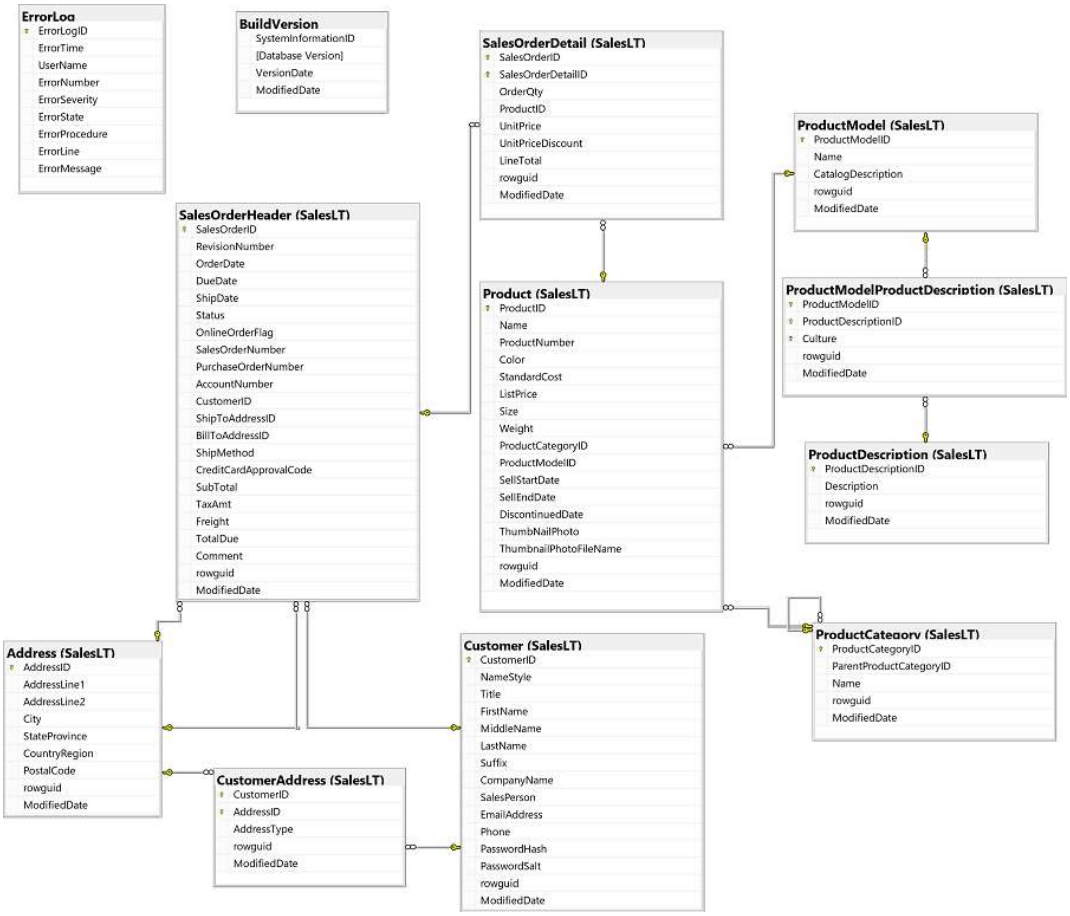
Modify Data

In this lab, you'll insert, update, and delete data in the **adventureworks** database. For your reference, the following diagram shows the tables in the database (you may need to resize the pane to see them clearly).



> **Note**: If you're familiar with the standard **AdventureWorks** sample database, you may notice that in this lab we are using a simplified version that makes it easier to focus on learning Transact-SQL syntax.

Insert data

You use the **INSERT** statement to insert data into a table.

1. Start Azure Data Studio, and create a new query (you can do this from the **File** menu or on the *welcome* page).
2. In the new **SQLQuery_...** pane, use the **Connect** button to connect the query to the **AdventureWorks** saved connection.
3. In the query editor, enter the following code to create a new table named **SalesLT.CallLog**, which we'll use in this lab.

Code | Copy

```
CREATE TABLE SalesLT.CallLog
(
    CallID int IDENTITY PRIMARY KEY NOT NULL,
    CallTime datetime NOT NULL DEFAULT GETDATE(),
    SalesPerson nvarchar(256) NOT NULL,
    CustomerID int NOT NULL REFERENCES SalesLT.Customer(CustomerID),
    PhoneNumber nvarchar(25) NOT NULL,
    Notes nvarchar(max) NULL
);
```

4. Use the ▸ **Run** button to run the code and create the table. Don't worry too much about the details of the **CREATE TABLE** statement - it creates a table with some fields that we'll use in subsequent tasks to insert, update, and delete data.

