



DBMS PROJECT

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OLYMPICS DATABASE MANAGEMENT SYSTEM

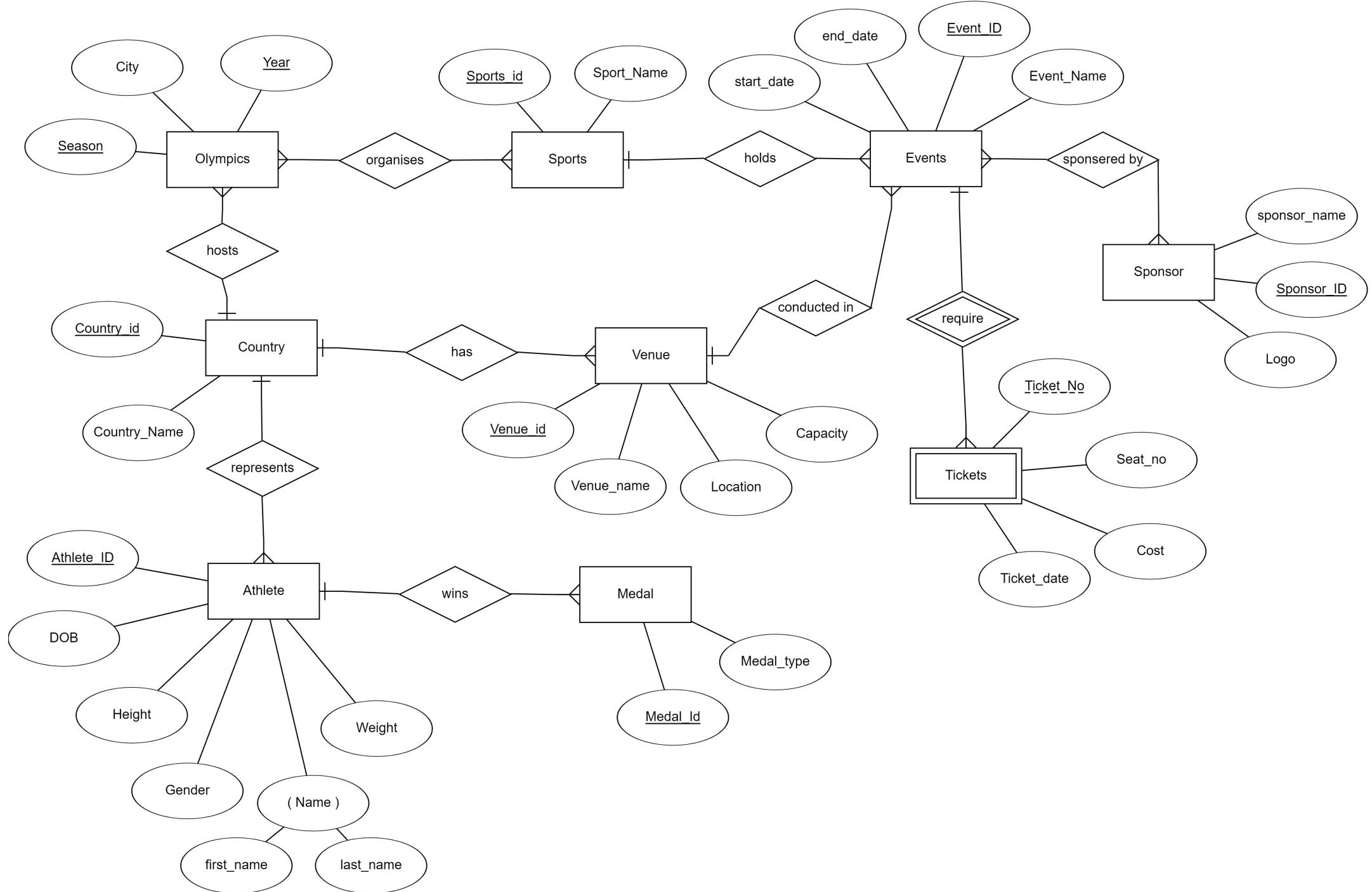
PROBLEM STATEMENT:

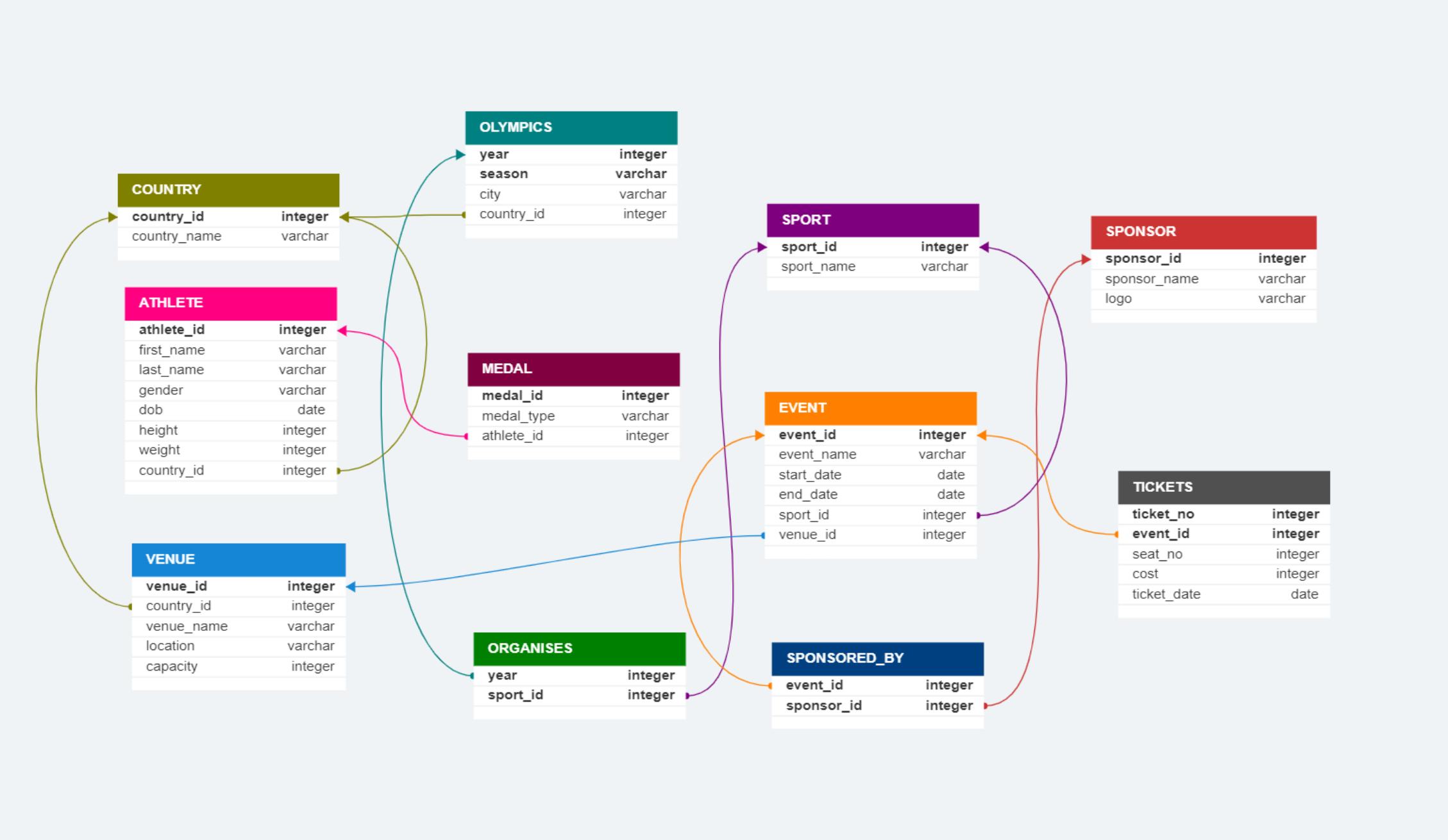
The Olympic games is a multi-sport event, considered as one of the largest and most prestigious international events. So, there is a need to design a modern database management system to store and manage information related to athletes, countries, events, results, schedules and more....

