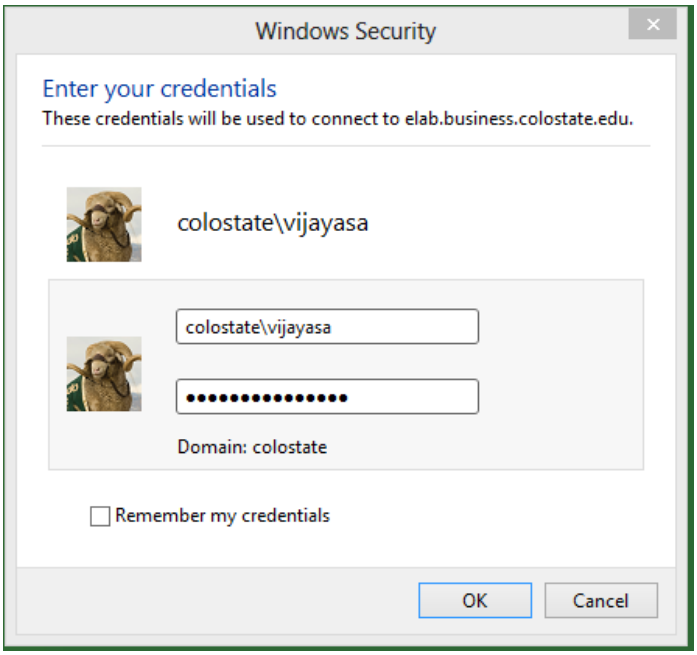
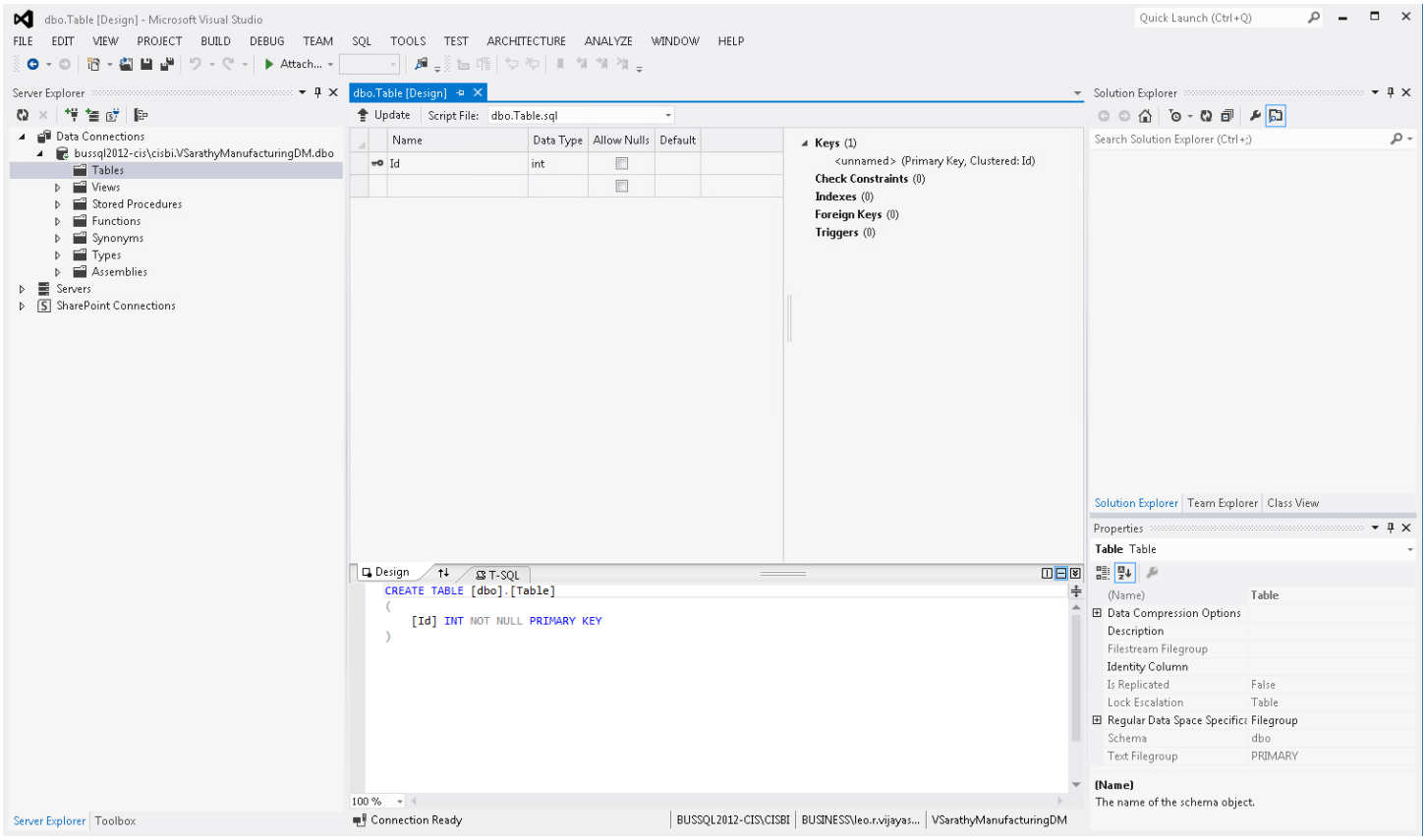
Hands-on-Exercise for Data Mart - Part 1

- Log on to elab (instructions are on Canvas: Modules → Course Information) using your eID credentials (see sample login dialog box below).

