	<input checked="" type="checkbox"/>	Year
Calendar Semester	<input checked="" type="checkbox"/>	Half Year
Fiscal Quarter	<input type="checkbox"/>	Regular
Fiscal Year	<input type="checkbox"/>	Regular
Fiscal Semester	<input type="checkbox"/>	Regular

< Back Next > Finish >> Cancel

Using the same procedure, change the attribute type of the highlighted attributes as indicated below.

Explorer (Ctrl + F)

Analysis Services Tutorial' (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

Add to Source Control Select Repository

This item does not support previewing

1

Screenshot of Microsoft SQL Server Management Studio (SSMS) showing the Dimension Wizard.

The SSIS Toolbox is visible on the left, and the Solution Explorer shows the project 'Analysis Services Tutorial' with 'Adventure Works DW2022.ds' selected.

The main window displays the 'Dimension Wizard' titled 'Completing the Wizard'. A red arrow points to the 'Name:' input field containing 'Dim Date'. Another red arrow points to the 'Finish' button at the bottom right of the wizard window.

Tables listed in the SSIS Toolbox:

- DimCustomer
- DimDate
- DimGeography
- DimProduct
- FactInternetSales

Output, Error List, and Variables tabs are visible at the bottom.

This item does not support previewing ↑ Add to Source Control ▾ Select Repository ▾

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENS

Dim Date.dim [Design] Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Quick Launch (Ctrl+Q)

Dimension Designer displays the Date dimension.

The *Cube Wizard* helps to define the measure groups (fact tables) and dimensions for a cube.

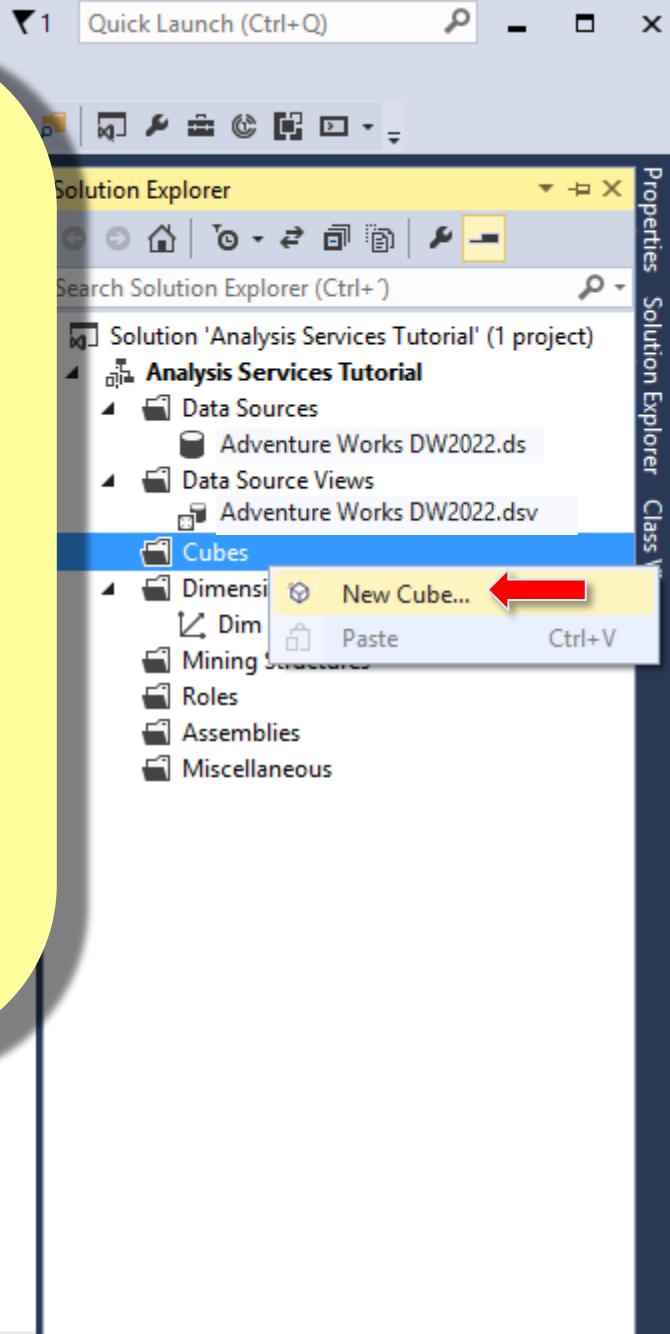
A **fact table** contains:

- A primary key made up by the foreign keys that connect to dimension tables;
- The numerical measures of a business (e.g.: units sold; sales amounts; units ordered), which may be analyzed using statistical functions (e.g.: sum; average).

A **dimension** table provides the basis for analyzing data in the fact table. It is used to answer “Who”, “What”, “When”, “Where” and “How” questions about the business events stored in the fact table.

A **cube** is a set of related measures and dimensions that is used to analyze data. The measures and dimensions in a cube are derived from the tables and views in the data source view on which the cube is based.

Next, you'll use the *Cube Wizard* (accessible from *Solution Explorer*) to create a (new) cube.



Screenshot of Microsoft SQL Server Management Studio (SSMS) showing the Cube Wizard.

The ribbon menu at the top includes: File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, a search bar, and tabs for Analysis Services Tutorial, Default, Start, and a few others.

The left sidebar contains the SSIS Toolbox and the Solution Explorer, which lists the project 'Analysis Services Tutorial' (1 of 1 project), Sources, Adventure Works DW2022.ds, Source Views, Adventure Works DW2022.dsv, Dimensions, Assemblies, and Miscellaneous.

The main workspace shows the 'Cube Wizard' window titled 'Welcome to the Cube Wizard'. It features a large image of a 3D cube and a descriptive text: "Use this wizard to create a new cube. First, you select the data source view and tables for the cube, and then you set its properties. You can also opt to create a cube without using a data source." Below this is a checkbox labeled "Don't show this page again".

At the bottom of the wizard window are four buttons: '< Back', 'Next >', 'Finish >>', and 'Cancel'. A red arrow points to the 'Next >' button.

The bottom navigation bar includes Output, Error List, Variables, Add to Source Control, Select Repository, and a status message: "This item does not support previewing".

Screenshot of Microsoft Analysis Services Cube Wizard in Visual Studio.

The window title is "Cube Wizard".

Select Creation Method:

Cubes can be created by using existing tables, creating an empty cube, or generating tables in the data source.

How would you like to create the cube?

Use existing tables 

Create an empty cube

Generate tables in the data source

Template:
(None)

Description:
Create a cube based on one or more tables in a data source.

Buttons at the bottom: < Back, Next > (highlighted with a red arrow), Finish >>, Cancel.

SSIS Toolbox is visible on the left.

Solution Explorer is visible on the right.

Output, Error List, Variables are visible at the bottom.

This item does not support previewing

Add to Source Control

Select Repository

1

Suggest button examines the tables and suggests *FactInternetSales* as a measure group table. Measure group tables, also called fact tables, contain the measures you are interested in, such as the number of units sold.

The screenshot shows the "Cube Wizard" dialog box in Microsoft SQL Server Data Tools (SSDT). The dialog is titled "Select Measure Group Tables" and displays a list of tables under "Measure group tables". The table "FactInternetSales" is selected, indicated by a checked checkbox. A red arrow points to the "Suggest" button in the top right corner of the dialog. Another red arrow points to the "Next >" button at the bottom right of the dialog. The background shows the SSDT interface with the SSIS Toolbox on the left and the Solution Explorer on the right.

Output Error List Variables

This item does not support previewing ↑ Add to Source Control ▾ Select Repository ▾ 1

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Dim Date.dim [Design] * Adventure Wor...2.dsv [Design]

Dimension Structure Attribute Relationships Translations

SSIS Toolbox

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Cube Wizard

Select Measures

Select measures that you want to include in the cube.

Measure

- Fact Internet Sales
 - Promotion Key
 - Currency Key
 - Sales Territory Key
 - Revision Number
- Order Quantity
- Unit Price
- Extended Amount
- Unit Price Discount Pct
- Discount Amount
- Product Standard Cost
- Total Product Cost
- Sales Amount
- Tax Amt
- Freight
- Fact Internet Sales Count

< Back Next > Finish >> Cancel

Explorer (Ctrl + E)

Analysis Services Tutorial' (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

1

By default, the wizard selects as measures/metrics all numeric columns in the fact table that are not linked to dimensions. However, the first four columns are not actual measures, so they need to be unselected.

The screenshot shows the 'Cube Wizard' dialog box in Visual Studio. The title bar says 'Cube Wizard'. The main area is titled 'Select Measures' with the sub-instruction 'Select measures that you want to include in the cube.' Below this is a list of items under the heading 'Measure'. Four items are highlighted with blue checkmarks and have red arrows pointing to them from the text above: 'Promotion Key', 'Currency Key', 'Sales Territory Key', and 'Revision Number'. The rest of the items in the list have grey checkmarks. At the bottom of the dialog are buttons: '< Back', 'Next >', 'Finish >>', and 'Cancel'. A large red arrow points to the 'Next >' button. A yellow callout bubble with black text is positioned in the top right corner of the image, containing the explanatory text about the non-measure items.

Select the already existing Date Dimension.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window | Analysis Services Tutorial

Dim Date.dim [Design] * Adventure Works DW2022.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

SSIS Toolbox Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Cube Wizard

Select Existing Dimensions

Select existing dimensions to include in the cube.

Dimension

Dim Date

< Back Next > Finish >> Cancel

Solution Explorer

Explorer (Ctrl + E)

Analysis Services Tutorial' (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

1

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Analysi...utorial

Help

SSIS Toolbox

Dim Date.dim [Design]* Adventure Wor...2.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes

- Dim Date
 - Calendar Quarter
 - Calendar Semester
 - Calendar Year
 - Date Key
 - English Month Name
 - Full Date Alternate Key

Cube Wizard

Select New Dimensions
Select new dimensions to be created, based on available tables.

Dimension

Dim Customer

- DimCustomer
- DimGeography

Dim Product

- DimProduct

Fact Internet Sales

- FactInternetSales

< Back Next > Finish >> Cancel

...and also all the other dimensions (if not already selected), except the fact table (*FactInternetSales*).

Explorer (Ctrl + E)
Analysis Services Tutorial' (1 of 1 project)
Analysis Services Tutorial
Sources
Adventure Works DW2022.ds
Source Views
Adventure Works DW2022.dsv
Dimensions
Assemblies
Miscellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

1

Name the cube as Analysis Services Tutorial.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window | Analysi...utorial

Dim Date.dim [Design] * Adventure Wor...2.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

SSIS Toolbox

Attributes

- Dim Date
 - Calendar Quarter
 - Calendar Semester
 - Calendar Year
 - Date Key
 - English Month Name
 - Full Date Alternate Key

Cube Wizard

Completing the Wizard

Name the cube, review its structure, and then click Finish to save the cube.

Cube name: **Analysis Services Tutorial**

Preview:

- Measure groups
 - Fact Internet Sales
 - Order Quantity
 - Unit Price
 - Extended Amount
 - Unit Price Discount Pct
 - Discount Amount
 - Product Standard Cost
 - Total Product Cost
 - Sales Amount
 - Tax Amt
 - Freight
 - Fact Internet Sales Count
 - Dimensions
 - Dim Date

< Back Next > **Finish** Cancel

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

Properties Solution Explorer

Analysis Services Tutorial' (1 of 1 project)

Analysis Services Tutorial

Sources

Adventure Works DW2022.ds

Source Views

Adventure Works DW2022.dsv

Dimensions

Assemblies

Cellaneous

In Solution Explorer, the *Analysis Services Tutorial* cube appears in the Cubes folder, and the *Customer* and *Product* database dimensions appear in the Dimensions folder. Additionally, in the center of the development environment, the *Cube Structure* tab displays the *Analysis Services Tutorial* cube.

The *Date* dimension is used as the basis for three date-related facts in the fact table. The three date-related facts let users explore the cube by three separate facts that are related to each product sale: the product order date, the due date for the order fulfillment and the order ship date.

The screenshot shows the Microsoft Visual Studio interface with the 'Analysis Services Tutorial' project open. The 'Cube Structure' tab is selected in the ribbon. In the center, the 'FactInternetSales' fact table is displayed, connected via arrows to three dimensions: 'DimCustomer', 'DimDate', and 'DimProduct'. The 'DimCustomer' dimension is shown with attributes like MiddleName, LastName, NameStyle, BirthDate, and MaritalStatus. The 'DimDate' dimension is shown with attributes like DateKey, FullDateAlternateKey, DayNumberOfWeek, and MonthNumberofYear. The 'DimProduct' dimension is shown with attributes like ProductKey, ProductAlternateKey, and EnglishProductName. The 'Dimensions' and 'Measures' panes are also visible on the left side of the interface.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Analysis Services Tutorial

Analysis Serv...cube [Design]* Dim Date.dim [Design]* Adventure Wor...2.dsv [Design]

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregation

Measures

Analysis Services Tutorial Fact Internet Sales

Dimensions

Analysis Services Tutorial Ship Date Order Date Dim Customer Due Date Dim Product

Data Source View

Customer

- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate
- MaritalStatus

StateProvince

- StateProvinceName
- CountryRegionCode
- EnglishCountryName
- SpanishCountryName
- FrenchCountryName
- PostalCode
- SalesTerritoryKey

FactInternetSales

- SalesOrderNumber
- SalesOrderLineNumber
- ProductKey
- OrderDateKey
- DueDateKey
- ShipDateKey
- CustomerKey
- PromotionKey
- CurrencyKey
- SalesTerritoryKey

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName

Solution Explorer

Search Solution Explorer (Ctrl + F)

Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim** (highlighted with a red arrow)
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

Properties

Notifications

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

Double-click on the highlighted object (*DimCustomer.dim*).

```
graph TD; Customer[Customer] --> FactInternetSales[FactInternetSales]; FactInternetSales --> DimProduct[DimProduct];
```

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Customer.dim [Design]* Analysis Services Tutorial.cube [D]

Dimension Structure Attribute Relationships Translations

Attributes Hierarchies

To create a new hierarchy, drag an attribute here.

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate**
- MaritalStatus**
- Suffix
- Gender**
- EmailAddress
- YearlyIncome**
- TotalChildren
- NumberChildrenAtHome
- EnglishEducation**
- SpanishEducation
- FrenchEducation
- EnglishOccupation**
- SpanishOccupation
- FrenchOccupation
- HouseOwnerFlag**
- NumberCarsOwned
- AddressLine1
- AddressLine2
- Phone
- DateFirstPurchase
- CommuteDistance

Add the following attributes to be included in the dimension. By default, only the primary keys of both dimensions (*DimCustomer* and *DimGeography*) were included. You need to select and drag the highlighted attributes from the *Customer* table in the *Data Source View* pane onto the *Attributes* pane.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIM

Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design]* Dim Date.dim [Design] Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- Commute Distance
- Customer Key
- Date First Purchase
- English Education
- English Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Total Children
- Yearly Income

To create a new hierarchy, drag an attribute here.

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate
- MaritalStatus
- Suffix
- Gender
- EmailAddress
- YearlyIncome
- TotalChildren
- NumberChildrenAtHo...
- EnglishEducation
- SpanishEducation
- FrenchEducation
- EnglishOccupation
- SpanishOccupation
- FrenchOccupation
- HouseOwnerFlag
- NumberCarsOwned
- AddressLine1
- AddressLine2
- Phone
- DateFirstPurchase
- CommuteDistance

Getting Started (SSIS) Error List Variables Output

Ready

Dim Customer is now updated with the selected attributes.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA

Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- Commute Distance
- Customer Key
- Date First Purchase
- English Education
- English Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Total Children
- Yearly Income

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Do the same for the table DimGeography. You need to drag the highlighted attributes from the *Geography* table in the *Data Source View* pane onto the *Attributes* pane.

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION Dimension Development

Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design] Dim Date.dim [Design] Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- English Country Region Name
- English Education
- English Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province Name
- Total Children
- Yearly Income

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Getting Started (SSIS) Error List Variables Output

Item(s) Saved

Dim Customer is now updated with the selected attributes.

In Solution Explorer, double-click on the highlighted object to select the DimProduct.

The screenshot shows the Microsoft SQL Server Data Tools (SSDT) interface. The title bar reads "Analysis...utorial". The ribbon menu includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window. The toolbar has icons for Undo, Redo, Save, and various development tools. The tabs at the top show "Dim Customer.dim [Design]", "Analysis Serv...cube [Design]*", and "Dim Date.dim [Design]".

The main area displays the "Cube Structure" tab of the Analysis Services cube [Design]. It shows a "Data Source View" diagram with three components: "Customer", "FactInternetSales", and "DimProduct". Arrows indicate relationships: FactInternetSales connects to Customer and DimProduct. Dimension tables (Customer and DimProduct) have arrows pointing to their respective fact table columns.

The left sidebar contains the "SSIS Toolbox" and two lists: "Measures" and "Dimensions". The "Dimensions" list includes "Analysis Services Tutorial", "Ship Date", "Order Date", "Dim Customer", "Due Date", and "Dim Product".

The right sidebar contains the "Properties" and "Solution Explorer" panes. The "Solution Explorer" pane shows the project structure:

- Solution 'Analysis Services Tutorial' (1 of 1 project)
 - Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim** (highlighted with a red arrow)
 - Roles
 - Assemblies
 - Miscellaneous

At the bottom, there are "Output", "Error List", and "Variables" tabs. The status bar at the bottom right includes "Add to Source Control", "Select Repository", and a notification icon with the number 1.

This item does not support previewing

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT

Dim Product.dim [Design] * Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translation

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Add the attributes to be included in the *DimProduct* dimension from the *DimProduct* table. You need to drag the highlighted attributes from the *Product* table in the *Data Source View* pane onto the *Attributes* pane.

Dim Product

Product Key

To create a new hierarchy, drag an attribute here.

DimProduct

StandardCost
FinishedGoodsFlag
Color
SafetyStockLevel
ReorderPoint
ListPrice
Size
SizeRange
Weight
DaysToManufacture
ProductLine
DealerPrice
Class
Style
ModelName
LargePhoto
EnglishDescription
FrenchDescription
ChineseDescription
ArabicDescription
HebrewDescription
ThaiDescription
GermanDescription
JapaneseDescription
TurkishDescription
StartDate
EndDate
Status

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION TOOLS WINDOW HELP

Dim Product.dim [Design]* Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design]* Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Key
- Product Line
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

To create a new hierarchy, drag an attribute here.

DimProduct

- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription
- ArabicDescription
- HebrewDescription
- ThaiDescription
- GermanDescription
- JapaneseDescription
- TurkishDescription
- StartDate
- EndDate
- Status

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

In Solution Explorer, double-click on the highlighted object to select the Analysis Services Tutorial cube.

The screenshot shows the SSMS interface with the following details:

- File Edit View Git Project Build Debug Test Analyze Tools Extensions Window**
- Solution Explorer** (Properties, Notifications)
- Analysis Services Tutorial** (1 of 1 project)
 - Analysis Services Tutorial**
 - Data Sources: Adventure Works DW2022.ds
 - Data Source Views: Adventure Works DW2022.dsv
 - Cubes: Analysis Services Tutorial.cube (highlighted with a red arrow)
 - Dimensions: Dim Date.dim, Dim Customer.dim, Dim Product.dim
 - Roles, Assemblies, Miscellaneous
- Analysis Services Tutorial.cube [Design]** (Current tab)
 - Measures**: Fact Internet Sales
 - Dimensions**: Analysis Services Tutorial
 - Ship Date
 - Order Date
 - Dim Customer
 - Due Date
 - Dim Product
 - Data Source View**: Shows relationships between Customer, StateProvince, FactInternetSales, and DimProduct dimensions.
- Output Error List Variables**
- This item does not support previewing**
- Add to Source Control Select Repository**

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW CUBE TOOLS WINDOW HELP

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design] Dim Date.dim [Design]

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregations Perspectives Translations Browser

Measures

- Analysis Services Tutorial
- Fact Internet Sales
 - Order Quantity
 - Unit Price
 - Extended Amount
 - Unit Price Discount Pct
 - Discount Amount
 - Product Standard Cost
 - Total Product Cost
 - Sales Amount
 - Tax Amt
 - Freight
 - Fact Internet Sales Count

Dimensions

- Analysis Services Tutorial
- Order Date
- Dim Customer
- Due Date
- Ship Date
- Dim Product

Data Source View

```
graph TD; FactInternetSales --> DimCustomer; FactInternetSales --> DimDate; FactInternetSales --> DimProduct; DimCustomer --> DimGeography; DimDate --> DimProduct;
```

Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

To view the cube and dimension data for the objects in the *Analysis Services Tutorial* cube in the *Analysis Services Tutorial* project, you need to deploy the project to a specified instance of Analysis Services and then process the cube and its dimensions. Deploying an Analysis Services project creates the defined objects in an instance of Analysis Services.

The screenshot shows the Microsoft Visual Studio interface. On the left, the Server Explorer and SSIS Toolbox are visible. In the center, the Solution Explorer shows a single project named 'Analysis Services Tutorial'. A context menu is open over this project, with the 'Deploy' option highlighted by a red arrow. Other options in the menu include Edit Database, Generate Relational Schema..., Show Deployment Progress, Process..., Build, Rebuild, Scope to Item, New Solution Explorer View, Add, Set as StartUp Project, Debug, Cut (Ctrl+X), Paste (Ctrl+V), Remove (Del), Rename, Unload Project, and Properties (Alt+Enter). At the bottom of the screen, there are tabs for Getting Started (SSIS), Error List, Variables, and Output, along with a message stating 'This item does not support previewing'.

If you get errors during deployment, you need to do the following:

1. Using *SQL Server Management Studio*, connect to the database engine instance;
2. Expand the *Security* folder and then *Logins*;
3. If the *NT Service\SQLServerOLAPService* login doesn't exist, right click *Logins*, select *New Login*, enter (or copy) *NT Service\SQLServerOLAPService* in the *Login name* and click *OK* to create it.
4. Double click the *NT Service\SQLServerOLAPService* login to edit its properties;
5. Click *User Mapping* (on the left side of the window);
6. Select the checkbox next to the *AdventureWorksDW2022* database. *Role membership* (below) should include *db_datareader* and *public*;
7. Click *OK* to accept the changes.
8. Repeat the project deployment in Visual Studio.

