Introduction to Microsoft Transact-SQL Queries

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## Summary:

This is an introduction / basic course for individuals who are fairly new to databases, Microsoft SQL Server and SQL queries. We will start with getting SQL Server Express installed on a computer and adding the AdventureWorks database to that SQL Server instance. We will be covering writing SQL to query data from a SQL Server, as well as inserting, updating and deleting data in a SQL Server database. This course will cover various techniques for filtering and manipulating data results including proper use of JOINs, aggregate functions, sub-queries, and use of expressions and calculated fields. We will NOT be covering creation of database objects (such as tables, constraints, views, indexes, triggers, stored procedures, and functions).

# Prerequisites:

* Knowledge of basic relational database concepts such as tables, fields, data types, foreign keys, etc.
* GitHub account (to access and pull down documents, example files, resources)
* Laptop running Windows 7, 8, or 8.1 with SQL Server Express 2014 downloaded (we will be setting this up in class.)
* AdventureWorks2014 sample database downloaded (we will be setting this up in class.)

# Week 1:

* (QUICK) Installing SQL Server Express 2014, AdventureWorks database and Overview
* GitHub repository for this class
* Relational Database concepts overview
  + Normalization, Primary Keys, Foreign Keys, Indexes, Schemas
  + Other systems: Oracle, MySQL, Access, IBM DB2
* SQL Data Types
* Structure of a basic SQL query
  + SELECT, FROM, WHERE, ORDER BY
  + Writing readable SQL
    - Schema, aliases, and qualification
    - Readable layout

# Week 2:

* Structure of a basic SQL query (continued)
  + Filtering data
    - Comparison operators for numbers, dates, and strings
    - Multiple criteria (AND, OR, and using parentheses)
    - Be aware of NULLs
  + Sorting data
  + JOINs – tying data together : INNER, LEFT, RIGHT, FULL OUTER, CROSS, self joins

# Week 3:

* Using functions and expressions for formatting output and filtering (calculated fields)
  + Common functions – ISNULL(), COALESCE(), GETDATE(), DATEADD(), DATEDIFF(), YEAR(), MONTH(), DATEPART(),etc.
  + Converting to different data types
* Operators - +, CASE
* Aggregate queries
  + GROUP BY clause
  + Aggregate functions
  + HAVING clause
* Advanced Filtering
  + EXISTS, IN, NOT IN with sub-queries
  + Dynamic filtering with CASE in the WHERE clause

# Week 4:

* Saving your query - as a View
* Parameterized queries: Stored Procedures
* Modifying existing data
  + INSERT statement
  + SELECT INTO
  + UPDATE statement
  + DELETE statement
* Some Tips and Tricks