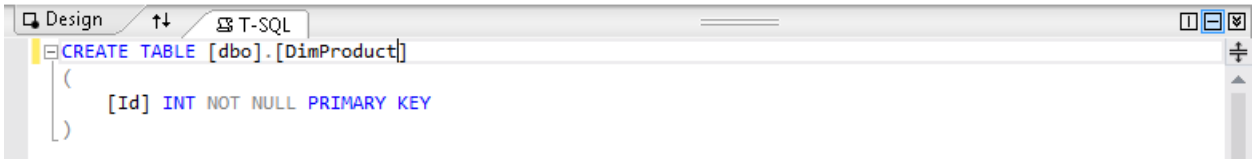


Learn by Doing – Creating the Maximum Miniatures Manufacturing Data Mart (Larson – Pages 107-114)

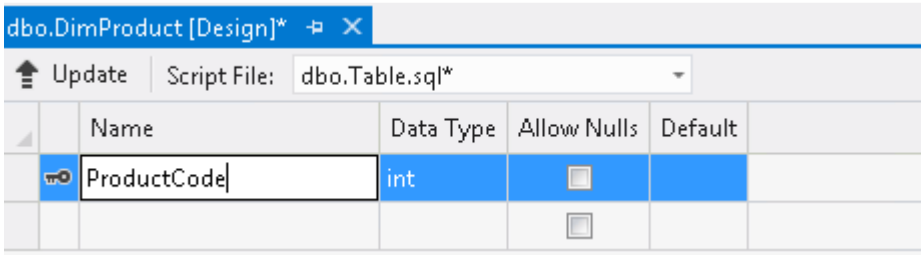
1. Read pages 88-106 in the Larson book. You will use Visual Studio 2017 (VS2017) instead of SQL Server Management Studio (page 107) to complete this exercise.
2. Start Visual Studio 2017 by double-clicking on the Visual Studio 2017 icon on the desktop. If you see a Welcome splash screen, click the "Not now, maybe later" link at the bottom of the screen. Click the "Start Visual Studio" button on the next splash screen.
3. In VS2017, from the main menu, click View → Server Explorer.
4. The Server Explorer window will display either on the left or right edge of your screen.
5. In the Server Explorer window, right-click on Data Connections and Choose Add Connection from the context menu.
6. Select "Microsoft SQL Server" in Choose Data Source window → click Continue (Note: This window will appear the first time you create a new data connection. After that, you may not see this window).
7. In the Add Connection window, a) type **buscissql\cisbi** for Server name; b) from the Select or enter a database name drop-down choose **your database** (e.g., if your last name is Smith, your database will be called SmithManufacturingDM), and c) click OK. You should see your database displayed under Data Connections in the Server Explorer window.
8. In the Server Explorer window, expand your database connection.
9. Right-click the Tables folder and select Add New Table from the context menu. A Table Design tab will appear, similar to the figure shown below.



