YOUSSEF NEHAD MOHAMED RIYAD SHASH
STUDENT ID: 29801362

Animal Doctors Pet Ownership Details

UNF

OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id, prfvet_name, (pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased))

1NF

OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id, prfvet_name)

Owner_id is candidate key and hence it is the primary key

PET (owner_id, pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased)

pet_id is unique for each pet, so it is the only primary key but this new relation brings the owner_id (OWNER PK) as a part of repeating group removal and it is not part of the primary key

Partial dependencies:
No partial dependencies since no composite PK

2NF

OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id, prfvet_name)

PET (owner_id, pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased)

Transitive dependencies:
prfvet_id -> prfvet_name

3NF

OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id)

PET (owner_id, pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased)

OWNER_PRF_VET (prfvet_id, prfvet_name)

Full dependencies:
owner_id → owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id

pet_id → owner_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased

prfvet_id → prfvet_name

Invoice for Professional Services

UNF

INVOICE (patient_id, patient_name, vet_id, vet_name, service_datetime, total_amount, pay_type (service_code, service_desc, service_cost), (drug_id, drug_name, qty_supplied, drug_cost))

1NF

INVOICE (patient_id, patient_name, vet_id, vet_name, service_datetime, total_amount, pay_type)
**patient_id and service_datetime are candidate keys
**vet_id and service_datetime are candidate keys
**patient_id and service_datetime are chosen to be primary keys

SERVICE (patient_id, service_datetime, service_code, service_desc, service_cost)
** patient_id, service_datetime, service_code are primary key

DRUG (patient_id, service_datetime, drug_id, drug_name, qty_supplied, drug_cost)
** patient_id, service_datetime, service_code are primary key

Partial dependencies:
patient_id -> patient_name
vet_id -> vet_name
service_code -> service_desc
drug_id -> drug_name

2NF

INVOICE (patient_id, vet_id, service_datetime, total_amount, pay_type)
PATIENT (patient_id, patient_name)
VET (vet_id, vet_name)
SERVICE (patient_id, service_datetime, service_code, service_cost)
DRUG (patient_id, service_datetime, drug_id, qty_supplied, drug_cost)
SERVICE_DETAILS (service_code, service_desc)
DRUG_DETAILS (drug_id, drug_name)

Transitive dependencies:
No transitive dependencies

3NF

INVOICE (patient_id, vet_id, service_datetime, total_amount, pay_type)
PATIENT (patient_id, patient_name)
VET (vet_id, vet_name)
SERVICE (patient_id, service_datetime, service_code, service_cost)
DRUG (patient_id, service_datetime, drug_id, qty_supplied, drug_cost)
SERVICE_DETAILS (service_code, service_desc)
DRUG_DETAILS (drug_id, drug_name)

Full dependencies:

patient_id, service_datetime -> vet_id, total_amount, pay_type
patient_id -> patient_name
vet_id -> vet_name
patient_id, service_datetime, service_code -> service_cost
patient_id, service_datetime, drug_id -> qty_supplied, drug_cost
service_code -> service_desc
drug_id -> drug_name

Collected 3NF relations:

INVOICE (patient_id, vet_id, service_datetime, total_amount, pay_type)
PATIENT (patient_id, patient_name)
VET (vet_id, vet_name)
SERVICE (patient_id, service_datetime, service_code, service_cost)
DRUG (patient_id, service_datetime, drug_id, qty_supplied, drug_cost)
SERVICE_DETAILS (service_code, service_desc)
DRUG_DETAILS (drug_id, drug_name)
OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, prfvet_id)
PET (owner_id, pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased)
OWNER_PRF_VET (prfvet_id, prfvet_name)

Attribute Synthesis:

Join together relations, which have an identical PK – ie. represent the same entity:

INVOICE (pet_id, vet_id, service_datetime, total_amount, pay_type)
VET (vet_id, vet_name, vet_phonenum, vet_employdate, vet_specialisation)
SERVICE (pet_id, service_datetime, service_code, service_cost)
DRUG (pet_id, service_datetime, drug_id, qty_supplied, drug_cost)
SERVICE_DETAILS (service_code, service_desc)
DRUG_DETAILS (drug_id, drug_name)

OWNER (owner_id, owner_givname, owner_famname, owner_addstreet, owner_addtown, owner_addpostcode, vet_id)
PET (owner_id, pet_id, pet_gender, pet_name, pet_type, pet_birthdate, pet_decreased)