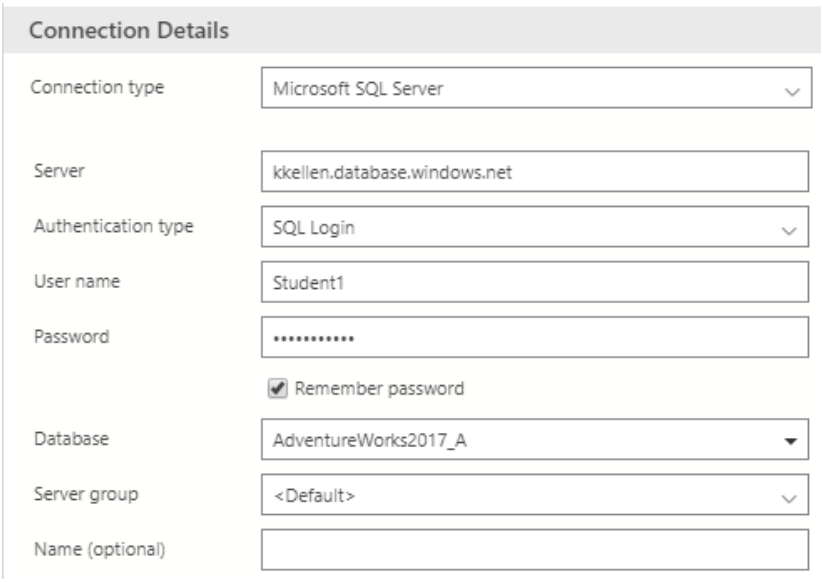
LaunchCode T-SQL Workshop Day 1 Labs

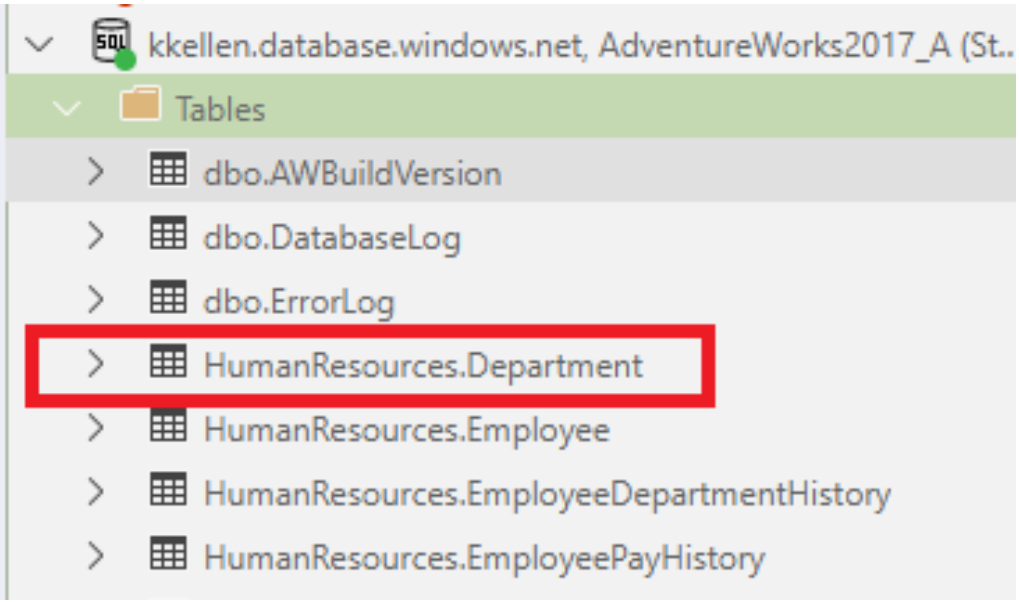
Module 1

Lab 1

1. Connect to kkellen.database.windows.net with username Student1 and password Vermilion1*



2. Navigate to Tables → HumanResources.Department



3. Right-click and choose “Select TOP 1000 rows”
4. Comment out the ModifiedDate column and click Run. (You can use two dashes to comment out a line.)
5. In a query window type in and run the following:

```
PRINT 'T-SQL is fun!';
```