Status:



Deployment Completed Successfully

Getting Started (SSIS) Error List Variables Output

Deploy succeeded

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Analysis Services Tutorial

Dim Customer.dim [Design] Analysis Serv....cube [Design]* Dim Date.dim [Design]

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregation

SSIS Toolbox

Measures

Analysis Services Tutorial Fact Internet Sales

Dimensions

Analysis Services Tutorial Ship Date Order Date Dim Customer Due Date Dim Product

Data Source View

```
graph TD; Customer[Customer] --- SP[StateProvince]; Customer --- FactInternetSales[FactInternetSales]; FactInternetSales --- DimProduct[DimProduct];
```

Output Error List Variables

Double-click on the highlighted object to select the Analysis Services Tutorial cube (if needed)

Solution Explorer

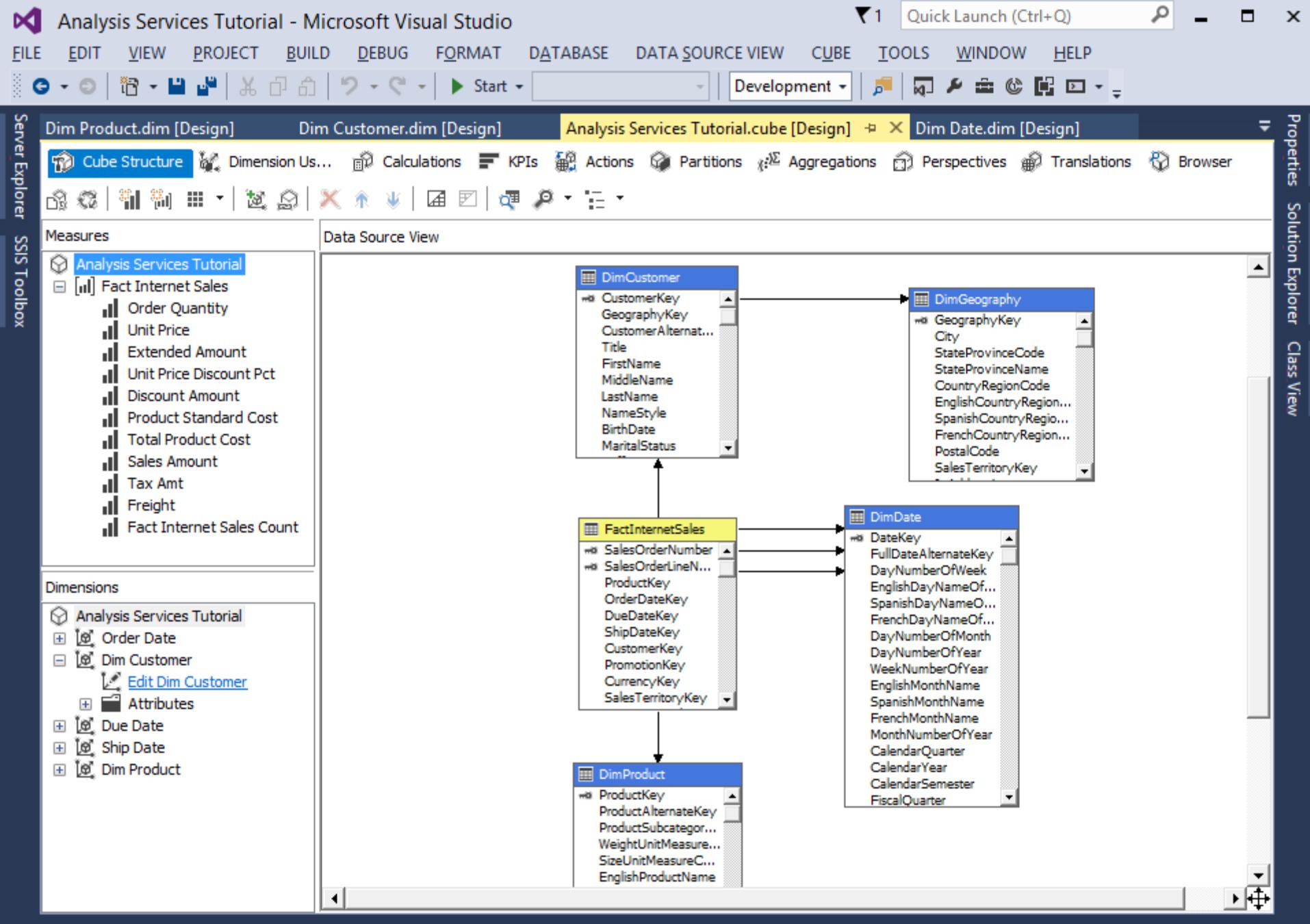
Search Solution Explorer (Ctrl + F)

Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

Properties Solution Explorer Notifications

This item does not support previewing Add to Source Control Select Repository



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE

Dim Product.dim [Design] Dim Customer.dim [Design]

Cube Structure Dimension Us... Calculations

Measures

- Analysis Services Tutorial
- Fact Internet Sales
 - Order Quantity
 - Unit Price
 - Extended Amount
 - Unit Price Discount Pct
 - Discount Amount
 - Product Standard Cost
 - Total Product Cost
 - Sales Amount
 - Tax Amt
 - Freight
 - Fact Internet Sales Count

Dimensions

- Analysis Services Tutorial
- Order Date
- Dim Customer
 - Edit Dim Customer
 - Attributes
- Due Date
- Ship Date
- Dim Product

Data Source View

CustomerKey
GeographyKey
CustomerAlternateKey
Title
FirstName
MiddleName
LastName
NameStyle
BirthDate
MaritalStatus

FactInternetSales

- SalesOrderNumber
- SalesOrderLineNumber
- ProductKey
- OrderDateKey
- DueDateKey
- ShipDateKey
- CustomerKey
- PromotionKey
- CurrencyKey
- SalesTerritoryKey

DimDate

- DateKey
- FullDateAlt
- DayNumber
- EnglishDay
- SpanishDay
- FrenchDay
- DayNumber
- DayNumber
- WeekNumber
- EnglishMonth
- SpanishMonth
- FrenchMonth
- MonthNumber
- CalendarQuarter
- CalendarYear
- CalendarSeason
- FiscalQuarter

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName

DisplayFolder
MeasureExpression
Visible True

Basic

- Description Order Quantity
- ID Order Quantity
- Name Order Quantity

Source FactInternetSales.OrderQuantity

FormatString **#,#**

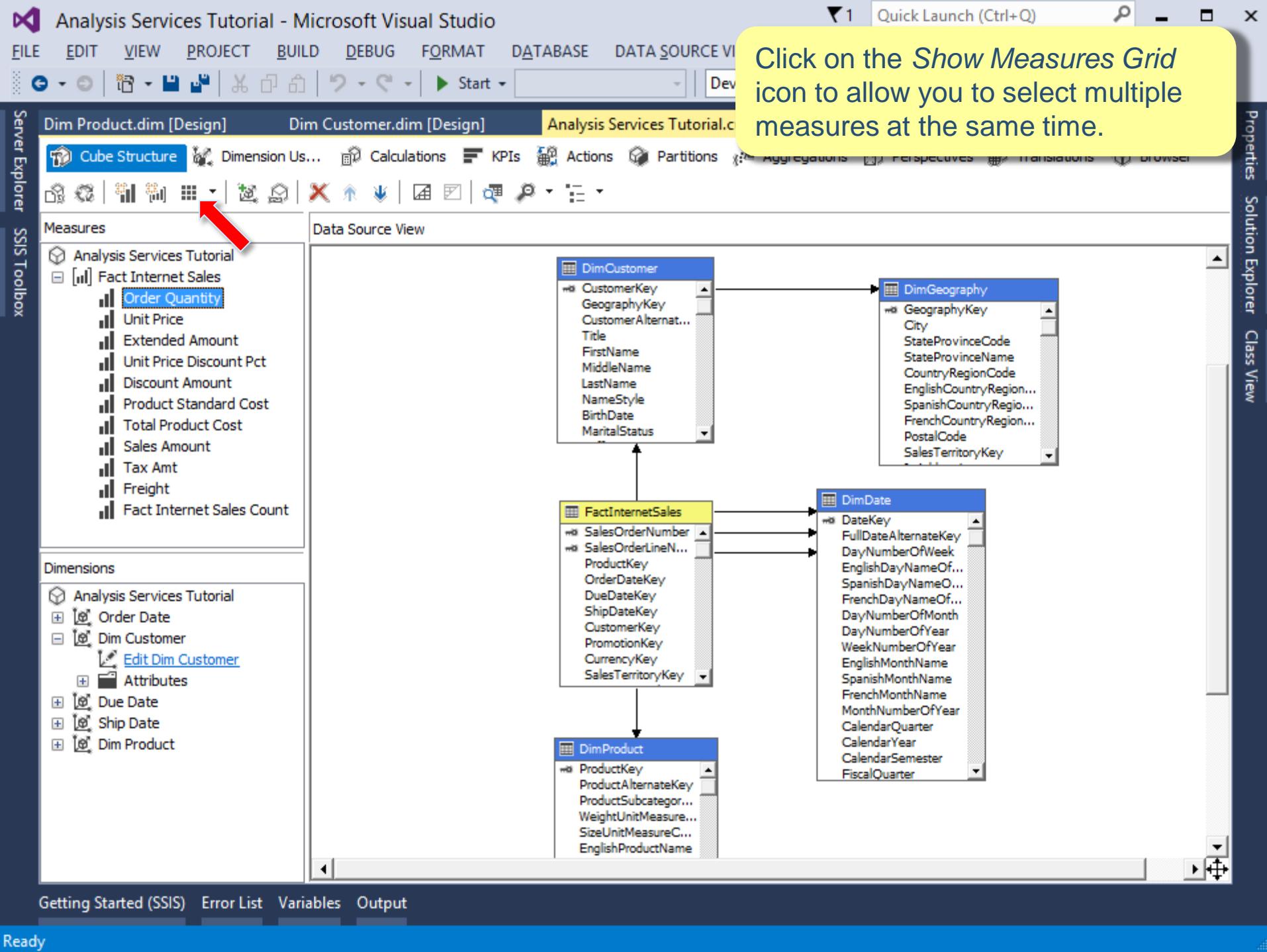
FormatString
Specifies the format used by clients when displaying the measure value.

Getting Started (SSIS) Error List Variables Output

Ready

You can use the *FormatString* property to define formatting settings that control how measures are displayed to users. Next, you'll specify formatting properties for the currency and percentage measures in the *Analysis Services Tutorial* cube. Start by defining the format of the Order Quantity as shown below in order to have a space between each set of three digits.

```
graph TD; FactInternetSales[FactInternetSales] --> DimDate[DimDate]; FactInternetSales --> DimProduct[DimProduct]; DimDate --> DimProduct;
```



Analysis Services Tutorial - Microsoft Visual Studio

File Edit View Project Build Debug Team Format Database Data S... Help

Adventure Works DW2019.dsv [Design] Dim Date.dim [Design] Analysis S...

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregations Perspectives Translations Browser

Measures

	Name	Measure Group	Data Type	Aggregation
	Order Quantity		Integer	Sum
	Unit Price	Internet Sales	Double	Sum
	Extended Amount	Internet Sales	Double	Sum
	Unit Price Discount Pct		Double	Sum
	Discount Amount	Internet Sales	Double	Sum
	Product Standard Cost	Internet Sales	Double	Sum
	Total Product Cost	Internet Sales	Double	Sum
	Sales Amount	Internet Sales	Double	Sum
	Tax Amt	Internet Sales	Double	Sum
	Freight	Internet Sales	Double	Sum
	Fact Internet Sales Co...		Integer	Count

Dimensions

- Analysis Services Tutorial
- + Order Date
- + Dim Customer
- + Due Date
- + Ship Date
- + Dim Product

Select the highlighted measures. You can select multiple measures by clicking each while holding down the **CTRL** key.

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Getting Started (SSIS) Properties

Data Source View

```
graph TD; FactInternetSales --> DimCustomer[DimCustomer]; DimCustomer --> DimGeography[DimGeography]
```

Output Variables Error List Add to Source Control

Ready

Analysis Services Tutorial - Microsoft Visual Studio

File Edit View Project Build Debug Team Database Cube Tools Test Analyze Window

Quick Launch (Ctrl+Q)

Server Explorer Toolbox SSIS Toolbox

Adventure Works DW2019.dsv [Design] Dim Date.dim [Design] Analysis Services Tutorial.cube [De]

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregation

Measures

Name	Measure Group	Data Type	Aggregation
Order Quantity		Integer	Sum
Unit Price	Fact Internet Sales	Double	Sum
Extended Amount	Fact Internet Sales	Double	Sum
Unit Price Discount Pct		Double	Sum
Discount Amount	Fact Internet Sales	Double	Sum
Product Standard Cost	Fact Internet Sales	Double	Sum
Total Product Cost	Fact Internet Sales	Double	Sum
Sales Amount	Fact Internet Sales	Double	Sum
Tax Amt	Fact Internet Sales	Double	Sum
Freight	Fact Internet Sales	Double	Sum
Fact Internet Sales Co...		Integer	Count

Dimensions

- Analysis Services Tutorial
 - + Order Date
 - + Dim Customer
 - + Due Date
 - + Ship Date
 - + Dim Product

Properties

Advanced

AggregateFunction	Sum
DataType	Inherited
DisplayFolder	
MeasureExpression	
Visible	True

Basic

Description	
FormatString	Currency
ID	

Output Variables Error List

Add to Source Control

A yellow callout bubble in the top right corner says "Apply the Currency style to all these measures." with a red arrow pointing to the "FormatString" property in the Properties window.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE CUBE TOOLS WINDOW HELP Development

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design]*

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregations Properties

Measures

Name	Measure Group	Data Type	Aggregation
Order Quantity		Integer	Sum
Unit Price		Double	Sum
Extended Amount		Double	Sum
Unit Price Discount Pct	net Sales	Double	Sum
Discount Amount		Double	Sum
Product Standard Cost		Double	Sum
Total Product Cost		Double	Sum
Sales Amount		Double	Sum
Tax Amt		Double	Sum
Freight		Double	Sum
FactInternetSales		Integer	Count

Dimensions

- Analysis Services Tutorial
- + Order Date
- Dim Customer
 - Edit Dim Customer
 - + Attributes
- + Due Date
- + Ship Date
- + Dim Product

Properties

Unit Price Discount Pct Measure

AggregateFunction	Sum
DataType	Inherited
DisplayFolder	
MeasureExpression	
Visible	True

Advanced

Description	
FormatString	Percent
ID	Unit Price Discount Pct
Name	Unit Price Discount Pct

Basic

Description	
FormatString	Percent
ID	Unit Price Discount Pct
Name	Unit Price Discount Pct

Source

FactInternetSales.Unit

FormatString

Specifies the format used by clients when displaying the measure value.

Getting Started (SSIS) Error List Variables Output

Ready

Apply the percentage style to this measure.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE CUBE TOOLS

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial.cube

Cube Structure Dimension Us... Calculations KPIs Actions Partitions A

Measures

Name	Measure Group	Data Type	Aggregation
Order Quantity		Integer	Sum
Unit Price		Double	Sum
Extended Amount		Double	Sum
Unit Price Discount P...	net Sales	Double	Sum
Discount Amount		Double	Sum
Product Standard Cost		Double	Sum
Total Product Cost		Double	Sum
Sales Amount		Double	Sum
Tax Amt		Double	Sum
Freight		Double	Sum

Dimensions

- Analysis Services Tutorial
- + Order Date
- Dim Customer
 - Edit Dim Customer
 - + Attributes
- + Due Date
- + Ship Date
- + Dim Product

Properties

Unit Price Discount Pct Measure

Advanced

AggregateFunction	Sum
DataType	Inherited
DisplayFolder	
MeasureExpression	
Visible	True

Basic

Description	
FormatString	Percent
ID	Unit Price Discount Pct
Name	Unit Price Discount Percentage

Source

FactInternetSales.UnitPriceDisc...

Name
Specifies the name of the object.

Change the name of the attribute (measure) to *Unit Price Discount Percentage*.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE CUBE TOOLS WINDOW

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial.cube

Cube Structure Dimension Us... Calculations KPIs Actions Partitions A

Measures

Name	Measure Group	Data Type	Aggregation
Order Quantity		Integer	Sum
Unit Price		Double	Sum
Extended Amount		Double	Sum
Unit Price Discount P...		Double	Sum
Discount Amount		Double	Sum
Product Standard Cost		Double	Sum
Total Product Cost		Double	Sum
Sales Amount		Double	Sum
Tax Amt	Fact Internet Sales	Double	Sum
Freight		Double	Sum

Dimensions

- Analysis Services Tutorial
- + Order Date
- Dim Customer
 - Edit Dim Customer
 - + Attributes
- + Due Date
- + Ship Date
- + Dim Product

Properties

Tax Amt Measure

Advanced

AggregateFunction	Sum
DataType	Inherited
DisplayFolder	
MeasureExpression	
Visible	True

Basic

Description	
FormatString	Currency
ID	Tax Amt
Name	Tax Amount ←

Source

FactInternetSales.TaxAmt (Doul

Name
Specifies the name of the object.

Getting Started (SSIS) Error List Variables Output

Ready

Change the name of the attribute (measure) to **Tax Amount**.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregations Perspectives Translations Browser

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Measures

Name	Measure Group	Data Type	Aggregation
Order Quantity		Integer	Sum
Unit Price		Double	Sum
Extended Amount		Double	Sum
Unit Price Discount P...		Double	Sum
Discount Amount		Double	Sum
Product Standard Cost		Double	Sum
Total Product Cost		Double	Sum
Sales Amount		Double	Sum
Tax Amount		Double	Sum
Freight		Double	Sum

Dimensions

- Analysis Services Tutorial
- + Order Date
- Dim Customer
 - Edit Dim Customer
 - Attributes
- + Due Date
- + Ship Date
- + Dim Product

Click on the Show Measures Tree icon on the toolbar of the Cube Structure tab to return to measure's tree view.

Data Source View

```
graph TD; DimCustomer[DimCustomer] --> FactInternetSales[FactInternetSales]; FactInternetSales --> DimProduct[DimProduct]
```

DimCustomer

- CustomerKey
- GeographyKey
- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate
- MaritalStatus

FactInternetSales

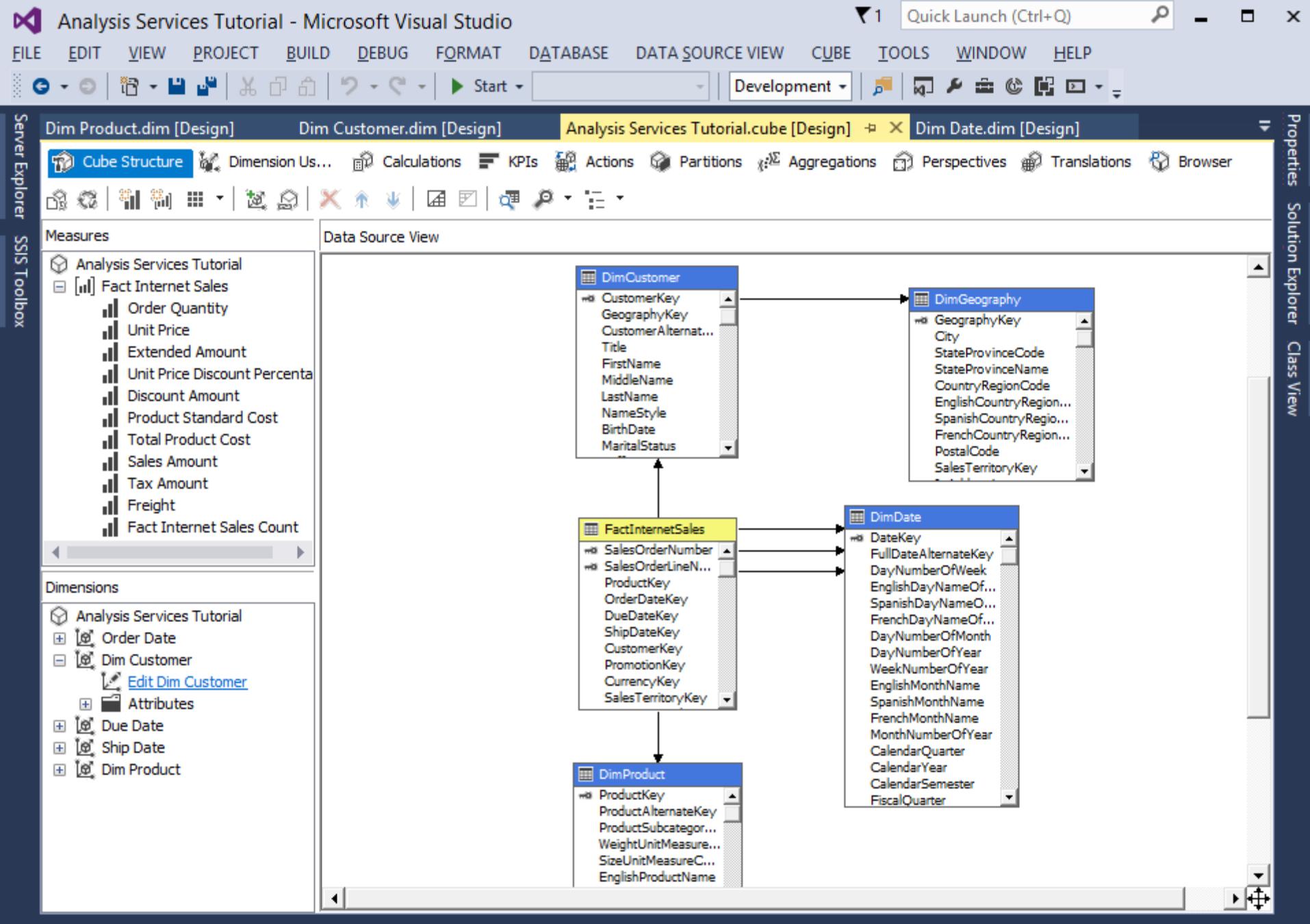
- SalesOrderNumber
- SalesOrderLineNumber
- ProductKey
- OrderDateKey
- DueDateKey
- ShipDateKey
- CustomerKey
- PromotionKey
- CurrencyKey
- SalesTerritoryKey

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureKey
- SizeUnitMeasureKey
- EnglishProductName

Getting Started (SSIS) Error List Variables Output

Ready



File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Analysis Services Tutorial

Dim Customer.dim [Design] Analysis Serv...cube [Design]* Dim Date.dim [Design]

Cube Structure Dimension Usage Calculations KPIs Actions Partitions Aggregation

SSIS Toolbox

Measures

- Analysis Services Tutorial
 - Fact Internet Sales
 - Order Quantity
 - Unit Price
 - Extended Amount
 - Unit Price Discount Percentage
 - Discount Amount
 - Product Standard Cost
 - Total Product Cost
 - Sales Amount
 - Tax Amount
 - Freight
 - Fact Internet Sales Count

Dimensions

- Analysis Services Tutorial
 - Ship Date
 - Order Date
 - Dim Customer
 - Due Date
 - Dim Product

Data Source View

The diagram illustrates the Data Source View (DSV) structure. At the top, the FactInternetSales fact table is shown with its columns: SalesOrderNumber, SalesOrderLineN..., ProductKey, OrderDateKey, DueDateKey, ShipDateKey, CustomerKey, PromotionKey, CurrencyKey, and SalesTerritoryKey. Two arrows point from this fact table to the DimCustomer dimension below it. Another arrow points from the FactInternetSales fact table to the DimProduct dimension at the bottom. The DimCustomer dimension is highlighted with a yellow background, and a red arrow points to it from the text instructions.

DimCustomer dimension:
Title
FirstName
MiddleName
LastName
NameStyle
BirthDate
MaritalStatus

DimProduct dimension:
ProductKey
ProductAlternateKey
ProductSubcategory...
WeightUnitMeasure...
SizeUnitMeasureC...
EnglishProductName

Solution Explorer

Search Solution Explorer (Ctrl + F)

Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim** (highlighted with a red arrow)
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

Properties

Output Error List Variables

Add to Source Control Select Repository

Ready

Double-click on the highlighted object to select the *DimCustomer* dimension.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW

Dim Product.dim [Design] Dim Customer.dim [Design] Analysis Services Tutorial.cub

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- English Country Region Name**
- English Education
- English Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province Name
- Total Children
- Yearly Income

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Quick Launch (Ctrl+Q)

You will now rename some attributes to more user-friendly names, but through a different way.

