**Normalization Exercise 1**

**HEALTH HISTORY REPORT**

PET ID PET NAME PET TYPE PET AGE OWNER VISIT DATE PROCEDURE

246 ROVER DOG 12 SAM COOK JAN 13/2002 01 - RABIES VACCINATION

MAR 27/2002 10 - EXAMINE and TREAT WOUND

APR 02/2002 05 - HEART WORM TEST

298 SPOT DOG 2 TERRY KIM JAN 21/2002 08 - TETANUS VACCINATION

MAR 10/2002 05 - HEART WORM TEST

341 MORRIS CAT 4 SAM COOK JAN 23/2001 01 - RABIES VACCINATION

JAN 13/2002 01 - RABIES VACCINATION

519 TWEEDY BIRD 2 TERRY KIM APR 30/2002 20 - ANNUAL CHECK UP

APR 30/2002 12 - EYE WASH

**UNF:**

**Pet [ pet\_id, pet\_name, pet\_type, pet\_age, owner, ( visitdate, procedure\_no,**

**procedure\_name ) ]**

**1NF:**

**Pet [ pet\_id, pet\_name, pet\_type, pet\_age, owner ]**

**Pet\_Visit [ pet\_id, visitdate, procedure\_no, procedure\_name ]**

**note: a procedure may occur on multiple dates, therefore visitdate is included as part of the key**

**2NF:**

**Pet [ pet\_id, pet\_name, pet\_type, pet\_age, owner ]**

**Pet\_Visit [ pet\_id, visitdate, procedure\_no ]**

**Procedure [ procedure\_no, procedure\_name ]**

**3NF:**

**same as 2NF**

**Normalization Exercise 2**

**INVOICE**

HILLTOP ANIMAL HOSPITAL DATE: JAN 13/2002

INVOICE # 987

MR. RICHARD COOK

123 THIS STREET

MY CITY, ONTARIO

Z5Z 6G6

PET PROCEDURE AMOUNT

ROVER RABIES VACCINATION 30.00

MORRIS RABIES VACCINATION 24.00

TOTAL 54.00

TAX (8%) 4.32

AMOUNT OWING 58.32

**UNF:**

**invoice [ invoice\_no, invoice\_date, cust\_name, cust\_addr, ( pet\_name,**

**procedure, amount ) ]**

**1NF:**

**invoice [ invoice\_no, invoice\_date, cust\_name, cust\_addr ]**

**invoice\_pet [ invoice\_no, pet\_id, pet\_name, procedure, amount ]**

**note: pet\_id was chose as a key because pet\_name is a character string and not a good key candidate.**

**2NF:**

**invoice [ invoice\_no, invoice\_date, cust\_name, cust\_addr ]**

**invoice\_pet [ invoice\_no, pet\_id, procedure, amount ]**

**pet [ pet\_id, pet\_name ]**

**3NF:**

**invoice [ invoice\_no, invoice\_date, cust\_no (FK) ]**

**invoice\_pet [ invoice\_no (FK), pet\_id (FK), procedure, amount ]**

**pet [ pet\_id, pet\_name ]**

**customer** **[ cust\_no, cust\_name, cust\_street, cust\_city, cust\_pstlcd ]**

**note: cust\_no was chose as a key because cust\_name is a character string and not a good key candidate. The customer address was broken apart in 3NF. All foreign keys are identified.**

**ABC Manufacturing Solution**

View 1 - Order

UNF:

ORDER [Order\_no ,Order\_dt, Cust\_name, Cust\_addr, Ship\_addr, Phone1, Phone2, Cust\_disc (item#, Prod\_code, Prod\_desc, Qty, Filled, Price)]

1NF:

ORDER [Order\_no, Order\_dt, Cust\_name, Cust\_addr, Ship\_addr, Phone1, Phone2, Cust\_disc)]

ORDER\_ITEM [Order\_no, Prod\_code, Prod\_desc, Qty, Filled, Price]

2NF:

ORDER [Order\_no, Order\_dt, Cust\_name, Cust\_addr, Ship\_addr, Phone1, Phone2, Cust\_disc]

ORDER\_ITEM [Order\_no, Prod\_code, Qty, Filled]

PRODUCT [ prod\_code, prod\_desc, prod\_price]

3NF:

ORDER [Order\_no, Order\_dt, Cust\_no (FK)]

ORDER\_ITEM [Order\_no, Prod\_code , Qty, Filled]

CUSTOMER[Cust\_no, Cust\_name, Cust\_addr, Cust\_ship\_addr, Cust-phone1, Cust-phone2, Cust-disc, Cust\_credlmt]

PRODUCT[Prod\_code, Prod-desc, Prod\_price, Prod\_qoh]

Final Solution: examine relationships to ensure correctness. break apart composite attributes such as name and address:

ORDER [Order\_no, Order\_dt, Cust\_no (FK)]

ORDER\_ITEM [Order\_no, Prod\_code(FK), Qty, Filled]

CUSTOMER[Cust\_no, Cust\_fname, Cust\_lname, Cust\_title, Cust\_addr, Cust\_city, Cust\_prov, Cust\_pstlcd, Cust\_ship\_addr, Cust\_ship\_city, Cust\_ship\_prov, Cust\_ship\_pstlcd, Cust-phone1, Cust-phone2, Cust-disc, Cust\_credlmt]

PRODUCT[Prod\_code, Prod-desc, Prod\_price, Qoh]

**ABC Manufacturing Solution**

View 2 - Product Inventory List

UNF:

PRODUCT[Prod\_code, Prod\_desc, Prod\_QOH, Prod\_BO, Prod\_price]

1NF:

same!

2NF:

same!

3NF:

same!

View 3 - Product Bill-of-Materials Report

UNF:

PRODUCT [Prod\_code, Prod\_desc, (Part\_numb, Part\_desc, Qty\_reqd)]

1NF:

PRODUCT[Prod\_code, Prod\_desc]

PROD\_PART [Prod\_code, Part\_numb, Part\_desc, Qty\_reqd)]

2NF:

PRODUCT[Prod\_code, Prod\_desc]

PROD\_PART [Prod\_code, Part\_numb, Part\_desc, Qty\_reqd)]

PART [Part\_numb, Part\_desc, QOH]

3NF:

same as 2NF

**Note that some attributes were added to entities because of the description given with the user views, not because they were seen in the views.**