6. Type and run this statement:

```
SELECT 'T-SQL is fun!';
```

Module 2

Use this information to help you write the queries:

INFO for Lab 1

The SELECT statement

```
--Returns all columns and all rows
SELECT *
FROM theTable;

--Returns just three columns but all the rows
SELECT column1, column2, column3
FROM theTable;
```

TOP

```
--Returns just 100 rows
SELECT TOP(100) column1, column2, column3
FROM theTable;

--Returns just 10% of rows
SELECT TOP(10) PERCENT column1, column2, column3
FROM theTable;
```

DISTINCT

```
--Returns a unique set of rows
SELECT DISTINCT colum1, column2, column3
FROM theTable;
```

Aliases

```
--Using an alias
SELECT column1 AS [Another Name], column2 as TheColumn, column3 as “Another Column”
FROM theTable AS A;
```

INFO for Lab 2

ORDER BY

```
--Use ORDER BY to sort the rows returned

SELECT column1, column2
FROM theTable
WHERE column1 > 1
ORDER BY column2;

--May specify multiple column
SELECT column1, column2
FROM theTable
WHERE column1 > 1
ORDER BY column2, column1;

--May specify DESC for descending order
```

```
SELECT column1, column2
FROM theTable
WHERE column1 > 1
ORDER BY column2 DESC;

SELECT column1, column2
FROM theTable
WHERE column1 > 1
ORDER BY column2 DESC, column1;
```

Lab 1: 15 minutes

1. Write a SELECT statement that queries the Sales.Customer table. Include the CustomerID, StoreID and the AccountNumber.
2. Write a SELECT statement that returns a unique list of FirstName and LastName values from Person.Person.
3. Write a SELECT statement that returns 50% of the Sales.SalesOrderHeader rows. Return SalesOrderID and OrderDate.

Lab 2: 10 minutes

1. Write a query that returns the BusinessEntityID and name columns from the Person.Person table. Sort the results by Lastname, Firstname, and MiddleName.
2. Modify the query written in question 1 so that the data is returned in the opposite order.

Module 3

The WHERE clause is used to filter the rows returned.

INFO for Lab 1

WHERE clause operators

- =, <>, !=
- <, >, <=, >=
- BETWEEN
- LIKE (with wildcards %,_ and more)
- IN
- AND, OR for multiple expressions
- NOT
- Parentheses to enforce logic

```
--Compare a column to a value
SELECT column1, column2, column3
FROM theTable
WHERE column1 = 1;

--Use tick marks with dates and strings
SELECT column1, column2, column3
FROM theTable
WHERE column2 = '2011-06-07' AND column3 = 'test';

--Between is inclusive, this will return rows where column1 = 1 and column1 = 5
SELECT column1, column2, column3
FROM theTable
WHERE column1 BETWEEN 1 AND 5;

--Use IN for a list
SELECT column1, column2, column3
FROM theTable
WHERE column1 IN (1,2,3);

--AND means both expressions must return true. OR means at least one expression must return true
SELECT column1, column2, column3
FROM theTable
WHERE column1 = 1 OR column2 < '2011-06-07'

--Use parenthesis to enforce logig
SELECT column1, column2, column3
FROM theTable
WHERE (column1 = 1 OR column2 >= '2011-06-07') AND column3 = 'test';

--NOT negates the expression
SELECT column1, column2, column3
```

```
FROM theTable
WHERE NOT (column1 = 1 OR column2 = '2011-06-07') AND column3 = 'test';
```

INFO for Lab 3

Notes about NULL

NULL means UNKNOWN, not FALSE, not an empty string, not zero. Nothing can be compared to NULL and most expressions containing NULL return NULL.

```
--Use ISNULL or COALESCE to replace NULL
SELECT ISNULL(column1, 'N/A') AS Column1
FROM theTable;

SELECT ISNULL(column1, column2, column3) AS TheAnswer
FROM theTable;

--Use IS NULL or IS NOT NULL to compare NULL
SELECT column1, column2, column3
FROM theTable
WHERE column1 IS NULL;

SELECT column1, column2, column3
FROM theTable
WHERE column1 IS NOT NULL;
```

