**Normalisation**

*i) Training course attendance details:*

**UNF**
**TRAINING**(tr_id, tr_name, tr_duration, tr_date_time, clinic_id, clinic_name, trainer_id, trainer_name, (participant_id, participant_base_id, participant_gname, participant_fname, participant_tr_completed, participant_tr_expiry))

Repeating Groups:
- **PARTICIPANT_TRAINING**
    - (participant_id, participant_base_id, participant_gname, participant_fname, participant_tr_completed, participant_tr_expiry)

**1NF**
**TRAINING**(tr_id, tr_name, tr_duration, tr_date_time, clinic_id, clinic_name, trainer_id, trainer_name)
**PARTICIPANT_TRAINING**(participant_id, tr_id, participant_base_id, participant_gname, participant_fname, participant_tr_completed, participant_tr_expiry)

Candidate Keys:
- **TRAINING**
    - tr_id
- **PARTICIPANT_TRAINING**
    - participant_id, tr_id

Partial Dependencies:
- **PARTICIPANT_TRAINING**
    - participant_id → participant_base_id, participant_gname, participant_fname

**2NF**
**TRAINING**(tr_id, tr_name, tr_duration, tr_date_time, clinic_id, clinic_name, trainer_id, trainer_name)
**PARTICIPANT_TRAINING**(participant_id, tr_id, participant_tr_completed, participant_tr_expiry)
**PARTICIPANT**(participant_id, participant_base_id, participant_gname, participant_fname)

Transitive Dependencies:
- **TRAINING**
    - clinic_id → clinic_name
    - trainer_id → trainer_name

**3NF**
**TRAINING**(tr_id, tr_name, tr_duration, tr_date_time, clinic_id, trainer_id)
**PARTICIPANT_TRAINING**(participant_id, tr_id, participant_tr_completed, participant_tr_expiry)
**PARTICIPANT**(participant_id, participant_base_id, participant_gname, participant_fname)
**CLINIC**(clinic_id, clinic_name)
**TRAINER**(trainer_id, trainer_name)

- **TRAINING**
  - tr_id → tr_name, tr_duration, tr_date_time, clinic_id, trainer_id
- **PARTICIPANT_TRAINING**
  - participant_id, tr_id → participant_tr_completed, participant_tr_expiry
- **PARTICIPANT**
  - participant_id → participant_base_id, participant_gname, participant_fname
- **CLINIC**
  - clinic_id → clinic_name
- **TRAINER**
  - trainer_id → trainer_name

*ii) Clinic Visit Invoice*

**UNF**
VISIT(pet_id, pet_name, vet_id, vet_name, owner_id, owner_gname, owner_fname, visit_date_time, (serv_code, serv_desc, serv_line_cost), (drug_id, drug_name, prescrip_qty, prescrip_line_cost), visit_total_amount, visit_payment_method)

Repeating groups:
SERVICE(serv_code, serv_desc, serv_line_cost)
PRESCRIPTION(drug_id, drug_name, prescrip_qty, prescrip_line_cost)

**1NF**
VISIT(pet_id, pet_name, vet_id, vet_name, owner_id, owner_gname, owner_fname, visit_date_time, visit_total_amount, visit_payment_method)
SERVICE_ACCOUNT(serv_code, serv_desc, serv_line_cost, vet_id, visit_date_time)
PRESCRIPTION(drug_id, drug_name, prescrip_qty, prescrip_line_cost)

Candidate Keys:
- **VISIT**
  - vet_id, visit_date_time
- **SERVICE_ACCOUNT**
  - serv_code, vet_id, visit_date_time
- **PRESCRIPTION**
  - drug_id, prescrip_qty

Partial Dependencies
**VISIT**
- vet_id → vet_name
**SERVICE_ACCOUNT**
- serv_code → serv_desc, serv_line_cost
**PRESCRIPTION**
- drug_id → drug_name

**2NF**
**VISIT**(pet_id, pet_name, <u>vet_id</u>, owner_id, owner_gname, owner_fname, <u>visit_date_time</u>, visit_total_amount, visit_payment_method)
**SERVICE_ACCOUNT**(<u>serv_code</u>, <u>visit_date_time</u>, <u>vet_id</u>, serv_line_cost)
**SERVICE**(<u>serv_code</u>, serv_desc)
**PRESCRIPTION**(<u>drug_id</u>, <u>prescrip_qty</u>, prescrip_line_cost)
**VET**(<u>vet_id</u>, vet_name)
**DRUG**(<u>drug_id</u>, drug_name)