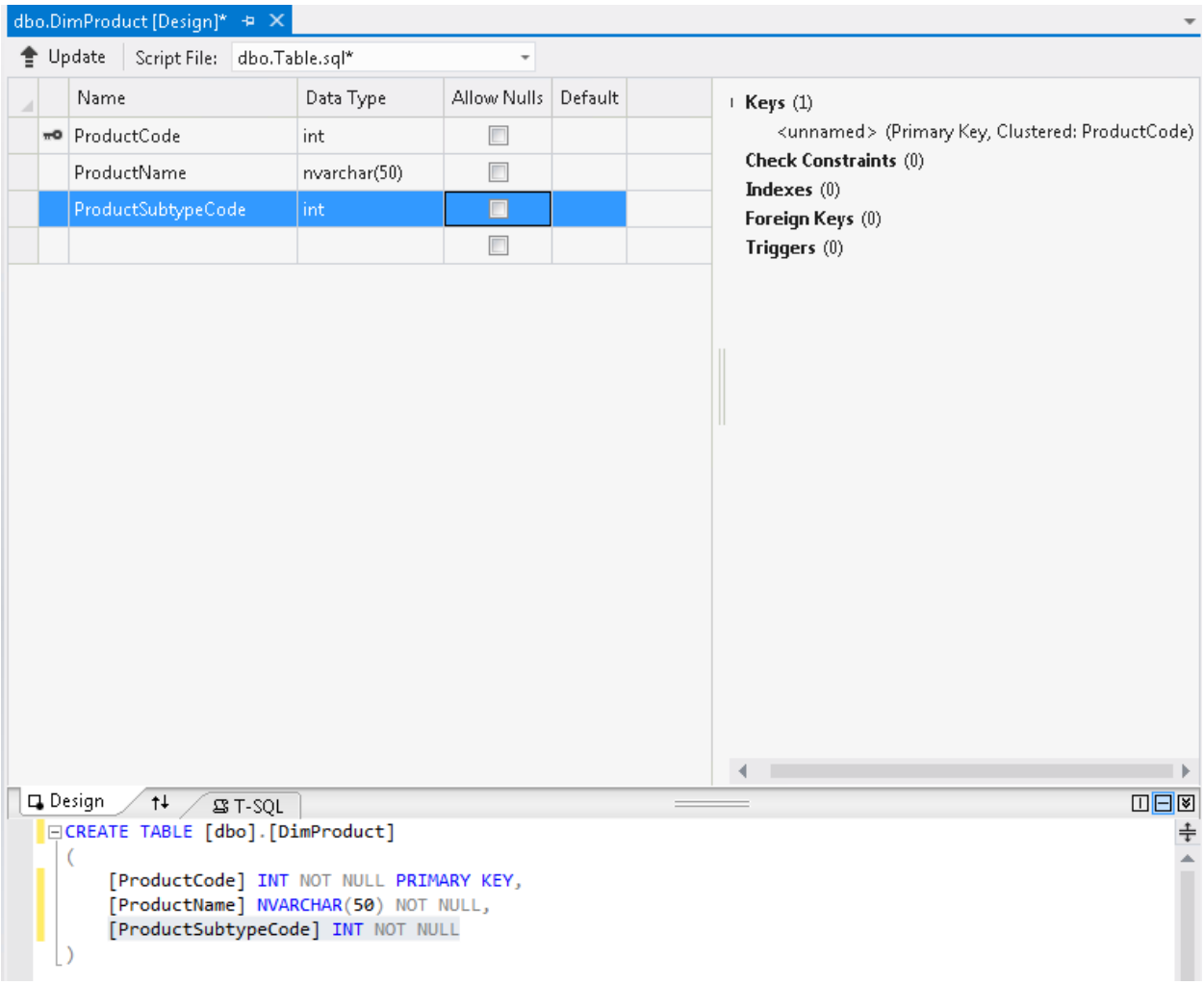
10. If the Properties window is not visible (lower right corner), select Properties Window from the View menu.
11. Begin by creating the DimProduct table from the schema (see Figure 6-17 in the Larson book).
12. In the Design window, replace "Table" with the name of the table – DimProduct (see figure below).



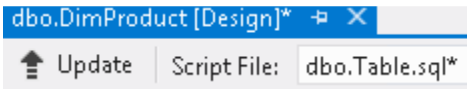
13. In the first row of the Table Design window, replace **"Id"** with **ProductCode** under Name (see figure below).



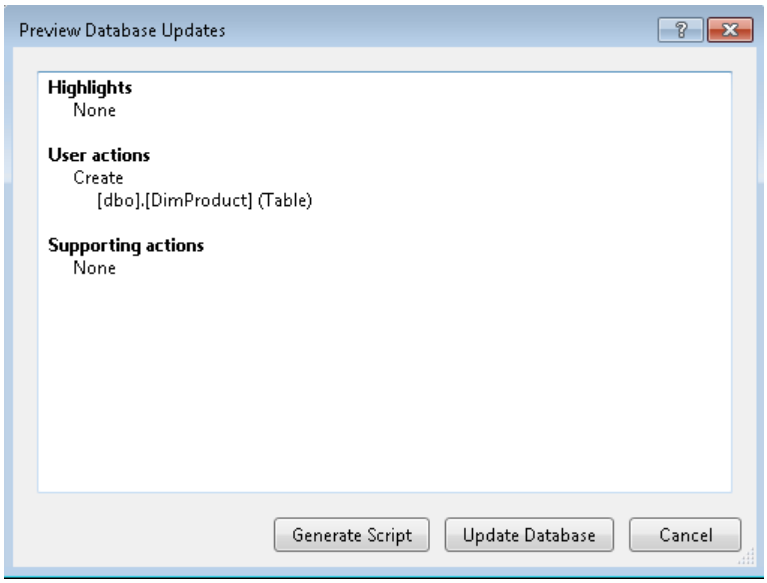
14. In the second row of the Table Design window, enter **ProductName** under Name, select nvarchar(50) under Data Type, and uncheck Allow Nulls.
15. In the third row of the Table Design window, enter **ProductSubtypeCode** under Name, select int under Data Type, and uncheck Allow Nulls.
16. Your screen should look like the figure below.