This system helps support the planning, execution, and evaluation of the Olympic games, ensuring data is accurate, up-to-date, and readily available.

This project can be extremely helpful and useful in following ways:

- Efficient data management.
- To store historical data about past Olympic games.
- Helps in decision making, which athletes and venues to choose.
- Data analytics helps improve future editions of Olympic games.





ASSUMPTIONS:

- Olympics can organize many sports and one sport is played in many olympic years.
- One sport can have many events but event is related to one sport only.
- One event can be sponsored by many sponsors. At the same time a sponsor can sponsor to many events.
- Only one country can host the Olympics each time.
- A country can have many venues.
- In one venue many events can occur.
- Many athletes can participate in olympics from one country.
- An athlete can win more than one medal.
- Without the event there are no tickets.
- A group of seats have same cost and for every event and every venue this cost is same.

NORMAL FORMS:

1. **First Normal Form (1NF):** This is the most basic level of normalization. In 1NF, each table cell should contain only a single value, and each column should have a unique name. The first normal form helps to eliminate duplicate data and simplify queries.
2. **Second Normal Form (2NF):** 2NF eliminates redundant data by requiring that each non-key attribute be dependent on the primary key. This means that each column should be directly related to the primary key, and not to other columns.

3. **Third Normal Form (3NF):** 3NF builds on 2NF by requiring that all non-key attributes are independent of each other. This means that each column should be directly related to the primary key, and not to any other columns in the same table.
4. **Boyce-Codd Normal Form (BCNF):** BCNF is a stricter form of 3NF that ensures that each determinant in a table is a candidate key. In other words, BCNF ensures that each non-key attribute is dependent only on the candidate key.

TABLES:

COUNTRY TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
COUNTRY_ID	INTEGER	PRIMARY KEY
COUNTRY_NAME	VARCHAR(50)	NOT NULL

NORMALIZATION:

Functional Dependencies :

Country_id \rightarrow Country_Name

1 NF :- This relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF & 3 NF & BCNF :- in this table there is only one functional dependency in which the candidate key is determining a non prime attribute. Which satisfies the BCNF condition. Therefore the table is in 1NF,2NF,BCNF.

INSERTING INTO TABLE:

```
CREATE TABLE COUNTRY(  
    COUNTRY_ID INTEGER PRIMARY KEY,  
    COUNTRY_NAME VARCHAR(50)  
)
```

```
INSERT INTO COUNTRY VALUES(91, 'India');  
INSERT INTO COUNTRY VALUES(1, 'United States');  
INSERT INTO COUNTRY VALUES(44, 'United Kingdom');  
INSERT INTO COUNTRY VALUES(33, 'France');  
INSERT INTO COUNTRY VALUES(49, 'Germany');  
INSERT INTO COUNTRY VALUES(81, 'Japan');  
INSERT INTO COUNTRY VALUES(7, 'Russia');  
INSERT INTO COUNTRY VALUES(86, 'China');  
INSERT INTO COUNTRY VALUES(55, 'Brazil');  
INSERT INTO COUNTRY VALUES(39, 'Italy');  
INSERT INTO COUNTRY VALUES(34, 'Spain');  
INSERT INTO COUNTRY VALUES(61, 'Australia');  
INSERT INTO COUNTRY VALUES(52, 'Mexico');  
INSERT INTO COUNTRY VALUES(20, 'Egypt');
```

```
INSERT INTO COUNTRY VALUES(353, 'Ireland');

INSERT INTO COUNTRY VALUES(880, 'Bangladesh');

INSERT INTO COUNTRY VALUES(234, 'Nigeria');

INSERT INTO COUNTRY VALUES(62, 'Indonesia');

INSERT INTO COUNTRY VALUES(351, 'Portugal');

INSERT INTO COUNTRY VALUES (93, 'Afghanistan');

INSERT INTO COUNTRY VALUES (355, 'Albania');

INSERT INTO COUNTRY VALUES (213, 'Algeria');

INSERT INTO COUNTRY VALUES (684, 'American Samoa');

INSERT INTO COUNTRY VALUES (376, 'Andorra');

INSERT INTO COUNTRY VALUES (244, 'Angola');

INSERT INTO COUNTRY VALUES (1264, 'Anguilla');

INSERT INTO COUNTRY VALUES (1268, 'Antigua and Barbuda');

INSERT INTO COUNTRY VALUES (54, 'Argentina');

INSERT INTO COUNTRY VALUES (374, 'Armenia');

INSERT INTO COUNTRY VALUES (297, 'Aruba');

INSERT INTO COUNTRY VALUES (43, 'Austria');

INSERT INTO COUNTRY VALUES (994, 'Azerbaijan');

INSERT INTO COUNTRY VALUES (1242, 'Bahamas');

INSERT INTO COUNTRY VALUES (973, 'Bahrain');

INSERT INTO COUNTRY VALUES (1246, 'Barbados');

INSERT INTO COUNTRY VALUES (375, 'Belarus');

INSERT INTO COUNTRY VALUES (32, 'Belgium');
```

