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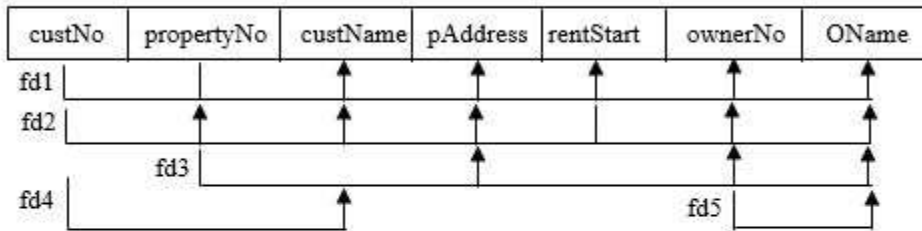
Dr. Vu

CSE 572

12 May 12, 2019

14.12 Given the following relational schema and its functional dependencies:

**RentalInfo**



(a) Specify candidate keys and state the primary key.

(b) Assuming that the relation is in first normal form (1NF), describe and illustrate the process of normalising the relational schema to second (2NF) and third (3NF) normal forms. Identify the primary and foreign keys in your third normal forms.

- A. In the given schema, {custNo, propertyNo} and {custNo, rentStart} are the candidate keys as they determine all other attributes. Any one of the candidate keys can be considered as primary key. However, I will let the primary key be {custNo, propertyNo}
- B. A given relation is in 2NF if every non-prime attribute is fully functional dependent on primary key of R. Attributes that are part of candidate key is prime attribute. From fd3, it can be seen that pAddress, ownerNo and OName are partially dependent on propertyNo. From fd4, custName is dependent on custNo. Thus, 2<sup>nd</sup> normalization will be

Table 1

propertyNo	pAddress	ownerNo	OName
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PK: propertyNo

Table 2

custNo	custName
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PK: custNo

Table 3

custNo	propertyNo	rentStart
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CK: custNo, propertyNo

FK: custNo, propertyNo

A relation is in 3NF if every non-prime attribute is fully functional dependent on key and there is no transitive relation of non-prime attribute on key.

In Table 1, OName is transitively dependent on propertyNo therefore relation is not in 3NF.

Thus, 3NF tables will be

Table 1

propertyNo	pAddress	ownerNo
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PK: propertyNo

FK: ownerNo

Table 2

ownerNo	OName
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PK:ownerNo

Table 3

custNo	custName
--------	----------

PK: custNo

Table 4

custNo	propertyNo	rentStart
--------	------------	-----------

CK: custNo, propertyNo

FK: custNo, propertyNo