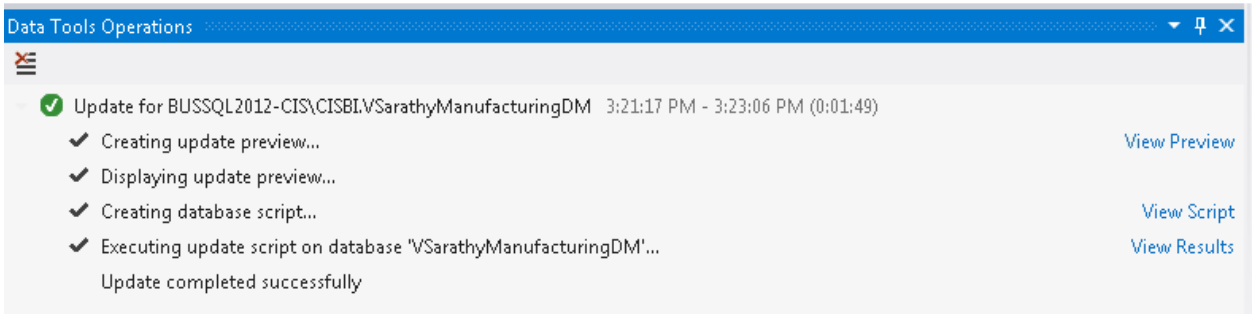
17. Click the Update button on the top left of the Table Design Window (see figure below).



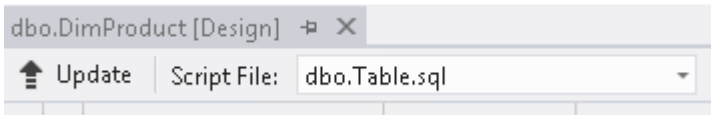
18. In the “Preview Database Updates” dialog box (see below), click “Update Database”.



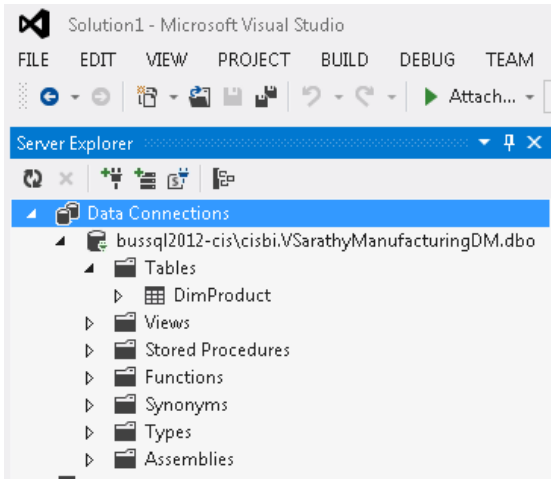
19. Confirm that the update was completed successfully in the Data Tool Operations window (see figure below).



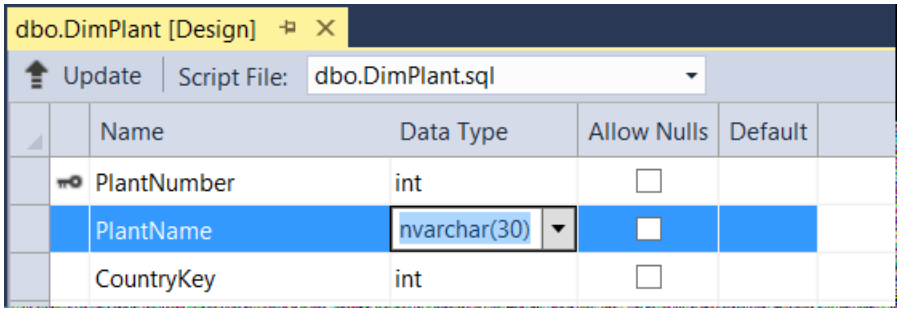
20. Close the Data Tool Operations window (click the X).
21. Click the Close button (the X on the dbo.DimProduct [Design] tab (see figure below).



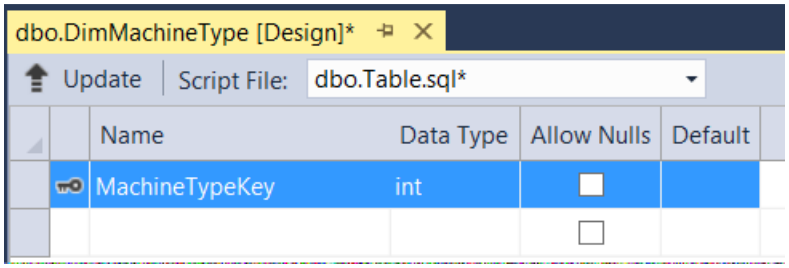
22. Right-click the Tables folder (in the Server Explorer window) and select Refresh from the context menu. You should see **DimProduct** displayed (see figure below).



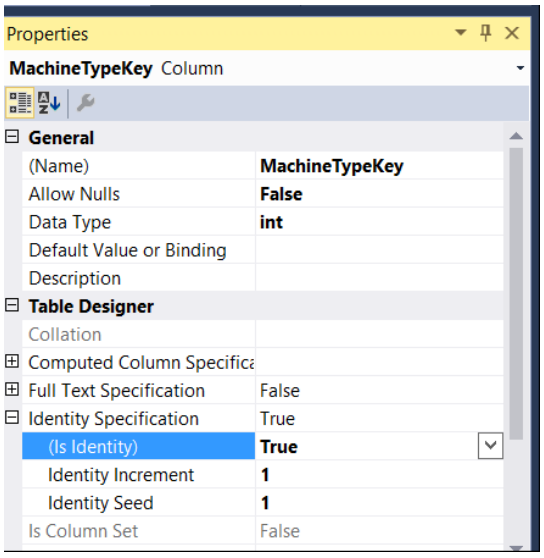
23. Next, create the DimProductSubtype, DimProductType, DimBatch, DimMachine, and DimPlant tables based on the schema in Figure 6-17 (Larson book). **Refer to steps 9-21 (above) for guidance. Note:** Be sure to select the appropriate data type and length and uncheck Allow Nulls for each field. You can change the length of a data type as needed. For example, the PlantName field in the DimPlant table has Nvarchar(30) as the data type and length. When creating this field, select nvarchar(50) for Data Type and then replace the 5 with a 3 (see figure below).