SELECT * FROM COUNTRY;

	COUNTRY_ID	COUNTRY_NAME
1	91	India
2	1	United States
3	44	United Kingdom
4	33	France
5	49	Germany
6	81	Japan
7	7	Russia
8	86	China
9	55	Brazil
10	39	Italy
11	34	Spain
12	61	Australia
13	52	Mexico
14	20	Egypt
15	353	Ireland
16	880	Bangladesh
17	234	Nigeria
18	62	Indonesia
19	351	Portugal
20	93	Afghanistan

21	355 Albania
22	213 Algeria
23	684 American Samoa
24	376 Andorra
25	244 Angola
26	1264 Anguilla
27	1268 Antigua and Barbuda
28	54 Argentina
29	374 Armenia
30	297 Aruba
31	43 Austria
32	994 Azerbaijan
33	1242 Bahamas
34	973 Bahrain
35	1246 Barbados
36	375 Belarus
37	32 Belgium

OLYMPICS TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
YEAR	INTEGER	PRIMARY KEY
SEASON	VARCHAR(50)	PRIMARY KEY
CITY	VARCHAR(50)	NOT NULL
COUNTRY_ID	INTEGER	FOREIGN KEY

NORMALISATION:

Functional Dependencies :-

{Year , Season} -> {Year , Season, City , Country_id}

1 NF :- This relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF & 3 NF & BCNF :- In this table there are only dependencies from primary key to all other keys which says that this table is in BCNF . Therefore this table is in 2nd 3rd normal form too.

TABLE CREATION AND INSERTION:

```
CREATE TABLE OLYMPICS(
    YEAR INTEGER,
    CITY VARCHAR(50),
    SEASON VARCHAR(50),
    COUNTRY_ID INTEGER,
    PRIMARY KEY(YEAR,SEASON),
    FOREIGN KEY(COUNTRY_ID) REFERENCES COUNTRY
);
```

```
INSERT INTO OLYMPICS VALUES(1952, 'Oslo', 'Winter', 91);
INSERT INTO OLYMPICS VALUES(1956, 'Melbourne', 'Summer', 1);
INSERT INTO OLYMPICS VALUES(1956, 'Cortina d Ampezzo', 'Winter', 44);
INSERT INTO OLYMPICS VALUES(1960, 'Rome', 'Summer', 33);
INSERT INTO OLYMPICS VALUES(1960, 'Squaw Valley', 'Winter', 49);
INSERT INTO OLYMPICS VALUES(1964, 'Tokyo', 'Summer', 61);
INSERT INTO OLYMPICS VALUES(1964, 'Innsbruck', 'Winter', 20);
INSERT INTO OLYMPICS VALUES(1968, 'Mexico City', 'Summer', 93);
INSERT INTO OLYMPICS VALUES(1968, 'Grenoble', 'Winter', 297);
INSERT INTO OLYMPICS VALUES(1972, 'Munich', 'Summer', 213);
INSERT INTO OLYMPICS VALUES(1972, 'Sapporo', 'Winter', 355);
INSERT INTO OLYMPICS VALUES(1976, 'Montreal', 'Summer', 1);
```

```
INSERT INTO OLYMPICS VALUES(1976, 'Innsbruck', 'Winter', 49);
INSERT INTO OLYMPICS VALUES(1980, 'Moscow', 'Summer', 1264);
INSERT INTO OLYMPICS VALUES(1980, 'Lake Placid', 'Winter', 351);
INSERT INTO OLYMPICS VALUES(1984, 'Los Angeles', 'Summer', 39);
INSERT INTO OLYMPICS VALUES(1984, 'Sarajevo', 'Winter', 55);
INSERT INTO OLYMPICS VALUES(1988, 'Seoul', 'Summer', 7);
INSERT INTO OLYMPICS VALUES(1988, 'Calgary', 'Winter', 244);
INSERT INTO OLYMPICS VALUES(1992, 'Barcelona', 'Summer', 1264);
INSERT INTO OLYMPICS VALUES(1992, 'Albertville', 'Winter', 1268);
INSERT INTO OLYMPICS VALUES(1994, 'Lillehammer', 'Winter', 43);
INSERT INTO OLYMPICS VALUES(1996, 'Atlanta', 'Summer', 54);
INSERT INTO OLYMPICS VALUES(1998, 'Nagano', 'Winter', 297);
INSERT INTO OLYMPICS VALUES(2000, 'Sydney', 'Summer', 353);
INSERT INTO OLYMPICS VALUES(2002, 'Salt Lake City', 'Winter', 52);
INSERT INTO OLYMPICS VALUES(2004, 'Athens', 'Summer', 91);
INSERT INTO OLYMPICS VALUES(2006, 'Turin', 'Winter', 880);
INSERT INTO OLYMPICS VALUES(2008, 'Beijing', 'Summer', 62);
INSERT INTO OLYMPICS VALUES(2010, 'Vancouver', 'Winter', 33);
INSERT INTO OLYMPICS VALUES(2012, 'London', 'Summer', 684);
INSERT INTO OLYMPICS VALUES(2014, 'Sochi', 'Winter', 20);
INSERT INTO OLYMPICS VALUES(2016, 'Rio de Janeiro', 'Summer', 684);
INSERT INTO OLYMPICS VALUES(2018, 'PyeongChang', 'Winter', 52);
INSERT INTO OLYMPICS VALUES(2021, 'Tokyo', 'Summer', 355);

SELECT * FROM OLYMPICS;
```

