

Entities

1. **Player:** This entity represents individual players in the NFL.
Attributes: player_id (key), player_name, position, team_id
2. **Team:** This entity represents the NFL teams.
Attributes: team_id (key), team_name, team_city
3. **Game:** This entity represents the games played between two teams.
Attributes: game_id (key), home_team_id, away_team_id, game_date
4. **Play:** This entity represents individual plays within a game.
Attributes: play_id (key), game_id, player_id, yards_gained, touchdown, fumble
5. **Position:** This entity represents the different positions played by players in the NFL.
Attributes: position_id (key), position_name
6. **Statistic:** This entity represents the different types of statistics tracked for each player.
Attributes: statistic_id (key), statistic_name, statistic_description

Relationships

1. **Player - Team:** Many players belong to one team.
Cardinality: Many-to-one
Participation: Mandatory for player, mandatory for team.
2. **Game - Team:** One game involves two teams.

Cardinality: One-to-many

Participation: Mandatory for game, mandatory for both teams.

3. **Plays - Game:** One play belongs to one game.

Cardinality: One-to-one

Participation: Mandatory for play, mandatory for game.

4. **Plays - Player:** One play involves many players.

Cardinality: One-to-many

Participation: Mandatory for play, mandatory for player.

5. **Player - Position:** One player can play multiple positions.

Cardinality: One-to-many

Participation: Mandatory for player, mandatory for position.

6. **Plays - Statistic:** One play can have multiple statistics.

Cardinality: One-to-many

Participation: Mandatory for play, mandatory for statistic.

Attributes

player_id: Key attribute that uniquely identifies a player. It cannot be null.

team_id: Key attribute that uniquely identifies a team. It cannot be null.

game_id: Key attribute that uniquely identifies a game. It cannot be null.

play_id: Key attribute that uniquely identifies a play. It cannot be null.

position_id: Key attribute that uniquely identifies a position. It cannot be null.

statistic_id: Key attribute that uniquely identifies a statistic. It cannot be null.

player_name: The name of the player. It cannot be null.

position_name: The name of the position. It cannot be null.

team_name: The name of the team. It cannot be null.

team_city: The city where the team is located. It cannot be null.

game_date: The date when the game was played. It cannot be null.

yards_gained: The number of yards gained on a particular play. It can be null.

touchdown: Whether or not a touchdown was scored on a particular play. It can be null.

fumble: Whether or not a fumble occurred on a particular play. It can be null.

statistic_name: The name of the statistic being tracked. It cannot be null.

statistic_description: A brief description of the statistic being tracked. It can be null.

The composite attributes from the original data on the website have been separated into appropriate sub-attributes where necessary. For example, player_name is a composite attribute consisting of first name and last name sub-attributes. These sub-attributes may need to be accessed separately in queries that require more detailed player information.

A few examples of multivalued attributes are:

Player.Teams: A player can have played for multiple teams throughout their career.

Player.Games_Played_by_Position: A player can play multiple games at different positions.

Game.Teams: A game involves two teams.

Team.Games: A team can play multiple games in a season.