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# CGT 456 Lecture 7

Data Connections



# Data Connections

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- Previously used:
  - ODBC (Open Database Connectivity)
- Learn about:
  - Inherent Microsoft SQL connections
    - TDS
  - OLEDB
    - Includes ODBC

# SqlDataAdapter

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- Represents a set of data commands and a database connection that are used to fill the `System.Data.DataSet` and update the SQL Server database
- `System.Data.SqlClient.SqlDataAdapter` class



# SqlDataAdapter.SelectCommand

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- Gets or Sets
  - A SQL statement or stored procedure used to select records in the data source



# DataSet

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- Represents an in-memory cache of data
- `System.Data.DataSet` class



# DataSet.Fill()

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- Adds or refreshes rows in a specified range in System.Data.DataSet to match those in the data source.



# DataTable

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- Represents one table of in-memory data
- `System.Data.DataTable` class

# DataSet.Tables[]

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□ Gets the collection of tables contained in `System.Data.DataSet`

□ `ds = new DataSet();`

...

`DataTable dt = new DataTable();`

`dt = ds.Tables[0];`





# Connection Pooling

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- Connection Pooling increases the performance of Web applications by reusing active database connections instead of creating a new connection with every request.
- When a new connection request comes in, the pool manager checks to see if the pool contains any unused connections and returns one if available.



# Classes

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- SqlConnection class
  - Represents an open connection to a MSFT SQL Server database
  
- SqlCommand class
  - Represents a SQL statement or stored procedure

# Classes (cont)

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- SqlDataReader class
  - Represents the results from a database query
  - We don't use this very often
  
- SqlDataAdapter class
  - Again, Represents a set of data commands and a database connection that are used to fill the System.Data.DataSet and update the SQL Server database

# Rows of a DataTable

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- Rows
  - A property of the DataTable class
- Represents all of the rows in the DataTable
- This is the oRS from ASP 3.0
- Fetched in C# using
  - Rows[<row>][<col>]
  - Rows[0][2]
    - Fetches the 3<sup>rd</sup> field of the 1<sup>st</sup> row

# DataReader class

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- Enables you to quickly get a set of records from a DB and display the records in a .net page.
- Limitation
  - It can retrieve ONLY one single DB record into memory at a time
  - Because of this, you cannot use DataReader to work with the results of query as a whole
  - Example:
    - Cannot use DataReader to retrieve a Count of the # of records retrieved.
    - Cannot use DataReader to filter or sort the records
    - Cannot cache a DataReader into memory

# ADO.NET

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- ActiveX Data Objects .NET
- Contains classes to perform standard DB tasks such as modifying & accessing DB data.
- The simplest definition of ADO.NET is that it is Microsoft's new .NET object library for data access

# OLEDB

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- ❑ OLE once stood for "Object Link Embedding" and "DB" for database. However, Microsoft no longer ascribes these meanings to the letters "OLE" and "DB."
- ❑ OLE DB is Microsoft's strategic low-level application program interface (API) for access to *different* data sources

# OLEDB

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- OLE DB includes not only the Structured Query Language (SQL) capabilities of the Microsoft-sponsored standard data interface Open Database Connectivity (ODBC) *but also includes access to data other than SQL data.*





# First Group of Connections

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- MSFT SQL Server
  - SqlConnection
  - SqlCommand
  - SqlDataReader
  
- OleDb – accessing other databases
  - OleDbConnection
  - OleDbCommand
  - OleDbDataReader

# Diff between those two groups

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- The Sql prefixed classes are optimized to work specifically with MSFT SQL Server
- The Sql classes operate directly using the Tabular Data Stream (TDS) protocol
  - TDS is low-level protocol (MSFT owned)
  - Handles client/server connections
  - By bypassing OLEDB and ODBC & working directly with TDS, you get dramatic performance benefits.



# Third Group

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- Memory-Resident representations of a DB
  - SqlDataAdapter
  - OleDbDataAdapter
  - DataSet
  - DataTable
  - DataRelation
  - DataView



# Classes (cont)

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## □ DataRelation

- Use to define relationships between tables
- We won't use this very often

## □ DataView

- Use to view data after being filtered or sorted



# Demo

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- Demo db connection, selection & displaying data from SQL Server