

# Project: Database Security

## Learning Goals of this Project:

You will learn about two different types of database vulnerabilities and how each attack works. Inference attacks are security attacks that attempt to extract sensitive information from a database by making educated guesses based on the available information. Hackers use this prevalent practice to data mine troves of information to connect the dots and extract sensitive information.

In an SQL injection attack, an attacker injects malicious SQL code into a web application's input fields to manipulate the database, gain unauthorized access to sensitive data, or execute harmful actions.

In particular, we will cover these learning topics:

- Basic T-SQL queries
- Basic JavaScript
- Database Inference attacks
- Database SQL injection attacks

## The final deliverables:

A single JSON formatted file will be submitted to Gradescope. This file should be named `**project_dbsec.json**`. A template can be found in the `/home/cs6035/assists/` folder.

See [Submission Details](#) for more information.

## Important Reference Material:

Valuable Information - see [Database Security Prerequisites](#)

All-Encompassing:

- [SQL Test / SQL Fiddle](#)
- [Chrome DevTool Documentation](#)
- [Chrome Debug Javascript](#)
- [HTML Table to CSV/Excel Converter](#)
- [Microsoft Excel](#) (you will need to use your Student Account and allow pop-ups)

Inference:

- [Hylkema, Michael - A Survey of Database Inference Attack Prevention Methods](#)
- [Thought Co - How to Copy Code From a Website](#)

SQL Injection:

- [Microsoft - Operators](#)
- [OWASP - SQL Injection](#)
- [Hacking Loops - The Ultimate SQL Injection Cheat Sheet](#)
- [PortSwigger - Using SQL Injection to Bypass Authentication](#)
- [PortSwigger - SQL Injection: The Union Operator](#)
- [SQL Shack - SQL Union overview, usage and examples](#)

## Submission:

Gradescope (auto-graded) - see [Submission Details](#)

## Virtual Machine:

- Apple M-based systems (i.e., not Intel Chip)

- The M-based chipset is not supported. If you choose to use such a device, extensions will not be granted due to issues that arise.
- Intel/AMD x64 version
  - <https://www.virtualbox.org/wiki/Downloads> (**Version 7.0/latest is required**)
  - For those curious, the RDBMS used to run the database for this project is the Microsoft SQL Server developer edition, which runs on Linux.
  - Note: The DBSec project is in the master VM. The link will be provided on the project release.

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