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION TOOLS WINDOW HELP

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis Services Tutorial.cube [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- Country-Region** (highlighted with a red arrow)
- English Education
- English Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province Name
- Total Children
- Yearly Income

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW Start Development

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis Services Tutorial.cube [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Attributes:

- Dim Customer
 - Birth Date
 - City
 - Commute Distance
 - Customer Key
 - Date First Purchase
 - Country-Region
 - Education
 - Occupation
 - Gender
 - Geography Key
 - House Owner Flag
 - Marital Status
 - Number Cars Owned
 - Number Children At Home
 - Postal Code
 - State Province
 - Total Children
 - Yearly Income

Hierarchies:

To create a new hierarchy, drag an attribute here.

Data Source View:

- DimGeography
 - GeographyKey
 - City
 - StateProvinceCode
 - StateProvinceName
 - CountryRegionCode
 - EnglishCountryRegionName
 - SpanishCountryRegionName
 - FrenchCountryRegionName
 - PostalCode
 - SalesTerritoryKey
 - IpAddressLocator
- DimCustomer
 - CustomerAlternateKey
 - Title
 - FirstName
 - MiddleName
 - LastName
 - NameStyle
 - BirthDate

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Rename the highlighted attributes as presented below.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE D...

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis S...

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

To create a new hierarchy, drag an attribute here.

Dim Geography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Server Explorer SSIS Toolbox Solution Explorer Class View

Create an hierarchy of dimension attributes. An hierarchy provides the basis for analyzing data at different levels of detail/granularity. To create the hierarchy start by dragging the *Country-Region* attribute from the *Attributes* pane into the *Hierarchies* pane.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- Country-Region
- Education
- Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province** ←
- Total Children
- Yearly Income

Hierarchy

- Country-Region
- <new level>

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Drag the *State Province* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Country-Region* level.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis Services T

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City**
- Commute Distance
- Customer Key
- Date First Purchase
- Country-Region
- Education
- Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province
- Total Children
- Yearly Income

Hierarchy

- Country-Region
- State Province
- <new level>

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Drag the *City* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *State-Province* level.

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION Development

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis Services Tutorial.cube [Design]* Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- Country-Region
- Education
- Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province
- Total Children
- Yearly Income

Hierarchy

- Country-Region
- State Province
- City
- <new level>

Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename
Properties Alt+ Enter

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Quick Launch (Ctrl+Q)

Rename the hierarchy name to Customer Geography.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION TOOLS WINDOW HELP

Dim Product.dim [Design] Dim Customer.dim [Design]* Analysis Services Tutorial.cube [Design]* Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City
- Commute Distance
- Customer Key
- Date First Purchase
- Country-Region
- Education
- Occupation
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Postal Code
- State Province
- Total Children
- Yearly Income

Customer Geography

- Country-Region
- State Province
- City
- <new level>

To create a new hierarchy, drag an attribute here.

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- CustomerAlternateKey
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate

Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW Development

Dim Customer.dim [Design] Analysis Services Tutorial.cube [Design] Adventure Works DW

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Customer

- Birth Date
- City**
- Commute Distance
- Country-Region**
- Customer Key
- Date First Purchase
- Education
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Occupation
- Postal Code**
- State Province**
- Total Children
- Yearly Income

Hierarchies

Customer Geography

- Country-Region
- State Province
- City
- <new level>

To create a new hierarchy, drag an attribute here.

Data Source View

DimGeography

- GeographyKey
- City
- StateProvinceCode
- StateProvinceName
- CountryRegionCode
- EnglishCountryRegionName
- SpanishCountryRegionName
- FrenchCountryRegionName
- PostalCode
- SalesTerritoryKey
- IpAddressLocator

DimCustomer

- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate
- MaritalStatus

You will now group related attributes into folders. First, select the highlighted attributes.

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Development

Dim Customer.dim [Design] * Analysis Services Tutorial.cube [Design] Adventure Works

Dimension Structure Attribute Relationships Translations Browser

Attributes

Dim Customer

- Birth Date
- City
- Commute Distance
- Country-Region
- Customer Key
- Date First Purchase
- Education
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Occupation
- Postal Code
- State Province
- Total Children
- Yearly Income

Hierarchies

Customer Geography

- Country-Region
- State Province
- City
- <new level>

To create a new hierarchy, drag an attribute here.

Properties

Advanced

AttributeHierarchyDisplayFolder	Location
AttributeHierarchyEnabled	True
AttributeHierarchyOptimizedState	FullyOptimized
AttributeHierarchyProcessingState	Unprocessed
AttributeHierarchyVisible	True
DiscretizationBucketCount	0
DiscretizationMethod	None
EstimatedCount	0
IsAggregatable	True
OrderBy	Name
OrderByAttribute	
ProcessingState	Unprocessed

Basic

Description	
FormatString	
ID	
Type	Regular
Usage	Regular

Misc

AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None

AttributeHierarchyDisplayFolder

Specifies the display folder for the attribute hierarchy (for use by client applications).

Server Explorer SSIS Toolbox Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW

Dim Customer.dim [Design] * Analysis Services Tutorial.cube [Design] Adventure Works

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Dim Customer

- Birth Date
- City
- Commute Distance ←
- Country-Region
- Customer Key
- Date First Purchase
- Education ←
- Gender ←
- Geography Key
- House Owner Flag
- Marital Status ←
- Number Cars Owned
- Number Children At Home ←
- Occupation ←
- Postal Code
- State Province
- Total Children ←
- Yearly Income ←

Hierarchies

Customer Geography

- Country-Region
- State Province
- City
- <new level>

To create a new hierarchy, drag an attribute here.

Properties

Advanced

AttributeHierarchyDisplayFolder	Demographic ←
AttributeHierarchyEnabled	True
AttributeHierarchyOptimizedState	FullyOptimized
AttributeHierarchyProcessingState	Unprocessed
AttributeHierarchyVisible	True
DiscretizationBucketCount	0
DiscretizationMethod	None
EstimatedCount	0
IsAggregatable	True
OrderBy	Name
OrderByAttribute	
ProcessingState	Unprocessed

Basic

Description	
FormatString	
ID	
Type	Regular
Usage	Regular

Misc

AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None

AttributeHierarchyDisplayFolder

Specifies the display folder for the attribute hierarchy (for use by client applications).

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

In Solution Explorer, double-click on the highlighted object to select the Adventure Works data source view.

The screenshot illustrates the Microsoft SQL Server Data Tools (SSDT) interface. On the left, the SSIS Toolbox is visible. The main area shows the Diagram Designer with a data model diagram. The diagram consists of three tables: DimCustomer, FactInternetSales, and DimProduct, connected by relationships. A dimension table, SalesTerritoryKey, is also shown. The Solution Explorer on the right lists the project structure, including Analysis Services Tutorial, Data Sources, Data Source Views, Cubes, Dimensions, Roles, Assemblies, and Miscellaneous. A specific item, 'Adventure Works DW2022.ds' under Data Source Views, is highlighted with a red arrow, indicating it is the target for selection.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Dim Product.dim [Design] | Dim Customer.dim [Design]* | Analysis Serv...l(cube [Design]

Diagram Organizer

<All Tables>

Dim Customer

- Birth Date
- City
- Commute Distance
- Country-Region
- Customer Key
- Date First Purchase
- Education
- Gender
- Geography Key
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Occupation
- Postal Code
- State Province
- Total Children
- Yearly Income

SalesTerritoryKey

DimCustomer

- CustomerKey
- GeographyKey
- CustomerAlternat...
- Title
- FirstName
- MiddleName
- LastName
- NameStyle
- BirthDate
- MaritalStatus

FactInternetSales

- SalesOrderNumber
- SalesOrderLineN...
- ProductKey
- OrderDateKey
- DueDateKey
- ShipDateKey
- CustomerKey
- PromotionKey
- CurrencyKey
- SalesTerritoryKey

DimProduct

DimDate

DimFullDay

DimDay

DimEnglishSpan

DimFrenchSpan

DimDay1

DimDay2

DimWeek

DimEnglishWeek

Search Solution Explorer (Ctrl + F)

Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.ds
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD

Adventure Works DW2012.dsv [Design]

Diagram Organizer

Tables

DimCustomer
DimDate
DimGeography
DimProduct (highlighted)
FactInternetSales

New Named Calculation... (highlighted)

New Relationship...
Replace Table
Delete Table From DSV
Explore Data
Properties

DimProduct

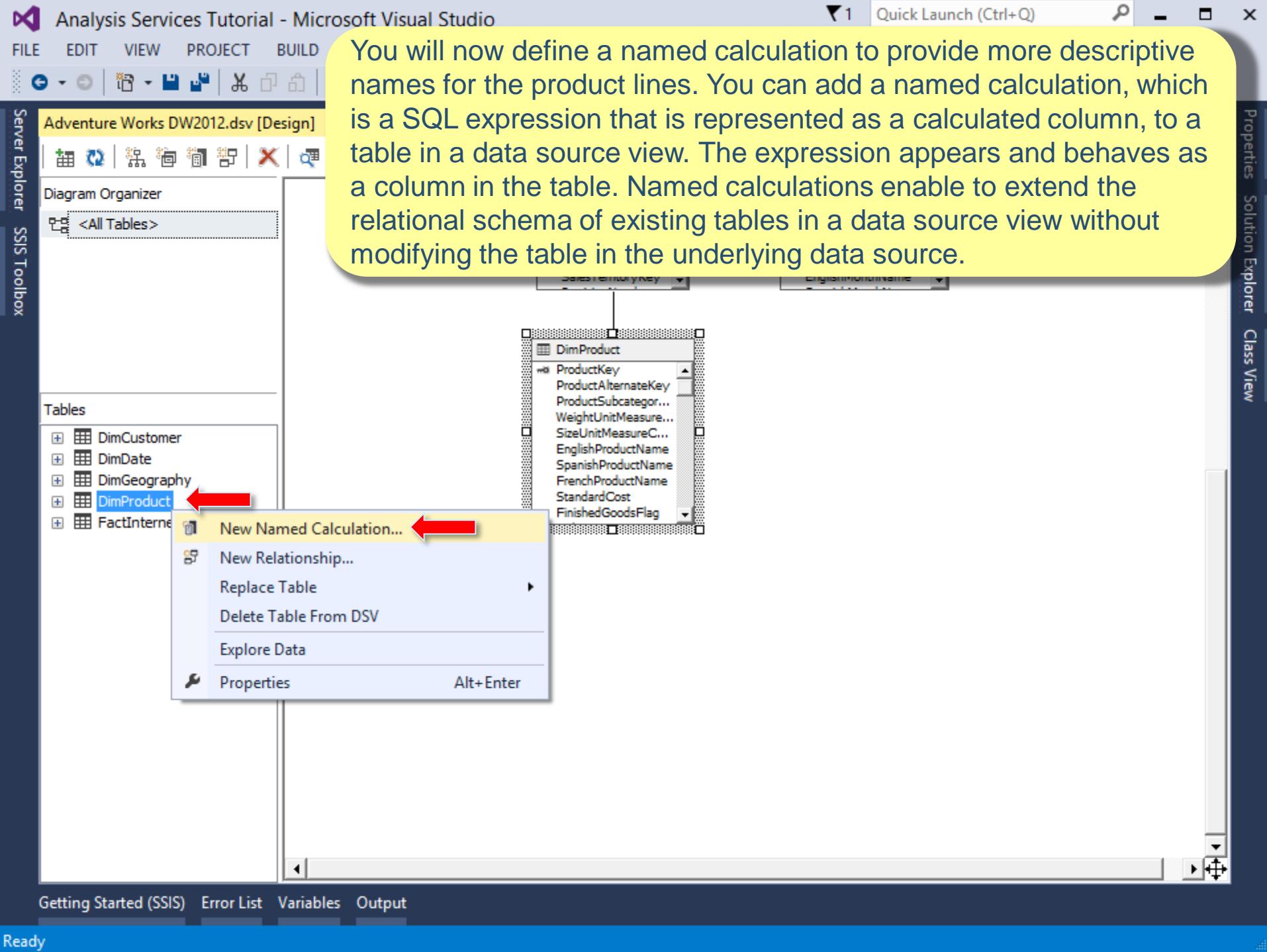
- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag

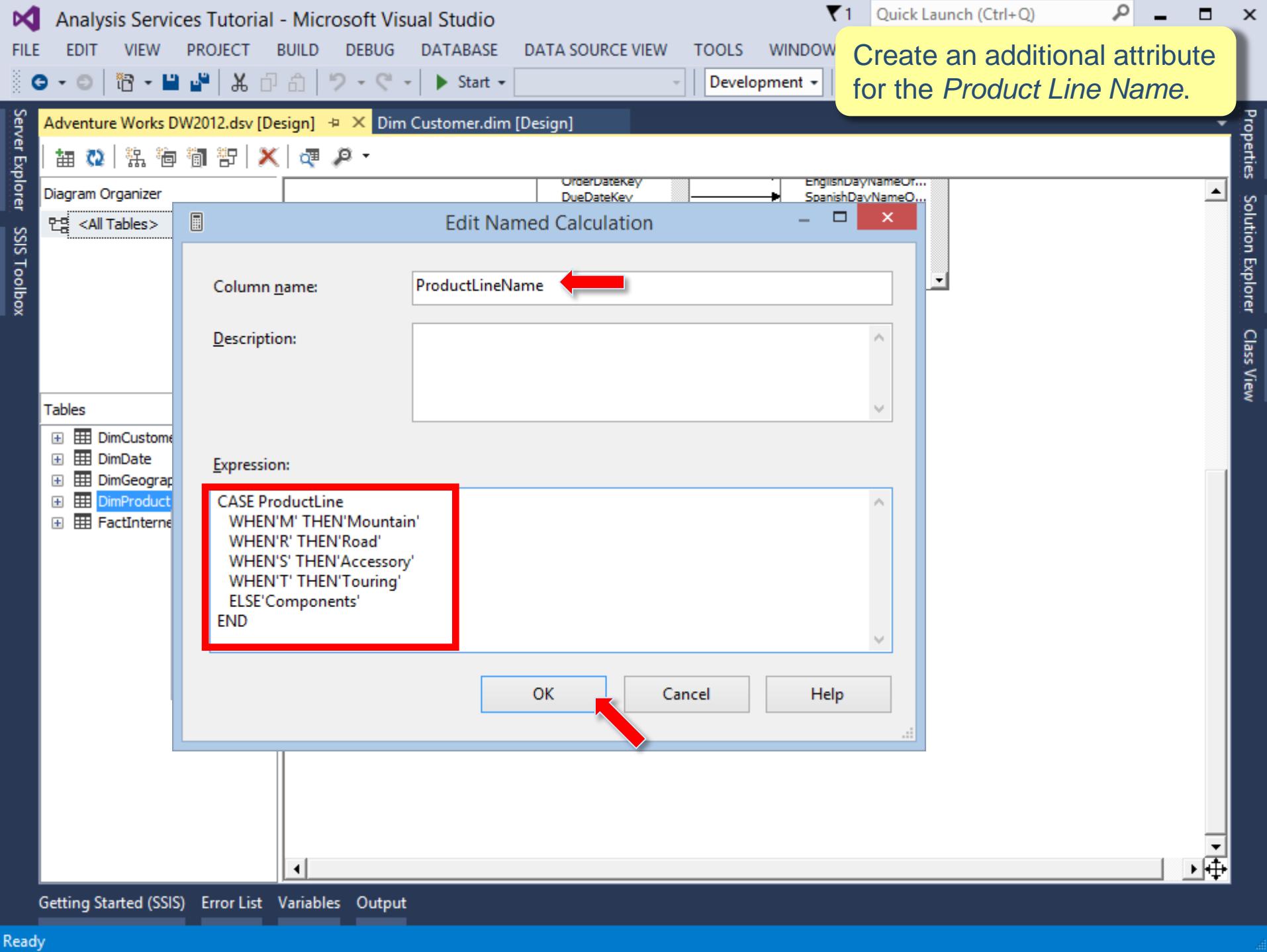
You will now define a named calculation to provide more descriptive names for the product lines. You can add a named calculation, which is a SQL expression that is represented as a calculated column, to a table in a data source view. The expression appears and behaves as a column in the table. Named calculations enable you to extend the relational schema of existing tables in a data source view without modifying the table in the underlying data source.

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready





In Solution Explorer, double-click on the highlighted object.

Solution Explorer

- Solution 'Analysis Services Tutorial' (1 of 1 project)
 - Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim** (highlighted with a red arrow)
 - Roles
 - Assemblies
 - Miscellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE D

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations

Attributes

Hierarchies

To create a new hierarchy, drag an attribute here.

Associate the new named calculation to the dimension's *Product Line* attribute. At the cube, *Product LineName* attribute values will be the new values for this attribute (e.g., *Mountain* instead of *M*).

ID Product Line

Name Product Line

Type Regular

Usage Regular

Misc

AttributeHierarchyOrdered True

ExtendedType

GroupingBehavior EncourageGrouping

InstanceSelection None

MemberNamesUnique False

VisualizationProperties

Parent-Child

MembersWithData NonLeafDataVisible

MembersWithDataCaption

NamingTemplate

RootMemberIf

UnaryOperatorColumn (none)

Source

CustomRollupColumn (none)

CustomRollupPropertiesColumn (none)

KeyColumns

DimProduct.ProductLine

NameColumn (none) ...

ValueColumn (none)

NameColumn

Specifies the details of the binding to the column containing the member name.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP Development

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim Properties

Dimension Structure

Attributes

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Key
- Product Line
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Name Column

Binding type: Column binding

Source table: DimProduct

Source column:

- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription
- ArabicDescription
- HebrewDescription
- ThaiDescription
- GermanDescription
- JapaneseDescription
- TurkishDescription
- StartDate
- EndDate
- Status
- ProductName

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

Product Line
Product Line
Regular
Regular
True
EncourageGrouping
None
False
NonLeafDataVisible
ParentIsBlankSelfOrMissing
(none)
(none)
DimProduct.ProductLine
(none)

Server Explorer
SSIS Toolbox
Solution Explorer
Class View

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS W...

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

To create a new hierarchy, drag an attribute here.

Properties

Product Key DimensionAttribute

ID	Product Key
Name	Product Key
Type	Regular
Usage	Key
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	DimProduct.ProductKey (
ValueColumn	(none)

NameColumn

Specifies the details of the binding to the column containing the member name.

Ready

Associate the *EnglishProductName* to the dimension's *ProductKey* attribute.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIM

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim Properties

At the cube, the *EnglishProductName* attribute values will replace the *ProductKey* attribute values.

Dimension Structure

Attributes

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Key
- Product Line
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Name Column

Binding type: Column binding

Source table: DimProduct

Source column:

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName** ←
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

Properties

- Product Key
- Product Key
- Regular
- Key
- True
- EncourageGrouping
- None
- False
- NonLeafDataVisible
- ParentIsBlankSelfOrMissing
- (none)
- (none)
- DimProduct.ProductKey (none)
- (none)

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

To create a new hierarchy, drag an attribute here.

Product Key DimensionAttribute

FormatString	
ID	Product Key
Name	Product Name 
Type	Regular
Usage	Key
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	ParentIsBlankSelfOrMissin
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
DimProduct.ProductKey (DimProduct.EnglishProd
NameColumn	
ValueColumn	(none)
Name	
Specifies the name of the object.	

Change the attribute name to something more meaningful, corresponding to its contents, i.e., change the attribute name to *Product Name*.

Server Explorer SSIS Toolbox Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line** ←
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

To create a new hierarchy, drag an attribute here.

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Getting Started (SSIS) Error List Variables Output

Ready

Create an hierarchy in the Product dimension.
You need to drag the *Product Line* attribute from the *Attributes* pane into the *Hierarchies* pane.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE D

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name** ←
- Product Line
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Hierarchy

- Product Line
- <new level>

To create a new hierarchy, drag an attribute here.

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Drag the *Model Name* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Product Line* level.

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name**
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Hierarchy

- Product Line
- Model Name
- <new level>

To create a new hierarchy, drag an attribute here.

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Drag the *Product Name* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Model Name* level.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMEN... Start Development

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Hierarchies

- Product Line
- Model Name
- Product Name
- <new level>

Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename F2
Properties Alt+Enter

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Quick Launch (Ctrl+Q)

Change the hierarchy name to *Product Model Lines*.

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION TOOLS WINDOW HELP

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Product Model Lines

- Product Line
- Model Name
- Product Name
- <new level>

To create a new hierarchy, drag an attribute here.

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Dim Product.dim [Design] Adventure Works DW2012.csv [Design] Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name
 - Reorder Point
 - Safety Stock Level
 - Size
 - Size Range
 - Standard Cost
 - Status
 - Style
 - Weight

Hierarchies

Product Model Lines

- Product Line
- Model Name
- Product Name

To create a new hierarchy, drag an attribute here.

Data Source View

DimProduct

- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag
- Color
- SafetyStockLevel
- ReorderPoint
- ListPrice
- Size
- SizeRange
- Weight
- DaysToManufacture
- ProductLine
- DealerPrice
- Class
- Style
- ModelName
- LargePhoto
- EnglishDescription
- FrenchDescription
- ChineseDescription

Getting Started (SSIS) Error List Variables Output

You will now create folders for the dimension related attributes. First, you need to select the highlighted attributes.

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP Development

Dim Product.dim [Design] Adventure Works DW2012.dsv [Design] Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Product Model Lines

- Product Line
- Model Name
- Product Name

To create a new hierarchy, drag an attribute here.

Properties

Advanced

AttributeHierarchyDisplayFolder	Stocking
AttributeHierarchyEnabled	True
AttributeHierarchyOptimizedState	FullyOptimized
AttributeHierarchyProcessingState	Unprocessed
AttributeHierarchyVisible	True
DiscretizationBucketCount	0
DiscretizationMethod	None
EstimatedCount	0
IsAggregatable	True
OrderBy	Name
OrderByAttribute	
ProcessingState	Unprocessed

Basic

Description	
FormatString	
ID	
Type	Regular
Usage	Regular

Misc

AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None

AttributeHierarchyDisplayFolder

Specifies the display folder for the attribute hierarchy (for use by client applications).

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Here, you give the name **Stocking** to the folder.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION

Dim Product.dim [Design] * Adventure Works DW2012.dsv [Design] Dim Customer.dim

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Dim Product

- Class
- Color
- Days To Manufacture
- Dealer Price
- List Price
- Model Name
- Product Line
- Product Name
- Reorder Point
- Safety Stock Level
- Size
- Size Range
- Standard Cost
- Status
- Style
- Weight

Product Model Lines

- Product Line
- Model Name
- Product Name

To create a new hierarchy, drag an attribute here.

Properties

Advanced

AttributeHierarchyDisplayFolder	Financial
AttributeHierarchyEnabled	True
AttributeHierarchyOptimizedState	FullyOptimized
AttributeHierarchyProcessingState	Unprocessed
AttributeHierarchyVisible	True
DiscretizationBucketCount	0
DiscretizationMethod	None
EstimatedCount	0
IsAggregatable	True
OrderBy	Name
OrderByAttribute	
ProcessingState	Unprocessed

Basic

Description	
FormatString	
ID	
Type	Regular
Usage	Regular

Misc

AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None

AttributeHierarchyDisplayFolder

Specifies the display folder for the attribute hierarchy (for use by client applications).

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Select the highlighted measures and put them in a common folder labeled as *Financial*.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION

Dim Product.dim [Design] Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships **Attribute Relationships**  Dimensions Browser

Product Name → Model Name
Product Name → Product Line

If the underlying data supports it, you should define attribute relationships between attributes. Defining attribute relationships speeds up dimension, partition, and query processing.