5. Create a new query, so you have two **SQLQuery_...** panes, and in the new pane, enter the following code to query the **SalesLT.CallLog** you just created.

Code Copy

```
SELECT * FROM SalesLT.CallLog;
```

6. Run the **SELECT** query and view the results, which show the columns in the new table but no rows, because the table is empty.

7. Switch back to the **SQLQuery_...** pane containing the **CREATE TABLE** statement, and replace it with the following **INSERT** statement to insert a new row into the **SalesLT.CallLog** table.

Code Copy

```
INSERT INTO SalesLT.CallLog
VALUES
('2015-01-01T12:30:00', 'adventure-works\pamela0', 1, '245-555-0173', 'Returning call re:
enquiry about delivery');
```

8. Run the query and review the message, which should indicate that 1 row was affected.
9. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that the results contain the row you inserted. The **CallID** column is an *identity* column that is automatically incremented (so the first row has the value **1**), and the remaining columns contain the values you specified in the **INSERT** statement

10. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code to insert another row. This time, the **INSERT** statement takes advantage of the fact that the table has a default value defined for the **CallTime** field, and allows *NULL* values in the **Notes** field.

Code Copy

```
INSERT INTO SalesLT.CallLog
VALUES
(DEFAULT, 'adventure-works\david8', 2, '170-555-0127', NULL);
```

11. Run the query and review the message, which should indicate that 1 row was affected.
12. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that the second row has been inserted, with the default value for the **CallTime** field (the current time when the row was inserted) and *NULL* for the **Notes** field.

13. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code to insert another row. This time, the **INSERT** statement explicitly lists the columns into which the new values will be inserted. The columns not specified in the statement support either default or *NULL* values, so they can be omitted.

Code Copy

```
INSERT INTO SalesLT.CallLog (SalesPerson, CustomerID, PhoneNumber)
VALUES
('adventure-works\jillian0', 3, '279-555-0130');
```

14. Run the query and review the message, which should indicate that 1 row was affected.
15. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that the third row has been inserted, once again using the default value for the **CallTime** field and *NULL* for the **Notes** field.

16. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code, which inserts two rows of data into the **SalesLT.CallLog** table.

Code Copy

```
INSERT INTO SalesLT.CallLog
VALUES
(DATEADD(mi,-2, GETDATE()), 'adventure-works\jillian0', 4, '710-555-0173', NULL),
(DEFAULT, 'adventure-works\shu0', 5, '828-555-0186', 'Called to arrange deliver of order
10987');
```

17. Run the query and review the message, which should indicate that 2 rows were affected.
18. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that two new rows have been added to the table.

19. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code, which inserts the results of a **SELECT** query into the **SalesLT.CallLog** table.

Code Copy

```
INSERT INTO SalesLT.CallLog (SalesPerson, CustomerID, PhoneNumber, Notes)
SELECT SalesPerson, CustomerID, Phone, 'Sales promotion call'
FROM SalesLT.Customer
WHERE CompanyName = 'Big-Time Bike Store';
```

20. Run the query and review the message, which should indicate that 2 rows were affected.
21. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that two new rows have been added to the table. These are the rows that were retrieved by the **SELECT** query.

22. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code, which inserts a row and then uses the **SCOPE_IDENTITY** function to retrieve the most recent *identity* value that has been assigned in the database (to any table), and also the **IDENT_CURRENT** function, which retrieves the latest *identity* value in the specified table.

Code Copy

```
INSERT INTO SalesLT.CallLog (SalesPerson, CustomerID, PhoneNumber)
VALUES
('adventure-works\josé1', 10, '150-555-0127');

SELECT SCOPE_IDENTITY() AS LatestIdentityInDB,
       IDENT_CURRENT('SalesLT.CallLog') AS LatestCallID;
```

23. Run the code and review the results, which should be two numeric values, both the same.
24. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it to validate that the new row that has been inserted has a **CallID** value that matches the *identity* value returned when you inserted it.

25. Switch back to the **SQLQuery_...** pane containing the **INSERT** statement, and replace it with the following code, which enables explicit insertion of *identity* values and inserts a new row with a specified **CallID** value, before disabling explicit *identity* insertion again.

