Module 2 Day 10

Week 2 Review

Today's Buffet

- NOTE: **Optional** Practice Exercise
- Database Security / SQL Injection
- Nullable Data
- Selecting an *IxxxDAO* implementation
- Client-Server computing: shared database

Database Security Best Practices

- Avoid creating DB logins for individual users if possible
  - Create logins for an application instead
  - User logs on to the application (if needed)
  - Application logs on to the database
- Avoid storing DB credentials in plain text
  - Use encryption or a password vault
- Use stored procedures to access / update data
  - Grant users EXECUTE permission on the procedures
  - Grant NO permission directly on the tables

SQL Injection

- A very common type of cyber-attack
- Allows a malicious user to read, update or delete data they should not have access to
- Caused by string concatenation in your program
- Prevented by using parameters
  - The bottom line: **Use Parameterized Queries!**

- https://informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/

Nullable "Value" Types – ?

- *IndepYear* is int in the database but it is *nullable*
  - The result data in C# may be of type int or may be type DbNull
- C# int is a value type.
  - Its default value is 0
  - null is not a valid value (that's only for reference types)
- int? is a "nullable integer"
  - It can store an integer, OR null
  - Test for null
    - HasValue propery
    - (IndepYear == null)