Module 2 Day 2

Aggregate Functions / Subqueries

What makes an application?

- Program Data
  - ✓ Variables & .NET Data Types
  - ✓ Arrays
  - ✓ More Collections (list, dictionary, stack, queue)
  - ✓ Classes and objects (OOP)
- Program Logic
  - ✓ Statements and expressions
  - ✓ Conditional logic (if)
  - ✓ Repeating logic (for, foreach, do, while)
  - ✓ Methods (functions / procedures)
  - ✓ Classes and objects (OOP)
  - ❑ Frameworks (MVC)

- Input / Output
  - User
    - ✓ Console read / write
    - ❑ HTML / CSS
    - ❑ Front-end frameworks (HTML / CSS / JavaScript)
  - Storage
    - ✓ File I/O
    - ❖ Relational database
    - ❑ APIs

Order By

- Sorts rows by the named column(s)
- SELECT col1, col2
  FROM table
  WHERE …
  ORDER BY col1 [ASC | DESC], col3 [ASC | DESC]…
- Order-by column does not need to be in the select list
- Multiple Order-by columns “break ties”
- ORDER BY n [ASC | DESC]
  - Uses the nth column in the select list
  - 1-based ☺

Top N

- Limits the result set to the first N rows
- SELECT TOP n col1, col2
- “Top 10 most populous cities”

Functions

- Use wherever you'd use a column name
- String functions
  - Concatenation with +
  - CONCAT, LEFT/RIGHT, LEN, LOWER, UPPER, LTRIM, RTRIM, TRIM, STR, SUBSTR
- https://www.w3schools.com/sql/sql_ref_sqlserver.asp
  - Also Numeric and Date functions
- ISNULL(expression, valueIfNull)

Aggregate Functions

- Performs some calculation on multiple rows and summarizes result
- AVG, COUNT, MAX, MIN, SUM
- SELECT AVG(col1), MAX(col2)
- SELECT COUNT(*) FROM employee
- This will always return one row!
- Column name will be undefined in the result set
  - You can name the column with AS

Grouping Results

- Always used with aggregate functions
- Returns 1 row per “group”
- SELECT col1, col2, FUNC1(col3)
  FROM tablename
  WHERE search-condition -- optional
  GROUP BY col1, col2
  ORDER BY … -- optional
- Columns NOT aggregated must be listed in the GROUP BY

Subquery

- One way of relating data between tables (or between a table and itself)
- SELECT col1, col2…
  FROM table1
  WHERE col3 IN | NOT IN
  (SELECT col9 FROM table2 WHERE …)
- Compares one column in the “outer” query to one column in the “inner” query