Code Copy

```
SET IDENTITY_INSERT SalesLT.CallLog ON;

INSERT INTO SalesLT.CallLog (CallID, SalesPerson, CustomerID, PhoneNumber)
VALUES
(20, 'adventure-works\josé1', 11, '926-555-0159');

SET IDENTITY_INSERT SalesLT.CallLog OFF;
```

26. Run the code and review the results, which should affect 1 row.
27. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it to validate that a new row has been inserted with the especific **CallID** value you specified in the **INSERT** statement (9).

Update data

To modify existing rows in a table, use the **UPDATE** statement.

1. On the **SQLQuery_...** pane containing the **INSERT** statement, replace the existing code with the following code.

Code Copy

```
UPDATE SalesLT.CallLog
SET Notes = 'No notes'
WHERE Notes IS NULL;
```

2. Run the **UPDATE** statement and review the message, which should indicate the number of rows affected.
3. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that the rows that previously had *NULL* values for the **Notes** field now contain the text *No notes*.
4. Switch back to the **SQLQuery_...** pane containing the **UPDATE** statement, and replace it with the following code, which updates multiple columns.

Code Copy

```
UPDATE SalesLT.CallLog
SET SalesPerson = '', PhoneNumber = ''
```

5. Run the **UPDATE** statement and note the number of rows affected.
6. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that *all* rows have been updated to remove the **SalesPerson** and **PhoneNumber** fields - this emphasizes the danger of accidentally omitting a **WHERE** clause in an **UPDATE** statement.
7. Switch back to the **SQLQuery_...** pane containing the **UPDATE** statement, and replace it with the following code, which updates the **SalesLT.CallLog** table based on the results of a **SELECT** query.

Code Copy

```
UPDATE SalesLT.CallLog
SET SalesPerson = c.SalesPerson, PhoneNumber = c.Phone
FROM SalesLT.Customer AS c
WHERE c.CustomerID = SalesLT.CallLog.CustomerID;
```

8. Run the **UPDATE** statement and note the number of rows affected.
9. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that the table has been updated using the values returned by the **SELECT** statement.

Challenge 1: Insert products

Challenge 2: Update products

Challenge 3: Delete products

Challenge 1

Challenge 2

Challenge 3

Delete data

To delete rows in the table, you generally use the **DELETE** statement; though you can also remove all rows from a table by using the **TRUNCATE TABLE** statement.

1. On the **SQLQuery_...** pane containing the **UPDATE** statement, replace the existing code with the following code.

Code Copy

```
DELETE FROM SalesLT.CallLog
WHERE CallTime < DATEADD(dd, -7, GETDATE());
```

2. Run the **DELETE** statement and review the message, which should indicate the number of rows affected.
3. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that rows with a **CallDate** older than 7 days have been deleted.

4. Switch back to the **SQLQuery_...** pane containing the **DELETE** statement, and replace it with the following code, which uses the **TRUNCATE TABLE** statement to remove all rows in the table.

Code Copy

```
TRUNCATE TABLE SalesLT.CallLog;
```

5. Run the **TRUNCATE TABLE** statement and note the number of rows affected.
6. Switch to the **SQLQuery_...** pane containing the **SELECT** query and run it. Note that *all* rows have been deleted from the table.

Challenges

Now it's your turn to try modifying some data.

> **Tip**: Try to determine the appropriate code for yourself. If you get stuck, suggested answers are provided at the end of this lab.

Challenge 1: Insert products

Each Adventure Works product is stored in the **SalesLT.Product** table, and each product has a unique **ProductID** identifier, which is implemented as an *identity* column in the **SalesLT.Product** table. Products are organized into categories, which are defined in the **SalesLT.ProductCategory** table. The products and product category records are related by a common **ProductCategoryID** identifier, which is an *identity* column in the **SalesLT.ProductCategory** table.