	YEAR	CITY	SEASON	COUNTRY_ID
1	1952	Oslo	Winter	91
2	1956	Melbourne	Summer	1
3	1956	Cortina d Ampezzo	Winter	44
4	1960	Rome	Summer	33
5	1960	Squaw Valley	Winter	49
6	1964	Tokyo	Summer	61
7	1964	Innsbruck	Winter	20
8	1968	Mexico City	Summer	93
9	1968	Grenoble	Winter	297
10	1972	Munich	Summer	213
11	1972	Sapporo	Winter	355
12	1976	Montreal	Summer	1
13	1976	Innsbruck	Winter	49
14	1980	Moscow	Summer	1264
15	1980	Lake Placid	Winter	351
16	1984	Los Angeles	Summer	39
17	1984	Sarajevo	Winter	55
18	1988	Seoul	Summer	7
19	1988	Calgary	Winter	244
20	1992	Barcelona	Summer	1264

21	1992 Albertville	Winter	1268
22	1994 Lillehammer	Winter	43
23	1996 Atlanta	Summer	54
24	1998 Nagano	Winter	297
25	2000 Sydney	Summer	353
26	2002 Salt Lake City	Winter	52
27	2004 Athens	Summer	91
28	2006 Turin	Winter	880
29	2008 Beijing	Summer	62
30	2010 Vancouver	Winter	33
31	2012 London	Summer	684
32	2014 Sochi	Winter	20
33	2016 Rio de Janeiro	Summer	684
34	2018 PyeongChang	Winter	52
35	2021 Tokyo	Summer	355

ATHLETE TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
ATHLETE_ID	INTEGER	PRIMARY KEY
FIRST_NAME	VARCHAR(50)	NOT NULL
LAST_NAME	VARCHAR(50)	NOT NULL
GENDER	VARCHAR(10)	NOT NULL
DOB	DATE	NOT NULL

HEIGHT	INTEGER	NOT NULL
WEIGHT	INTEGER	NOT NULL
COUNTRY_ID	INTEGER	FOREIGN KEY

NORMALIZATION:

Functional Dependencies :-

$\text{athlete_id} \rightarrow \{\text{athlete_id}, \text{first_name}, \text{last_name}, \text{gender}, \text{dob}, \text{height}, \text{weight}, \text{country_id}\}$

1 NF :- this relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF :- In this table there is a single candidate key i.e , athlete_id and it is only a single attribute so there is no proper subset of this therefore there is no partial dependency.

Hence this table is in 2nd normal form.

3 NF :- In this table all functional dependencies are from candidate key(prime attribute(athlete_id)) to non prime attributes . Therefore there is no transitive dependency. Hence this table is in 3rd normal form.

BCNF :- all functional dependencies are from superkey i.e athlete_id to all other attributes. Therefore this table is in

BCNF.