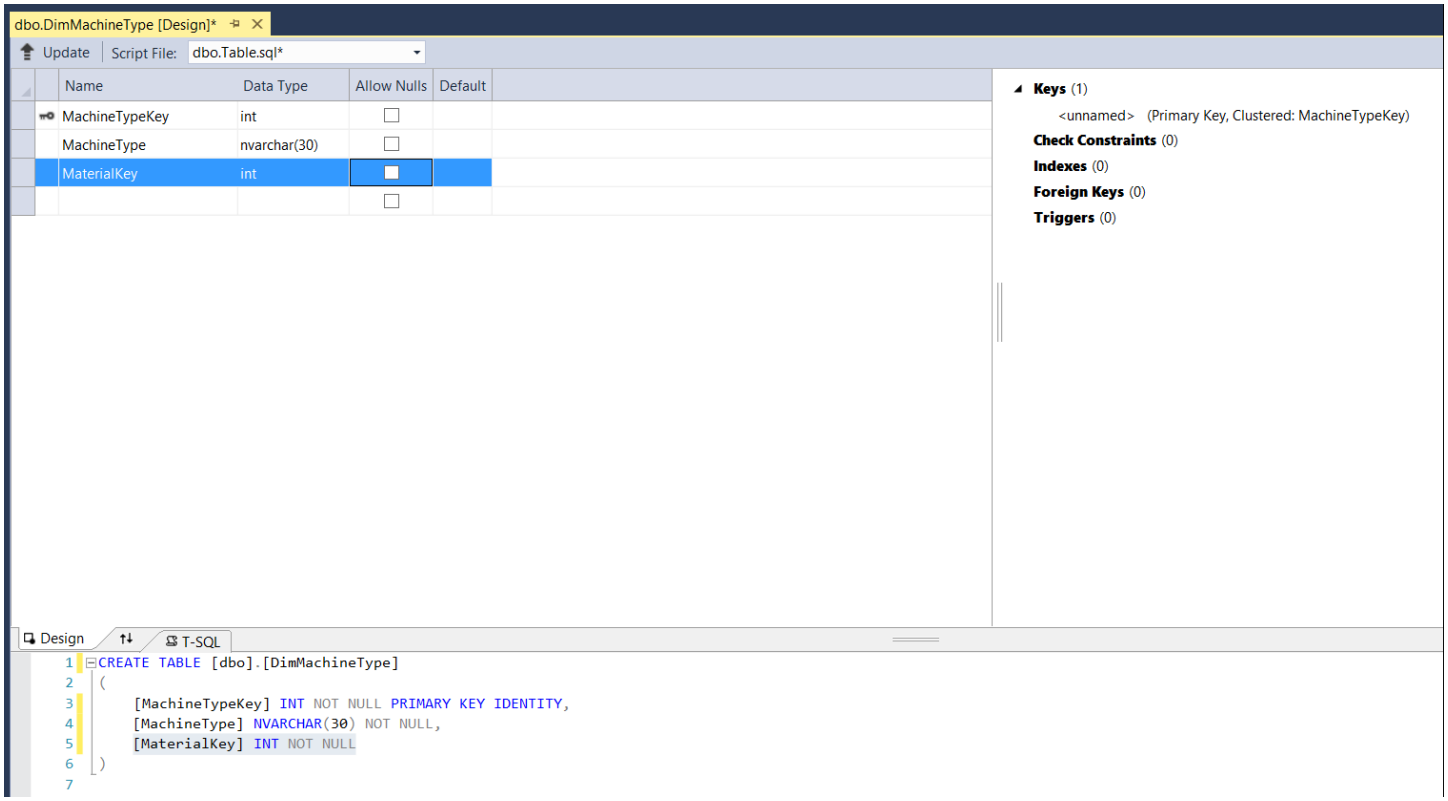
24. Next, create the DimMachineType, DimMaterial, and DimCountry tables based on the schema in Figure 6-17 (Larson book). **Note:** The primary key columns for these tables have to be set as identity columns. The benefit of an identity column is that the primary key values are auto-generated. This eliminates the need to provide a unique value for each new record that is added to the table. Follow steps 25-37 to create the DimMachineType table with its primary key set as an identity column. You can then repeat the process for creating the DimMaterial and DimCountry tables.
25. Right-click the Tables folder and select Add New Table from the context menu. The Table Design tab will appear.
26. In the Design window, replace "Table" with the name of the table – DimMachineType.
27. In the first row of the Table Design window, replace **"Id"** with **MachineTypeKey** under Name.
28. Make sure this first row is selected. You can select the row by clicking on the empty square to the left the key symbol (see figure below)



