

Class will begin at 8:00 am Central Time

Introduction to T-SQL Queries




Kathi Kellenberger

Redgate Software



Kathi Kellenberger

- Editor and Advocate
Redgate Software

-  /Kathikellenberger
-  @aunkathi
- <http://aunkathisql.com>
-  Kathi.Kellenberger@red-gate.com

- Lifelong learner
- Teacher

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- Co-leader of PASS
Women in Technology
 - Data Platform MVP

Agenda

- Day 1
 - Module 1: Introduction
 - Module 2: Simple select statements
 - Module 3: Filtering
 - Module 4: Expressions
- Day 2
 - Module 5: Joining
 - Module 6: Grouping
 - Module 7: Subqueries
 - Module 8: UNION

CLASS MATERIALS

- <https://github.com/KathiKellenberger/July2020TSQLClass>
- Slides
- Demos
- Labs!
- Resources

Schedule

- Lunch around noon for 30 minutes
- Take a break before or after lab
- Done at 3pm or when we get through Module 4

Module 1: Introduction

What's a database?

Database

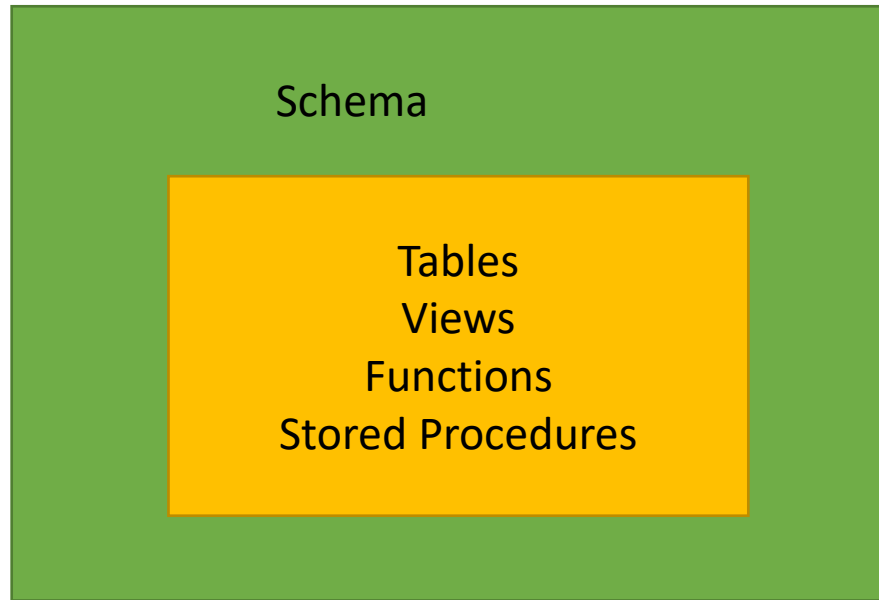
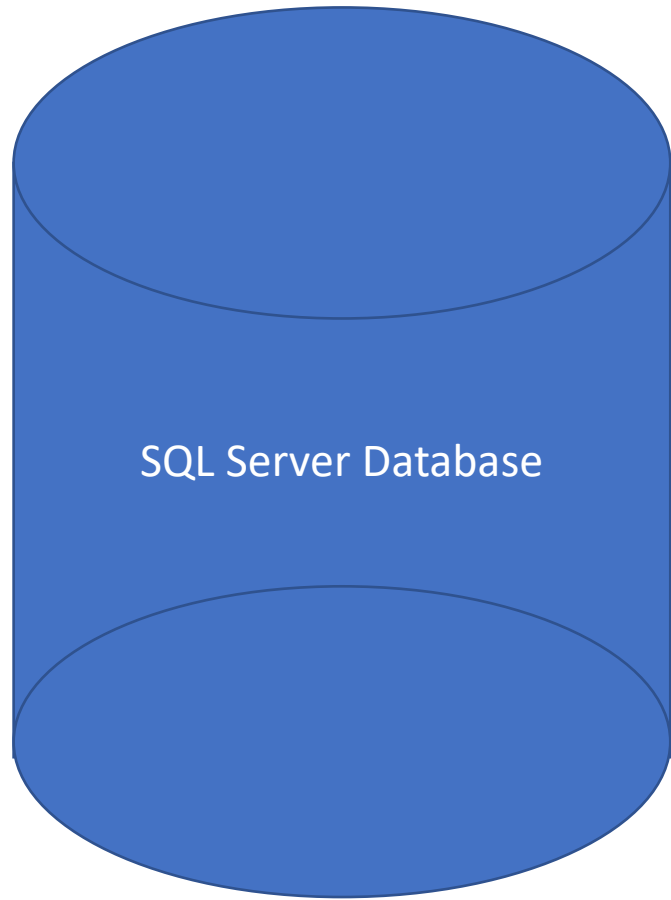


```
target_date | target_time  
-----  
2016-12-26 | 02:29:30  
2016-12-26 | 02:32:29  
2016-12-26 | 02:32:29  
2016-12-26 | 02:35:29  
2016-12-26 | 02:35:29  
2016-12-26 | 02:38:29  
2016-12-26 | 02:38:29  
2016-12-26 | 02:41:30  
2016-12-26 | 02:41:30  
2016-12-26 | 02:44:29  
2016-12-26 | 02:44:29
```

A database is an organized collection of data. It is the collection of schemas, tables, queries, reports, views and other objects. The data are typically organized to model aspects of reality in a way that supports processes requiring information, such as modelling the availability of rooms in hotels in a way that supports finding a hotel with vacancies.

