Ilyas Karimov Normalization and Denormalization II

Task 1.

First, show a simple example database, including sample data, that is not in 1NF, 2NF, 3NF, 4NF and not in BCNF. That is, this database is not in any of these normal forms. Explain why not.

This table is not inTable

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1. 1NF because of FullName is not atomic
2. 2NF because concerns more than one entity
3. 3NF because it has transitive dependency
4. 4NF because it has multi-valued dependency
5. BCNF because of overlapping candidate keys

Task 2.

Change the form of that database, without changing any content, so that it is in 1NF but not any of the higher normal forms. Explain why it is in 1NF and not in any higher normal form.

After eliminating the Fullname column and dividing it into two columns Name and Surname, it holds 1NF.

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Task 3. Now change that database so that it is in 2NF but not any higher normal form, without changing any content, and explain why it is in 2NF and not any higher NF. Show dependency diagrams.

Non-prime attribute Surname is dependent on EmpNo which is a proper subset of a candidate key. That's why it violates the rule for 2NF.

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After changing it, it is in 2NF.

Dependency Diagram:

Diagram

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Task 4.

Now change that database–keeping its content the same–to convert it to 3NF but not any other higher normal form. Explain why it is in 3NF and not in 4NF and BCNF. Show dependency diagrams.

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There are no transitive dependencies, therefore, this is in 3NF but not in 4NF because there’s a multi-varied dependency.

Dependency Diagram:



Task 5.

Now change that database–keeping its content the same–to convert it to 4NF but not any other higher normal form. Explain why it is in 4NF and not BCNF. Show dependency diagrams.

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Now, this is in 4NF because there are no multi-varied and it is in 3NF.

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Dependency Diagram:

Diagram

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Task 6.

Now change that database–keeping its content the same–to convert it to BCNF.  Explain why it is in BCNF. Show dependency diagrams.

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Now, it is in 1NF, 2NF, 3NF, 4NF, BCNF.

Dependency Diagram:

Diagram

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