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:**

Pets [**pet\_id**, pet\_name, pet\_type, pet\_age, owner,procedure\_id, visitdate, procedure]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PET ID** | **PET NAME** | **PET TYPE** | **PET AGE** | **OWNER** | **VISIT DATE** | **PROCEDURE\_ID** | **PROCEDURE** |
| 246 | ROVER | BIRD | 12 | SAM COOK | JAN 13/2002 | 01 | RABIES VACCINATION |
| 246 | ROVER | BIRD | 12 | SAM COOK | MAR 27/2002 | 10 | EXAMINE and TREAT WOUND |
| 246 | ROVER | BIRD | 12 | SAM COOK | APR 02/2002 | 05 | HEART WORM TEST |
| 298 | SPOT | CAT | 2 | TERRY KIM | JAN 21/2002 | 08 | TETANUS VACCINATION |
| 298 | SPOT | CAT | 2 | TERRY KIM | MAR 10/2002 | 05 | HEART WORM TEST |
| 341 | MORRIS | CAT | 4 | SAM COOK | JAN 23/2001 | 01 | RABIES ACCINATION |
| 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:**

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

Procedures [**procedure\_id**, procedure]

Date [**pet\_id**, **procedure\_id**, visitdate]

**Pet(Key: PET ID )**

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

**Procedures(Key: PROCEDURE\_ID)**

|  |  |
| --- | --- |
| **PROCEDURE\_ID** | **PROCEDURE** |
| 01 | RABIES VACCINATION |
| 05 | HEART WORM TEST |
| 08 | TETANUS VACCINATION |
| 10 | EXAMINE and TREAT WOUND |
| 12 | EYE WASH |
| 20 | ANNUAL CHECK UP |

**Date(Key: PET ID + PROCEDURE\_ID)**

|  |  |  |
| --- | --- | --- |
| **PET ID** | **PROCEDURE\_ID** | **VISIT DATE** |
| 246 | 01 | JAN 13/2002 |
| 246 | 10 | MAR 27/2002 |
| 246 | 05 | APR 02/2002 |
| 298 | 08 | JAN 21/2002 |
| 298 | 05 | MAR 10/2002 |
| 341 | 01 | JAN 23/2001 |
| 341 | 01 | JAN 13/2002 |
| 519 | 20 | APR 30/2002 |
| 519 | 12 | APR 30/2002 |

**3NF = 2NF: cơ sở dữ liệu mà ta thiết kế ở chuẩn 2NF đã đạt chuẩn 3NF**

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

**UNF:**

Invoice [**invoice\_id**, invoice\_date, customer\_name, customer\_address, (pet\_name, procedure, amount)]

**Invoice(Key: invoice\_id)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **invoice\_id** | invoice\_date, | customer\_name, | customer\_address | pet |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO | ROVER, RABIES VACCINATION, 30.00 |
|  |  |  |  | MORRIS, RABIES VACCINATION, 24.00 |

**1NF:**

Invoice [**invoice\_id**, invoice\_date, customer\_name, customer\_address]

Invoice\_Pets [**invoice\_id, pet\_id**, pet\_name, procedure, amount]

**Invoice (Key: invoice\_id)**

|  |  |  |  |
| --- | --- | --- | --- |
| **invoice\_id** | invoice\_date | customer\_name | customer\_address |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO |

**Invoice\_Pets (Key: invoice\_id, pet\_id)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **invoice\_id** | **pet\_id** | pet\_name | procedure | amount |
| 987 | 246 | ROVER | RABIES VACCINATION | 30.00 |
| 987 | 341 | MORRIS | RABIES VACCINATION | 24.00 |

**2NF:**

Invoice [**invoice\_id**, invoice\_date, customer\_name, customer\_address]

Invoice\_Pet [**invoice\_id, pet\_id**, procedure, amount]

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

**Invoice (Key: invoice\_id)**

|  |  |  |  |
| --- | --- | --- | --- |
| **invoice\_id** | invoice\_date | customer\_name | customer\_address |
| 987 | JAN 13/2002 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO |

**Invoice\_Pet (Key: invoice\_id, pet\_id)**

|  |  |  |  |
| --- | --- | --- | --- |
| **invoice\_id** | **pet\_id** | procedure | amount |
| 987 | 246 | RABIES VACCINATION | 30.00 |
| 987 | 341 | RABIES VACCINATION | 24.00 |

**Pet (Key: pet\_id)**

|  |  |
| --- | --- |
| **pet\_id** | pet\_name |
| 246 | ROVER |
| 341 | MORRIS |

**3NF:**

Invoice [**invoice\_id**, invoice\_date, customer\_id (FK)]

Invoice\_Pet [**invoice\_id (FK), pet\_id (FK)**, procedure, amount]

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

Customer [**customer\_id**, customer\_name, customer\_address]

**Invoice (Key: invoice\_id)**

|  |  |  |
| --- | --- | --- |
| **invoice\_id** | invoice\_date | customer\_id |
| 987 | JAN 13/2002 | Z5Z 6G6 |

**Invoice\_Pet (Key: invoice\_id, pet\_id)**

|  |  |  |  |
| --- | --- | --- | --- |
| **invoice\_id** | **pet\_id** | procedure | amount |
| 987 | 246 | RABIES VACCINATION | 30.00 |
| 987 | 341 | RABIES VACCINATION | 24.00 |

**Pet (Key: pet\_id)**

|  |  |
| --- | --- |
| **pet\_id** | pet\_name |
| 246 | ROVER |
| 341 | MORRIS |

**Customer (Key: customer\_id)**

|  |  |  |
| --- | --- | --- |
| **customer\_id** | customer\_name | customer\_address |
| Z5Z 6G6 | MR. RICHARD COOK | 123 THIS STREET - MY CITY, ONTARIO |