<span style="color:red">Transitive Dependencies</span>
**VISIT**
- owner_id → owner_gname, owner_fname
- pet_id → pet_name

**3NF**
**VISIT**(pet_id, <u>vet_id</u>, owner_id, <u>visit_date_time</u>, visit_total_amount, visit_payment_method)
**SERVICE_ACCOUNT**(<u>serv_code</u>, <u>visit_date_time</u>, <u>vet_id</u>, serv_line_cos)
**SERVICE**(<u>serv_code</u>, serv_desc)
**PRESCRIPTION**(<u>drug_id</u>, <u>prescrip_qty</u>, prescrip_line_cost)
**PET**(<u>pet_id</u>, pet_name)
**VET**(<u>vet_id</u>, vet_name)
**DRUG**(<u>drug_id</u>, drug_name)
**OWNER**(<u>owner_id</u>, owner_gname, owner_fname)

**VISIT**
- vet_id, visit_date_time → pet_id, owner_id, visit_total_amount, visit_payment_method
**SERVICE**
- serv_code → serv_desc, serv_line_cost
**PRESCRIPTION**
- drug_id, prescrip_qty → prescrip_line_cost
**PET**
- pet_id → pet_name
**VET**
- vet_id → vet_name
**DRUG**
- drug_id → drug_name
**OWNER**
- owner_id → owner_gname, owner_fname

*COLLECTED 3NF RELATIONS*
1. **TRAINING**(<u>tr_id</u>, tr_name, tr_duration, tr_date_time, clinic_id, vet_id)
2. **PARTICIPANT_TRAINING**(<u>participant_id</u>, <u>tr_id</u>, participant_tr_completed, participant_tr_expiry)
3. **PARTICIPANT**(<u>participant_id</u>, participant_base_id, participant_gname, participant_fname)

4.  **CLINIC**(<u>clinic_id</u>, clinic_name)
5.  **TRAINER**(<u>trainer_id</u>, trainer_name)
6.  **VISIT**(<u>vet_id</u>, <u>visit_date_time</u>, pet_id, owner_id, visit_total_amount, visit_payment_method)
7.  **PET**(<u>pet_id</u>, pet_name)
8.  **OWNER**(<u>owner_id</u>, owner_gname, owner_fname)
9.  **VET**(<u>vet_id</u>, vet_name)
10. **SERVICE_ACCOUNT**(<u>serv_code</u>, <u>visit_date_time</u>, vet_id)
11. **SERVICE**(<u>serv_code</u>, serv_desc, serv_line_cost)
12. **PRESCRIPTION**(<u>drug_id</u>, <u>prescrip_qty</u>, prescrip_line_cost)
13. **DRUG**(<u>drug_id</u>, drug_name)

ATTRIBUTE SYNTHESIS
(3,5,9) MERGE
- **VET**(vet_id, vet_base_id, vet_gname, vet_fname)

(2) RENAME
- **VET_TRAINING**(<u>vet_id</u>, <u>tr_id</u>, vet_tr_completed, vet_tr_expiry)

*FINAL RELATIONS*
1.  **TRAINING**(<u>tr_id</u>, tr_name, tr_duration, tr_date_time, clinic_id, vet_id)
2.  **VET_TRAINING**(<u>vet_id</u>, <u>tr_id</u>, vet_tr_completed, vet_tr_expiry)
3.  **VET**(<u>vet_id</u>, vet_base_id, vet_gname, vet_fname)
4.  **CLINIC**(<u>clinic_id</u>, clinic_name)
5.  **VISIT**(<u>vet_id</u>, <u>visit_date_time</u>, pet_id, owner_id, visit_total_amount, visit_payment_method)
6.  **PET**(<u>pet_id</u>, pet_name)
7.  **OWNER**(<u>owner_id</u>, owner_gname, owner_fname)
8.  **SERVICE_ACCOUNT**(<u>serv_code</u>, <u>visit_date_time</u>, vet_id)
9.  **SERVICE**(<u>serv_code</u>, serv_desc, serv_line_cost)
10. **PRESCRIPTION**(<u>drug_id</u>, <u>prescrip_qty</u>, prescrip_line_cost)
11. **DRUG**(<u>drug_id</u>, drug_name)