

Functional Dependencies in our Database

Table name: Team

Primary Key: id

Since our primary key id can uniquely determine the other attributes of team i.e. name, captain, stadium etc. hence, all other attributes can be uniquely determined when we know id of a team. Same can be said for attribute position as two teams cannot share the same position and hence, knowing the position can give us all the details about the team. The functional dependencies are as follows:

id----->name

id----->captain

id----->stadium

Table name: Player

Primary Key: id

As in earlier table Team, our primary key here is id which corresponds to unique player id. Functional dependencies are as follows:

id----->name

id----->role

id----->runs

id----->wicket

id----->team

Table name: Fixture

Primary Key: id

Knowing id of a fixture means we can determine the other attributes of fixture uniquely. Hence all other attributes are functionally dependent on id of fixture.

A team can have multiple fixtures so hometeam or away team cannot be used to determine other attributes of fixture uniquely. Same goes for date, stadium and result as multiple matches can be organized on a date, or in a stadium and multiple matches can share the same result (WIN, LOSS, NP).

id----->date

id----->hometeam

id----->awayteam

id----->stadium

id----->result

Table name: Stadium

Primary Key: hometeam

Since hometeam is primary key, all other attributes can be uniquely determined. This is false in case of other attributes since knowing either name(can be duplicate) or city(a city can have multiple stadiums) or contact number(can be duplicate if the owner of the stadiums is same) cannot determine a stadium uniquely.

hometeam----->name

hometeam----->city

hometeam----->contact

Table name: Points

Primary Key: id

Primary key in points table is id which corresponds to unique team id. Knowing this, we can uniquely determine other attributes points, runrate, played, won, and lost. So all other attributes are functionally dependent only on id.

id----->runrate

id----->won

id----->lost

id----->points

id----->played

The following statements apply for all tables (Team, Player, Fixture, Stadium, Points) in our database:

Our table is in first normal form since:

1. All attributes have atomic values
2. Order of tuples is irrelevant for all tables
3. All the columns have unique names in respective tables
4. Values stored in a column belong to the same domain.

Our table is in second normal form since:

1. It is in the first normal form
2. There is no partial dependency since all primary keys have only a single attribute so all other attributes are functionally dependent on that attribute.

Our table is in third normal form since:

1. It is in the second normal form

2. There is no transitive dependency since in each table, only a single attribute (primary key of respective table in our case) can uniquely identify values of other attributes.