IT214 Database Management Systems Project

OlympiDB : A Comprehensive Database Management System for the Olympic Games

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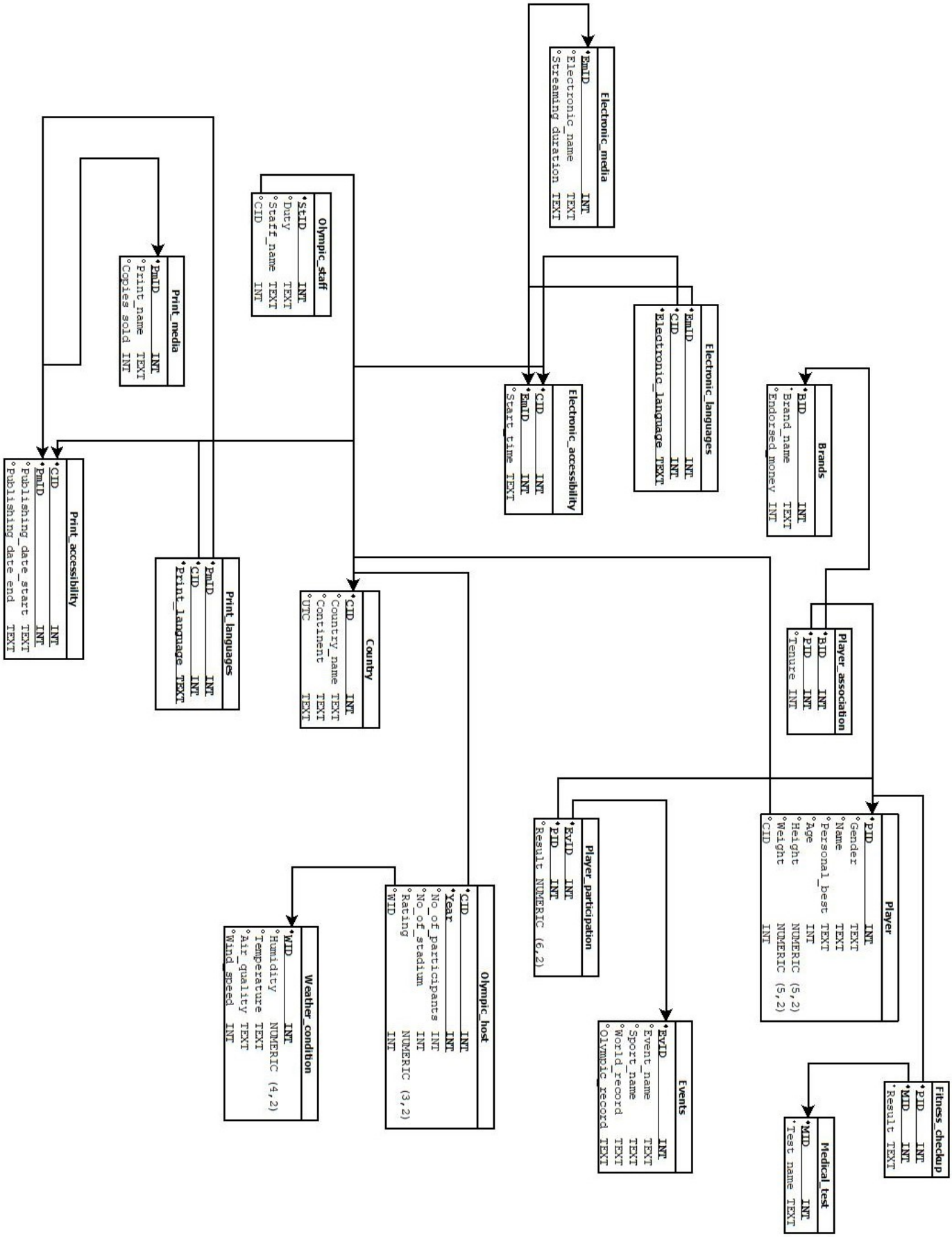
1 Relational Schema



2 Minimal FD Set and Proof that relations are in BCNF

1) **Player**(PID, Gender, Name, Personal_best, Age, Height, Weight, CID)

- PID → {Gender, Name, Personal_best, Age, Height, Weight, CID}
- PID$^+$→ {PID, Gender, Name, Personal_best, Age, Height, Weight, CID}
- PID$^+$ has all the attributes. So, PID is the key of the relation.
- All FDs have key, i.e., PID on the left side. So, this relation is in BCNF.

2) **Country**(CID, Country_name, Continent, UTC)

- CID → {Country_name, Continent, UTC}
- CID$^+$→ {CID, Country_name, Continent, UTC}
- CID$^+$ has all the attributes. So, CID is the key of the relation.
- All FDs have key, i.e., CID on the left side. So, this relation is in BCNF.

3) **Medical_test**(MID, Test_name)

- MID → {Test_name}
- MID$^+$→ {MID, Test_name}
- MID$^+$ has all the attributes. So, MID is the key of the relation.
- All FDs have key, i.e., MID on the left side. So, this relation is in BCNF.

4) **Fitness_checkup**(PID, MID, Result)

- {PID, MID} → {Result}
- {PID, MID}$^+$→ {PID, MID, Result}
- {PID, MID}$^+$ has all the attributes. So, {PID, MID} is the key.
- All FDs have key, i.e., {PID, MID} on the left side. So, this relation is in BCNF.

