NJIT | YING WU COLLEGE OF COMPUTING

IT635: Database Administration

Instructor Information

- Logan Reyes, ler25@njit.edu

- Virtual Office Hours:
    - 5-6PM on Thursday via Discord
    - Discord/Webex by appointment (email or message on Discord to set up, will respond within 24 hours)
- Course Discord [optional]: https://discord.gg/JgtW3WT6fv

Academic Integrity

The NJIT Honor Code will be upheld at all times. The work you do and submit is expected to be the result of your effort only. You may discuss the high level (general) solution of a design problem, however, cooperation should not result in one or more students having possession of copied graphics, code, or any other project element created by another student. Cite all resources used on assignments and projects. Any violations of the NJIT Honor code will be brought to the immediate attention of the Dean of Students.

Description

This course will be a hands-on project focused exploration of database administration. Students will work on a number of projects using PostgreSQL and MongoDB. Students will be expected to work extensively through Command Line Interface as well as programmatically for their database environments.

Learning Outcomes

- Working knowledge of SQL and NoSQL databases
- Experience writing interfaces to databases through python
- Understanding of relational database theory and practice
- Understanding of resiliency and disaster recovery issues as they relate to database administration
- Understanding of database migration issues
- A knowledge of the various database systems currently available and their typical application

Prerequisite Knowledge

Some basic experience with programming, a basic understanding of simple unix commands, and a familiarity with SQL.

Course Requirements

- VPN access to the NJIT network. A computer with a webcam for face to face conferencing and Respondus test taking. This computer must be able to run Docker to complete the exercises.
- Access to Canvas is required.

Assessment and Grade Distribution

- Exercises: 20%
- Midterm Project: 20%
- Midterm Exam: 20%
- Final Exam: 20%
- Final Project: 20%

Submission Criteria

Project Proposal: The proposal functions as our contract for your project. You put forth the vision for your project and we will discuss together what will be expected at grading time. Specific deliverables will be agreed upon and posted to the project assignment. This will function as a rubric for how your project is graded. Without an approved proposal your project cannot be graded (and will default to a 0).

Late Policy

Any projects that are submitted late will have a penalty of 1 point (of its percent value towards your final grade) per day late. No exceptions.

Course Schedule

Week 1: Introduction, Unix Review, Git introduction, WSL2 introduction, PostgreSQL installation
Week 2: SQL Basics, Small-scale Databases, CLI Database Access
Week 3: Project Proposals Due, Interfacing with a Database
Week 4: Backup and Migration
Week 5: Medium-scale Relational Databases
Week 6: Midterm Review
Week 7: Midterm Exam & Midterm Project Check-In
Week 8: Backup, Recovery / Live Replication and High Availability
Week 9: Normal Forms
Week 10: NoSQL Databases
Week 11: Large-scale Databases
Week 12: Common Database Issues / Performance
Week 13: Exploration of Database Tools
Week 14: Final Review
Week 15: Final Exam & Final Project Presentations Due