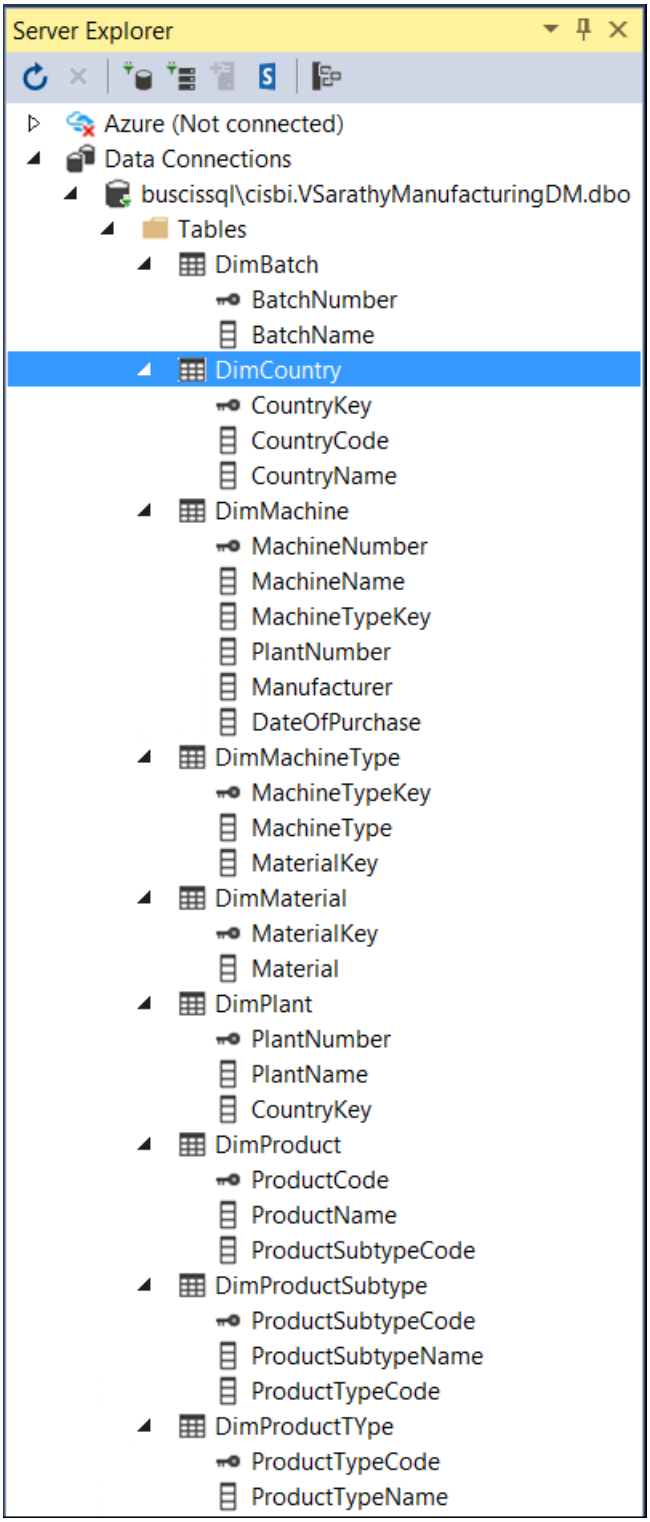
29. In the Properties window (bottom right of your screen), expand the Identity Specification property by clicking on the + sign next to it. Select **True** from the (Is Identity) drop-down list. Leave the Identity Increment and the Identity Seed each set to 1 (see figure below)



30. In the second row of the Table Design window, enter **MachineType** under Name, select nvarchar(50) under Data Type (change the 5 to a 3), and uncheck Allow Nulls.
31. In the third row of the Table Design window, enter **MaterialKey** under Name, select int under Data Type, and uncheck Allow Nulls.
32. Your screen should look like the figure below.



33. Click the Update button on the top left of the Table Design Window.
34. In the "Preview Database Updates" dialog box, click "Update Database".
35. Confirm that the update was completed successfully in the Data Tool Operations window.
36. Close the Data Tool Operations window (click the X).
37. Click the Close button (the X on the dbo.MachineType [Design] tab.
38. Now, create the DimMaterial and DimCountry tables based on the schema in Figure 6-17 (Larson book). **Refer to steps 25-37 (above) for guidance. Note:** Be sure to select the appropriate data type and length and uncheck Allow Nulls for each field. You can change the length of a data type as needed. Also, remember to set the MaterialKey column in the DimMaterial table and the CountryKey column in the DimCountry table as Identity columns.
39. After you have created the tables, your Server Explorer window should resemble the figure below (make sure that you have refreshed the Tables folder, and expanded each of the tables).