TABLE CREATION AND INSERTION:

```
CREATE TABLE ATHLETE(  
    ATHLETE_ID INTEGER PRIMARY KEY,  
    FIRST_NAME VARCHAR(50),  
    LAST_NAME VARCHAR(50),  
    GENDER VARCHAR(10),  
    DOB DATE,  
    HEIGHT INTEGER,  
    WEIGHT INTEGER,  
    COUNTRY_ID INTEGER,  
    FOREIGN KEY(COUNTRY_ID) REFERENCES COUNTRY  
);
```

```
INSERT INTO ATHLETE  
VALUES(101,'Ussain','Bolt','Male',to_date('1986-08-21','YYYY-MM-DD'),195,94,1);
```

```
INSERT INTO ATHLETE  
VALUES(102,'Serena','Williams','Female',to_date('1981-09-26','YYYY-MM-DD'),175,70,1);
```

```
INSERT INTO ATHLETE  
VALUES(103,'Michael','Phelps','Male',to_date('1985-06-30','YYYY-MM-DD'),193,88,1);
```

```
INSERT INTO ATHLETE  
VALUES(104,'Simone','Biles','Female',to_date('1997-03-14','YYYY-MM-DD'),142,47,1);
```

```
INSERT INTO ATHLETE
VALUES(105,'Usman','Khawaja','Male',to_date('1986-12-18','YYYY-MM-DD'),178,75,91);

INSERT INTO ATHLETE
VALUES(106,'Caroline','Wozniacki','Female',to_date('1990-07-11','YYYY-MM-DD'),177,68,1);

INSERT INTO ATHLETE
VALUES(107,'LeBron','James','Male',to_date('1984-12-30','YYYY-MM-DD'),206,113,1);

INSERT INTO ATHLETE
VALUES(108,'Lindsey','Vonn','Female',to_date('1984-10-18','YYYY-MM-DD'),175,68,44);

INSERT INTO ATHLETE
VALUES(109,'Rafael','Nadal','Male',to_date('1986-06-03','YYYY-MM-DD'),185,85,33);

INSERT INTO ATHLETE
VALUES(110,'Katie','Ledecky','Female',to_date('1997-03-17','YYYY-MM-DD'),180,68,1);

INSERT INTO ATHLETE
VALUES(111,'Novak','Djokovic','Male',to_date('1987-05-22','YYYY-MM-DD'),188,77,1);

INSERT INTO ATHLETE
VALUES(112,'Simone','Manuel','Female',to_date('1996-08-02','YYYY-MM-DD'),178,61,1);

INSERT INTO ATHLETE
VALUES(113,'Roger','Federer','Male',to_date('1981-08-08','YYYY-MM-DD'),185,85,1);

INSERT INTO ATHLETE
VALUES(114,'Allyson','Felix','Female',to_date('1985-11-18','YYYY-MM-DD'),168,55,1);

INSERT INTO ATHLETE
VALUES(115,'Cristiano','Ronaldo','Male',to_date('1985-02-05','YYYY-MM-DD'),187,83,49);

INSERT INTO ATHLETE VALUES(116,'Sonia','O
Sullivan','Female',to_date('1969-11-28','YYYY-MM-DD'),163,50,39);

INSERT INTO ATHLETE
VALUES(117,'Diego','Maradona','Male',to_date('1960-10-30','YYYY-MM-DD'),165,75,52);

INSERT INTO ATHLETE
VALUES(118,'Fabiola','Zarina','Female',to_date('1991-09-15','YYYY-MM-DD'),169,65,52);
```

```
INSERT INTO ATHLETE
VALUES(119,'Kareem','Abdul-Jabbar','Male',to_date('1947-04-16','YYYY-MM-DD'),218,102,61);

INSERT INTO ATHLETE
VALUES(120,'Steffi','Graf','Female',to_date('1969-06-14','YYYY-MM-DD'),177,64,39);

INSERT INTO ATHLETE
VALUES(121,'Diego','Schwartzman','Male',to_date('1992-08-16','YYYY-MM-DD'),170,70,52);

INSERT INTO ATHLETE
VALUES(122,'Gina','Lollobrigida','Female',to_date('1927-07-04','YYYY-MM-DD'),163,60,39);

INSERT INTO ATHLETE
VALUES(123,'Cesar','Cielo','Male',to_date('1987-01-10','YYYY-MM-DD'),194,84,55);

INSERT INTO ATHLETE
VALUES(124,'Fabiana','Murer','Female',to_date('1981-03-16','YYYY-MM-DD'),180,62,55);

INSERT INTO ATHLETE
VALUES(125,'Andres','Iniesta','Male',to_date('1984-05-11','YYYY-MM-DD'),170,68,34);

INSERT INTO ATHLETE
VALUES(126,'Natalie','Coughlin','Female',to_date('1982-08-23','YYYY-MM-DD'),178,61,1);

INSERT INTO ATHLETE
VALUES(127,'Fernando','Alonso','Male',to_date('1981-07-29','YYYY-MM-DD'),171,68,34);

INSERT INTO ATHLETE
VALUES(128,'Laura','Kenny','Female',to_date('1992-04-24','YYYY-MM-DD'),163,56,44);

INSERT INTO ATHLETE
VALUES(129,'Sebastian','Vettel','Male',to_date('1987-07-03','YYYY-MM-DD'),176,70,49);

INSERT INTO ATHLETE
VALUES(130,'Jackie','Joyner-Kersee','Female',to_date('1962-03-03','YYYY-MM-DD'),178,68,1);

INSERT INTO ATHLETE
VALUES(131,'Lin','Dan','Male',to_date('1983-10-14','YYYY-MM-DD'),178,70,86);

INSERT INTO ATHLETE
VALUES(132,'Yelena','Isinbayeva','Female',to_date('1982-06-03','YYYY-MM-DD'),175,65,7);
```

```
INSERT INTO ATHLETE  
VALUES(133,'Daley','Thompson','Male',to_date('1958-07-30','YYYY-MM-DD'),185,88,44);
```

```
INSERT INTO ATHLETE VALUES(134,'Dan','O  
Brien','Male',to_date('1966-07-18','YYYY-MM-DD'),193,91,1);
```

```
INSERT INTO ATHLETE VALUES(135,'Hicham','El  
Guerrouj','Male',to_date('1974-09-14','YYYY-MM-DD'),180,61,33);
```

```
INSERT INTO ATHLETE VALUES(136,'Florence','Griffith  
Joyner','Female',to_date('1959-12-21','YYYY-MM-DD'),178,59,1);
```

```
INSERT INTO ATHLETE  
VALUES(138,'Usain','Bolt','Male',to_date('1986-08-21','YYYY-MM-DD'),195,94,1);
```

```
INSERT INTO ATHLETE  
VALUES(139,'Jessica','Ennis-Hill','Female',to_date('1986-01-28','YYYY-MM-DD'),165,57,44);
```

```
SELECT * FROM ATHLETE;
```

	ATHLETE_ID	FIRST_NAME	LAST_NAME	GENDER	DOB	HEIGHT	WEIGHT	COUNTRY_ID
1	101	Ussain	Bolt	Male	21-08-86	195	94	1
2	102	Serena	Williams	Female	26-09-81	175	70	1
3	103	Michael	Phelps	Male	30-06-85	193	88	1
4	104	Simone	Biles	Female	14-03-97	142	47	1
5	105	Usman	Khawaja	Male	18-12-86	178	75	91
6	106	Caroline	Wozniacki	Female	11-07-90	177	68	1
7	107	LeBron	James	Male	30-12-84	206	113	1
8	108	Lindsey	Vonn	Female	18-10-84	175	68	44
9	109	Rafael	Nadal	Male	03-06-86	185	85	33
10	110	Katie	Ledecky	Female	17-03-97	180	68	1
11	111	Novak	Djokovic	Male	22-05-87	188	77	1
12	112	Simone	Manuel	Female	02-08-96	178	61	1
13	113	Roger	Federer	Male	08-08-81	185	85	1
14	114	Allyson	Felix	Female	18-11-85	168	55	1
15	115	Cristiano	Ronaldo	Male	05-02-85	187	83	49
16	116	Sonia	O Sullivan	Female	28-11-69	163	50	39
17	117	Diego	Maradona	Male	30-10-60	165	75	52
18	118	Fabiola	Zarina	Female	15-09-91	169	65	52
19	119	Kareem	Abdul-Jabbar	Male	16-04-47	218	102	61
20	120	Steffi	Graf	Female	14-06-69	177	64	39

21	121	Diego	Schwartzman	Male	16-08-92	170	70	52
22	122	Gina	Lollobrigida	Female	04-07-27	163	60	39
23	123	Cesar	Cielo	Male	10-01-87	194	84	55
24	124	Fabiana	Murer	Female	16-03-81	180	62	55
25	125	Andres	Iniesta	Male	11-05-84	170	68	34
26	126	Natalie	Coughlin	Female	23-08-82	178	61	1
27	127	Fernando	Alonso	Male	29-07-81	171	68	34
28	128	Laura	Kenny	Female	24-04-92	163	56	44
29	129	Sebastian	Vettel	Male	03-07-87	176	70	49
30	130	Jackie	Joyner-Kersee	Female	03-03-62	178	68	1
31	131	Lin	Dan	Male	14-10-83	178	70	86
32	132	Yelena	Isinbayeva	Female	03-06-82	175	65	7
33	133	Daley	Thompson	Male	30-07-58	185	88	44
34	134	Dan	O'Brien	Male	18-07-66	193	91	1
35	135	Hicham	El Guerrouj	Male	14-09-74	180	61	33
36	136	Florence	Griffith Joyner	Female	21-12-59	178	59	1
37	138	Usain	Bolt	Male	21-08-86	195	94	1
38	139	Jessica	Ennis-Hill	Female	28-01-86	165	57	44