5) **Electronic_media**(EmID, Electronic_name, Streaming_duration)

- EmID → {Electronic_name, Streaming_duration}
- EmID$^+$→ {EmID, Electronic_name, Streaming_duration}
- EmID$^+$ has all the attributes. So, EmID is the key of the relation.
- All FDs have key, i.e., EmID on the left side. So, this relation is in BCNF.

6) **Electronic_languages**(EmID, CID, Electronic_language)

- {EmID, CID, Electronic_language} → ϕ
- {EmID, CID, Electronic_language}$^+$ → {EmID, CID, Electronic_language}
- {EmID, CID, Electronic_language}$^+$ has all the attributes. So, {EmID, CID, Electronic_language} is the key of the relation.
- All FDs have key, i.e., {EmID, CID, Electronic_language} on the left side. So, this relation is in BCNF.

7) **Electronic_accessibility**(EmID, CID, Start_time)

- {EmID, CID} → {Start_time}
- {EmID, CID}$^+$→ {EmID, CID, Start_time}
- {EmID, CID}$^+$ has all the attributes. So, {EmID, CID} is the key of the relation.
- All FDs have key, i.e., {EmID, CID} on the left side. So, this relation is in BCNF.

8) **Events**(EvID, Event_name, Sport_name, World_record, Olympic_record)

- EvID → {Event_name, Sport_name, World_record, Olympic_record}
- EvID$^+$→ {EvID, Event_name, Sport_name, World_record, Olympic_record}
- EvID$^+$ has all the attributes. So, EvID is the key of the relation.
- All FDs have key, i.e., EvID on the left side. So, this relation is in BCNF.

9) **Brands**(BID, Brand_name, Endorsed_money)

- BID → {Brand_name, Endorsed_money}
- BID$^+$→ {BID, Brand_name, Endorsed_money}
- BID$^+$ has all the attributes. So, BID is the key of the relation.
- All FDs have key, i.e., BID on the left side. So, this relation is in BCNF.

10) **Weather_conditions**(WID, Temperature, Air_quality, Humidity, Wind_speed)

- {WID} → {Temperature, Air_quality, Humidity, Wind_speed}
- {WID}$^+$→ {WID, Temperature, Air_quality, Humidity, Wind_speed}
- {WID}$^+$ has all the attributes. So, WID is the key of the relation.
- All FDs have key, i.e., WID on the left side. So, this relation is in BCNF.

11) **Print_media**(PmID, Print_name, Copies_sold)

- PmID → {Print_name, Copies_sold}
- PmID$^+$→ {PmID, Print_name, Copies_sold}
- PmID$^+$ has all the attributes. So, PmID is the key of the relation.
- All FDs have key, i.e., PmID on the left side. So, this relation is in BCNF.

12) **Print_languages**(PmID, CID, Print_language)

- {PmID, CID, Print_language} → ϕ
- {PmID, CID, Print_language}$^+$ → {PmID, CID, Print_language}
- {PmID, CID, Print_language}$^+$ has all the attributes. So, {PmID, CID, Print_language} is the key of the relation.
- All FDs have key, i.e., {PmID, CID, Print_language} on the left side. So, this relation is in BCNF.

13) **Print_accessibility**(PmID, CID, Publishing_date_start, Publishing_date_end)

- {PmID, CID} → {Publishing_date_start, Publishing_date_end}
- {PmID, CID}$^+$→ {PmID, CID, Publishing_date_start, Publishing_date_end}
- {PmID, CID}$^+$ has all the attributes. So, {PmID, CID} is the key of the relation.
- All FDs have key, i.e., {PmID, CID} on the left side. So, this relation is in BCNF.

14) **Player_association**(PID, BID, Tenure)

- {PID, BID} → {Tenure}
- {PID, BID}$^+$→ {PID, BID, Tenure}
- {PID, BID}$^+$ has all the attributes. So, {PID, BID} is the key of the relation.
- All FDs have key, i.e., {PID, BID} on the left side. So, this relation is in BCNF.

15) **Player_participation**(PID, EvID, Result)

- {PID, EvID} → {Result}
- {PID, EvID}$^+$→ {PID, EvID, Result}
- {PID, EvID}$^+$ has all the attributes. So, {PID, EvID} is the key of the relation.
- All FDs have key, i.e., {PID, EvID} on the left side. So, this relation is in BCNF.

16) **Olympic_host**(CID, Year, No_of_participants,No_of_stadium, Rating, WID)

- {CID, Year} → {No_of_participants,No_of_stadium, Rating, WID}
- {CID, Year}$^+$→ {CID, Year, No_of_participants,No_of_stadium, Rating, WID}
- {CID, Year}$^+$ has all the attributes. So, {CID, Year} is the key of the relation.
- All FDs have key, i.e., {CID, Year} on the left side. So, this relation is in BCNF.

17) **Olympic_staff**(StID, CID, Staff_name, Duty)

- StID → {CID, Staff_name, Duty}
- StID$^+$→ {StID, CID, Staff_name, Duty}
- StID$^+$ has all the attributes. So, StID is the key of the relation.
- All FDs have key, i.e., StID on the left side. So, this relation is in BCNF.

3 DDL Script

The DDL Script is provided in the zip file.