Lab 1: 15 minutes

1. Write a query using a WHERE clause that displays all the employees listed in the HumanResources.Employee table who have the job title “Research and Development Engineer”. Display the BusinessEntityID, LoginID, and the JobTitle for each one. Remember to use tick marks around values in the WHERE clause.
2. Write a query displaying all the columns of the Production.ProductCostHistory table from the rows in which the standard cost is between the values of $10 and $13.
3. Write a query finding the name Mary Gibson from the Person.Person table. Return the BusinessEntityID, FirstName, and LastName columns.

Lab 2: 15 minutes

1. Return the SalesOrderID, OrderDate, and CurrencyRateID from the Sales.SalesOrderHeader table where there is no currency rate ID.
2. Rewrite the query so that it returns rows with no currency rate ID or it could be 1536
3. Write a query using the Person.Person table. Return BusinessEntityID, FirstName, MiddleName, LastName and a FullName column that includes all three.

Module 4

INFO for Lab 1

Expressions

```
--Concatenate strings
SELECT column1 + column2 AS NewColumn
FROM theTable;

--Math

SELECT 1 + 2, column1 * column2
FROM theTable;

--Cast an integer to a string
SELECT CAST(ID as varchar(10)) + Name AS CustID
FROM theTable;

SELECT CONVERT(varchar(10), ID)  + Name AS CustID
FROM theTable;

--See CAST and Convert article for styles
SELECT CONVERT(varchar(10),OrderDate,101) AS FormattedDate
FROM theTable;

--Replace NULL with an empty string

SELECT FirstName + ' ' + ISNULL(Middlename, '') + ' ' + LastName
FROM Names;
```

INFO for Lab 2

String functions

- RTRIM, LTRIM -- remove spaces
- LEFT, RIGHT -- return a number of characters
- LEN, DATALENGTH -- return the length
- CHARINDEX -- find a string
- SUBSTRING -- return part of a string
- REVERSE -- returns the string backwards
- UPPER, LOWER -- returns all upper or lower case
- REPLACE -- replace part of a string
- CONCATENATE – build a string and it takes care of NULL and conversions

INFO for Lab 3

Date functions

- GETDATE, SYSDATETIME -- returns the server date
- DATEADD -- adds a time period to a date
- DATEDIFF -- subtract a time period from a date

- DATENAME, DATEPART -- returns part of a date
- DAY, MONTH, YEAR -- returns part of a date
- CONVERT and FORMAT – formatting dates
- MM = months, mm = minutes (when using the Format function)

Lab 1: 10 minutes

1. Write a query using the Production.Product table displaying the Product ID, Color, and Name columns. Add a column called Description formatted as “Name: Color”. If the color is missing, substitute “N/A”.
2. Write a query using the Sales.SpecialOffer table. Display MinQty and MaxQty columns and the difference between them along with the SpecialOfferID and Description columns.

Lab 2: 15 minutes

1. Write a query displaying the BusinessEntityID from the Person.Person table. Also return the first and last names all in uppercase.
2. Return the first initial and last name from all the names in the Person.Person table.
3. Return the LastNames from Person.Person in spelled reverse order.

Lab 3: 15 minutes

1. Write a query that calculates the number of days between the date an order was placed and the date that it was shipped using the Sales.SalesOrdeHeader table. Include the SalesOrderID, OrderDate, and ShipDate columns. (Note that the answer is 7 for all the rows).
2. Write a query that displays only the date, not the time, for the OrderDate, DueDate, and ShipDate in the Sales.SalesOrderHeader table. Try to use a different function for each column.
3. Write a query that adds six months to each OrderDate in the Sales.SalesOrderHeader table. Include the SalesOrderID and OrderDate columns.

