

Functional Dependency and Normal Form

For a relation to be in 1NF,

It should only have single(atomic) valued attributes.

Values stored in a column should be of the same type/domain.

And the order doesn't matter.

All the columns in a table should have unique names.

1. **Trainers**

ID -> Name, Age, Sex, Salary, Last Paid

Candidate Key = ID

The relation is in 1NF and 2NF (no partial dependency). It is also in 3NF since there is no non-key attribute which is dependent on another non-key attribute (transitive dependency).

2. **Members**

ID -> Name, Age, Sex, Member Since, Plan, Trainer_ID, Plan Started

Candidate Key = ID

The relation is in 1NF and 2NF (no partial dependency). It is also in 3NF since there is no non-key attribute which is dependent on another non-key attribute (transitive dependency).

3. **Equipment**

Name -> Purchased On, Cost, Status

Candidate Key = Name

The relation is in 1NF and 2NF (no partial dependency). It is also in 3NF since there is no non-key attribute which is dependent on another non-key attribute (transitive dependency).

4. **Plans**

ID -> Name, Duration, Cost

Candidate Key = ID

The relation is in 1NF and 2NF (no partial dependency). It is also in 3NF since there is no non-key attribute which is dependent on another non-key attribute (transitive dependency).

5. **Exercise**

ID -> Name, Bodypart, Equipment

Name -> ID, Bodypart, Equipment

Equipment -> ID, Bodypart, Name

Candidate Key = ID, Name, Equipment

The relation is in 1NF and 2NF (no partial dependency). It is also in 3NF since there is no non-key attribute which is dependent on another non-key attribute (transitive dependency).