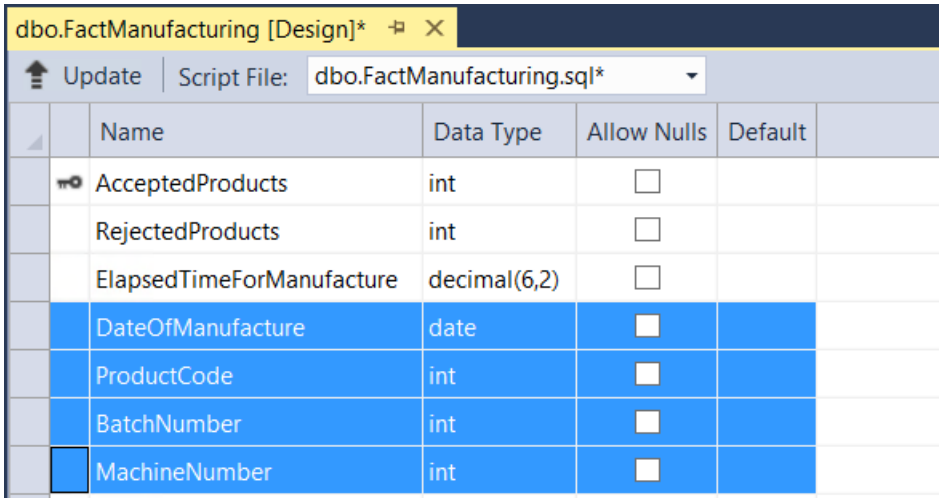
Note

If you wish to make changes to a created table, right-click the table name (in the Server Explorer), and select Open Table Definition from the context menu. Make the necessary changes and click Update to save the changes. If you receive an error when trying to update your changes, select Tools → Options from the main menu. In the Options dialog box, expand Database Tools and select Table and Database Designers. Uncheck the Prevent saving changes that require table re-creation check box and click OK.

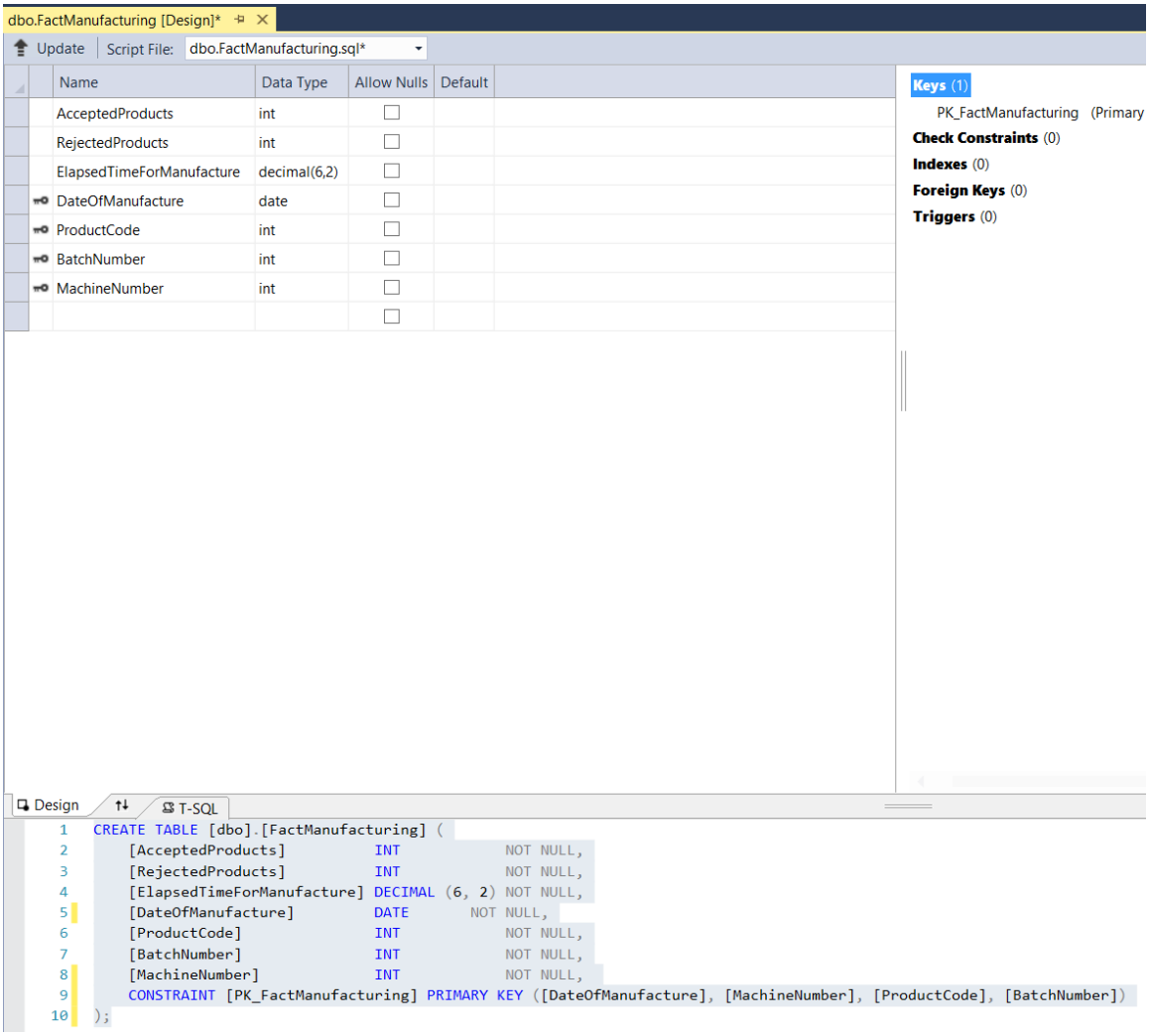
40. Next, create the FactManufacturing table. Right-click the Tables folder and select Add New Table from the context menu. In the Design window, replace "Table" with the name of the table – FactManufacturing. Using the schema shown in Figure 6-17 (Larson book), create the entries for the seven columns in this table (uncheck Allow Nulls for all fields). When creating the ElapsedTimeForManufacture field, select decimal(18,0) under Data Type, and then replace the 18 with 6 (Precision) and 0 with 2 (Scale).