Attributes

Class	Safety Stock Level
Color	Size
Days To Manufacture	Size Range
Dealer Price	Standard Cost
List Price	Status
Model Name	Style
Product Line	Weight
Product Name	
Reorder Point	

Attribute Relationships

Product Name	→	Class	Product Name	→	Size
Product Name	→	Color	Product Name	→	Size Range
Product Name	→	Days To Manufacture	Product Name	→	Standard Cost
Product Name	→	Dealer Price	Product Name	→	Status
Product Name	→	List Price	Product Name	→	Style
Product Name	→	Model Name	Product Name	→	Weight
Product Name	→	Product Line			
Product Name	→	Reorder Point			
Product Name	→	Safety Stock Level			

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Dim Product.dim [Design] Adventure Works DW2012.dsv [Design] Dim Customer.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Product Name Model Name Product Line

New Attribute Relationship... Properties Alt+Enter

Attributes

Class	Safety Stock Level
Color	Size
Days To Manufacture	Size Range
Dealer Price	Standard Cost
List Price	Status
Model Name	Style
Product Line	Weight
Product Name	
Reorder Point	

Attribute Relationships

Product Name	→	Class	Product Name	→	Size
Product Name	→	Color	Product Name	→	Size Range
Product Name	→	Days To Manufacture	Product Name	→	Standard Cost
Product Name	→	Dealer Price	Product Name	→	Status
Product Name	→	List Price	Product Name	→	Style
Product Name	→	Model Name	Product Name	→	Weight
Product Name	→	Product Line			
Product Name	→	Reorder Point			
Product Name	→	Safety Stock Level			

Getting Started (SSIS) Error List Variables Output

Ready

In the *Relationship type* list, leave the relationship type set to *Flexible* because relationships between the members might change over time. For example, a product model might eventually be moved to a different product line.

The screenshot shows the 'Create Attribute Relationship' dialog box in Microsoft Visual Studio. The dialog has two main sections: 'Source Attribute' and 'Related Attribute'. In the 'Source Attribute' section, the 'Name' dropdown contains 'Model Name' (indicated by a red arrow). Below it, 'Member count: 0' and 'Key columns: - DimProduct.ModelName' are displayed. In the 'Related Attribute' section, the 'Name' dropdown contains 'Product Line' (indicated by a red arrow). Below it, 'Member count: 0' and 'Key columns: - DimProduct.ProductLine' are displayed. At the bottom, the 'Relationship type' dropdown is set to 'Flexible (may change over time)' (indicated by a red arrow). The 'OK' button is highlighted with a red arrow. On the left, a sidebar lists attributes: Class, Color, Days To Manufacture, Dealer Price, List Price, Model Name, Product Line, Product Name, Reorder Point, Standard Cost, Status, Style, and Weight. A preview grid on the right shows various relationships between these attributes.

FILE EDIT VIEW PROJECT BUILD DEBUG DATA

Dim Product.dim [Design] Adventure Works DW20

Dimension Structure Attribute Relationships

Product Name

Attributes

Class Color Days To Manufacture Dealer Price List Price Model Name Product Line Product Name Reorder Point Standard Cost Status Style Weight

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

The figure represents the 1 to many relationships between the dimension attributes.

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW Development

Product.dim [Design] X

Dimension Structure Attribute Relationships Translations Browser

Product Name Model Name Product Line

Attributes

Class	Reorder Point
Color	Safety Stock Level
Days To Manufacture	Size
Dealer Price	Size Range
End Date	Standard Cost
List Price	Start Date
Model Name	Status
Product Line	Style
Product Name	Weight

Attribute Relationships

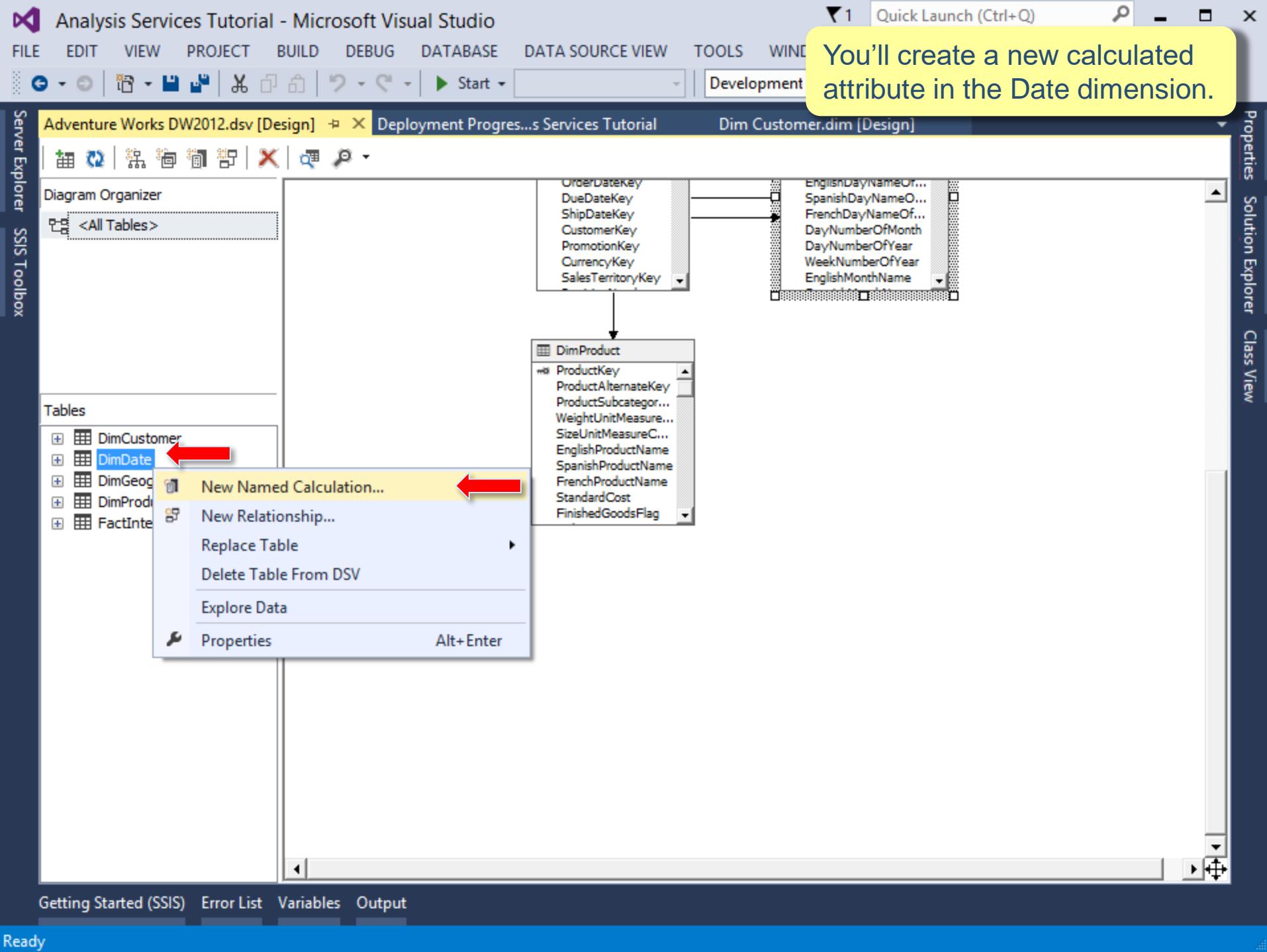
Model Name	→ Product Line	Product Name	→ Safety Stock Level
Product Name	→ Class	Product Name	→ Size
Product Name	→ Color	Product Name	→ Size Range
Product Name	→ Days To Manufacture	Product Name	→ Standard Cost
Product Name	→ Dealer Price	Product Name	→ Start Date
Product Name	→ End Date	Product Name	→ Status
Product Name	→ List Price	Product Name	→ Style
Product Name	→ Model Name	Product Name	→ Weight
Product Name	→ Reorder Point		

Getting Started (SSIS) Error List Variables Output

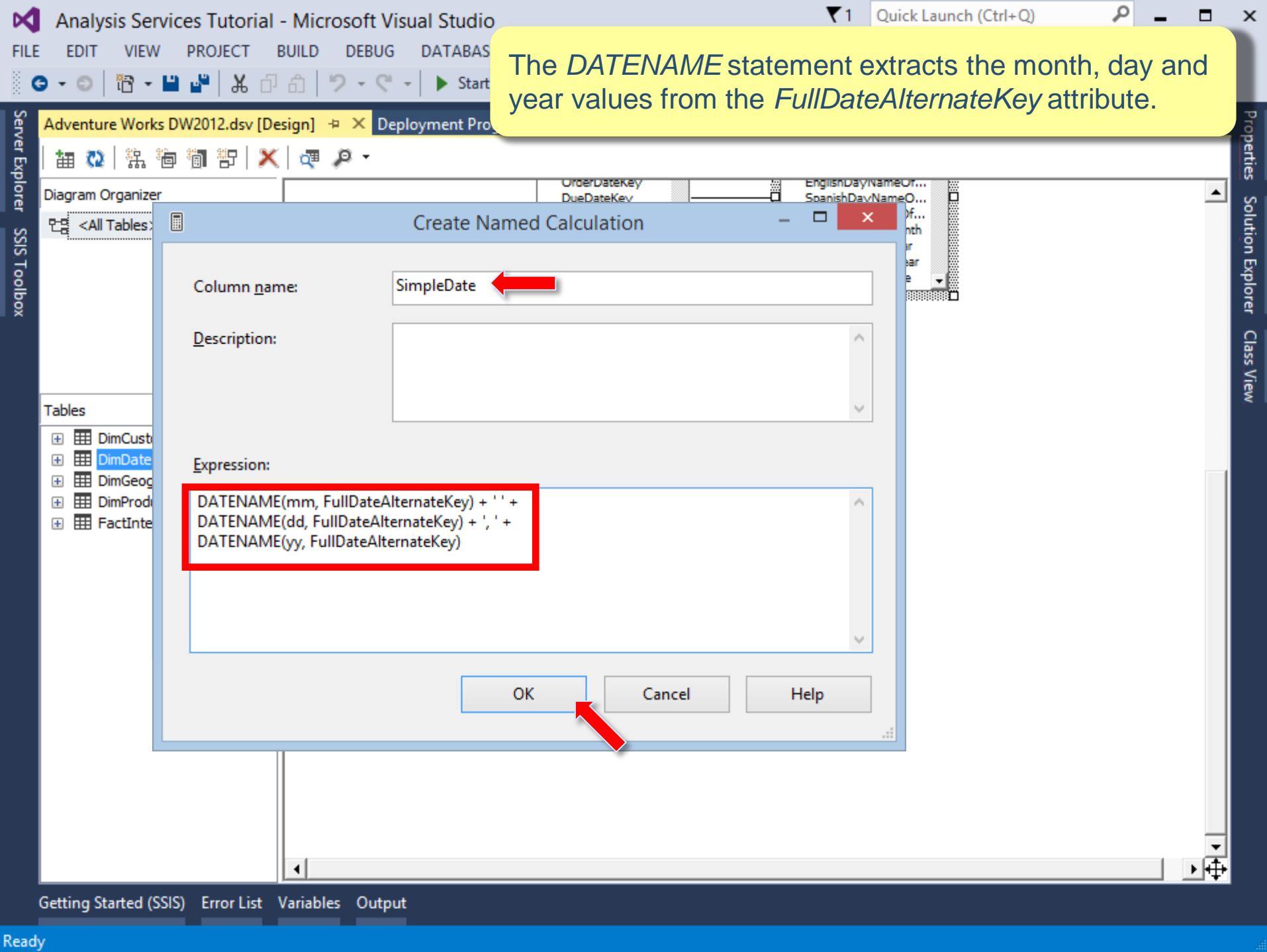
Ready

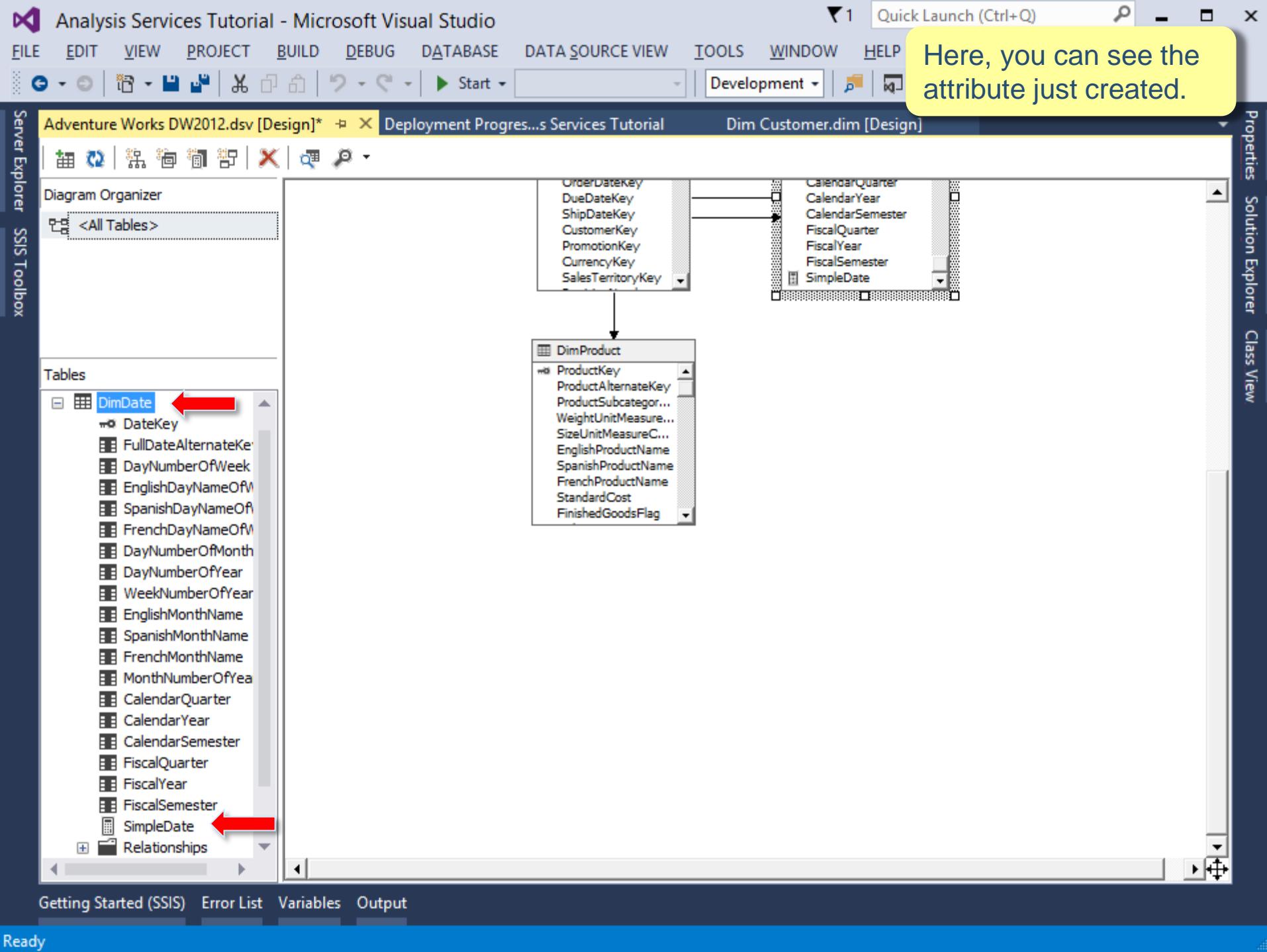
In Solution Explorer, double-click on the highlighted object to select the Adventure Works data source view.

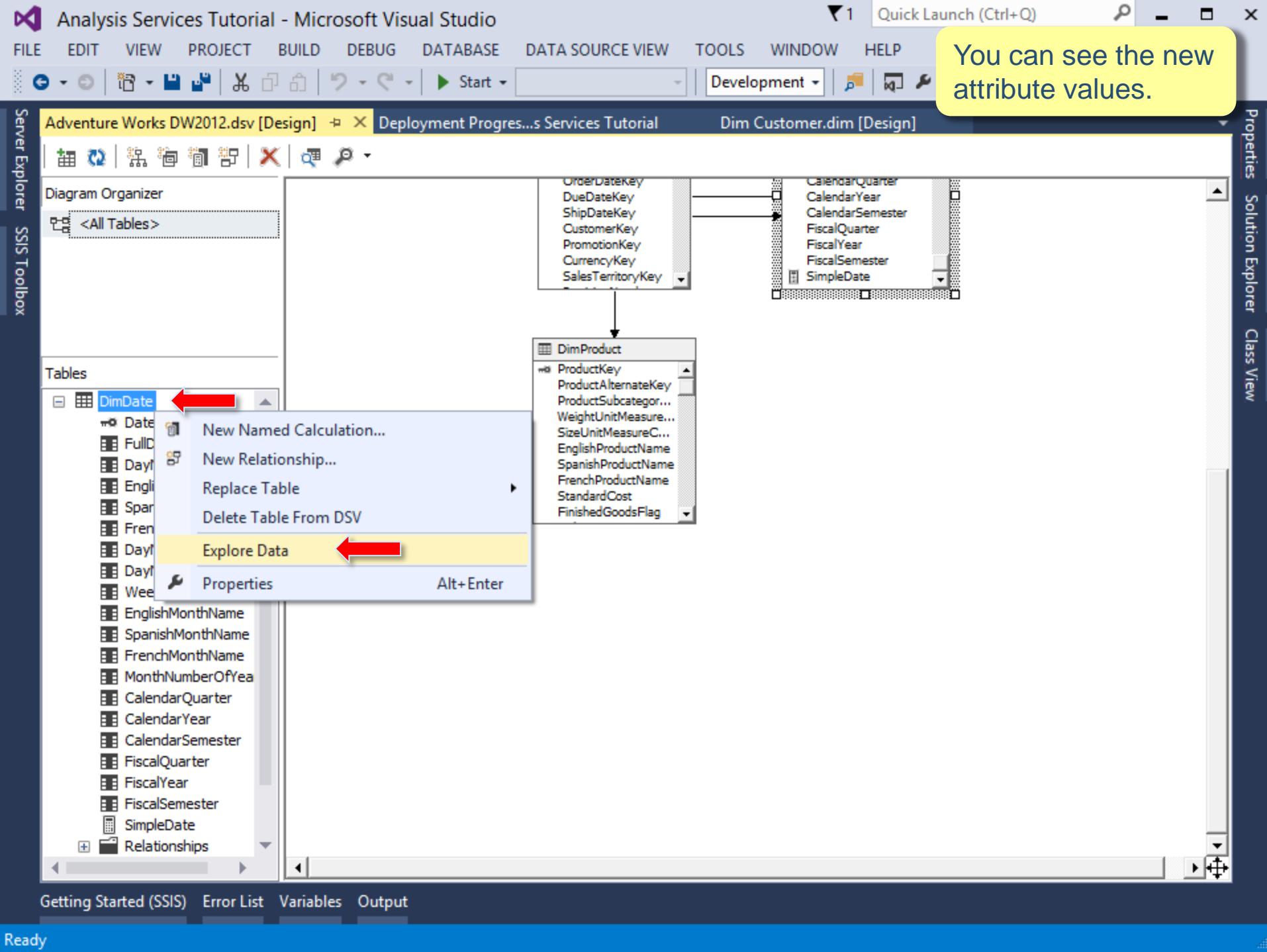
The screenshot shows the Microsoft SQL Server Data Tools (SSDT) interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, and Help. The toolbar below has icons for Undo, Redo, Save, Open, and various development tools. The title bar shows 'Dim Product.dim [Design]*' and 'Dim Customer.dim [Design]*'. The main workspace displays a dimension relationship diagram with nodes: Product Name, Model Name, and Product Line, connected by arrows. Below this are two tables: 'Attributes' and 'Attribute Relationships'. The 'Attributes' table lists columns like Class, Color, Days To Manufacture, Dealer Price, List Price, Model Name, Product Line, Product Name, and Reorder Point. The 'Attribute Relationships' table lists relationships between Product Name and other columns: Safety Stock Level, Size, Size Range, Standard Cost, Status, Style, Weight, Product Line, Class, Color, Days To Manufacture, Dealer Price, List Price, Model Name, Reorder Point, and Safety Stock Level. The bottom navigation bar includes Output, Error List, Variables, Add to Source Control, Select Repository, and a status message indicating the item does not support previewing. The right side features the Solution Explorer pane, which shows the project structure for 'Analysis Services Tutorial' (1 of 1 project). It includes nodes for Analysis Services Tutorial, Data Sources (with Adventure Works DW2022.ds), Data Source Views, Cubes (with Analysis Services Tutorial.cube), Dimensions (with Dim Date.dim, Dim Customer.dim, Dim Product.dim), Roles, Assemblies, and Miscellaneous. The 'Adventure Works DW2022.dsv' file is highlighted with a blue selection bar, and a red arrow points to it from the text instructions.



You'll create a new calculated attribute in the Date dimension.







Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE TOOLS WINDOW HELP

Development

Explore DimDate Table Adventure Works DW2012.dsv [Design] Deployment Progress Services Tutorial Dim Customer.dim [Design]

Table

MonthNumberOfYear	CalendarQuarter	CalendarYear	CalendarSemester	FiscalQuarter	FiscalYear	FiscalSemester	SimpleDate
1	2005	1	3	2005	2		January 1, 2005
1	2005	1	3	2005	2		January 2, 2005
1	2005	1	3	2005	2		January 3, 2005
1	2005	1	3	2005	2		January 4, 2005
1	2005	1	3	2005	2		January 5, 2005
1	2005	1	3	2005	2		January 6, 2005
1	2005	1	3	2005	2		January 7, 2005
1	2005	1	3	2005	2		January 8, 2005
1	2005	1	3	2005	2		January 9, 2005
1	2005	1	3	2005	2		January 10, 2005
1	2005	1	3	2005	2		January 11, 2005
1	2005	1	3	2005	2		January 12, 2005
1	2005	1	3	2005	2		January 13, 2005
1	2005	1	3	2005	2		January 14, 2005
1	2005	1	3	2005	2		January 15, 2005
1	2005	1	3	2005	2		January 16, 2005
1	2005	1	3	2005	2		January 17, 2005
1	2005	1	3	2005	2		January 18, 2005
1	2005	1	3	2005	2		January 19, 2005
1	2005	1	3	2005	2		January 20, 2005
1	2005	1	3	2005	2		January 21, 2005
1	2005	1	3	2005	2		January 22, 2005
1	2005	1	3	2005	2		January 23, 2005

In Solution Explorer, double-click on the highlighted object to select the DimDate dimension.

The screenshot shows the Microsoft SQL Server Data Tools (SSDT) interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, and Analysis Services Tutorial. The toolbar below has icons for Undo, Redo, Save, and various development tools. The main workspace contains three tabs: 'Explore DimDate Table', 'Dim Product.dim [Design]*', and 'Dim Customer.dim [Design]'. The 'Dim Product.dim [Design]' tab is active, showing a table with columns MonthNumberOfYear, CalendarQuarter, CalendarYear, CalendarSemester, FiscalQuarter, and FiscalYear. The bottom navigation bar includes Output, Error List, Variables, Add to Source Control, Select Repository, and a status message indicating the item does not support previewing.

Analysis Services Tutorial

Solution Explorer

Search Solution Explorer (Ctrl + F)

Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.dsv
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

Output Error List Variables

This item does not support previewing

Add to Source Control Select Repository

1

You will now associate the attribute just created to the dimension's *Date Key* attribute.

