Normal Form

Below data is used to describe information of treatment for pets at a pet medical center. Using decomposition technique to model these data into relational model basing normal forms. You should start from 1NF to 3NF.

1. Healthy 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

1NF

PET (PET ID, PET NAME, PET TYPE, PET AGE, OWNER, VISIT DATE, PROCEDURE – ID, PROCEDURE – DESCRIPTION)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PET ID | PET NAME | PET TYPE | PET AGE | OWNER | VISIT DATE | PROCEDURE - ID | PROCEDURE - DESCRIPTION |
| 246 | ROVER | DOG | 12 | SAM COOK | JAN 13/2002 | 01 | RABIES VACCINATION |
| 246 | ROVER | DOG | 12 | SAM COOK | MAR 27/2002 | 10 | EXAMINE and TREAT WOUND |
| 246 | ROVER | DOG | 12 | SAM COOK | APR 02/2002 | 05 | HEART WORM TEST |
| 298 | SPOT | DOG | 2 | TERRY KIM | JAN 21/2002 | 08 | TETANUS VACCINATION |
| 298 | SPOT | DOG | 2 | TERRY KIM | MAR 10/2002 | 05 | HEART WORM TEST |
| 341 | MORRIS | CAT | 4 | SAM COOK | JAN 23/2001 | 01 | RABIES VACCINATION |
| 341 | MORRIS | CAT | 4 | SAM COOK | JAN 13/2002 | 01 | RABIES VACCINATION |
| 519 | TWEEDY | BIRD | 2 | TERRY KIM | APR 30/2002 | 20 | ANNUAL CHECK UP |
| 519 | TWEEDY | BIRD | 2 | TERRY KIM | APR 30/2002 | 12 | EYE WASH |

2NF

PET (PET ID, PET NAME, PET TYPE, PET AGE, OWNER)

PROCEDURE (PROCEDURE – ID, PROCEDURE – DESCRIPTION, VISIT DATE)

PET- PROCEDURE (PET ID, PROCEDURE – ID)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PET ID | PET NAME | PET TYPE | PET AGE | OWNER |
| 246 | ROVER | DOG | 12 | SAM COOK |
| 298 | SPOT | DOG | 2 | TERRY KIM |
| 341 | MORRIS | CAT | 4 | SAM COOK |
| 519 | TWEEDY | BIRD | 2 | TERRY KIM |



|  |  |  |
| --- | --- | --- |
| PROCEDURE - ID | PROCEDURE - DESCRIPTION | VISIT DATE |
| 01 | RABIES VACCINATION | JAN 13/2002 |
| 10 | EXAMINE and TREAT WOUND | MAR 27/2002 |
| 05 | HEART WORM TEST | APR 02/2002 |
| 08 | TETANUS VACCINATION | JAN 21/2002 |
| 05 | HEART WORM TEST | MAR 10/2002 |
| 01 | RABIES VACCINATION | JAN 23/2001 |
| 01 | RABIES VACCINATION | JAN 23/2001 |
| 20 | ANNUAL CHECK UP | APR 30/2002 |
| 12 | EYE WASH | APR 30/2002 |

|  |  |
| --- | --- |
| PET ID | PROCEDURE - ID |
| 246 | 01 |
| 246 | 10 |
| 246 | 05 |
| 298 | 08 |
| 298 | 05 |
| 341 | 01 |
| 341 | 01 |
| 519 | 20 |
| 519 | 12 |



3NF

PET (PET ID, PET NAME, PET TYPE, PET AGE, OWNER)

PROCEDURE (PROCEDURE – ID, PROCEDURE – DESCRIPTION, VISIT DATE)

PET- PROCEDURE (PET ID, PROCEDURE – ID)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PET ID | PET NAME | PET TYPE | PET AGE | OWNER |
| 246 | ROVER | DOG | 12 | SAM COOK |
| 298 | SPOT | DOG | 2 | TERRY KIM |
| 341 | MORRIS | CAT | 4 | SAM COOK |
| 519 | TWEEDY | BIRD | 2 | TERRY KIM |



|  |  |  |
| --- | --- | --- |
| PROCEDURE - ID | PROCEDURE - DESCRIPTION | VISIT DATE |
| 01 | RABIES VACCINATION | JAN 13/2002 |
| 10 | EXAMINE and TREAT WOUND | MAR 27/2002 |
| 05 | HEART WORM TEST | APR 02/2002 |
| 08 | TETANUS VACCINATION | JAN 21/2002 |
| 05 | HEART WORM TEST | MAR 10/2002 |
| 01 | RABIES VACCINATION | JAN 23/2001 |
| 01 | RABIES VACCINATION | JAN 23/2001 |
| 20 | ANNUAL CHECK UP | APR 30/2002 |
| 12 | EYE WASH | APR 30/2002 |

|  |  |
| --- | --- |
| PET ID | PROCEDURE - ID |
| 246 | 01 |
| 246 | 10 |
| 246 | 05 |
| 298 | 08 |
| 298 | 05 |
| 341 | 01 |
| 341 | 01 |
| 519 | 20 |
| 519 | 12 |



1. 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

1NF

INVOICE (INVOICE-ID, INVOICE-DATE, CUSTOMER-NAME, CUSTOMER -ADDRESS, PET-ID, PET-NAME, PROCEDURE, AMOUNT)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| INVOICE-ID | INVOICE-DATE | CUSTOMER -NAME | CUSTOMER -ADDRESS | PET-ID | PET-NAME | PROCEDURE | AMOUNT |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO | 1 | ROVER | RABIES VACCINATION | 30.00 |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO | 2 | MORRIS | RABIES VACCINATION | 24.00 |

2NF

INVOICE (INVOICE-ID, INVOICE-DATE, CUSTOMER -NAME, CUSTOMER -ADDRESS)

PET (PET-ID, PET-NAME, PROCEDURE, AMOUNT)

INVOICE-PET (INVOICE-ID, PET-ID)

|  |  |  |  |
| --- | --- | --- | --- |
| INVOICE-ID | INVOICE-DATE | CUSTOMER -NAME | CUSTOMER -ADDRESS |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO |

|  |  |  |  |
| --- | --- | --- | --- |
| PET-ID | PET-NAME | PROCEDURE | AMOUNT |
| 1 | ROVER | RABIES VACCINATION | 30.00 |
| 2 | MORRIS | RABIES VACCINATION | 24.00 |



|  |  |
| --- | --- |
| INVOICE-ID | PET-ID |
| 987 | 1 |
| 987 | 2 |



3NF

INVOICE (INVOICE-ID, INVOICE-DATE, CUSTOMER-ID)

PET (PET-ID, PET-NAME, PROCEDURE, AMOUNT)

INVOICE-PET (INVOICE-ID, PET-ID)

CUSTOMER (CUSTOMER-ID, CUSTOMER-NAME, CUSTOMER-ADDRESS)

|  |  |  |
| --- | --- | --- |
| INVOICE-ID | INVOICE-DATE | CUSTOMER -ID |
| 987 | JAN 13/2002 | 1 |

|  |  |  |
| --- | --- | --- |
| CUSTOM-ID | CUSTOMER -NAME | CUSTOMER -ADDRESS |
| 1 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO |



|  |  |  |  |
| --- | --- | --- | --- |
| PET-ID | PET-NAME | PROCEDURE | AMOUNT |
| 1 | ROVER | RABIES VACCINATION | 30.00 |
| 2 | MORRIS | RABIES VACCINATION | 24.00 |

|  |  |
| --- | --- |
| INVOICE-ID | PET-ID |
| 987 | 1 |
| 987 | 2 |

