

The ER diagram illustrates the database structure for the Olympic Games. It includes the following tables and their attributes:

- Event**: Event_ID, Event_Name, Event_Type, Event_Sex, Discipline, Sport_ID
- Event_Venue**: Event_ID, Venue_ID
- Venue**: Venue_ID, Venue_Name, Capacity
- Sport**: Sport_ID, Sport_Name
- Team**: Team_ID, Country_ID
- Team_Medal**: Medal_Type, Team_ID, Event_ID
- Team_Record**: Match_ID, Team_ID, Record_Type, Record_Score
- Team_Member**: Player_ID, Team_ID
- Country**: Country_ID, Country_Name
- Player**: Player_ID, Player_Name, Gender, Height, Weight, D.O.B, Country_ID, Sport_ID
- Individual_Record**: Match_ID, Player_ID, Record_Type, Record_Score
- Individual_Medal**: Medal_Type, Player_ID, Event_ID
- Event_Match**: Match_ID, Event_Date, Event_Phase, Olympic_Day, Event_ID, Venue_ID
- Player_Participation**: Player_ID, Event_ID
- Team_Match**: Match_ID, Team_ID, Score, Position
- Player_Match**: Match_ID, Player_ID, Score, Position

Relationships are indicated by lines with cardinalities (1, 2, 3, 4):

- Event** (1) to **Event_Venue** (1)
- Event** (1) to **Team** (2)
- Event** (1) to **Team_Medal** (1)
- Event** (1) to **Team_Record** (1)
- Event** (1) to **Event_Match** (1)
- Event** (1) to **Individual_Record** (1)
- Event** (1) to **Individual_Medal** (1)
- Event** (1) to **Player_Participation** (2)
- Event_Venue** (1) to **Venue** (1)
- Venue** (1) to **Sport** (2)
- Sport** (2) to **Team** (2)
- Sport** (2) to **Player** (2)
- Team** (2) to **Team_Medal** (1)
- Team** (2) to **Team_Record** (1)
- Team** (2) to **Team_Member** (1)
- Team** (2) to **Team_Match** (1)
- Team** (2) to **Player** (2)
- Team_Member** (1) to **Player** (1)
- Country** (1) to **Team** (2)
- Country** (1) to **Player** (2)
- Player** (2) to **Individual_Record** (1)
- Player** (2) to **Individual_Medal** (1)
- Player** (2) to **Player_Participation** (2)
- Player** (2) to **Player_Match** (1)
- Player_Participation** (2) to **Individual_Medal** (1)
- Player_Participation** (2) to **Team_Match** (1)
- Player_Participation** (2) to **Player_Match** (1)
- Team_Match** (1) to **Player_Match** (1)

Country (*Country_Id* , Country_Name)
Sport (*Sport_Id* , Sport_Name)
Player (*Player_Id* , Player_Name, Gender, Height, Weight, D.O.B, Country_Id ,
Sport_Id)
Event (*Event_Id* , Event_Name, Event_Type, Event_Sex, Discipline, Sport_Id)
Venue (*Venue_Id* , Venue_Name, Capacity)
Team (*Team_Id* , Country_Id)
Player_Participation (Event_Id, Player_Id)
Team_Member (Team_Id, Player_Id)
Event_Venue (Event_Id, Venue_Id)
Individual_Medal (*Event_Id* , *Player_Id*, Medal_Type)
Team_Medal (*Event_Id* , *Team_Id*, Medal_Type)
Event_Match (*Match_Id* , Event_Phase, Event_Date, Olympic_Day, Event_Id ,
Venue_Id)
Player_Match (Match_Id, Player_Id, Score, Position)
Team_Match (Match_Id, Team_Id, Score, Position)
Individual_Record (Match_Id, Player_Id, Record_Type, Record_Score)
Team_Record (Match_Id, Team_Id , Record_Type, Record_Score)