SPORT TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
SPORT_ID	INTEGER	PRIMARY KEY
SPORT_NAME	VARCHAR(50)	NOT NULL

NORMALIZATION:

Functional Dependencies :-

sport_id \rightarrow sport_name

1 NF :- This relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF :- In this table there is a single candidate key i.e , sport_id and it only a single attribute so there is no proper subset of this therefore there is no partial dependency. Hence this table is in 2nd normal form.

3 NF :- In this table all functional dependencies are from candidate key(prime attribute) to non prime attributes . Therefore there is no transitive dependency. Hence this table is in 3rd normal form.

BCNF :- all functional dependencies are from superkey i.e sport_id to all other attributes. Therefore this table is in BCNF.

TABLE CREATION AND INSERTION:

```
CREATE TABLE SPORT(  
    SPORT_ID INTEGER PRIMARY KEY,  
    SPORT_NAME VARCHAR(50)  
);
```

```
INSERT INTO SPORT VALUES(1,'Badminton');  
INSERT INTO SPORT VALUES (2, 'Basketball');  
INSERT INTO SPORT VALUES (3, 'Boxing');  
INSERT INTO SPORT VALUES (4, 'Cycling');  
INSERT INTO SPORT VALUES (5, 'Diving');  
INSERT INTO SPORT VALUES (6, 'Equestrian');
```

```
INSERT INTO SPORT VALUES (7, 'Fencing');

INSERT INTO SPORT VALUES (8, 'Football');

INSERT INTO SPORT VALUES (9, 'Gymnastics');

INSERT INTO SPORT VALUES (10, 'Hockey');

INSERT INTO SPORT VALUES (11, 'Judo');

INSERT INTO SPORT VALUES (12, 'Rowing');

INSERT INTO SPORT VALUES (13, 'Sailing');

INSERT INTO SPORT VALUES (14, 'Swimming');

INSERT INTO SPORT VALUES (15, 'Table Tennis');

INSERT INTO SPORT VALUES (16, 'Tennis');

INSERT INTO SPORT VALUES (17, 'Track and Field');

INSERT INTO SPORT VALUES (18, 'Volleyball');

INSERT INTO SPORT VALUES (19, 'Water Polo');

INSERT INTO SPORT VALUES (20, 'Wrestling');

SELECT * FROM SPORT;
```

	SPORT_ID	SPORT_NAME
1	1	Badminton
2	2	Basketball
3	3	Boxing
4	4	Cycling
5	5	Diving
6	6	Equestrian
7	7	Fencing
8	8	Football
9	9	Gymnastics
10	10	Hockey
11	11	Judo
12	12	Rowing
13	13	Sailing
14	14	Swimming
15	15	Table Tennis
16	16	Tennis
17	17	Track and Field
18	18	Volleyball
19	19	Water Polo
20	20	Wrestling

SPONSOR TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
SPONSOR_ID	INTEGER	PRIMARY KEY
SPONSOR_NAME	VARCHAR(50)	NOT NULL
LOGO	VARCHAR(50)	NOT NULL

NORMALIZATION:

Functional Dependencies :-

sponser_id \rightarrow {sponser_id , sponser_name , logo}

1 NF :- This relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF & 3 NF & BCNF :- In this table there are only 2 dependencies where a candidate key is determining other attributes. Therefore as the superkey is acting as determinant in all the dependencies , this table is in BCNF which means this is also in 2nd and 3rd normal forms.

TABLE CREATION AND INSERTION:

```
CREATE TABLE SPONSOR(  
SPONSOR_ID INTEGER PRIMARY KEY,  
SPONSOR_NAME VARCHAR(50),  
LOGO VARCHAR(50)  
);
```

```
INSERT INTO SPONSOR VALUES (1, 'Nikhitha', 'BMW');
```

```
INSERT INTO SPONSOR VALUES (2, 'John', 'Coca-Cola');
```

```
INSERT INTO SPONSOR VALUES (3, 'Sarah', 'Nike');
```

```
INSERT INTO SPONSOR VALUES (4, 'Michael', 'Adidas');
```

```
INSERT INTO SPONSOR VALUES (5, 'Emily', 'Toyota');

INSERT INTO SPONSOR VALUES (6, 'David', 'Samsung');

INSERT INTO SPONSOR VALUES (7, 'Jessica', 'Apple');

INSERT INTO SPONSOR VALUES (8, 'Andrew', 'Pepsi');

INSERT INTO SPONSOR VALUES (9, 'Olivia', 'Microsoft');

INSERT INTO SPONSOR VALUES (10, 'Daniel', 'McDonalds');

INSERT INTO SPONSOR VALUES (11, 'Sophia', 'Amazon');

INSERT INTO SPONSOR VALUES (12, 'Matthew', 'Sony');

INSERT INTO SPONSOR VALUES (13, 'Emma', 'Volkswagen');

INSERT INTO SPONSOR VALUES (14, 'Jacob', 'Intel');

INSERT INTO SPONSOR VALUES (15, 'Ava', 'Honda');

INSERT INTO SPONSOR VALUES (16, 'William', 'Nestle');

INSERT INTO SPONSOR VALUES (17, 'Mia', 'LOreal');

INSERT INTO SPONSOR VALUES (18, 'James', 'Google');

INSERT INTO SPONSOR VALUES (19, 'Charlotte', 'Lamborghini');

INSERT INTO SPONSOR VALUES (20, 'Benjamin', 'Facebook');

SELECT * FROM SPONSOR;
```