1. Insert a product
   - Adventure Works has started selling the following new product. Insert it into the **SalesLT.Product** table, using default or *NULL* values for unspecified columns:
     - **Name**: LED Lights
     - **ProductNumber**: LT-L123
     - **StandardCost**: 2.56
     - **ListPrice**: 12.99
     - **ProductCategoryID**: 37
     - **SellStartDate**: *Today's date*
   - After you have inserted the product, run a query to determine the **ProductID** that was generated.
   - Then run a query to view the row for the product in the **SalesLT.Product** table.
2. Insert a new category with two products
   - Adventure Works is adding a product category for *Bells and Horns* to its catalog. The parent category for the new category is **4** (*Accessories*). This new category includes the following two new products:
     - First product:
       - **Name**: Bicycle Bell
       - **ProductNumber**: BB-RING
       - **StandardCost**: 2.47

        - **ListPrice**: 4.99
        - **ProductCategoryID**: *The **ProductCategoryID** for the new Bells and Horns category*
        - **SellStartDate**: *Today's date*
    - Second product:
        - **Name**: Bicycle Horn
        - **ProductNumber**: BB-PARP
        - **StandardCost**: 1.29
        - **ListPrice**: 3.75
        - **ProductCategoryID**: *The **ProductCategoryID** for the new Bells and Horns category*
        - **SellStartDate**: *Today's date*
  - Write a query to insert the new product category, and then insert the two new products with the appropriate **ProductCategoryID** value.
  - After you have inserted the products, query the **SalesLT.Product** and **SalesLT.ProductCategory** tables to verify that the data has been inserted.

Challenge 2: Update products

You have inserted data for a product, but the pricing details are not correct. You must now update the records you have previously inserted to reflect the correct pricing. Tip: Review the documentation for UPDATE in the Transact-SQL Language Reference.

1. Update product prices
    - The sales manager at Adventure Works has mandated a 10% price increase for all products in the *Bells and Horns* category. Update the rows in the **SalesLT.Product** table for these products to increase their price by 10%.
2. Discontinue products
    - The new LED lights you inserted in the previous challenge are to replace all previous light products. Update the **SalesLT.Product** table to set the **DiscontinuedDate** to today's date for all products in the Lights category (product category ID **37**) other than the LED Lights product you inserted previously.

Challenge 3: Delete products

The Bells and Horns category has not been successful, and it must be deleted from the database.

1. Delete a product category and its products
    - Delete the records for the *Bells and Horns* category and its products. You must ensure that you delete the records from the tables in the correct order to avoid a foreign-key constraint violation.

Challenge Solutions

This section contains suggested solutions for the challenge queries.

Challenge 1

1. Insert a product:

Code Copy

```
 INSERT INTO SalesLT.Product (Name, ProductNumber, StandardCost, ListPrice,
ProductCategoryID, SellStartDate)
 VALUES
 ('LED Lights', 'LT-L123', 2.56, 12.99, 37, GETDATE());

 SELECT SCOPE_IDENTITY();

 SELECT * FROM SalesLT.Product
 WHERE ProductID = SCOPE_IDENTITY();
```

2. Insert a new category with two products:

Code Copy

```
INSERT INTO SalesLT.ProductCategory (ParentProductCategoryID, Name)
VALUES
(4, 'Bells and Horns');

INSERT INTO SalesLT.Product (Name, ProductNumber, StandardCost, ListPrice,
ProductCategoryID, SellStartDate)
VALUES
('Bicycle Bell', 'BB-RING', 2.47, 4.99, IDENT_CURRENT('SalesLT.ProductCategory'),
GETDATE()),
('Bicycle Horn', 'BH-PARP', 1.29, 3.75, IDENT_CURRENT('SalesLT.ProductCategory'),
GETDATE());

SELECT c.Name As Category, p.Name AS Product
FROM SalesLT.Product AS p
JOIN SalesLT.ProductCategory as c
    ON p.ProductCategoryID = c.ProductCategoryID
WHERE p.ProductCategoryID = IDENT_CURRENT('SalesLT.ProductCategory');
```

Challenge 2

1. Update product prices:

Code Copy

```
UPDATE SalesLT.Product
SET ListPrice = ListPrice * 1.1
WHERE ProductCategoryID =
    (SELECT ProductCategoryID
     FROM SalesLT.ProductCategory
     WHERE Name = 'Bells and Horns');
```

2. Discontinue products:

Code Copy

```
UPDATE SalesLT.Product
SET DiscontinuedDate = GETDATE()
WHERE ProductCategoryID = 37
AND ProductNumber <> 'LT-L123';
```

Challenge 3

1. Delete a product category and its products:

Code Copy

```sql
DELETE FROM SalesLT.Product
WHERE ProductCategoryID =
    (SELECT ProductCategoryID
     FROM SalesLT.ProductCategory
     WHERE Name = 'Bells and Horns');

DELETE FROM SalesLT.ProductCategory
WHERE ProductCategoryID =
    (SELECT ProductCategoryID
     FROM SalesLT.ProductCategory
     WHERE Name = 'Bells and Horns');
```