

# PROJECT Phase1

## DESCRIPTION OF THE MINI-WORLD:

Our mini-world encompasses everything Olympic-related. It contains details on past and ongoing sports events, awards won by each country and participating athletes from each nation. It tracks audience attendance for Olympics and inventory used for Olympic operations. Management details including employee data are covered along with information on associated businesses like food vendors, merchants and sponsorships.

## PURPOSE OF THE DATABASE:

Our database enables analysis of Olympic performance trends, better event planning, and supports informed decision-making for future Olympics .It allows efficient data retrieval and multiple views of the database for multiple users and also control their access to the DB.

## USERS OF THE DATABASE and WHAT THEY USE IT FOR:

1. Olympics management uses it to track all the information about the tickets sold, finances for inventory ,condition of the playing arena, employees, to keep track of all the businesses and to track the metrics of each game.
2. Journalists and media use it to broadcast about all the metrics of each game and info about medals won by each country and keep a record of it as history
3. Athletes use it track their own and competitors stats, medals etc
4. Audience watching from around the world to observe the results of sports that took place in Olympics.

## Database requirements section

### Entities:

\*Attribute type is not mentioned for simple attributes explicitly.

- AUDIENCE
  - Ticket\_ID (Key) - INT
  - Name (composite) - {first, last} - VARCHAR 255
  - DOB - DATE

- Sex - CHAR
  - Age (derived attribute) - INT
  - Country of origin - VARCHAR 255
- SPORTSPEOPLE
    - Name (composite) - {first, last} - VARCHAR 255
    - SPORTSPEOPLE\_ID (Key) - INT
    - Country - VARCHAR 255
    - DOB - DATE
    - Physical Description (composite) - {Sex, Height, Weight} - VARCHAR 255
    - Age (derived attribute) - INT
    - number of awards (derived attribute) - INT
- BUSINESSES
    - Type of Business (Food / Merch / Sponsorships) (multi valued) - VARCHAR 255
    - Enterprise name - VARCHAR 255
    - Registration\_ID (Key) - INT
    - Country of origin - VARCHAR 255
    - contract year - INT
    - revenue earned - DECIMAL(10,2)
    - rental fee paid (if applicable) - DECIMAL(10,2)
- MANAGEMENT
    - Type (Logistics team / security team / organizers / Judges / Finance managers / etc) - VARCHAR 255
    - Team ID (Key) - INT
    - Number of employees (Derived attribute) - INT
- EMPLOYEES

- Employee ID (Key) - INT
  - Name (composite) - {first, last} - VARCHAR 255
  - Sex - CHAR
  - DOB - DATE
  - Age (Derived attribute) - INT
- SPORTS
    - sport ID (Key) - INT
    - Name - VARCHAR 255
    - Division - VARCHAR 255 (ex - Heavyweight, lightweight, in wrestling, etc)
    - Gender(s) involved (multi valued) - VARCHAR 255
    - Rules (multi valued) - VARCHAR 4096
    - Max Number of participants - INT
    - time duration(in seconds) - DECIMAL(8,6)
    - Round - VARCHAR 255 (ex - semi final, qualifiers, final, round seven, etc)
    - Statistics - VARCHAR 4096 (Description of result of the sport)
- PLAYING ARENA
    - Arena ID - (key) - INT
    - Name - VARCHAR 255
    - Dimensions (composite) - {length, width} - DECIMAL(5,2)
    - Location (composite) - {Latitude, Longitude} - DECIMAL(10,2)
    - Playing Condition - VARCHAR 255 (describes weather conditions, etc)
    - Damage % - DECIMAL() (describes the need of renovation)
- AWARDS - weak
    - Level (gold / silver / bronze) - VARCHAR 255
    - Country - VARCHAR 255
    - Year - INT

- INVENTORY - Weak
  - Name - VARCHAR 255
  - Type (Sport equipment / Vehicle / Measurement Devices) VARCHAR 255
  - Quantity - INT
  - Status - VARCHAR 255 (Damage status)
  - Cost - DECIMAL(10,2)

## SUB-CLASSES:

- MANAGEMENT:  
Logistics team, security team, organizers, Judges and Finance managers
- SPORTSPEOPLE:  
Coaches and Athletes