Dim Date.dim [Design] Explore DimDate Table Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes

Hierarchies

To create a new hierarchy, drag an attribute here.

Properties

Date Key DimensionAttribute

ID	Date Key
Name	Date Key
Type	Regular
Usage	Key
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	DimDate.DateKey (Integer)
ValueColumn	(none)

NameColumn

Specifies the details of the binding to the column containing the member name.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE D... Quick Launch (Ctrl+O)

Dim Date.dim [Design] Explore DimDate Table Adventure Works DW2012.dsv [Design] Properties

Server Explorer SSIS Toolbox Solution Explorer Class View

At the cube, the *DateKey* attribute values will be replaced by the new *SimpleDate* attribute values.

Dimension Structure

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Name Column

Binding type: Column binding

Source table: DimDate

Source column:

- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- CalendarSemester
- FiscalQuarter
- FiscalYear
- FiscalSemester
- SimpleDate

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

Properties

- Date Key
- Date Key
- Regular
- Key
- True
- EncourageGrouping
- None
- False
- NonLeafDataVisible
- ParentsIsBlankSelfOrMissing
- (none)
- (none)
- DimDate.DateKey (Integer)
- (none)
- (none)

Getting Started (SSIS) Error List Variables Output

Ready

You will now create an hierarchy of attributes for the *Date* dimension. Start by dragging the *Calendar Year* attribute from the *Attributes* pane into the *Hierarchies* pane.

Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes

Hierarchies

Data Source View

To create a new hierarchy, drag an attribute here.

DimDate

- Calendar Quarter
- Calendar Semester
- Calendar Year**
- Date Key
- English Month Name
- Full Date Alternate Key

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Hierarchy

- Calendar Year
- <new level>

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Drag the *Calendar Semester* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Calendar Year* level.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Hierarchy

- Calendar Year
- Calendar Semester
- <new level>

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Drag the *Calendar Quarter* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Calendar Semester* level.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name**
- Full Date Alternate Key

Hierarchy

- Calendar Year
- Calendar Semester
- Calendar Quarter
- <new level>

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Drag the *English Month Name* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *Calendar Quarter* level.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Hierarchy

- Calendar Year
- Calendar Semester
- Calendar Quarter
- English Month Name
- <new level>

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

And finally, drag the *Date Key* attribute from the *Attributes* pane into the cell in the *Hierarchies* pane, underneath the *English Month Name* level.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Hierarchy

- Calendar Year
- Calendar Semester
- Calendar Quarter
- English Month Name
- Date Key
- <new level>

Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename F2
Properties Alt+Enter

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Getting Started (SSIS) Error List Variables Output

Ready

Rename the hierarchy as *Calendar Date*.

The screenshot shows the Microsoft Visual Studio interface for an Analysis Services dimension named 'Dim Date.dim'. The 'Hierarchies' pane is active, showing a context menu for a hierarchy node. The menu includes options like Cut, Copy, Paste, Delete, Rename (which is highlighted with a red arrow), and Properties. A yellow callout bubble at the top right of the window says 'Rename the hierarchy as *Calendar Date*'. The 'Attributes' and 'Data Source View' panes are also visible.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Dim Date.dim [Design] * Start

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Calender Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- English Month Name
- Date Key
- <new level>

To create a new hierarchy, drag an attribute here.

Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename F2
Properties Alt+Enter

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

You will now rename some hierarchy's attributes. To start, rename the *English Month Name* as *Calendar Month*.

Getting Started (SSIS) Error List Variables Output

Ready

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date Key

To create a new hierarchy, drag an attribute here.

Cut Ctrl+X

Copy Ctrl+C

Paste Ctrl+V

Delete Del

Rename F2

Properties Alt+ Enter

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Getting Started (SSIS) Error List Variables Output

Ready

Quick Launch (Ctrl+Q)

Rename the Date Key as Date. This only changes the attribute name at the hierarchy.

The screenshot shows the Microsoft Visual Studio Analysis Services Designer interface. In the center pane, under the 'Hierarchies' heading, there is a tree view of a hierarchy named 'Calendar Date'. The 'Date Key' node is selected and has a context menu open over it. The menu items are: Cut (Ctrl+X), Copy (Ctrl+C), Paste (Ctrl+V), Delete (Del), Rename (F2, highlighted with a red arrow), and Properties (Alt+Enter). To the right of the hierarchy tree, there is a 'Data Source View' pane showing a list of attributes for a dimension named 'DimDate'. The 'DateKey' attribute is highlighted with a blue selection bar. At the top of the screen, a yellow callout bubble contains the text: 'Rename the Date Key as Date. This only changes the attribute name at the hierarchy.'.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE VIEW DIMENSION TOOLS WINDOW HELP

Dim Date.dim [Design] + X Adventure Works DW2012.dsv [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date
- <new level>

To create a new hierarchy, drag an attribute here.

DimDate

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATA

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies Data Source View

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name
- Full Date Alternate Key

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month

To create a new hierarchy, drag an attribute here.

Start New Hierarchy

Create Level

Set Attribute Usage

Show Attributes in

Cut Ctrl+X

Copy Ctrl+C

Paste Ctrl+V

Delete Del

Rename F2

Properties Alt+Enter

DimDate

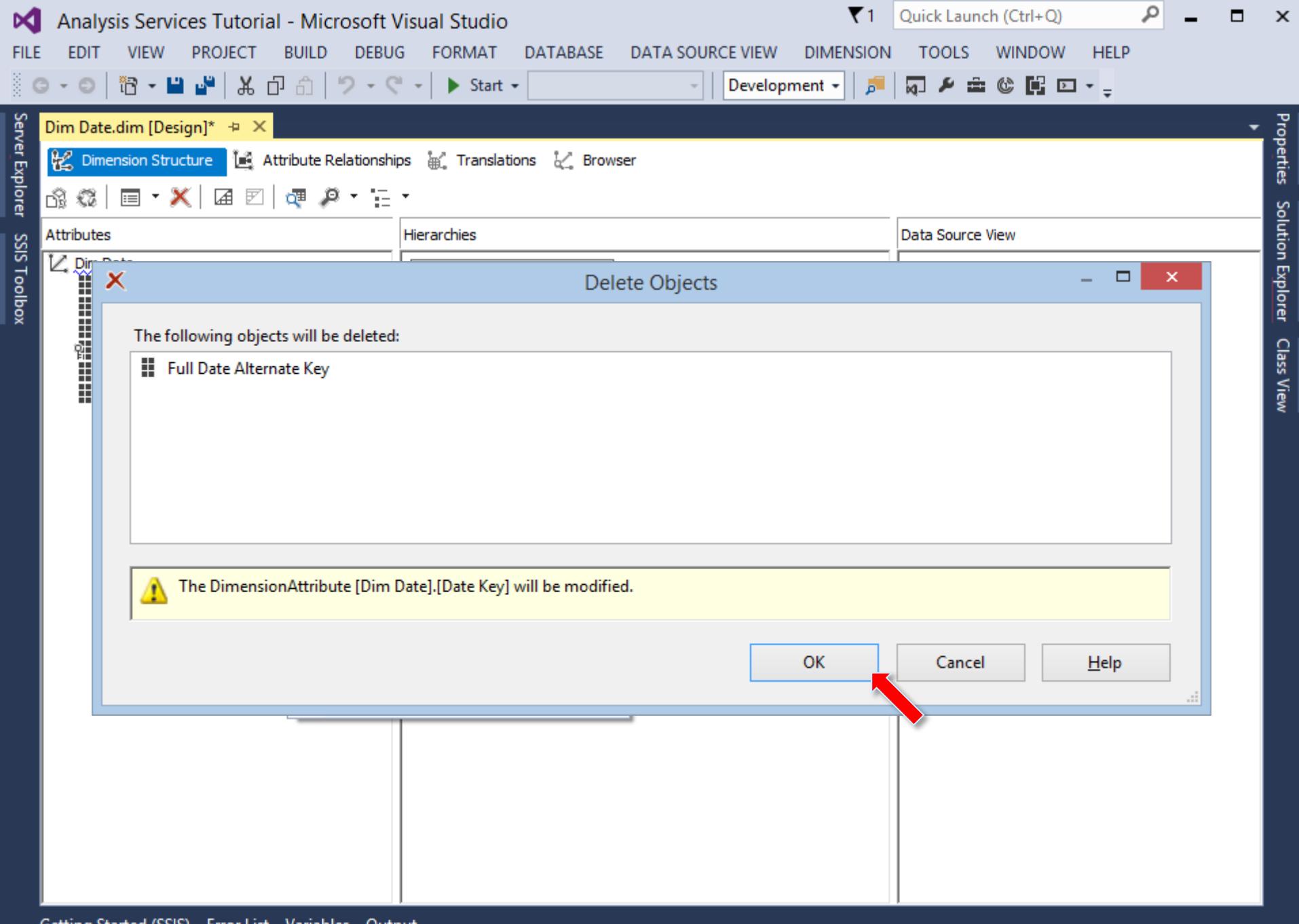
- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName

Getting Started (SSIS) Error List Variables Output

Ready

Delete the *Full Date Alternate Key* attribute from the Attributes pane because is not going to be used.

The screenshot shows the Microsoft Visual Studio interface for an Analysis Services dimension named 'Dim Date.dim'. In the 'Attributes' pane, the 'Full Date Alternate Key' attribute is selected and highlighted with a red arrow. A context menu is open over this attribute, with the 'Delete' option highlighted by another red arrow. To the right of the 'Attributes' pane is the 'Hierarchies' pane, which displays a hierarchy for 'Calendar Date' with levels: 'Calendar Year', 'Calendar Semester', 'Calendar Quarter', and 'Calendar Month'. Below the 'Hierarchies' pane is the 'Data Source View' pane, showing the structure of the 'DimDate' table with attributes like 'DateKey', 'FullDateAlternateKey', and 'DayNumberOfWeek'. The top status bar indicates '1' errors in the 'Error List'.



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSIONS

Dim Date.dim [Design] X

Dimension Structure Attribute Relationships **Attribute Relationships** Browser

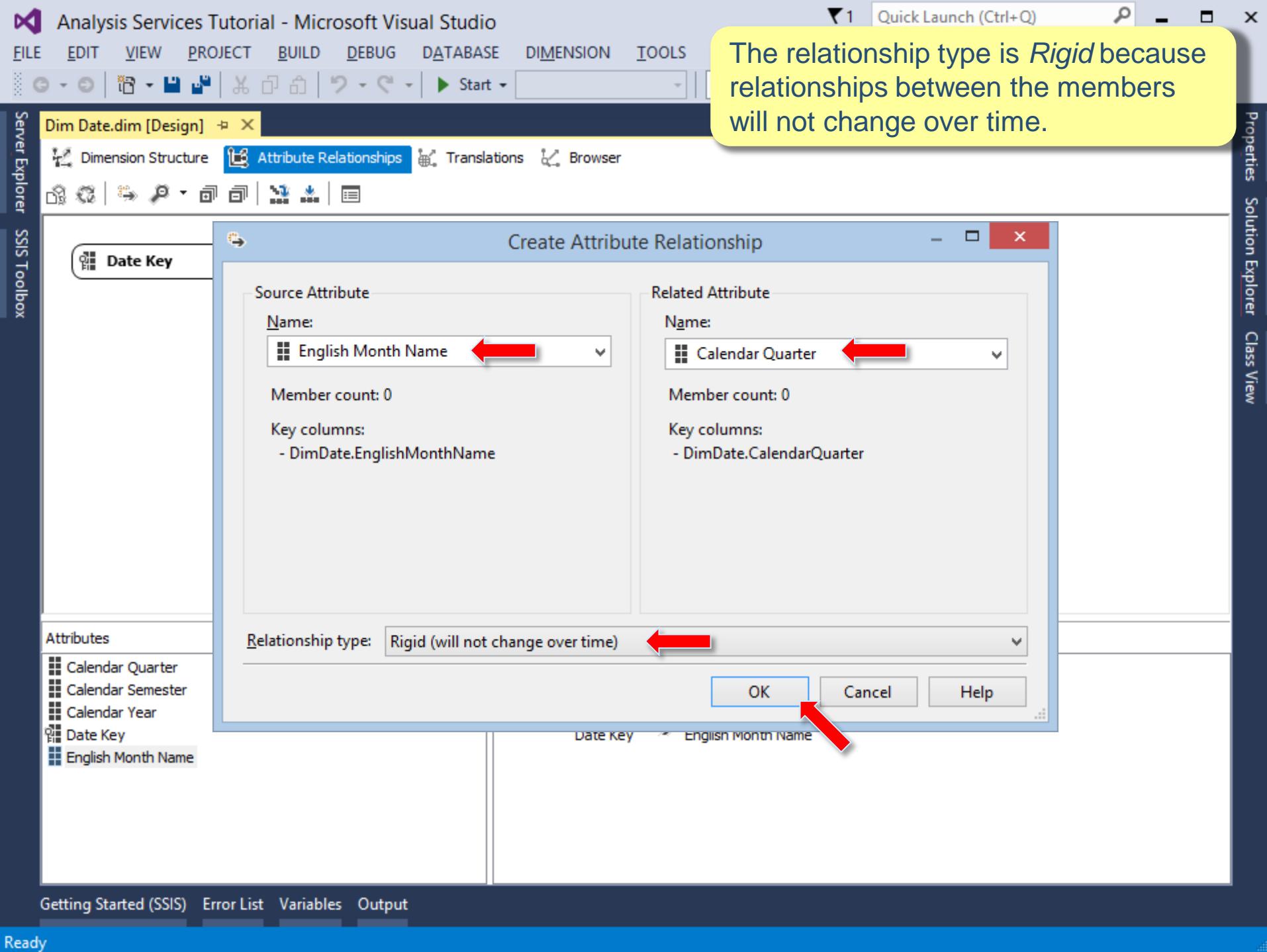
You will now define the *Attribute Relationships* in the *Date* dimension. Attribute relationships speeds up dimension, partition, and query processing.

```
graph TD; DateKey[Date Key] --> Semester[Calendar Semester]; DateKey --> Year[Calendar Year]; DateKey --> Quarter[Calendar Quarter]; DateKey --> MonthName[English Month Name]
```

New Attribute Relationship... Properties Alt+Enter

Attributes	Attribute Relationships
Calendar Quarter Calendar Semester Calendar Year Date Key English Month Name	Date Key → Calendar Quarter Date Key → Calendar Semester Date Key → Calendar Year Date Key → English Month Name

Getting Started (SSIS) Error List Variables Output



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Date Key → Calendar Semester
Date Key → Calendar Year
English Month Name → Calendar Quarter

New Attribute Relationship... Properties Alt+Enter

Attributes

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Attribute Relationships

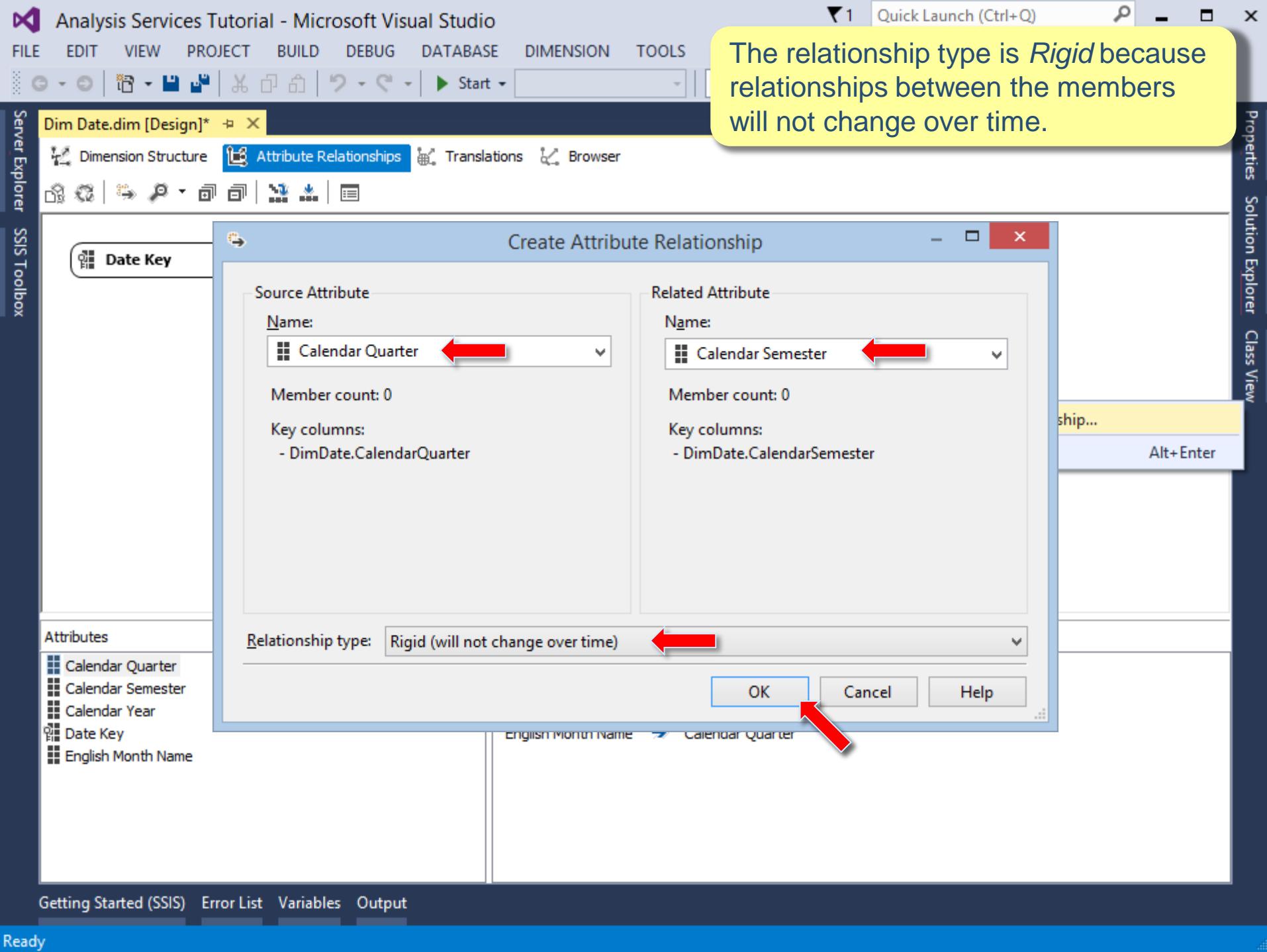
	→	
Date Key	→	Calendar Semester
Date Key	→	Calendar Year
Date Key	→	English Month Name
English Month Name	→	Calendar Quarter

Getting Started (SSIS) Error List Variables Output

Ready

```
graph LR; DateKey1[Date Key] --> Semester[Calendar Semester]; DateKey1 --> Year[Calendar Year]; MonthName[English Month Name] --> Quarter[Calendar Quarter]
```

	→	
Date Key	→	Calendar Semester
Date Key	→	Calendar Year
Date Key	→	English Month Name
English Month Name	→	Calendar Quarter



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Quick Launch (Ctrl+Q)

Dim Date.dim [Design]*

Dimension Structure Attribute Relationships Translations Browser

Date Key → Calendar Year
Calendar Year → English Month Name
English Month Name → Calendar Quarter
Calendar Quarter → Calendar Semester

New Attribute Relationship... Properties

Attributes

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

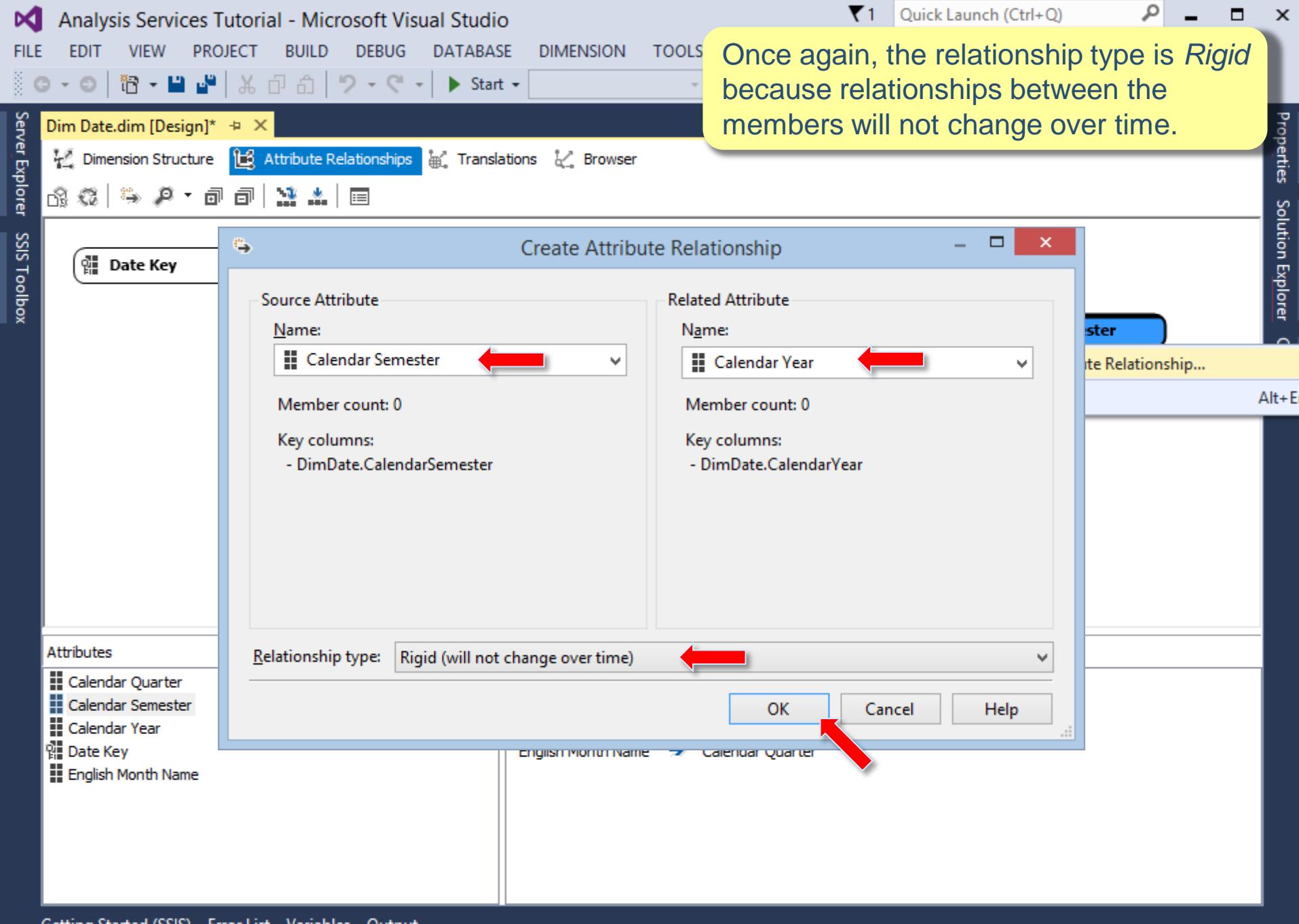
Attribute Relationships

Calendar Quarter	→	Calendar Semester
Date Key	→	Calendar Year
Date Key	→	English Month Name
English Month Name	→	Calendar Quarter

Getting Started (SSIS) Error List Variables Output

Ready

```
graph LR; DateKey[Date Key] --> CY[Calendar Year]; CY --> EMonthName[English Month Name]; EMonthName --> CQuarter[Calendar Quarter]; CQuarter --> CSemester[Calendar Semester]
```



Analysis Services Tutorial - Microsoft Visual Studio

The figure represents the 1 to many relationships between the dimension attributes.

