Project 5

CMP 420 & CMP 758 - Database Systems
Fall 2022
Total points: 100

Submission Details and Instructions

- Please submit all your work on Blackboard. Please do not email your work. **Emailed work will receive a 0.**
- Due date: **Monday December 5, 2022, by 11:59 pm**. No late submission will be accepted.
- All work must be submitted on Blackboard in a PDF or Microsoft Word Document.
- Make sure to explain your answers in detail to receive full credit

In this project, you need an understanding of Functional Dependencies and Normalization to complete this project.

1. (20 points) Consider the Relation R5 = (P, Q, R, S, T), with the following functional dependencies:
   P -> R
   QS -> R
   PQS -> T
   In this relation R5, is (P, Q, S) the Candidate Key. What normal form does R5 satisfy? You may assume that all tuples are unique and attributes are atomic. (Make sure to explain your answers in detail to receive full credit)

2. (20 points) Consider the relation R = (A, B, C, D), with the following functional dependencies:
   AB -> C
   C -> D
   What is the Candidate Key for this relation? What normal form does R satisfy? You may assume that all tuples are unique and attributes are atomic. (Make sure to explain your answers in detail to receive full credit)

3. (20 points) Consider the Relation R = (A, C, B, D, E), with Functional Dependencies: A -> B, C -> D. What is the Candidate Key for R? (Make sure to explain your answers in detail to receive full credit)

4. (20 points) Given a relation R = {P, Q, R, S, T} with the following functional dependencies:
   PQ → R
   RS → T
   ST → Q
   Decompose R into 3NF relations. Show your work to receive full credit.

5. (20 points) Consider a relation R (x, y, z, u, v) with the following dependencies:
   xy -> z
   zu -> v
   uv -> y
   List all candidate keys for this relation (show your work).