## Sports - 2 key attributes:

1. {Sport ID}
2. {Name, Division, Gender(s) involved} ex- Swimming 100m Male

## Relationships:

BINARY:

SNO	NAME	E1	E2	Cardinality ratio
1	Participates in	SPORTSPEOPLE (0,N)	SPORTS (1,N)	N:N
2	Secured by	AWARDS (1,N)	SPORTSPEOPLE (0,N)	N:N
3	used in (identifying)	INVENTORY (1,N)	SPORT (M,N)	N:N
4	supervises (self)	EMPLOYEE(supervisor) (0,N)	EMPLOYEE(supervisee) (0,1)	1:N
5	Fans of	AUDIENCE (0,N)	SPORTSPEOPLE (1,N)	N:N
6	Works for	EMPLOYEE (1,1)	MANAGEMENT (5,N)	N:1

7	Achieved in (identifying)	AWARDS (1,1)	SPORTS (3,N)	N:1
8	Training (self)	SPORTSPEOPLE (coach) (1,N)	SPORTSPEOPLE (athlete) (0,N)	N:N
9	Conducts	MANAGEMENT (0,N)	SPORT (1,N)	N:N
10	made purchases from	AUDIENCE (0,N)	BUSINESS (0,N)	N:N

OTHER:

NAME	E1	E2	E3	E4	Cardinality Ratio
used in, by and at	INVENTORY (1,N)	SPORT (M,N)	SPORTSPEOPLE (1,N)	Playing-Arena (1,N)	N:N:N:N

### ASSUMPTIONS:

the following are as per the above mentioned SNO's.

1. As Coaches in SPORTSPEOPLE don't play any sport, min is 0 and a sport must be played by at least one sportsperson
2. An award can be secured by a group so the max for AWARDS is N.
3. An inventory must be used in at least one sport, and a sport uses at least M inventories.
5. An audience might not be a fan of any sportsperson.
7. A sport has minimum of 3 awards; Gold, Silver, Bronze
8. Coach trains at least one athlete and an athlete may not have a coach
9. a sport must be conducted by at least one managing body and a management may not conduct any sports.
10. A business may have no purchases made from them.

### FUNCTIONAL REQUIREMENTS:

#### 1. RETRIEVALS:

##### a. Queries:

##### i. SELECTION:

Retrieve all the SPORTSPEOPLE tuples who are above 21 years of

age.

ex -

```
SELECT * FROM SPORTSPEOPLE WHERE AGE > 21
```

ii. PROJECTION:

Retrieve the names of the sportspeople from France.

ex -

```
SELECT Name FROM SPORTSPEOPLE WHERE Country = 'France'
```

iii. AGGREGATE:

Retrieve the number of awards secured by a particular country.

ex -

```
SELECT COUNT(number of awards) AS TOTAL_AWARDS FROM SPORTSPEOPLE WHERE Country = 'India'
```

iv. SEARCH:

Retrieve all the equipment which are some kind of balls.

ex -

```
SELECT Name FROM INVENTORY WHERE Name LIKE '%ball%'
```

b. ANALYSIS:

- Number of female athletes who secured bronze medals in 2016 Rio Olympics from the country = 'Zimbabwe'  
(JOIN between AWARDS and SPORTSPEOPLE)
- List of awards along with athlete names secured by INDIA in badminton collectively by men's and women's singles divisions at Paris Olympics 2024. (JOIN between AWARDS, SPORTS and SPORTSPEOPLE)
- Number of Americans who bought from McDonald's in the last 3 Olympics  
(JOIN between AUDIENCE and BUSINESSES)

2. MODIFICATIONS:

a. INSERT:

- i. insert <'Marketing team', 1357, 31> into MANAGEMENT assuming the team ID 1357 doesn't exist previously.  
it doesn't violate referential constraint as MANAGEMENT currently doesn't refer to any other entity.

b. UPDATE:

- i. Update the quantity of the INVENTORY tuple with name = 'Football' from 50 to 100.

c. DELETE:

i. Delete the SPORTS tuple with sport ID = 1429

Assuming that this tuple is not referenced by any other entity, this does not violate referential integrity constraint.