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### Normalization Exercise :

# INVOICE

HILLTOP ANIMAL HOSPITAL

DATE: JAN 13/2002

INVOICE # 987

MR. RICHARD COOK, 123 THIS STREET, MY CITY, ONTARIO, Z5Z 6G6

<u>PET</u>	<u>PROCEDURE</u>	<u>AMOUNT</u>
ROVER	RABIES VACCINATION	30.00
MORRIS	RABIES VACCINATION	24.00
	TOTAL	54.00
	TAX (8%)	<u>4.32</u>
	AMOUNT OWING	<u>58.32</u>

**UNF:**

[illegible]

**1NF:**

[illegible]

## 2NF:

第二范式（2NF）要求：

数据已经符合第一范式（1NF）。

消除部分函数依赖：非主键字段必须完全依赖于主键，而不能只依赖于主键的一部分。

以INVOICE和PET作为主键，则CUSTOMER NAME和CUSTOMER ADDERSS依赖于INVOICE而不依赖于PET，PROCEDURE和AMOUNT依赖于PET

则分解成

INVOICE	CUSTOMER NAME	CUSTOMER ADDERSS	TOTAL	TAX	AMOUNT OWING	DATE

PET	PROCEDURE	AMOUNT

INVOICE	PET

如此将不存在部分函数依赖

## 3NF:

因为CUSTOMER ADDERSS依赖于CUSTOMER NAME 传递依赖于INVOICE，TAX依赖于TOTAL，AMOUNT依赖于TAX和TOTAL，所以分解为

<i>INVOICE</i>	<i>CUSTOMER NAME</i>	<i>TOTAL</i>	<i>DATE</i>

<i>INVOICE</i>	<i>CUSTOMER ADDRSS</i>	<i>TAX</i>	<i>AMOUNT OWING</i>

<i>PET</i>	<i>PROCEDURE</i>	<i>AMOUNT</i>

<i>INVOICE</i>	<i>PET</i>

则不存在传递依赖

**BCNF:**

由于表中不存在任何字段对任一候选关键字段的传递函数依赖。  
 所以：

<i>INVOICE</i>	<i>CUSTOMER NAME</i>	<i>TOTAL</i>	<i>DATE</i>

<i>INVOICE</i>	<i>CUSTOMER ADDRSS</i>	<i>TAX</i>	<i>AMOUNT OWING</i>

<i>PET</i>	<i>PROCEDURE</i>	<i>AMOUNT</i>

<i>INVOICE</i>	<i>PET</i>