

For each of the following, explain why or why not a relation is in a particular normal form, underline primary keys and indicate which fields are foreign keys and which relation they are keys into.

1. PetStore(storeBranchName, storeAddr, storeManager, (customerName, customerAddr, customerPhone, (petName, petBreed, petSex, price)))

FDs

storeBranchName \rightarrow storeAddr, storeManager
customerName \rightarrow customerAddr, customerPhone
customerName, petName \rightarrow petBreed, petSex
customerName, storeBranchName \rightarrow petName
petBreed \rightarrow price

- a. Is this relation in 1NF? If not, why isn't it? Then put it in 1NF.
- b. Is this relation in 2NF? If not, why isn't it? Then put it in 2NF.
- c. Is this relation in 3NF? If not, why isn't it? Then put it in 3NF.

2. R(A, B, C, D, E)

Fds

A \rightarrow B, C
C \rightarrow D
A, C \rightarrow E

- a. Is this relation in 1NF? Why or why not? If not, put it into 1NF.
- 2b. Is it now in 2NF? Why or why not? If not, put it into 2NF.
- 2c. Is it now in 3NF? Why or why not? If not, put it into 2NF.

3.price(product,sName,uPrice,qty,storeLocation,unitWeight)

Fds

product, sname \rightarrow qty

sName \rightarrow storeLocation

product \rightarrow uprice, unitWeight

a. Is this relation in 1NF? If not, why isn't it? Then put it in 1NF.

b. Is this relation in 2NF? If not, why isn't it? Then put it in 2NF.

c. Is this relation in 3NF? If not, why isn't it? Then put it in 3NF.

4.person(personId, name, country, (phone, type))

FDs

personId \rightarrow name, country, phone

name \rightarrow country

phone \rightarrow type

a. Is this relation in 1NF? If not, why isn't it? Then put it in 1NF.

b. Is this relation in 2NF? If not, why isn't it? Then put it in 2NF.

c. Is this relation in 3NF? If not, why isn't it? Then put it in 3NF.

5.carTheft(VID,vehicleType, (ownerID,ownerName),
(suspectId,suspectName))

FDs

VID \rightarrow vehicleType, ownerID

ownerId \rightarrow ownerName

suspectID \rightarrow suspectName

a. Is this relation in 1NF? If not, why isn't it? Then put it in 1NF.

b. Is this relation in 2NF? If not, why isn't it? Then put it in 2NF.

c. Is this relation in 3NF? If not, why isn't it? Then put it in 3NF.