	SPONSOR_ID	SPONSOR_NAME	LOGO
1	1 Nikhitha	BMW	
2	2 John	Coca-Cola	
3	3 Sarah	Nike	
4	4 Michael	Adidas	
5	5 Emily	Toyota	
6	6 David	Samsung	
7	7 Jessica	Apple	
8	8 Andrew	Pepsi	
9	9 Olivia	Microsoft	
10	10 Daniel	McDonalds	
11	11 Sophia	Amazon	
12	12 Matthew	Sony	
13	13 Emma	Volkswagen	
14	14 Jacob	Intel	
15	15 Ava	Honda	
16	16 William	Nestle	
17	17 Mia	LOreal	
18	18 James	Google	
19	19 Charlotte	Lamborghini	
20	20 Benjamin	Facebook	

ORGANISES TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
YEAR	INTEGER	PRIMARY KEY,FOREIGN KEY
SEASON	VARCHAR(50)	PRIMARY KEY,FOREIGN KEY

SPORT_ID	INTEGER	PRIMARY KEY,FOREIGN KEY
-----------------	---------	-------------------------

NORMALIZATION:

Functional Dependencies :-

{year, season, sport_id} \rightarrow {year ,season, sport_id}

Only composite candidate key in this relationship table.

So directly in BCNF. Hence in 2NF and 3NF.

TABLE CREATION AND INSERTION:

```
CREATE TABLE ORGANISES(
    YEAR INTEGER,
    SEASON VARCHAR(50),
    SPORT_ID INTEGER,
    FOREIGN KEY(YEAR,SEASON) REFERENCES OLYMPICS,
    FOREIGN KEY(SPORT_ID) REFERENCES SPORT,
    PRIMARY KEY(YEAR,SEASON,SPORT_ID)
);
```

```
INSERT INTO organises VALUES(1952,'Winter',3);
```

```
INSERT INTO organises VALUES (1956,'Winter',7);

INSERT INTO organises VALUES (1956,'Winter',8);

INSERT INTO organises VALUES (1964,'Winter',11);

INSERT INTO organises VALUES (1964,'Summer',14);

INSERT INTO organises VALUES (1964,'Winter',15);

INSERT INTO organises VALUES (1972,'Summer',18);

INSERT INTO organises VALUES (1972,'Winter',16);

INSERT INTO organises VALUES (1972,'Summer',14);

INSERT INTO organises VALUES (1981,'Winter',10);

INSERT INTO organises VALUES (1988,'Winter',12);

INSERT INTO organises VALUES (1988,'Winter',18);

INSERT INTO organises VALUES (1988,'Summer',19);

INSERT INTO organises VALUES (2010,'Winter',16);

INSERT INTO organises VALUES (2010,'Winter',11);

INSERT INTO organises VALUES (2012,'Summer',10);

INSERT INTO organises VALUES (2012,'Summer',8);

INSERT INTO organises VALUES (2018,'Winter',6);

INSERT INTO organises VALUES (2018,'Winter',15);

INSERT INTO organises VALUES (2021,'Summer',2);

INSERT INTO organises VALUES (2021,'Summer',4);

INSERT INTO organises VALUES (2021,'Summer',11);
```

```
INSERT INTO organises VALUES(2002,'Winter',17);
INSERT INTO organises VALUES(2002,'Winter',14);
INSERT INTO organises VALUES(2004,'Summer',19);
INSERT INTO organises VALUES(2004,'Summer',20);
INSERT INTO organises VALUES(2008,'Summer',5);
INSERT INTO organises VALUES(2008,'Summer',9);
INSERT INTO organises VALUES(2008,'Summer',10);
INSERT INTO organises VALUES(1992,'Winter',8);
INSERT INTO organises VALUES(1992,'Winter',13);

SELECT * FROM ORGANISES;
```

	YEAR	SEASON	SPORT_ID
1	1952	Winter	3
2	1956	Winter	7
3	1956	Winter	8
4	1964	Winter	11
5	1964	Summer	14
6	1964	Winter	15
7	1972	Summer	18
8	1972	Winter	16
9	1972	Summer	14
10	1988	Winter	12
11	1988	Winter	18
12	1988	Summer	19
13	2010	Winter	16
14	2010	Winter	11
15	2012	Summer	10
16	2012	Summer	8
17	2018	Winter	6
18	2018	Winter	15
19	2021	Summer	2
20	2021	Summer	4
21	2021	Summer	11
22	2002	Winter	17
23	2002	Winter	14
24	2004	Summer	19
25	2004	Summer	20
26	2008	Summer	5
27	2008	Summer	9
28	2008	Summer	10
29	1992	Winter	8
30	1992	Winter	13

VENUE TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
VENUE_ID	INTEGER	PRIMARY KEY
COUNTRY_ID	INTEGER	FOREIGN KEY
VENUE_NAME	VARCHAR(50)	NOT NULL
LOCATION	VARCHAR(50)	NOT NULL
CAPACITY	INTEGER	NOT NULL

NORMALIZATION:

Functional Dependencies :-

venue_id \rightarrow {venue_id , country_id , venue_name , location , capacity}

1 NF :- This relation satisfies 1NF condition. Therefore it is in 1st normal form.

2 NF & 3 NF & BCNF :- In this table there are only dependencies where a candidate key is determining other attributes. Therefore as the superkey is acting as determinant in all the dependencies , this table is in BCNF which means this is also in 2nd and 3rd normal forms.

