

# DBMS Project | Normalization

## Football Teams

All the relation are in 1NF since the domains all of its attributes are unique and atomic (AKA the attributes are indivisible). They are also in 2NF, since there are no partial dependencies and in 3NF too, since there are no transitive dependencies for non-prime attributes, i.e. no  $n.p \rightarrow n.p..$

Therefore, the relation is also lossless.

### Player

$R = (\text{player\_id}, \text{first\_name}, \text{last\_name}, \text{nationality}, \text{date\_of\_birth}, \text{position}, \text{team})$

$F = \{\text{player\_id} \rightarrow \text{first\_name}, \text{last\_name}, \text{nationality}, \text{date\_of\_birth}, \text{position}, \text{team}\}$

Minimal cover:  $\{\text{player\_id} \rightarrow \text{first\_name},$   
                   $\text{player\_id} \rightarrow \text{last\_name},$   
                   $\text{player\_id} \rightarrow \text{nationality},$   
                   $\text{player\_id} \rightarrow \text{date\_of\_birth},$   
                   $\text{player\_id} \rightarrow \text{position},$   
                   $\text{player\_id} \rightarrow \text{team}\}$

$(\text{player\_id})^+ = R$  is a **C.K.**

### Teams

$R = (\text{team\_name}, \text{stadium\_name})$

$F = \{\text{team\_name} \rightarrow \text{stadium\_name}\}$

It's already in the minimal cover.

$(\text{team\_name})^+ = R$  is a **C.K.**

The relation is already in BCNF.

### Stadiums

$R = (\text{stadium\_name}, \text{capacity}, \text{country}, \text{city}, \text{street}, \text{date\_of\_building})$

$F = \{\text{stadium\_name} \rightarrow \text{capacity}, \text{country}, \text{city}, \text{street}, \text{date\_of\_building}\}$

Minimal cover: {stadium\_name → capacity,  
                  stadium\_name → country, city,  
                  stadium\_name → street,  
                  stadium\_name → date\_of\_building}

(stadium\_name)+ = R is a **C.K.**

## Matches

R = (match\_id, home\_team, away\_team, match\_date, match\_start\_time, season)

F = {match\_id → home\_team, away\_team, match\_date, match\_start\_time, season}

Minimal cover: {match\_id → home\_team,  
                  match\_id → away\_team,  
                  match\_id → match\_date,  
                  match\_id → match\_start\_time,  
                  match\_id → season}

(match\_id)+ = R is a **C.K.**

## Results

R = (result\_id, home\_goals, home\_yellowCard, home\_redCard, home\_fouls,  
home\_shots, away\_goals, away\_yellowCard, away\_redCard, away\_fouls,  
away\_shots, match\_id)

F = {result\_id → home\_goals, home\_yellowCard, home\_redCard, home\_fouls,  
home\_shots, away\_goals, away\_yellowCard, away\_redCard, away\_fouls,  
away\_shots, match\_id}

Minimal cover: {result\_id → home\_goals,  
                  result\_id → home\_yellowCard,  
                  result\_id → home\_redCard,  
                  result\_id → home\_fouls,  
                  result\_id → home\_shots,  
                  result\_id → away\_goals,  
                  result\_id → away\_yellowCard,  
                  result\_id → away\_redCard,  
                  result\_id → away\_fouls,  
                  result\_id → away\_shots,  
                  result\_id → match\_id}

(result\_id)+ = R is a **C.K.**

### Referee

$R = (\text{referee\_id}, \text{first\_name}, \text{last\_name})$

$F = \{\text{referee\_id} \rightarrow \text{first\_name}, \text{last\_name}\}$

Minimal cover:  $\{\text{referee\_id} \rightarrow \text{first\_name},$   
 $\text{referee\_id} \rightarrow \text{last\_name}\}$

$(\text{referee\_id})^+ = R$  is a **C.K.**

### MatchReferee

$R = (\text{match\_referee\_id}, \text{match\_id}, \text{referee\_id})$

$F = \{\text{match\_referee\_id} \rightarrow \text{match\_id}, \text{referee\_id}\}$

Minimal cover:  $\{\text{match\_referee\_id} \rightarrow \text{match\_id},$   
 $\text{match\_referee\_id} \rightarrow \text{referee\_id}\}$

$(\text{match\_referee\_id})^+ = R$  is a **C.K.**

### Sponsors

$R = (\text{sponsor\_id}, \text{sponsor\_name}, \text{contact\_email}, \text{description})$

$F = \{\text{sponsor\_id} \rightarrow \text{sponsor\_name}, \text{contact\_email}, \text{description}\}$

Minimal cover:  $\{\text{sponsor\_id} \rightarrow \text{sponsor\_name},$   
 $\text{sponsor\_id} \rightarrow \text{contact\_email},$   
 $\text{sponsor\_id} \rightarrow \text{description}\}$

$(\text{sponsor\_id})^+ = R$  is a **C.K.**

### Sponsorship

$R = (\text{sponsorship\_id}, \text{sponsor\_id}, \text{team\_name})$

$F = \{\text{sponsorship\_id} \rightarrow \text{sponsor\_id}, \text{team\_name}\}$

Minimal cover:  $\{\text{sponsorship\_id} \rightarrow \text{sponsor\_id},$   
 $\text{sponsorship\_id} \rightarrow \text{team\_name}\}$

$(\text{sponsorship\_id})^+ = R$  is a **C.K.**