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW Development

Dim Date.dim [Design] * X

Dimension Structure Attribute Relationships Translations Browser

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

English Month Name → Calendar Quarter → Calendar Semester → Calendar Year

Attributes

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Attribute Relationships

From	To
Calendar Quarter	→ Calendar Semester
Calendar Semester	→ Calendar Year
Date Key	→ English Month Name
English Month Name	→ Calendar Quarter

Getting Started (SSIS) Error List Variables Output

Ready

In Solution Explorer, double-click on the highlighted object to select the Adventure Works data source view.

The screenshot shows the Microsoft Analysis Studio interface. The main window displays the 'Dim Product.dim [Design]' tab, specifically the 'Attribute Relationships' section. It shows a relationship diagram where 'Date Key' is connected to 'English Month Name', which is connected to 'Calendar Quarter'. Below this, the 'Attributes' and 'Attribute Relationships' panes are visible. The 'Attribute Relationships' pane lists several relationships, including 'Calendar Quarter' to 'Calendar Semester', 'Calendar Semester' to 'Calendar Year', 'Date Key' to 'English Month Name', and 'English Month Name' to 'Calendar Quarter'. The bottom left shows tabs for 'Output', 'Error List', and 'Variables'. To the right, the 'Solution Explorer' window is open, showing the project structure for 'Analysis Services Tutorial'. A red arrow points to the 'Adventure Works DW2022.ds' file under 'Data Sources'. The status bar at the bottom indicates that the selected item does not support previewing.

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

SSIS Toolbox

Explore DimDate Table Dim Product.dim [Design]*

Dimension Structure Attribute Relationships Translations Browser

Date Key English Month Name Calendar Quarter

Attributes

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Attribute Relationships

Calendar Quarter	→	Calendar Semester
Calendar Semester	→	Calendar Year
Date Key	→	English Month Name
English Month Name	→	Calendar Quarter

Output Error List Variables

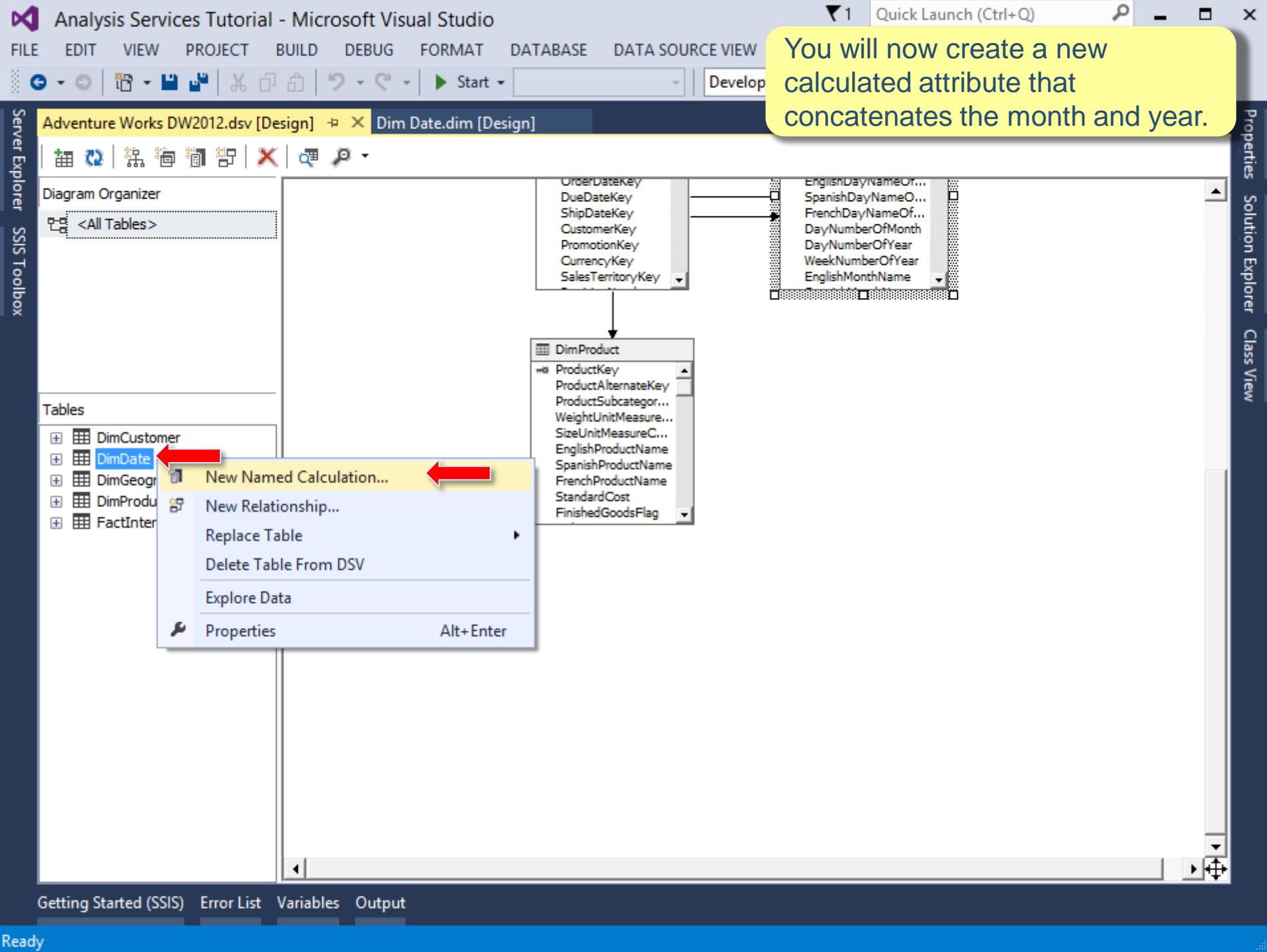
Search Solution Explorer (Ctrl + F)

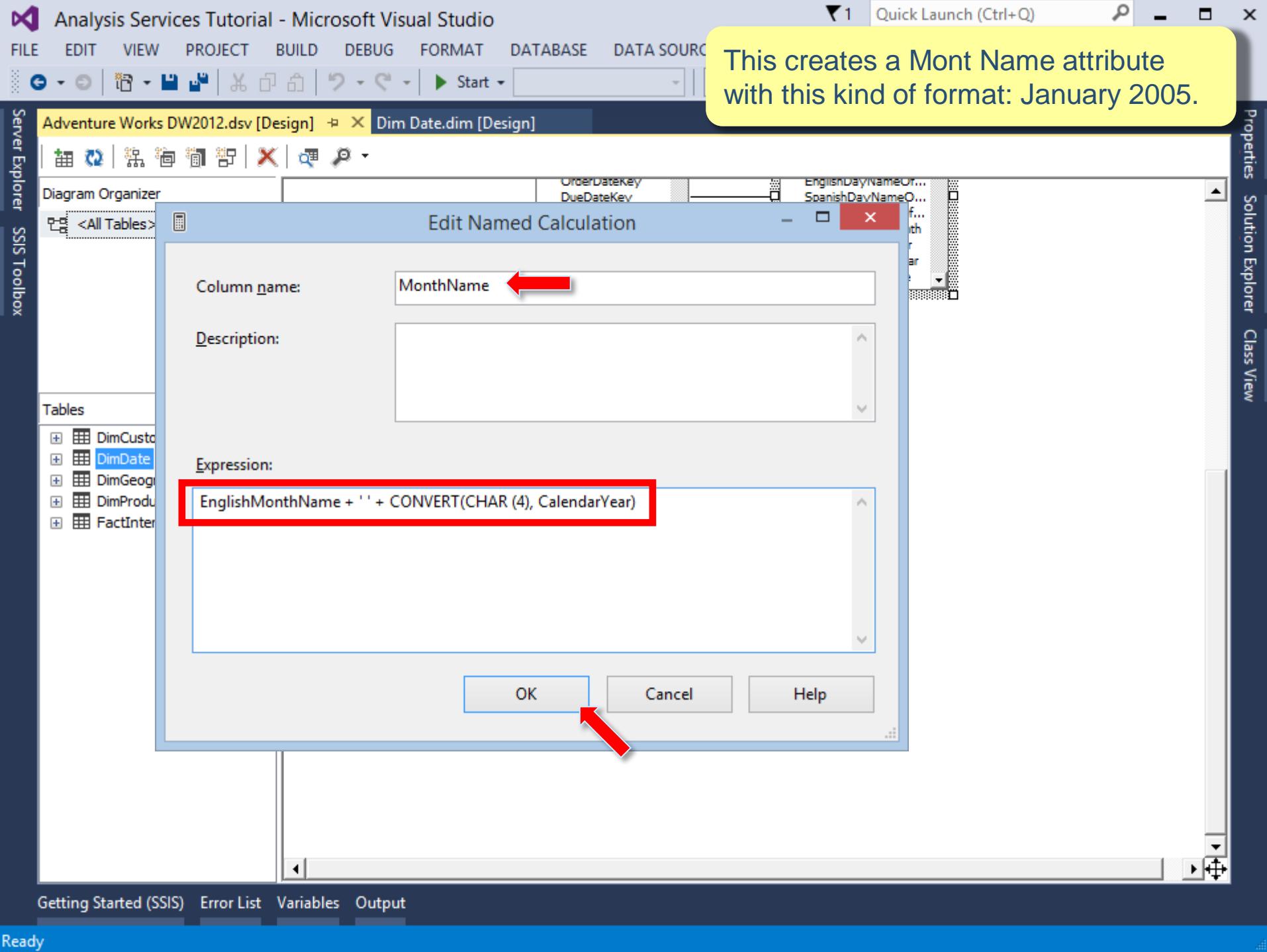
Solution 'Analysis Services Tutorial' (1 of 1 project)

- Analysis Services Tutorial
 - Data Sources
 - Adventure Works DW2022.ds
 - Data Source Views
 - Adventure Works DW2022.ds
 - Cubes
 - Analysis Services Tutorial.cube
 - Dimensions
 - Dim Date.dim
 - Dim Customer.dim
 - Dim Product.dim
 - Roles
 - Assemblies
 - Miscellaneous

This item does not support previewing

Add to Source Control Select Repository





Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Create a new calculated attribute that concatenates the quarter and year.

Diagram Organizer <All Tables>

Tables

- DimCustomer
- DimDate**
- DimGeogr
- DimProdut
- FactInter

New Named Calculation... (highlighted with red arrow)

New Relationship... Replace Table Delete Table From DSV Explore Data Properties Alt+Enter

DimProduct

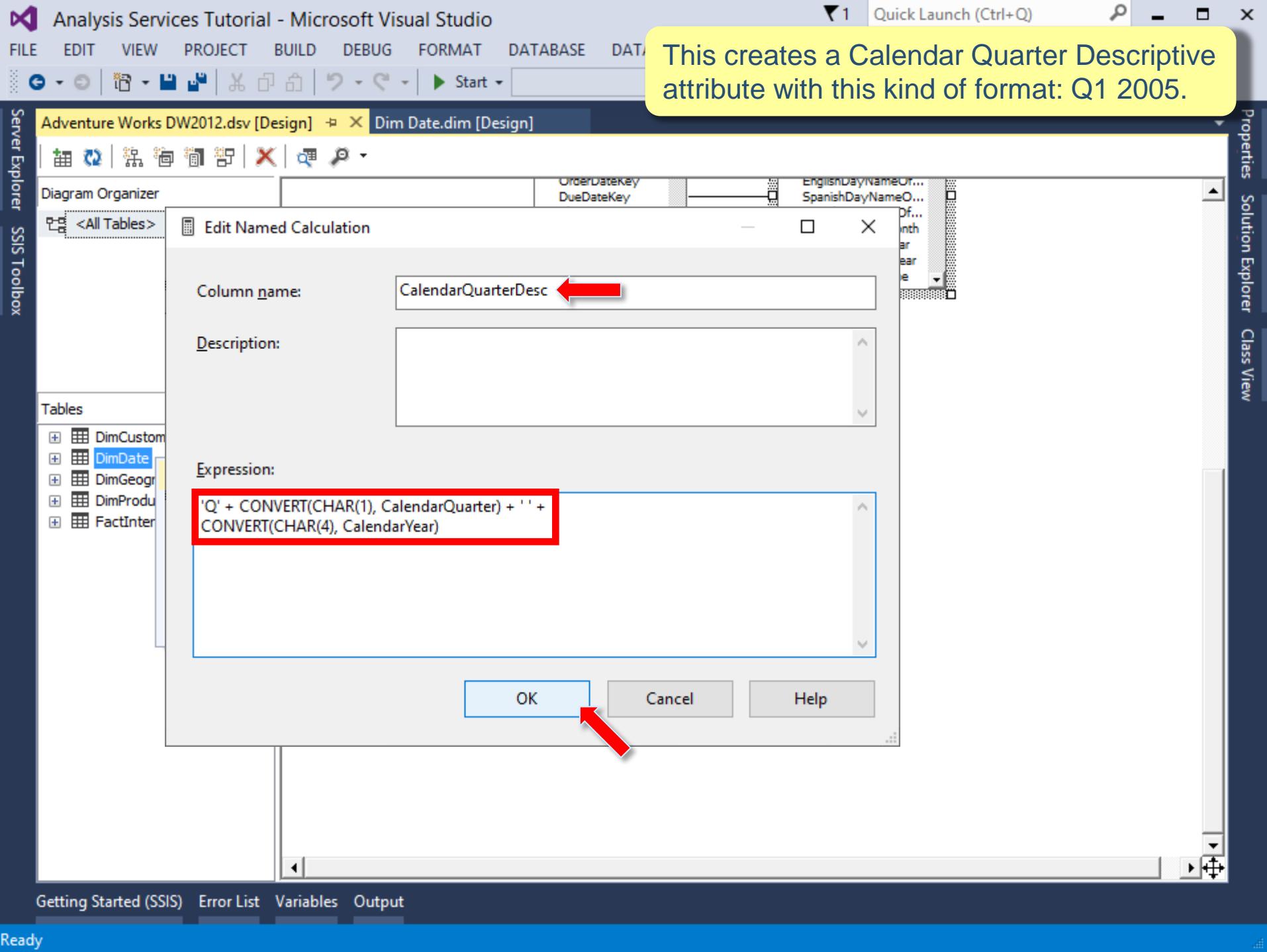
- ProductKey
- ProductAlternateKey
- ProductSubcategory...
- WeightUnitMeasure...
- SizeUnitMeasureC...
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag

OrderDateKey
DueDateKey
ShipDateKey
CustomerKey
PromotionKey
CurrencyKey
SalesTerritoryKey

EnglishDayNameOr...
SpanishDayNameO...
FrenchDayNameOf...
DayNumberOfMonth
DayNumberOfYear
WeekNumberOfYear
EnglishMonthName

Diagram showing relationships between DimDate, DimProduct, and DimDateKey/DimMonthKey tables.

The screenshot shows the Microsoft Visual Studio interface for Analysis Services. The title bar reads "Analysis Services Tutorial - Microsoft Visual Studio". The menu bar includes FILE, EDIT, VIEW, PROJECT, BUILD, DEBUG, FORMAT, DATABASE, and DATA SOURCE. The toolbar has various icons for file operations. The main window shows a diagram of database tables: DimDate, DimProduct, and DimDateKey/DimMonthKey. The DimDate table is selected, and its context menu is open. The "New Named Calculation..." option is highlighted with a red arrow. Other options in the context menu include "New Relationship...", "Replace Table", "Delete Table From DSV", "Explore Data", "Properties", and "Alt+Enter". The "Properties" tab is currently selected. The status bar at the bottom shows "Getting Started (SSIS) Error List Variables Output". A yellow callout bubble in the top right corner says "Create a new calculated attribute that concatenates the quarter and year." The "Server Explorer", "Solution Explorer", and "Class View" toolbars are visible on the right side.



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG FORMAT DATABASE DATA SOURCE

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

At last, create a new calculated attribute that concatenates the semester and year.

Diagram Organizer <All Tables>

Tables

- DimCustomer
- DimDate**
- DimGeogr
- DimProd
- FactInter

New Named Calculation... (highlighted with red arrow)

New Relationship... Replace Table Delete Table From DSV Explore Data Properties Alt+Enter

OrderDateKey
DueDateKey
ShipDateKey
CustomerKey
PromotionKey
CurrencyKey
SalesTerritoryKey

EnglishDayNameOfWeek
SpanishDayNameOfWeek
FrenchDayNameOfWeek
DayNumberOfMonth
DayNumberOfYear
WeekNumberOfYear
EnglishMonthName

DimProduct

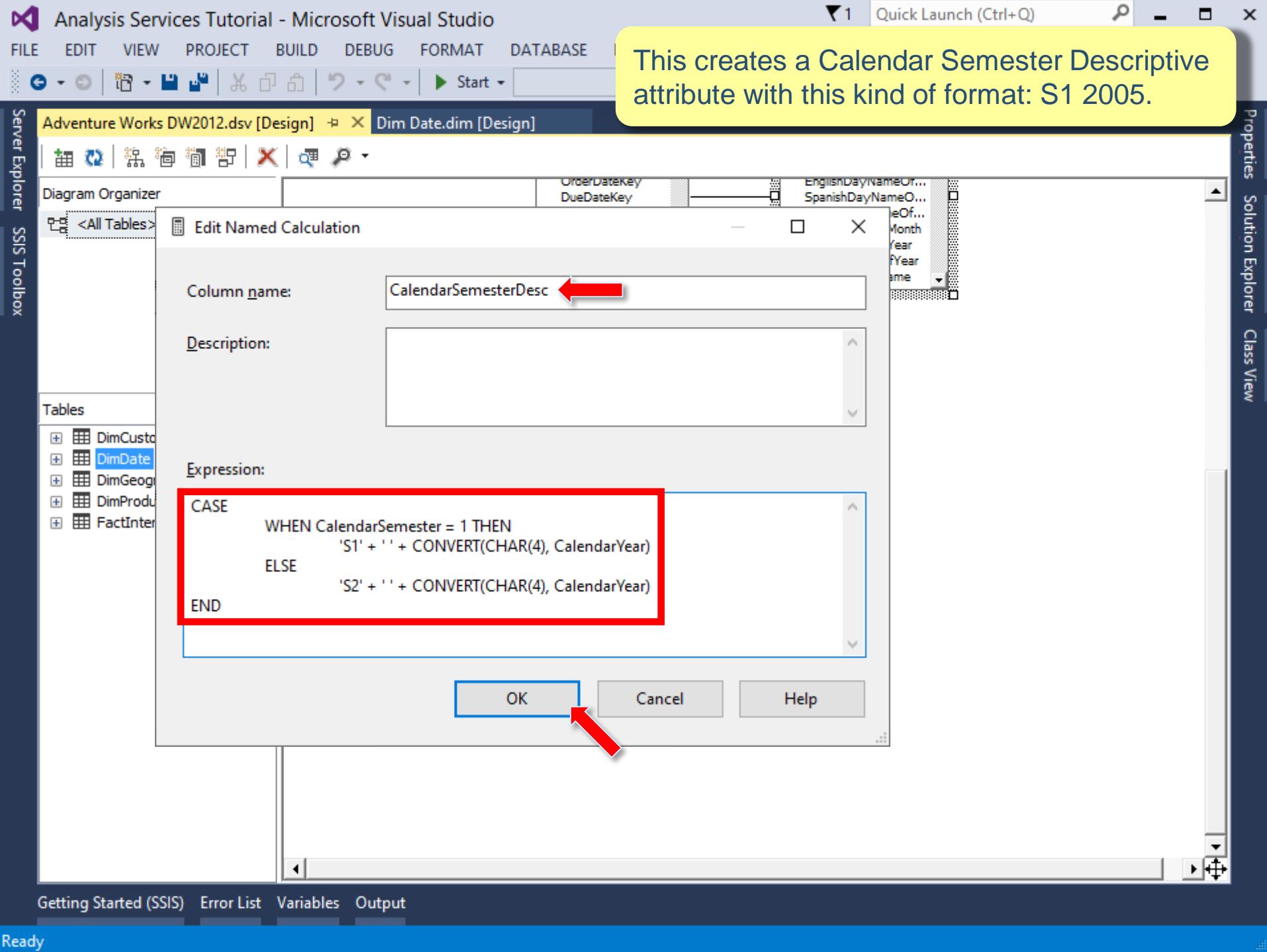
- ProductKey
- ProductAlternateKey
- ProductSubcategoryKey
- WeightUnitMeasureCode
- SizeUnitMeasureCode
- EnglishProductName
- SpanishProductName
- FrenchProductName
- StandardCost
- FinishedGoodsFlag

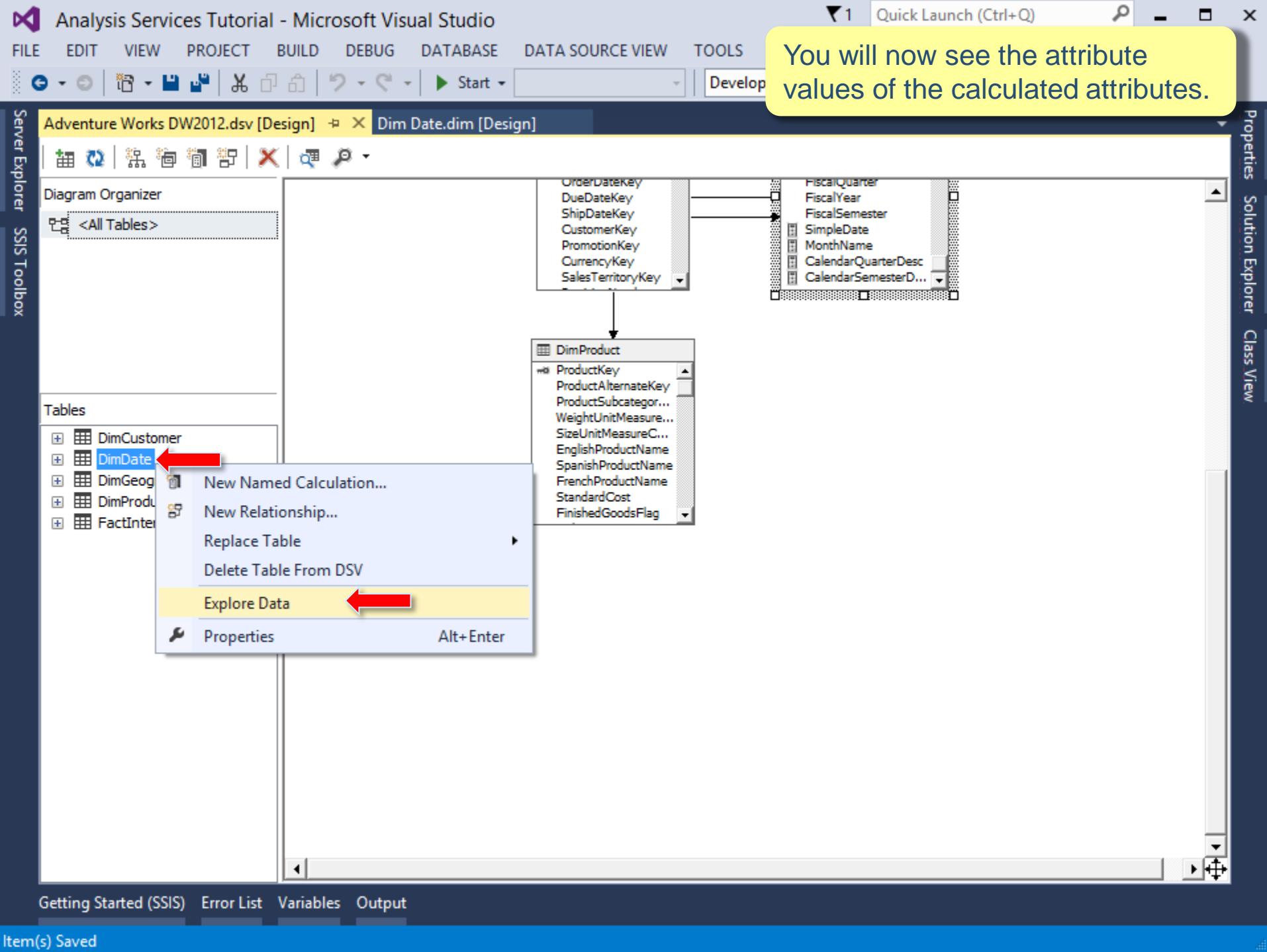
Server Explorer SSIS Toolbox Properties Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

```
graph TD; DimDate[Dim Date.dim] --- OrderDateKey[OrderDateKey]; DimDate --- DueDateKey[DueDateKey]; DimDate --- ShipDateKey[ShipDateKey]; DimDate --- CustomerKey[CustomerKey]; DimDate --- PromotionKey[PromotionKey]; DimDate --- CurrencyKey[CurrencyKey]; DimDate --- SalesTerritoryKey[SalesTerritoryKey]; DimDate --- EnglishDayNameOfWeek[EnglishDayNameOfWeek]; DimDate --- SpanishDayNameOfWeek[SpanishDayNameOfWeek]; DimDate --- FrenchDayNameOfWeek[FrenchDayNameOfWeek]; DimDate --- DayNumberOfMonth[DayNumberOfMonth]; DimDate --- DayNumberOfYear[DayNumberOfYear]; DimDate --- WeekNumberOfYear[WeekNumberOfYear]; DimDate --- EnglishMonthName[EnglishMonthName]; DimCustomer[DimCustomer] --- DimDate; DimProduct[DimProduct] --- DimDate; DimGeogr[DimGeogr] --- DimDate; DimProd[DimProd] --- DimDate; FactInter[FactInter] --- DimDate;
```





Analysis Services Tutorial - Microsoft Visual Studio

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

Quick Launch (Ctrl+Q)

Server Explorer Toolbox SSIS Toolbox Solution Explorer Team Explorer Getting Started (SSIS) Properties

Explore DimDate Table + X Adventure Works DW2019.dsv [Design] Dim Date.dim [Design] Analysis Services Tutorial.cube [Design]

Table

darSemester	FiscalQuarter	FiscalYear	FiscalSemester	SimpleDate	MonthName	CalendarQuarterDesc	CalendarSemesterDesc
3	2005	2		January 1, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 2, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 3, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 4, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 5, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 6, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 7, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 8, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 9, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 10, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 11, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 12, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 13, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 14, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 15, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 16, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 17, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 18, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 19, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 20, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 21, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 22, 2005	January 2005	Q1 2005	S1 2005
3	2005	2		January 23, 2005	January 2005	Q1 2005	S1 2005

Output Variables Error List

Add to Source Control ▾

Ready

Here, you can see the new attributes' values.

