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13 February 2023

COSC 4820

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Homework 4)

**Problem 1:**

None of the given FD’s from relation R hold in relation S. This is primarily because D is not in S.

**Problem 2:**

1. The violations of BCNF in relation A are (C->D), (D->A), and (C->A).
2. The relation B belongs to BCNF and therefore contains no violations.
3. Aside from trivial FD’s such as (A->A) or (ABCD->ABCD), the minimal FD’s that are in BCNF are the keys {AB}, {BC}, and {BD} which all point to the entire relation. Larger FD’s would include trivial/unnecessary relations.
4. Aside from trivial FD’s, the minimal FD’s that are in BCNF are the keys {AB}, {BC}, {CD}, and {AD} which all point to the entire relation. Larger FD’s would include trivial/unnecessary relations.

**Problem 3:**

Given that ‘AD’ is the only key to the relation, all FD’s that do not at least contain ‘AD’ and are not trivial relations, such as C->C, are BCNF violations. This means that regardless of which point in a decomposition that we extend ‘A’ it will always be a BCNF violation because it is non-trivial and is also not a key.