

HOMEWORK 4

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1 Part One

Consider the attribute set $R = ABCDEGH$ and the FD set $F = \{AB \rightarrow C, AC \rightarrow B, AD \rightarrow E, B \rightarrow D, BC \rightarrow A, E \rightarrow G\}$.

- For each of the following attribute sets, do the following: (i) Compute the set of dependencies that hold over the set and write down a minimal cover. (ii) Name the strongest normal form that is not violated by the relation containing these attributes. (iii) Decompose it into a collection of BCNF relations if it is not in BCNF.

(a) ABC (b) $ABCD$ (c) $ABCEG$ (d) $DCEGH$ (e) $ACEH$

- Which of the following decompositions of $R = ABCDEG$, with the same set of dependencies F , is (a) dependency-preserving? (b) lossless-join?

(a) $\{AB, BC, ABDE, EG\}$

(b) $\{ABC, ACDE, ADG\}$

2 Part Two

Table : PURCHASES

<u>Customer_ID</u>	<u>Order_ID</u>	<u>Product_ID</u>	Cust_Name	Product_Name	Phn_Nos	Day	Discount
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Convert the relational table to a) 1NF b) 2NF c) 3NF

Information about the table :

- Composite Key is Customer_ID + Order_ID + Product_ID
- Phn_Nos is a multi-valued attribute.
- $Day \rightarrow Discount$
- $Customer_ID \rightarrow Cust_Name$
- $Product_ID \rightarrow Product_Name$
- $Order_ID \rightarrow Day$

3 Submission Instructions

Please submit a single PDF from the team named as <team.number>.pdf (without the < and >). Handwritten submissions are not allowed. Penalty will be given for not following the submission criteria. All the best!