In Solution Explorer, double-click on the highlighted object to select the DimDate dimension.

The screenshot shows the Microsoft SQL Server Data Tools (SSDT) interface. On the left, the SSIS Toolbox is visible. In the center, the 'Explore DimDate Table' window displays a grid of data from the Dim Date dimension, showing columns like CalendarQuarter, FiscalYear, and SimpleDate. At the top, tabs for 'Dim Product.dim [Design]*' and 'Dim Date.dim [Design]' are selected. On the right, the Solution Explorer pane shows the project structure, including Analysis Services Tutorial, Data Sources, Data Source Views, Cubes, Dimensions, and other objects. A red arrow points to the 'Dim Date.dim' node under Dimensions, which is highlighted with a blue selection bar. The status bar at the bottom indicates 'This item does not support previewing'.

The KeyColumns property contains the column or columns that represent the key for the attribute. Next, you'll create a composite key for the *EnglishMonthName* and *CalendarYear* attributes. Composite keys can be helpful when you need to uniquely identify an attribute (e.g., when they are used in attribute relationships).

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Calendar Date

- Calendar Year
- □ Calendar Semester
- □ Calendar Quarter
- □ Calendar Month
- □ Date
- <new level>

To create a new hierarchy, drag an attribute here.

ID

ID	English Month Name
Name	English Month Name
Type	Months
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	ParentsIsBlankSelfOrMissing
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
DimDate.EnglishMont	
NameColumn	(none)
ValueColumn	(none)

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design] Start Development Properties

Dimension Structure Attribute Relationships Translations Browser English Month Name DimensionAttribute

Properties

Key Columns

Source table: DimDate

Available Columns

- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- CalendarSemester
- FiscalQuarter
- FiscalYear
- EnglishMonthName

Key Columns

- EnglishMonthName

OK Cancel Help

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Deploy failed

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG

Adventure Works DW2012.dsv [Design] Dim D

Dimension Structure Attribute Relationships

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Source table: DimDate

Available Columns

- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarSemester
- FiscalQuarter
- FiscalYear
- FiscalSemester
- SimpleDate

Key Columns

- EnglishMonthName
- CalendarYear

> <

OK Cancel Help

Besides the *EnglishMonthName* attribute the *CalendarYear* attribute is also needed to form a composite key that uniquely identifies each value used in the attribute relationships. Instead of these two attributes, the *MonthName* attribute (alone) could also have been used as the only *Key Column*.

KeyColumns
Specifies the details of the binding to the column(s) containing the member key(s).

Getting Started (SSIS) Error List Variables Output

Deploy failed

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]*

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name**

Hierarchies

Calendar Date
▪ Calendar Year
▪▪ Calendar Semester
▪▪ Calendar Quarter
▪▪ Calendar Month
▪▪ Date
<new level>

To create a new hierarchy, drag an attribute here.

Properties

English Month Name DimensionAttribute

ID	English Month Name
Name	English Month Name
Type	Months
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	(Collection)
NameColumn	(none)
ValueColumn	(none)

...

NameColumn

Specifies the details of the binding to the column containing the member name.

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Ready

Now you need to associate the calculated attribute *MonthName* to this dimension attribute.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIM

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]* Properties

At the cube, the *MonthName* attribute values will replace the *EnglishMonthName* attribute values.

Dimension Structure

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Name Column

Binding type: Column binding

Source table: DimDate

Source column:

- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- CalendarSemester
- FiscalQuarter
- FiscalYear
- FiscalSemester
- SimpleDate
- MonthName** 
- CalendarQuarterDesc
- CalendarSemesterDesc

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

Properties

Attribute

- English Month Name
- English Month Name
- Months
- Regular
- True
- EncourageGrouping
- None
- False
- NonLeafDataVisible
- ParentIsBlankSelfOrMissing
- (none)
- (none)
- (Collection)
- (none)
- (none)

Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date

<new level>

To create a new hierarchy, drag an attribute here.

Next, you'll create a composite key for the *CalendarQuarter* and *CalendarYear* attributes.

Properties

Calendar Quarter DimensionAttribute

ID	Calendar Quarter
Name	Calendar Quarter
Type	Quarters
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	ParentsIsBlankSelfOrMissing
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	(none)
ValueColumn	(none)

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Item(s) Saved

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design] Start Development Properties

Dimension Structure Attribute Relationships Translations Browser Calendar Quarter DimensionAttribute

Key Columns

Source table: DimDate

Available Columns

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarYear
- CalendarQuarter

Key Columns

- CalendarQuarter

OK Cancel Help

KeyColumns
Specifies the details of the binding to the column(s) containing the member key(s).

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Properties

Calendar Quarter DimensionAttribute

Server Explorer Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG

Adventure Works DW2012.dsv [Design] Dimension Structure Attribute Relationship

Server Explorer SSIS Toolbox

Besides the *CalendarQuarter* attribute the *CalendarYear* attribute is also needed to form a composite key that uniquely identifies each value used in the attribute relationships. Instead of these two attributes, the *CalendarQuarterDesc* attribute (alone) could also have been used as the only *Key Column*.

Source table: DimDate

Available Columns

- DateKey
- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarSemester
- EnglishQuarter

Key Columns

- CalendarQuarter
- CalendarYear

OK Cancel Help

KeyColumns
Specifies the details of the binding to the column(s) containing the member key(s).

Getting Started (SSIS) Error List Variables Output

Item(s) Saved

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIM

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date

<new level>

To create a new hierarchy, drag an attribute here.

Now you need to associate the calculated attribute *CalendarQuarterDesc* to this dimension attribute.

Properties

Calendar Quarter DimensionAttribute

ID	Calendar Quarter
Name	Calendar Quarter
Type	Quarters
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	(Collection)
NameColumn	(none)
ValueColumn	(none)

...

NameColumn

Specifies the details of the binding to the column containing the member name.

Server Explorer SSIS Toolbox Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Properties

At the cube, the *CalendarQuarterDesc* attribute values will replace the *CalendarQuarter* attribute values.

Binding type: Column binding

Source table: DimDate

Source column:

- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- CalendarSemester
- FiscalQuarter
- FiscalYear
- FiscalSemester
- SimpleDate
- MonthName
- CalendarQuarterDesc** ←
- CalendarSemesterDesc

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

Attribute

Calendar Quarter
Calendar Quarter
Quarters
Regular
True
EncourageGrouping
None
False
NonLeafDataVisible
ParentsIsBlankSelfOrMissing
(none)
(none)
(Collection)
(none)
(none)

Server Explorer

SSIS Toolbox

Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Build failed

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSIO

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date
- <new level>

To create a new hierarchy, drag an attribute here.

Properties

Calendar Semester DimensionAttribute

ID	Calendar Semester
Name	Calendar Semester
Type	HalfYears
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	ParentsIsBlankSelfOrMissing
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	(none)
ValueColumn	(none)

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Deploy failed

Next, you'll create a composite key for the *CalendarSemester* and *CalendarYear* attributes.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW HELP

Development

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Properties

Calendar Semester DimensionAttribute

Dimension Structure Attribute Relationships Translations Browser

Key Columns

Source table: DimDate

Available Columns

- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- EnglishQuarter

Key Columns

- CalendarSemester

OK Cancel Help

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Server Explorer

SSIS Toolbox

Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Deploy failed

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG

Adventure Works DW2012.dsv [Design] Dimension Structure Attribute Relationship

Attributes

Dim Date

- Calendar Quarter
- Calendar Semester
- Calendar Year
- Date Key
- English Month Name

Source table: DimDate

Available Columns

- FullDateAlternateKey
- DayNumberOfWeek
- EnglishDayNameOfWeek
- SpanishDayNameOfWeek
- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- FiscalQuarter
- EnglishName

Key Columns

- CalendarSemester
- CalendarYear

> <

OK Cancel Help

KeyColumns

Specifies the details of the binding to the column(s) containing the member key(s).

Besides the *CalendarSemester* attribute the *CalendarYear* attribute is also needed to form a composite key that uniquely identifies each value used in the attribute relationships. Instead of these two attributes, the *CalendarSemesterDesc* attribute (alone) could also have been used as the only *Key Column*.

Properties Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIM

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Dimension Structure Attribute Relationships Translations Browser

Attributes Hierarchies

Calendar Date

- Calendar Year
- Calendar Semester
- Calendar Quarter
- Calendar Month
- Date
- <new level>

To create a new hierarchy, drag an attribute here.

Now you need to associate the calculated attribute *CalendarSemesterDesc* to this dimension attribute.

Properties

Calendar Semester DimensionAttribute

ID	Calendar Semester
Name	Calendar Semester
Type	HalfYears
Usage	Regular
Misc	
AttributeHierarchyOrdered	True
ExtendedType	
GroupingBehavior	EncourageGrouping
InstanceSelection	None
MemberNamesUnique	False
VisualizationProperties	
Parent-Child	
MembersWithData	NonLeafDataVisible
MembersWithDataCaption	
NamingTemplate	
RootMemberIf	
UnaryOperatorColumn	(none)
Source	
CustomRollupColumn	(none)
CustomRollupPropertiesColumn	(none)
KeyColumns	
NameColumn	(Collection)
NameColumn	(none)
ValueColumn	(none)

...

NameColumn

Specifies the details of the binding to the column containing the member name.

Server Explorer SSIS Toolbox Solution Explorer Class View

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASES

Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

At the cube, the *CalendarSemesterDesc* attribute values will replace the *CalendarSemester* attribute values.

Properties

Name Column

Binding type: Column binding

Source table: DimDate

Source column:

- FrenchDayNameOfWeek
- DayNumberOfMonth
- DayNumberOfYear
- WeekNumberOfYear
- EnglishMonthName
- SpanishMonthName
- FrenchMonthName
- MonthNumberOfYear
- CalendarQuarter
- CalendarYear
- CalendarSemester
- FiscalQuarter
- FiscalYear
- FiscalSemester
- SimpleDate
- MonthName
- CalendarQuarterDesc
- CalendarSemesterDesc**

OK Cancel Help

Specifies the details of the binding to the column containing the member name.

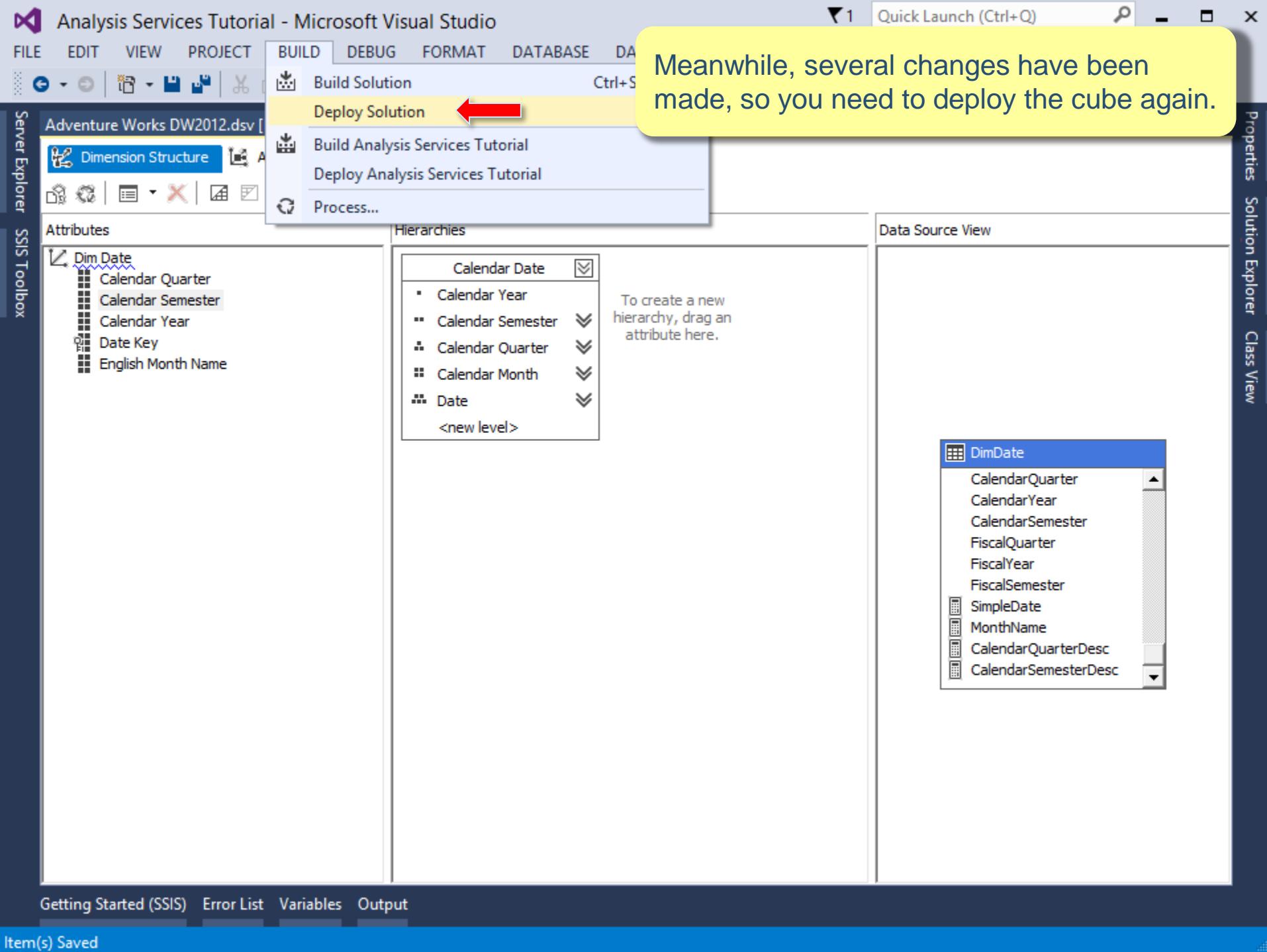
Attribute

- Calendar Semester
- Calendar Semester**
- HalfYears
- Regular
- True
- EncourageGrouping
- None
- False
- NonLeafDataVisible
- ParentIsBlankSelfOrMissing
- (none)
- (none)
- (Collection)
- (none)
- (none)

Server Explorer SSIS Toolbox Solution Explorer Class View

Getting Started (SSIS) Error List Variables Output

Build failed



Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE DIMENSION TOOLS WINDOW Develop

Quick Launch (Ctrl+Q)

Now, the cube is properly updated.

Deployment Progress...s Services Tutorial Adventure Works DW2012.dsv [Design] Dim Date.dim [Design]

Server: localhost
Database: Analysis Services Tutorial

Command
Command

- Processing Database 'Analysis Services Tutorial' completed.
 - Start time: 19/05/2016 00:00:34; End time: 19/05/2016 00:00:36; Duration: 0:00:02
 - Processing Cube 'Analysis Services Tutorial' completed.
 - Start time: 19/05/2016 00:00:35; End time: 19/05/2016 00:00:36; Duration: 0:00:01
 - Processing Measure Group 'Fact Internet Sales' completed.
 - Processing Dimension 'Dim Date' completed.

Status:

 Deployment Completed Successfully

Getting Started (SSIS) Error List Variables Output

Deploy succeeded

In Solution Explorer, double-click on the highlighted object to select the Analysis Services Tutorial cube.

The screenshot shows the Microsoft SQL Server Data Tools (SSDT) interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, and a search bar. The ribbon tabs are Develop and Default. The left sidebar has an SSIS Toolbox tab. The main workspace has tabs for Explore DimDate Table, Dim Product.dim [Design], and Dim Date.dim [Design]. The Dim Date.dim [Design] tab is active, showing the Attributes and Hierarchies panes. The Attributes pane lists Dim Date, Calendar Quarter, Calendar Semester, Calendar Year, Date Key, and English Month Name. The Hierarchies pane shows a list of hierarchy levels under 'Calendar Date': Calendar Year, Calendar Semester, Calendar Quarter, English Month Name, and Date, with '<new level>' at the bottom. A tooltip in the Hierarchies pane says: 'To create a new hierarchy, drag an attribute here.' The right side features the Solution Explorer pane, which displays the project structure for 'Analysis Services Tutorial'. It includes nodes for Data Sources (Adventure Works DW2022.ds), Data Source Views (Adventure Works DW2022.dsv), Cubes, Dimensions (Dim Date.dim, Dim Customer.dim, Dim Product.dim), Roles, Assemblies, and Miscellaneous. The node 'Analysis Services Tutorial.cube' is highlighted with a red arrow pointing to it. The bottom navigation bar includes Output, Error List, Variables, Add to Source Control, Select Repository, and a status message indicating the item does not support previewing.

Analysis Services Tutorial - Microsoft Visual Studio

FILE EDIT VIEW PROJECT BUILD DEBUG DATABASE C

Analysis Services Tutorial.cube [Design] Dim Date.dim [Design]

Cube Structure Dimension Us... Calculations KPIs Actions Partitions Aggregations Perspectives Transactions Browser

Server Explorer SSIS Toolbox Properties Solution Explorer Class View

In the Browser tab, the Excel/icon allows you to launch Excel using the workspace database as the data source.

Language: Default

Edit as Text Import...       

Dimension	Hierarchy	Operator	Filter Expression	Para...
<Select dimension>				

Analysis Services Tutorial

Metadata

Measure Group: <All>

- + Analysis Services Tutorial
 - Measures
 - KPIs
 - + Dim Product
 - Due Date
 - Order Date
 - Ship Date

Calculated Members

Drag levels or measures here to add to the query.

Getting Started (SSIS) Error List Variables Output

Ready



Book1 - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW POWERPIVOT

Paulo Oliveira

Clipboard

Font Alignment Number Styles Cells Editing

A1 : X ✓ fx

Microsoft Excel Security Notice ? X

Microsoft Office has identified a potential security concern.

File Path: C:\Users\Paulo\AppData\Local\Temp\tmpF10C.odc

Data connections have been blocked. If you choose to enable data connections, your computer may no longer be secure. Do not enable this content unless you trust the source of this file.

Enable Disable

tmpF10C +

READY

Book4 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA

Calibri 11 A A

B I U Font

Clipboard

Format as Table Delete Sort & Find & Filter Select

Cell Styles Format Cells Editing

B9 : X ✓ fx

A B C D E F

PivotTable Fields

To build a report, choose fields from the PivotTable Field List

Choose fields to add to report:

- Extended Amount
- Freight
- Internet Sales Count
- Order Quantity
- Product Standard Cost
- Sales Amount
- Tax Amount

Drag fields between areas below:

FILTERS COLUMNS

ROWS VALUES

Defer Layout Update UPDATE

Expand Fact Internet Sales, and then drag the Sales Amount measure to the Values area.

tmp68A

READY

100%

PIVOTTABLE TOOLS

ANALYZE **DESIGN** **Paulo Oliveira**

PivotTable

Active Field: **Sales Amount**

Drill Down Drill Up Group

Insert Slicer Insert Timeline Filter Connections

Refresh Change Data Source

Actions Calculations

PivotChart Recommended PivotTables

Show

Active Field Filter Data Tools

A1 : **X** **✓** **fx** **Sales Amount**

	A	B	C	D	E	F	G	H	I	J
1	Sales Amount									
2	\$29 358 677,22									
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										

PivotTable Fields

Choose fields to add to report:

- Σ Fact Internet Sales**
 - Discount Amount
 - Extended Amount
 - Fact Internet Sales Count
 - Freight
 - Order Quantity
 - Product Standard Cost
 - Sales Amount

Drag fields between areas below:

FILTERS

COLUMNS

ROWS

VALUES

Sales Amount

Defer Layout Update UPDATE

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA PIVOTTABLES REFRESH SOURCE DATA TOOLS

Active Field: Sales Amount Drill Down Drill Up Group Insert Slicer Insert Timeline Filter Connections Refresh Source PivotTables Tools

A2 : X ✓ fx 29358677,2206965

Sales Amount \$29 358 677,22

PivotTable Fields

Choose fields to add to report:

- Dim Product
 - Product Model Lines
- Financial
- Stocking
- More Fields

- Due Date
 - Due Date.Calendar Date
- More Fields

Drag fields between areas below:

FILTERS	COLUMNS
ROWS	VALUES
Sales Amount	

Defer Layout Update UPDATE

tmpF10C

READY

Expand *Product* and drag the *Product Model Lines* hierarchy to the *Columns* area.