Solutions

Module 1

Lab 1

Just follow the directions on this one

Module 2

Lab 1

```
--1
SELECT CustomerID, StoreID, AccountNumber
FROM Sales.Customer;


--2
SELECT DISTINCT FirstName, LastName
FROM Person.Person;

--3
SELECT TOP(50) PERCENT SalesOrderID, OrderDate
FROM Sales.SalesOrderHeader;
```

Lab 2

```
--1
SELECT BusinessEntityID, FirstName, MiddleName, LastName
FROM Person.Person
ORDER BY LastName, FirstName, MiddleName;

--2
SELECT BusinessEntityID, FirstName, MiddleName, LastName
FROM Person.Person
ORDER BY LastName DESC, FirstName DESC, MiddleName DESC;
```

Module 3

Lab 1

```
--1
SELECT BusinessEntityID, LoginID, JobTitle
FROM HumanResources.Employee
WHERE JobTitle = 'Research and Development Engineer';

--2
SELECT *
FROM Production.ProductCostHistory
WHERE StandardCost BETWEEN 10 AND 13;

--Another solution
SELECT *
FROM Production.ProductCostHistory
WHERE StandardCost >= 10 AND StandardCost <= 13;

--3
SELECT BusinessEntityID, FirstName, LastName
FROM Person.Person
WHERE FirstName = 'Mary' AND LastName = 'Gibson';
```

Lab 2

```
--1
SELECT SalesOrderID, OrderDate, CurrencyRateID
FROM Sales.SalesOrderHeader AS SOH
WHERE CurrencyRateID IS NULL;

--2
```

```sql
SELECT SalesOrderID, OrderDate, CurrencyRateID
FROM Sales.SalesOrderHeader AS SOH
WHERE CurrencyRateID IS NULL OR CurrencyRateID = 1536
ORDER BY CurrencyRateID DESC;

SELECT SalesOrderID, OrderDate, CurrencyRateID
FROM Sales.SalesOrderHeader AS SOH
WHERE ISNULL(CurrencyRateID,1536)  = 1536
ORDER BY CurrencyRateID DESC;

SELECT SalesOrderID, OrderDate, CurrencyRateID
FROM Sales.SalesOrderHeader AS SOH
WHERE  COALESCE(CurrencyRateID,1536)  = 1536
ORDER BY CurrencyRateID DESC;


--3
SELECT P.BusinessEntityID, P.FirstName, P.MiddleName, P.LastName,
    FirstName + ' ' + COALESCE(MiddleName,'') + ' ' + LastName AS FullName
FROM person.Person AS p;
```

Module 4

Lab 1

```sql
--1
SELECT ProductID, Color, Name,
       Name + ': ' + ISNULL(Color,'N/A') AS Description
FROM Production.Product;

--Another option
SELECT ProductID, Color, Name,
       CONCAT(Name, ': ', COALESCE(Color,'N/A')) AS Description
FROM Production.Product;

--2
SELECT SpecialOfferID, Description, MinQty, MaxQty, MaxQty - MinQty AS Range
FROM Sales.SpecialOffer;
```

Lab 2

```sql
--1
SELECT BusinessEntityID, UPPER(FirstName) AS FirstName, UPPER(LastName) AS LastName
FROM Person.Person;

--2
SELECT LEFT(FirstName,1) AS FirstInitial, LastName
FROM Person.Person;

--3
SELECT REVERSE(LastName) AS ReverseName
FROM Person.Person;
```

Lab 3

```sql
--1
SELECT SalesOrderID, OrderDate, ShipDate,
       DATEDIFF(DAY,OrderDate,ShipDate) AS NoOfDays
FROM Sales.SalesOrderHeader;

--2
--Shows all the ways to do this
SELECT CAST(OrderDate AS DATE) AS OrderDate, CONVERT(VARCHAR(10),DueDate,20) AS DueDate,
       FORMAT(ShipDate,'yyyy-MM-dd') AS ShipDate
FROM sales.SalesOrderHeader;
```

```sql
--3
SELECT SalesOrderID, OrderDate, DATEADD(MONTH, 6, OrderDate) AS inSixMonths
FROM Sales.SalesOrderHeader;
```