    Note: The decimal data type is used to store real numbers. The precision determines the total number of digits contained in the number. The scale tells how many of those digits are to the right of the decimal. The ElapsedTimeForManufacture field has a maximum of six digits, with two of those digits to the right of the decimal. Therefore, the largest number that can be stored in this field is 9999.99.

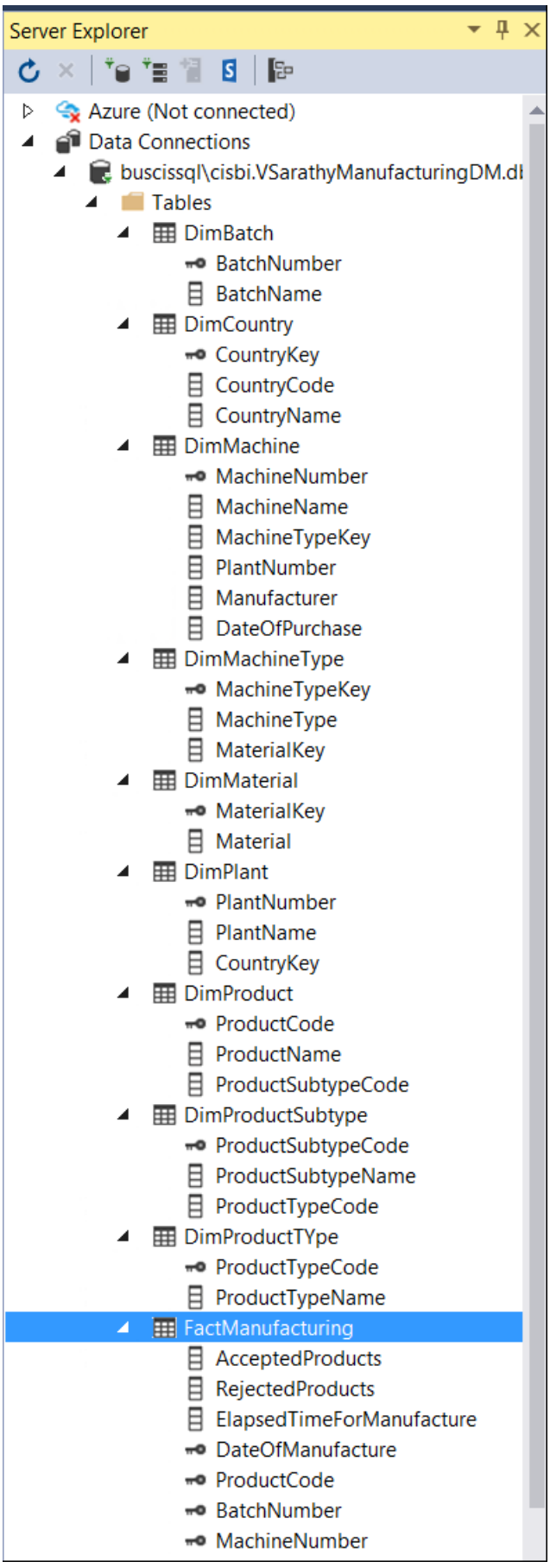
41. Click the square to the left of the DateOfManufacture field. Hold down SHIFT key and click the square to the left of the MachineNumber field. This selects these two fields and all the fields in between, as shown below.



    Right-click the selected columns and select Set Primary Key from the context menu to make these four fields a compound primary key. You screen should look like the figure below:



42. Click the Update button on the top left of the Table Design Window.
43. In the “Preview Database Updates” dialog box, click “Update Database”.
44. Confirm that the update was completed successfully in the Data Tool Operations window.
45. Close the Data Tool Operations window (click the X).
46. Click the Close button (the X on the dbo.FactManufacturing [Design] tab
47. Your Server Explorer window should resemble the figure below (make sure that you have refreshed the Tables folder, and expanded each of the tables).



You can close VS2017 by selecting File → Exit from the main menu.