Database - Wikipedia

<https://en.wikipedia.org/wiki/Database>



Tables

UsedCars					
ID	Make	Model	Type	Year	Color
1	Chevrolet	Malibu	Passenger car	2015	Blue
2	Hyundai	Sonata	Passenger car	2011	Silver
3	Chrysler	Pacifica	Minivan	2017	White
4	Toyota	Prius	Hybrid car	2013	White
5	Hyundai	Elantra	Passenger car	2015	Blue
6	Chevrolet	Silverado	Truck	2013	Red

```
SELECT *  
FROM UsedCars  
WHERE Make = 'Hyundai';
```

T-SQL

- SQL = Structured Query Language
- T-SQL = Transact SQL
- Each vendor has own version
- The basics are the same

PRINT, GO, USE, and comments

- Print displays a message
- GO is a batch separator
- USE – switch databases (will not work with our Azure dbs)
- -- (two dashes) for a one-line comment
- /* */ for multi line comments
- Use a tick mark aka single quote around strings or dates
- Use a semi-colon at end of statements

Accounts

Login	Password
Student1	Vermilion1*
Student2	Alexander1*
Student3	Washington1*
Student4	Greyside1*

Get started

- Connection
 - Kkellen.database.windows.net
 - Student1 with pw Vermilion1*
 - SQL Authentication
 - Type in a Database
 - AdventureWorks2017_A
 - AdventureWorks2017_B
 - AdventureWorks2017_C
- You can continue to use the databases after today.
- This is Azure's database as a service

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)	

Demo 1: Getting around in Azure Data Studio

Lab

- Complete Module 1 Lab 1
- Start back up at

Module 2:

Simple SELECT statements

SELECT

- Keyword for retrieving data from a database
- Return a list of columns or expressions
- Syntax

```
SELECT <expr1>[,<expr2>,<expr3>,...]
```

FROM

- The table where the data can be found
- Syntax

```
SELECT *  
FROM <schema>.<table>
```

```
SELECT <expr1>[,<expr2>,<expr3>,...]  
FROM <schema>.<table>
```

- The schema is often “dbo”
- You join tables together in the FROM clause, but you’ll learn about that in a later module (tomorrow!)

Aliases

- Give a name to an expression or table
- Syntax

```
SELECT <expr1> AS Name1
```

```
FROM <tablename> AS tbl
```

```
SELECT <expr1> AS [The name]
```

```
SELECT <expr1> AS "The name"
```

TOP

- Return a number of rows or a percent of rows
- Syntax

```
SELECT TOP(n) <expr1>[,<expr2>,<expr3>,...]  
FROM <schema>.<table>
```

```
SELECT TOP(n) PERCENT <expr1>[,<expr2>,<expr3>,...]  
FROM <schema>.<table>
```

DISTINCT

- Return a unique set of rows

- Syntax

```
SELECT DISTINCT <expr1>[,<expr2>,<expr3>,...]  
FROM <schema>.<table>
```

Demo: SELECT FROM

Lab

- Complete Module 2 Lab 1
- Start at 9:50
- 13 minutes
- In lab info, label the parts to make it easier

Ordering data

- Use the ORDER BY clause
- One or more columns or expressions
- Ascending by default
- Use DESC to reverse order

Demo: ORDER BY

Lab

- Complete Module 2 Lab 2

Module 3: Filtering

WHERE

- Basic Syntax

```
SELECT <expr1>[,<expr2>,<expr3>,...]
```

```
FROM <schema>.<table>
```

```
WHERE <expr5> = <expr6>
```

```
ORDER BY <expr1>
```

- Dates example

```
SELECT SalesOrderID, ShipDate
```

```
FROM Sales.SalesOrderHeader
```

```
WHERE ShipDate >= '2011-06-07' and ShipDate < '2011-06-08'
```

Operators

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

Demo: The WHERE clause

Lab

- Complete Module 3 Lab 1

Working with NULL

- Unknown
- Can't compare anything to NULL
- When trying to compare to NULL, the row is not returned
- Use ISNULL or COALESCE to replace the NULL
- Use IS NULL or IS NOT NULL to compare

Demo: NULL

Lab

- Complete Module 3 Lab 2

Module 4: Expressions

What's in an expression?

- Column, really anything
- Column1 + Column2
- Concatenating strings
 <string1> + <string2>
- Math
 <number> <operator> <number>
- Lots of built-in functions!

Functions

- CAST and CONVERT – change a data type
- ISNULL and COALESCE – replace NULL

Demo: Expressions

Lab

- Complete Module 4 Lab 1

String functions

- RTRIM, LTRIM, TRIM 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

Demo: String functions

Lab

- Complete Module 4 Lab 2

Working with Dates

- GETDATE, SYSDATETIME returns the server date
- DATEADD adds a time period to a date
- DATEDIFF finds the difference between two dates
- DATENAME, DATEPART returns part of a date
- DAY, MONTH, YEAR returns part of a date
- CONVERT, FORMAT formatting dates

Demo: Working with dates

Lab

- Complete Module 4 Lab 3