The screenshot illustrates the process of creating a PivotTable. In the PivotTable Fields pane, 'Product Model Lines' is highlighted with a red arrow. Below it, the 'COLUMNS' area is also indicated with a red arrow. The main worksheet shows the value '\$29 358 677,22' in cell A2.

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW POWERPIVOT ANALYZE DESIGN Paulo Oliveira

PivotTable Active Field: Sales Amount Drill Down Drill Up Group Insert Slicer Insert Timeline Filter Connections Refresh Change Data Source Actions Calculations PivotChart Recommended PivotTables Show

A2 : X ✓ fx

	Column Labels					
1	Accessory	Mountain	Road	Touring	Grand Total	
2						
3	Sales Amount	\$604 053,30	\$10 251 183,52	\$14 624 108,58	\$3 879 331,82	\$29 358 677,22
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						

PivotTable Fields

Choose fields to add to report:

- Product Model Lines
- Financial
- Stocking
- More Fields

- Due Date
- Due Date.Calendar Date
- More Fields

Drag fields between areas below:

FILTERS

COLUMNS

Product Mod...

ROWS

VALUES

Sales Amount

Defer Layout Update

UPDATE

Book4 - Excel PIVOTTABLE TOOLS ? -

FILE HOME INSERT PAGE LAYOUT FORMulas PIVOTTABLES PivotTables Tools

Active Field: Sales Amount Drill Down Drill Up Group Filter Connections Source Data

PIVOTABLE FIELDS

Choose fields to add to report:

- ▶ Demographic
- ▶ Location
 - City
 - Country-Region
- ▶ Customer Geography

Drag fields between areas below:

FILTERS COLUMNS

ROWS VALUES

Defer Layout Update UPDATE

A1 : X ✓ fx

Column Labels

	A	B	C	D	E	F	G
1		Accessory	Mountain	Road	Touring	Grand Total	
2	Sales Amount	\$604 053,30	\$10 251 183,52	\$14 624 108,58	\$3 879 331,82	\$29 358 677,22	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							

tmp68A

READY

100%

Customer Geography hierarchy from the Location display folder in the Customer dimension to the Rows area.

Book4 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW POWERPIVOT ANALYZE DESIGN Paulo Oliveira

PivotTable Active Field: Sales Amount Drill Down Drill Up Group Insert Slicer Insert Timeline Filter Connections Refresh Change Data Source Actions Calculations PivotChart Recommended PivotTables Show

A1 : X ✓ fx Sales Amount

	A	B	C	D	E	F
1	Sales Amount	Column Labels				
2	Row Labels	+ Accessory	+ Mountain	+ Road	+ Touring	Grand Total
3	+ Australia	\$127 128,61	\$2 906 994,45	\$5 029 120,41	\$997 757,12	\$9 061 000,58
4	+ Canada	\$82 736,07	\$672 429,31	\$948 943,35	\$273 736,13	\$1 977 844,86
5	+ France	\$55 001,21	\$917 158,25	\$1 323 295,80	\$348 562,45	\$2 644 017,71
6	+ Germany	\$54 382,29	\$1 021 094,33	\$1 390 063,25	\$428 772,47	\$2 894 312,34
7	+ United Kingdom	\$67 636,33	\$1 185 550,41	\$1 610 247,36	\$528 278,11	\$3 391 712,21
8	+ United States	\$217 168,79	\$3 547 956,78	\$4 322 438,41	\$1 302 225,54	\$9 389 789,51
9	Grand Total	\$604 053,30	\$10 251 183,52	\$14 624 108,58	\$3 879 331,82	\$29 358 677,22
10						
11						
12						
13						
14						
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16						
17						
18						
19						
20						
21						
22						
23						

PivotTable Fields

Choose fields to add to report:

- Demographic
- Location
 - City
 - Country-Region
- Customer Geography
 - Postal Code
 - State-Province

Drag fields between areas below:

FILTERS COLUMNS
Product Mod... ▾

ROWS VALUES
Customer Ge... ▾ Sales Amount ▾

Defer Layout Update UPDATE

Book4 - Excel PIVOTTABLE TOOLS ? -

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA

Active Field: Sales Amount Drill Down Drill Up Group Insert Slicer Insert Timeline Filter Refresh Change Data Source Actions Calculations PivotChart Recommended PivotTables Tools

A1 : X ✓ fx Sales Amount

	A	B	C	D	E	F
1	Sales Amount	Column Labels				
2	Row Labels	+ Accessory	+ Mountain	+ Road	+ Touring	Grand Total
3	Australia	\$127 128,61	\$2 906 994,45	\$5 029 120,41	\$997 757,12	\$9 061 000,58
4	Canada	\$82 736,07	\$672 429,31	\$948 943,35	\$273 736,13	\$1 977 844,86
5	France	\$55 001,21	\$917 158,25	\$1 323 295,80	\$348 562,45	\$2 644 017,71
6	Germany	\$54 382,29	\$1 021 094,33	\$1 390 063,25	\$428 772,47	\$2 894 312,34
7	United Kingdom	\$67 636,33	\$1 185 550,41	\$1 610 247,36	\$528 278,11	\$3 391 712,21
8	United States	\$217 168,79	\$3 547 956,78	\$4 322 438,41	\$1 302 225,54	\$9 389 789,51
9	Grand Total	\$604 053,30	\$10 251 183,52	\$14 624 108,58	\$3 879 331,82	\$29 358 677,22
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22						
23						

Expand Order Date, and then drag the Order Date.Calendar Date hierarchy into the Filters area.

PivotTable Fields

Choose fields to add to report:

- Order Date
 - Order Date.Calendar Date
- Product
 - Product Model Lines

Drag fields between areas below:

FILTERS COLUMNS

ROWS VALUES

Defer Layout Update UPDATE

READY

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW POWERPIVOT ANALYZE DESIGN Paulo Oliveira

Font: Calibri 11pt, Alignment: Center, Number: Currency (\$), Styles: Conditional Formatting, Format as Table, Cell Styles.

Cells: Insert, Delete, Format, Sort & Filter, Find & Select.

C7

A B C D E F

1 Order Date.Calendar Date All

2

3 Sales Amount Column Labels

4 Row Labels Accessory Mountain Road Touring Grand Total

5 Australia \$127 128,61 \$2 906 994,45 \$5 029 120,41 \$997 757,12 \$9 061 000,

6 Canada \$82 736,07 \$672 429,31 \$948 943,35 \$273 736,13 \$1 977 844,

7 France \$55 001,21 \$917 158,25 \$1 323 295,80 \$348 562,45 \$2 644 017,

8 Germany \$54 382,29 \$1 021 094,33 \$1 390 063,25 \$428 772,47 \$2 894 312,

9 United Kingdom \$67 636,33 \$1 185 550,41 \$1 610 247,36 \$528 278,11 \$3 391 712,

10 United States \$217 168,79 \$3 547 956,78 \$4 322 438,41 \$1 302 225,54 \$9 389 789,

11 Grand Total \$604 053,30 \$10 251 183,52 \$14 624 108,58 \$3 879 331,82 \$29 358 677,

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PivotTable Fields

Choose fields to add to report:

- Order Date
 - Order Date.Calendar Date
 - More Fields
- Product
 - Product Model Lines
 - Product Line
 - Model Name

Drag fields between areas below:

FILTERS	COLUMNS
Order Date.C...	Product Mod...
ROWS	
Customer Ge...	Sales Amount

Defer Layout Update UPDATE

Book1 - Excel PIVOTTABLE TOOLS ? - X

FILE HOME INSERT PAGE LAYOUT FORM PIVOTTABLES

Active Field: Calendar Year Drill Down Drill Up Group Filter Data Tools

A1 : Order Date.Calendar Date

Order Date.Calendar Date All

Search Calendar Year

Sales Row L

2008
2009
2010
2011
2012
S1 CY 2012
Q1 CY 2012
February 2012
January 2012
March 2012

Mountain Road Touring Grand Total

\$2 906 994,45 \$5 029 120,41 \$997 757,12 \$9 061 000,
\$672 429,31 \$948 943,35 \$273 736,13 \$1 977 844,
\$917 158,25 \$1 323 295,80 \$348 562,45 \$2 644 017,
\$1 021 094,33 \$1 390 063,25 \$428 772,47 \$2 894 312,
\$1 185 550,41 \$1 610 247,36 \$528 278,11 \$3 391 712,
\$3 547 956,78 \$4 322 438,41 \$1 302 225,54 \$9 389 789,
\$10 251 183,52 **\$14 624 108,58** **\$3 879 331,82** **\$29 358 677**

Select Multiple Items OK Cancel

PivotTable Fields

Choose fields to add to report:

Product Line
Model Name
Product Name
Financial
Stocking
More Fields

Due Date
Due Date.Calendar Date

Drag fields between areas below:

FILTERS Order Date.C... COLUMNS Product Mod...

ROWS Customer Ge... VALUES Sales Amount

Defer Layout Update UPDATE

tmp2A6F

READY

Click the arrow to the right of the *Order Date.Calendar Date* filter, expand 2012, expand S1 CY 2012, expand Q1 CY 2012, select February 2012, and then click OK.

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA

Calibri 11 A A
B I U Alignment
Font

Clipboard

A1 : Order Date.Calendar Date

Order Date.Calendar Date February 2012

Sales Amount

Row Labels Column Labels

Mountain Road Grand Total

Australia	\$51 472,99	\$89 544,36	\$141 017,35
Canada	\$4 142,84	\$61 032,29	\$65 175,13
France	\$16 437,43	\$25 952,77	\$42 390,20
Germany	\$6 147,29	\$24 850,37	\$30 997,66
United Kingdom	\$10 312,46	\$49 096,07	\$59 408,52
United States	\$39 156,08	\$128 849,25	\$168 005,32
Grand Total	\$127 669,09	\$379 325,10	\$506 994,19

PivotTable Fields

Choose fields to add to report:

- Product Line
 - Model Name
 - Product Name
 - Financial
 - Stocking
 - More Fields
- Due Date
 - Due Date
 - Due Date.Calendar Date
- Customer Group

Drag fields between areas below:

FILTERS: Order Date.Calendar Date

COLUMNS: Product Model

ROWS: Customer Group

VALUES: Sales Amount

Defer Layout Update

UPDATE

tmp2A6F

READY

Here, you have the *sales amount* by *region* and *product line* for the month of *February, 2012*.

Book1 - Excel

PIVOTTABLE TOOLS

If necessary, you can drill down to see the data with further detail.

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Calibri 11 A A General Co
B I U Alignment Number Cell Styles Format Cells Editing

C4 : Road

The screenshot shows the Microsoft Excel ribbon at the top with tabs like FILE, HOME, and REVIEW. Below the ribbon is a toolbar with font and style options. The main area displays a PivotTable with data for Sales Amount by Country and Region. To the right, the 'PIVOTTABLE TOOLS' ribbon is open, specifically the 'PIVOT TABLE' tab. A yellow callout bubble points to the 'Format' button in the 'Cells' group, with the text 'If necessary, you can drill down to see the data with further detail.' The 'PivotTable Fields' pane is visible on the right, listing fields like Product Line, Model Name, and Sales Amount, along with their respective values and sub-categories.

	A	B	C	D	E	F
1	Order Date.Calendar Date	February 2012				
2						
3	Sales Amount	Column Labels				
4		+ Mountain	+ Road		Road Total	Gran
5	Row Labels		+ Road-250	+ Road-550-W	+ Road-650	
6	+ Australia	\$51 472,99	\$79 496,14	\$3 001,31	\$7 046,91	\$89 544,36
7	+ New South Wales	\$18 508,85	\$29 669,25		\$1 565,98	\$31 235,23
8	+ Queensland	\$12 383,87	\$29 669,25		\$2 348,97	\$32 018,22
9	+ South Australia		\$2 181,56	\$1 000,44	\$782,99	\$3 964,99
10	+ Tasmania	\$4 098,20				\$4
11	+ Victoria	\$16 482,07	\$17 976,08	\$2 000,88	\$2 348,97	\$22 325,92
12	+ Canada	\$4 142,84	\$58 465,88	\$1 000,44	\$1 565,98	\$61 032,29
13	+ France	\$16 437,43	\$23 386,35	\$1 000,44	\$1 565,98	\$25 952,77
14	+ Germany	\$6 147,29	\$18 499,65	\$4 001,75	\$2 348,97	\$24 850,37
15	+ Bayern			\$1 000,44		\$1
16	+ Brandenburg	\$2 049,10				\$2
17	+ Hamburg	\$2 049,10	\$6 806,48	\$1 000,44		\$7 806,91
18	+ Hessen		\$2 443,35	\$1 000,44		\$3 443,79
19	+ Nordrhein-Westfalen	\$2 049,10	\$4 624,91		\$1 565,98	\$6 190,89
20	+ Saarland		\$4 624,91	\$1 000,44	\$782,99	\$6 408,34
21	+ United Kingdom	\$10 312,46	\$38 395,50	\$6 002,63	\$4 697,94	\$49 096,07
22	+ United States	\$39 156,08	\$116 582,70	\$6 002,63	\$6 263,92	\$128 849,25

PivotTable Fields

Choose fields to add to report:

Product Line

Model Name

Product Name

Financial

Stocking

More Fields

Due Date

Due Date.Calendar Date

Drag fields between areas below:

FILTERS

Order Date.C... ▾

Product Mod... ▾

ROWS

Customer Ge... ▾

Sales Amount ▾

Defer Layout Update

UPDATE

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA PIVOTTABLE TOOLS ? - X

Calibri 11 A A

B I U Alignment Number Styles Cells Editing

A5 : Accessory

Here, you have the *sales amount* by *product line* and *gender* of the products that were shipped to customers during the years of 2012 and 2013.

	A	B	C	D	E
1	Ship Date.Calendar Date	(Multiple Items)			
2					
3	Sales Amount	Column Labels			
4	Row Labels	F	M	Grand Total	
5	Accessory	\$281 746,85	\$287 337,28	\$569 084,13	
6	+ Bike Wash	\$3 243,60	\$3 529,80	\$6 773,40	
7	+ Classic Vest	\$15 938,50	\$16 954,50	\$32 893,00	
8	+ Cycling Cap	\$9 340,61	\$9 259,70	\$18 600,31	
9	+ Half-Finger Gloves	\$15 967,48	\$16 971,57	\$32 939,05	
10	+ Hitch Rack - 4-Bike	\$17 040,00	\$19 440,00	\$36 480,00	
11	+ Hydration Pack	\$19 136,52	\$19 301,49	\$38 438,01	
12	+ Long-Sleeve Logo Jersey	\$41 041,79	\$40 091,98	\$81 133,77	
13	+ Patch kit	\$3 341,11	\$3 464,77	\$6 805,88	
14	+ Short-Sleeve Classic Jersey	\$39 682,65	\$42 274,17	\$81 956,82	
15	+ Sport-100	\$107 139,38	\$105 844,75	\$212 984,13	
16	+ Water Bottle	\$9 875,21	\$10 204,55	\$20 079,76	
17	Mountain	\$4 478 189,63	\$4 329 925,18	\$8 808 114,81	
18	+ All-Purpose Bike Stand	\$21 147,00	\$16 377,00	\$37 524,00	
19	+ Fender Set - Mountain	\$21 518,42	\$22 265,74	\$43 784,16	
20	+ HL Mountain Tire	\$22 750,00	\$23 065,00	\$45 815,00	
21	+ LL Mountain Tire	\$9 121,35	\$10 620,75	\$19 742,10	
22	+ ML Mountain Tire	\$15 204,93	\$16 854,38	\$32 059,31	

PivotTable Fields

Choose fields to add to report:

- More Fields
- Order Date
 - Order Date.Calendar Date
- More Fields
- Ship Date
 - Ship Date.Calendar Date
- More Fields

Drag fields between areas below:

FILTERS: Ship Date.Calendar Date

COLUMNS: Gender

ROWS: Product Mod...

VALUES: Sales Amount

Defer Layout Update UPDATE

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Calibri 11 A A General %

B I U Alignment Number Cell Styles Format Cells Editing

A5 Row Labels

Here, the ordered quantities are also added to the previous data analysis.

	A	B	C	D	E
1	Ship Date.Calendar Date (Multiple Items)				
2					
3					
4					
5	Row Labels	Sales Amount	Order Quantity	Sales Amount	Order Quantity
6	Accessory	\$281 746,85	10 896	\$287 337,28	11 115
7	+ Bike Wash	\$3 243,60	408	\$3 529,80	444
8	+ Classic Vest	\$15 938,50	251	\$16 954,50	267
9	+ Cycling Cap	\$9 340,61	1 039	\$9 259,70	1 030
10	+ Half-Finger Gloves	\$15 967,48	652	\$16 971,57	693
11	+ Hitch Rack - 4-Bike	\$17 040,00	142	\$19 440,00	162
12	+ Hydration Pack	\$19 136,52	348	\$19 301,49	351
13	+ Long-Sleeve Logo Jersey	\$41 041,79	821	\$40 091,98	802
14	+ Patch kit	\$3 341,11	1 459	\$3 464,77	1 513
15	+ Short-Sleeve Classic Jersey	\$39 682,65	735	\$42 274,17	783
16	+ Sport-100	\$107 139,38	3 062	\$105 844,75	3 025
17	+ Water Bottle	\$9 875,21	1 979	\$10 204,55	2 045
18	Mountain	\$4 478 189,63	7 745	\$4 329 925,18	7 903
19	+ All-Purpose Bike Stand	\$21 147,00	133	\$16 377,00	103
20	+ Fender Set - Mountain	\$21 518,42	979	\$22 265,74	1 013
21	+ HL Mountain Tire	\$22 750,00	650	\$23 065,00	659
22	+ LL Mountain Tire	\$9 121,35	365	\$10 620,75	425

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Calibri 11 A A Currency %

B I U Alignment Number Cell Styles Format

Clipboard Cells Editing

B7 : 1436,3384

Freight amounts spent with orders from French customers by year.

	A	B	C	D	E	F
1						
2						
3	Freight	Column Labels				
4	Row Labels	+ 2012	+ 2013	Grand Total		
5	France	\$15 729,33	\$39 496,48	\$55 225,81		
6	+ Charente-Maritime	\$357,57	\$397,90	\$755,47		
7	+ Essonne	\$1 436,34	\$4 129,05	\$5 565,39		
8	+ Garonne (Haute)	\$259,43	\$837,34	\$1 096,77		
9	+ Hauts de Seine	\$1 362,44	\$4 221,43	\$5 583,87		
10	+ Loir et Cher	\$132,44	\$286,03	\$418,48		
11	+ Loiret	\$514,37	\$1 385,34	\$1 899,70		
12	+ Moselle	\$492,59	\$1 554,24	\$2 046,82		
13	+ Nord	\$2 434,73	\$5 691,43	\$8 126,15		
14	+ Pas de Calais	\$115,62	\$167,95	\$283,58		
15	+ Seine (Paris)	\$3 623,49	\$8 060,03	\$11 683,52		
16	+ Seine et Marne	\$736,64	\$1 508,98	\$2 245,63		
17	+ Seine Saint Denis	\$2 302,10	\$5 836,98	\$8 139,07		
18	+ Somme	\$240,96	\$390,99	\$631,95		
19	+ Val de Marne	\$180,44	\$359,67	\$540,11		
20	+ Val d'Oise	\$167,41	\$802,37	\$969,78		
21	+ Yveline	\$1 372,77	\$3 866,74	\$5 239,51		
22	Grand Total	\$15 729,33	\$39 496,48	\$55 225,81		

Sales amounts and quantities by customer on the 2nd quarter of 2013

	A	B	C	D	E	F
1	Order Date.Calendar Date	Q 2 CY 2013				
2						
3	Row Labels	Sales Amount	Order Quantity			
4	+ Australia	\$1 052 361,97	2 713			
5	+ Canada	\$259 569,55	1 756			
6	+ France	\$376 991,02	1 179			
7	+ Germany	\$389 211,36	1 179			
8	+ Bayern	\$57 251,76	174			
9	+ Brandenburg	\$6 683,89	19			
10	+ Hamburg	\$74 108,76	214			
11	+ Hessen	\$88 215,71	220			
12	+ Nordrhein-Westfalen	\$65 077,03	243			
13	+ Saarland	\$97 874,21	309			
14	+ United Kingdom	\$549 279,82	1 658			
15	+ United States	\$1 346 379,76	4 918			
16	Grand Total	\$3 973 793,48	13 403			
17						
18						
19						
20						
21						
22						

PivotTable Fields

Choose fields to add to report:

- + **Region**
- + **Location**
 - City
 - Country-Region
- + **Customer Geography**
 - Country-Region**
 - State Province**
 - City
 - Postal Code

Drag fields between areas below:

FILTERS	COLUMNS
Order Date.C...	<input type="checkbox"/> Values
ROWS	VALUES
Customer Ge...	<input type="checkbox"/> Sales Amo...
	<input type="checkbox"/> Order Qua...
<input type="checkbox"/> Defer Layout Update	
UPDATE	

tmp2A6F

READY

Book1 - Excel

PIVOTTABLE TOOLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA

Calibri 11 A A

B I U Alignment

B4 : X ✓ fx Column Labels

A B C D

	Education	Graduate Degree				
1	House Owner Flag	1				
2	Sales Amount	Column Labels	H	L	M	Grand Total
3	Row Labels					
4	F	\$63 688,59	\$1 731 117,91	\$142 449,78	\$267 865,53	\$2 205 121,81
5	0	\$49 598,94	\$1 422 127,88	\$122 624,86	\$236 310,08	\$1 830 661,76
6	1	\$3 889,06	\$104 557,44	\$9 303,38	\$15 121,80	\$132 871,68
7	2	\$1 567,79	\$46 997,37	\$7 078,29	\$12 057,88	\$67 701,32
8	3	\$1 317,98	\$10 520,01		\$24,99	\$11 862,98
9	4	\$3 570,57	\$105 868,87	\$3 103,89	\$4 150,86	\$116 694,18
10	5	\$3 744,25	\$41 046,33	\$339,36	\$199,93	\$45 329,87
11	M	\$59 123,36	\$1 658 977,89	\$127 434,67	\$239 291,72	\$2 084 827,63
12	0	\$47 511,39	\$1 476 657,24	\$116 884,17	\$210 043,59	\$1 851 096,39
13	1	\$3 994,32	\$73 886,73	\$3 334,73	\$21 854,90	\$103 070,67
14	2	\$1 026,58	\$22 171,07	\$539,99	\$3 456,96	\$27 194,60
15	3	\$1 325,34	\$5 015,94	\$21,49	\$89,97	\$6 452,74
16	4	\$3 271,21	\$38 627,04	\$5 315,24	\$3 641,37	\$50 854,86
17	5	\$1 994,52	\$42 619,87	\$1 339,05	\$204,93	\$46 158,37
18	Grand Total	\$122 811,95	\$3 390 095,80	\$269 884,45	\$507 157,25	\$4 289 949,44
19						
20						
21						
22						
23						

tmp350F

READY

Sales amounts by gender and number of children by product class for customers who have a graduate degree and that own a house.

You can try by yourself any multidimensional data analysis you want!

PivotTable Fields

Choose fields to add to report:

Demographic

- Commute Distance
- Education
- Gender
- House Owner Flag
- Number Cars Owned
- Number Children At Ho...
- Occupation

Drag fields between areas below:

FILTERS

- Education
- House Owne...

COLUMNS

- Class

ROWS

- Gender
- Number Chil...

VALUES

- Sales Amount

Defer Layout Update

UPDATE

100%