



Example 2: 3NF and Fc Given R(A,B,C) Let's do this together $FDs = \{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C\}$ Compute Fc and convert the relation into 3NF

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Example: BCNF and F+

Given R(A,B,C,D,E)

Let's do this together

 $FDs = \{ A \rightarrow B, AB \rightarrow D, B \rightarrow BDE, C \rightarrow D, D \rightarrow D \}$

Compute F+ and convert the relation into BCNF

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Practice 1: Decomposition

Given R (A, B, C) FDs = $\{A \rightarrow B, B \rightarrow C\}$

Supposed R is decomposed in two different ways :

- 1. R1(A, B), R2(B, C)
 - Does this satisfy lossless-join decomposition?
 - Does this satisfy dependency preserving?
- 2. R1(A, B), R2(A, C)
 - Does this satisfy lossless-join decomposition?
 - Does this satisfy dependency preserving?

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Practice 2: 3NF and BCNF

Given R (A, B, C, D, E) FDs = $\{A \rightarrow C, C \rightarrow DE, D \rightarrow B, A \rightarrow D\}$

Decompose table R using 3NF

Decompose table R using BCNF

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Practice 3: 3NF

Does the Customer_order table satisfy 3NF requirements? If not, convert the table into 3NF

Customer_order

OrderId	CustomerID	Date	Store	Address
1	2	10/1/2019	South	11 Sorth Str
2	1	9/25/2019	West	22 West Str
3	3	8/12/2019	East	33 East Str
4	4	10/23/2019	West	22 West Str
5	8	5/11/2019	North	44 North Str
6	6	5/11/2019	South	11 Sorth Str
7	5	7/31/2019	East	33 East Str
8	7	10/17/2019	West	22 West Str
9	6	9/19/2019	North	44 North Str
10	4	10/23/2019	North	44 North Str
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Practice 4: BCNF

Does the Student_Major_Advisor table satisfy BCNF requirements? If not, convert the table into BCNF

Student_Major_Advisor

ComputingID	Major	Advisor		
ht1y	Computer Science	someone1		
dt2y	Physics	someone2		
dt2y	Engineering	somoone3		
md3y	Computer Science	someone4		
mn4e	Math	someone5		
md3y	Computer Science	someone1		

computingID, Major \rightarrow Advisor Advisor \rightarrow Major

Assume:

(semantic/business rules)

- Each Student may major in several subjects.
- For each Major, a given Student has only one Advisor.
- Each Major has several Advisors.
- Each Advisor advises only one Major.
- Each Advisor advises several Students in one Major.

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