CSCI3170 Short Assignment #2 (Solution)

Name: Pass / Fail

Student ID:

Consider the following relation schema and functional dependency:

R(A,B,C)
F = {A → C, C→ A}

1. Find A^+, B^+, C^+, AB^+ and BC^+

   Ans:

   A^+=AC

   B^+=B

   C^+=AC

   AB^+=ABC

   BC^+=ABC

2. List all the candidate keys of the relation.

   Ans:

   AB and BC

3. Is the relation in BCNF? Briefly explain your answer.

   Ans:

   No.
   The dependency A→C violates the BCNF requirement, as
   - it is not a trivial relation, and
   - A is not a superkey

   (Note: To prove a relation not belonging to BCNF (or 3NF), you only need to point out one functional dependency that violates the requirement. You may also point out that C→A violates the BCNF requirement)

4. Is the relation in 3NF? Briefly explain your answer

   Ans:

   Yes.
   The dependency A→C does not violate the 3NF requirement, as C is part of the candidate key BC. Similarly, the dependency C→A does not violate the 3NF requirement, as A is also part of the candidate key AB.

   (Note: To prove a relation belonging to 3NF (or BCNF), you need to show that every functional dependency satisfies the requirement.)