

# LaunchCode T-SQL Workshop Day 1 Labs

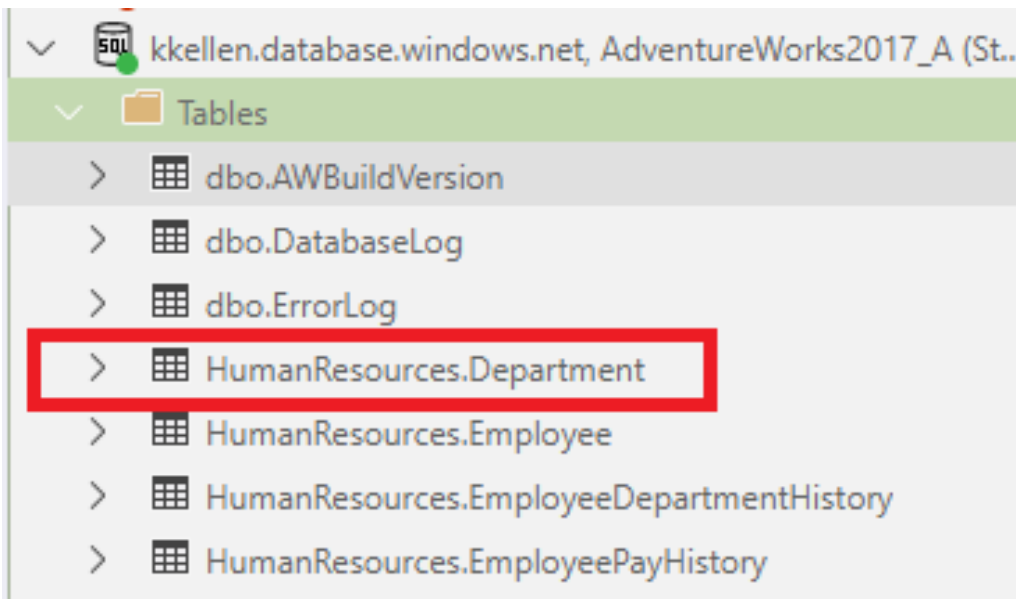
## Module 1

### Lab 1

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

Connection Details	
Connection type	Microsoft SQL Server
Server	kkellen.database.windows.net
Authentication type	SQL Login
User name	Student1
Password	*****
	<input checked="" type="checkbox"/> Remember password
Database	AdventureWorks2017_A
Server group	<Default>
Name (optional)	

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:

### 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 column1, column2, column3
```

```
FROM theTable;
```

### Aliases

--Using an alias

```
SELECT column1 AS [Another Name], column2 as TheColumn, column3 as "Another Column"
```

```
FROM theTable AS A;
```

### 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;
```

#### Lab 1

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

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.

### 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 logic

```
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';

### 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;
```

### Lab 1

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

1. Write a query displaying the ProductID, Name, and Color columns from rows in the Production.Product table. Display only those rows where no color has been assigned.
2. Write a query displaying the ProductID, Name, and Color columns from rows in the Production.Product table. Display only those rows in which the color is known not to be blue.
3. Write a query displaying ProductID, Name, Style, Size, and Color from the Production.Product table. Include only the rows where at least one of the Size or Color columns contains a value.

## Module 4

### Expressions

--Concatenate strings

```
SELECT column1 + column2 AS NewColumn  
FROM theTable;
```

--Math

```
SELECT 1 + 2, column1 * column2  
FROM theTable;
```

### 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

### 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

### Other functions

- ISNULL, COALESCE –replace a null
- CAST – convert to another data type
- CONVERT – convert to another data type plus formatting
- CONCATENATE – builds a string from multiple parts. You don't have to worry about data types. You don't have to worry about NULL unless you wish to substitute NULL.
- FORMAT – format dates or numbers

### Lab 1

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 them along with the SpecialOfferID and Description columns.

#### Lab 2

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

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.SalesOrderHeader 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 ProductID, Name, Color
FROM Production.Product
WHERE Color IS NULL;
```



```
--2
SELECT ProductID, Name, Color
FROM Production.Product
WHERE Color <> 'Blue' OR Color IS NULL;

--Other solutions
SELECT ProductID, Name, Color
FROM Production.Product
WHERE ISNULL(Color, '') <> 'Blue';

SELECT ProductID, Name, Color
FROM Production.Product
WHERE COALESCE(Color, '') <> 'Blue';

--3
SELECT ProductID, Name, Style, Size, Color
FROM Production.Product
WHERE Size IS NOT NULL OR Color IS NOT NULL;
```

## Module 4

### Lab 1

```
--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

```
--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

```
--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;

--3
```

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