Country : BCNF

FDs

Country_Id \rightarrow Country_Name

Country_Name \rightarrow Country_Id

Primary Key - Country_Id

Sport : BCNF

FDs

Sport_Id \rightarrow Sport_Name

Sport_Name \rightarrow Sport_Id

Primary Key - Sport_Id

Player : BCNF

FDs

Player_Id \rightarrow Player_Name

Player_Id \rightarrow Gender

Player_Id \rightarrow Height

Player_Id \rightarrow Weight

Player_Id \rightarrow D.O.B

Player_Id \rightarrow Country_Id

Player_Id \rightarrow Sport_Id

Primary Key - Player_Id

Event : BCNF

FDs

Event_Id \rightarrow Event_Name

Event_Id \rightarrow Event_Type

Event_Id \rightarrow Event_Sex

Event_Id \rightarrow Discipline

Event_Id \rightarrow Sport_Id

Event_Name \rightarrow Event_Id

Primary Key - Event_Id

Venue : BCNF

FDs

Venue_Id \rightarrow Venue_Name

Venue_Id \rightarrow Venue_Capacity

Venue_Name \rightarrow Venue_Id

Primary Key - Venue_Id

Team : BCNF

FDs

Team_Id \rightarrow Country_Id

Primary Key - Team_Id

Player_Participation : BCNF

FD's

None

Primary Key - { Event_Id, Player_Id }

Team_Member : BCNF

FDs

None

Primary Key - { Player_Id, Team_Id }

Event_Venue : BCNF

FDs

None

Primary Key - { Event_Id, Venue_Id }

Individual_Medal : BCNF

FDs

$\{ \text{Event_Id}, \text{Player_Id} \} \rightarrow \text{Medal_Type}$

Primary Key - $\{ \text{Event_Id}, \text{Player_Id} \}$

Team_Medal : BCNF

FDs

$\{ \text{Event_Id}, \text{Team_Id} \} \rightarrow \text{Medal_Type}$

Primary Key - $\{ \text{Event_Id}, \text{Team_Id} \}$

Event_Match : BCNF

FDs

$\text{Match_Id} \rightarrow \text{Event_Phase}$

$\text{Match_Id} \rightarrow \text{Event_Date}$

$\text{Match_Id} \rightarrow \text{Olympic_Day}$

$\text{Match_Id} \rightarrow \text{Event_Id}$

$\text{Match_Id} \rightarrow \text{Sport_Id}$

Primary Key - Match_Id

Player_Match : BCNF

FDs

$\{ \text{Match_Id}, \text{Player_Id} \} \rightarrow \text{Score}$

$\{ \text{Match_Id}, \text{Player_Id} \} \rightarrow \text{Position}$

Primary Key - $\{ \text{Match_Id}, \text{Player_Id} \}$

Team_Match : BCNF

FDs

$\{ \text{Match_Id}, \text{Teamr_Id} \} \rightarrow \text{Score}$

$\{ \text{Match_Id}, \text{Team_Id} \} \rightarrow \text{Position}$

Primary Key - $\{ \text{Match_Id}, \text{Team_Id} \}$

Individual_Record : BCNF

FDs

$\{ \text{Match_Id}, \text{Player_Id} \} \rightarrow \text{Record_Score}$

$\{ \text{Match_Id}, \text{Player_Id} \} \rightarrow \text{Record_Type}$

Primary Key - $\{ \text{Match_Id}, \text{Player_Id} \}$

Team_Record : BCNF

FDs

$\{ \text{Match_Id}, \text{Team_Id} \} \rightarrow \text{Record_Score}$

$\{ \text{Match_Id}, \text{Team_Id} \} \rightarrow \text{Record_Type}$

Primary Key - $\{ \text{Match_Id}, \text{Team_Id} \}$

ALL RELATIONS ARE IN BCNF.

Canonical Form of FD's :

- 1.Venue_ID -> { Venue_Name , Capacity}
2. Event_ID -> { Event_Name, Event_Type , Event_Sex, Discipline ,Sport_Id}
- 3.Sport_ID -> { Sport_Name}
- 4.Player_ID -> { Team_ID}
- 5.{Team_ID,Event_ID} -> { Medal_Type}
- 6.Team_ID -> {Country_ID}
- 7.Player_ID -> { Player_Name ,Gender, Height, Weight, D.O.B., Country_ID, Sport_ID}
- 8.{Match_ID, Team_ID} -> {Record_Type, Record_Score}
- 9.Country_ID -> {Country_Name}
- 10.{Match_ID,Player_ID} -> {Record_Type, Record_Score}
- 11.{Match_ID,Team_ID} -> {Score, Position}
- 12.{Match_ID, Player_ID} -> {Score, Position}
- 13.Match_ID -> {Event_Date, Event_Phase, Olympic_Day, Event_ID, Venue_ID}
- 14.{Player_ID,Event_ID} -> Medal_Type