TABLE CREATION AND INSERTION:

```
CREATE TABLE VENUE(
```

```
VENUE_ID INTEGER PRIMARY KEY,  
COUNTRY_ID INTEGER,  
VENUE_NAME VARCHAR(50),  
LOCATION VARCHAR(50),  
CAPACITY INTEGER,  
FOREIGN KEY(COUNTRY_ID) REFERENCES COUNTRY  
);
```

```
INSERT INTO VENUE VALUES (1000, 91, 'Wankhade Stadium', 'Mumbai', 33006);  
INSERT INTO VENUE VALUES (1001, 1, 'Madison Square Garden', 'New York',  
20000);  
INSERT INTO VENUE VALUES (1002, 44, 'Wembley Stadium', 'London', 90000);  
INSERT INTO VENUE VALUES (1003, 33, 'Stade de France', 'Paris', 81338);  
INSERT INTO VENUE VALUES (1004, 49, 'Olympiastadion', 'Berlin', 74667);  
INSERT INTO VENUE VALUES (1005, 81, 'Tokyo Dome', 'Tokyo', 55000);  
INSERT INTO VENUE VALUES (1006, 7, 'Luzhniki Stadium', 'Moscow', 81006);  
INSERT INTO VENUE VALUES (1007, 86, 'Beijing National Indoor Stadium', 'Beijing',  
18000);  
INSERT INTO VENUE VALUES (1008, 55, 'Ginásio do Ibirapuera', 'Sao Paulo',  
11286);  
INSERT INTO VENUE VALUES (1009, 39, 'PalaLottomatica', 'Rome', 10500);  
INSERT INTO VENUE VALUES (1010, 34, 'Palau Sant Jordi', 'Barcelona', 17093);
```

INSERT INTO VENUE VALUES (1011, 61, 'Melbourne Cricket Ground', 'Melbourne', 100024);

INSERT INTO VENUE VALUES (1012, 52, 'Mexico City Arena', 'Mexico City', 22000);

INSERT INTO VENUE VALUES (1013, 20, 'Cairo Stadium Indoor Halls Complex', 'Cairo', 20000);

INSERT INTO VENUE VALUES (1014, 353, 'Aviva Stadium', 'Dublin', 51700);

INSERT INTO VENUE VALUES (1015, 91, 'Gaddafi Stadium', 'Lahore', 27000);

INSERT INTO VENUE VALUES (1016, 880, 'Sher-e-Bangla National Cricket Stadium', 'Dhaka', 26000);

INSERT INTO VENUE VALUES (1017, 234, 'National Stadium', 'Lagos', 55000);

INSERT INTO VENUE VALUES (1018, 62, 'Istora Senayan', 'Jakarta', 7500);

INSERT INTO VENUE VALUES (1019, 351, 'Estádio da Luz', 'Lisbon', 64400);

INSERT INTO VENUE VALUES (1020, 93, 'Ghazi Amanullah Khan International Cricket Stadium', 'Kabul', 25000);

INSERT INTO VENUE VALUES (1021, 355, 'Qemal Stafa Stadium', 'Tirana', 22000);

INSERT INTO VENUE VALUES (1022, 213, 'Stade 5 Juillet 1962', 'Algiers', 80000);

INSERT INTO VENUE VALUES (1023, 684, 'Veterans Memorial Stadium', 'Pago Pago', 10000);

INSERT INTO VENUE VALUES (1024, 376, 'Estadi Nacional', 'Andorra la Vella', 3306);

INSERT INTO VENUE VALUES (1025, 244, 'Estádio 11 de Novembro', 'Luanda', 50000);

INSERT INTO VENUE VALUES (1026, 1264, 'Ronald Webster Park', 'The Valley', 1000);

INSERT INTO VENUE VALUES (1027, 1268, 'Sir Vivian Richards Stadium', 'North Sound', 10000);

INSERT INTO VENUE VALUES (1028, 54, 'Luna Park Stadium', 'Buenos Aires', 8400);

INSERT INTO VENUE VALUES (1029, 374, 'Yerevan Football Academy Stadium', 'Yerevan', 1200);

INSERT INTO VENUE VALUES (1030, 297, 'Oranjestad Basketball Stadium', 'Oranjestad', 2500);

INSERT INTO VENUE VALUES (1031, 61, 'Optus Stadium', 'Perth', 60000);

INSERT INTO VENUE VALUES (1032, 43, 'Ernst Happel Stadium', 'Vienna', 50705);

INSERT INTO VENUE VALUES (1033, 994, 'Baku National Stadium', 'Baku', 69870);

INSERT INTO VENUE VALUES (1034, 1242, 'Thomas A. Robinson National Stadium', 'Nassau', 15000);

INSERT INTO VENUE VALUES (1035, 973, 'Bahrain National Stadium', 'Riffa', 30000);

INSERT INTO VENUE VALUES (1036, 880, 'Sher-e-Bangla Cricket Stadium', 'Mirpur', 25000);

INSERT INTO VENUE VALUES (1037, 1246, 'Kensington Oval', 'Bridgetown', 11000);

INSERT INTO VENUE VALUES (1038, 375, 'Dinamo Stadium', 'Minsk', 22220);

INSERT INTO VENUE VALUES (1039, 32, 'King Baudouin Stadium', 'Brussels', 50024);

SELECT * FROM VENUE;

	VENUE_ID	COUNTRY_ID	VENUE_NAME	LOCATION	CAPACITY
1	1000	91	Wankhade Stadium	Mumbai	33006
2	1001	1	Madison Square Garden	New York	20000
3	1002	44	Wembley Stadium	London	90000
4	1003	33	Stade de France	Paris	81338
5	1004	49	Olympiastadion	Berlin	74667
6	1005	81	Tokyo Dome	Tokyo	55000
7	1006	7	Luzhniki Stadium	Moscow	81006
8	1007	86	Beijing National Indoor Stadium	Beijing	18000
9	1008	55	Ginásio do Ibirapuera	Sao Paulo	11286
10	1009	39	PalaLottomatica	Rome	10500
11	1010	34	Palau Sant Jordi	Barcelona	17093
12	1011	61	Melbourne Cricket Ground	Melbourne	100024
13	1012	52	Mexico City Arena	Mexico City	22000
14	1013	20	Cairo Stadium Indoor Halls Complex	Cairo	20000
15	1014	353	Aviva Stadium	Dublin	51700
16	1015	91	Gaddafi Stadium	Lahore	27000
17	1016	880	Sher-e-Bangla National Cricket Stadium	Dhaka	26000
18	1017	234	National Stadium	Lagos	55000
19	1018	62	Istora Senayan	Jakarta	7500
20	1019	351	Estádio da Luz	Lisbon	64400
21	1020	93	Ghazi Amanullah Khan International Cricket Stadium	Kabul	25000
22	1021	355	Qemal Stafa Stadium	Tirana	22000
23	1022	213	Stade 5 Juillet 1962	Algiers	80000
24	1023	684	Veterans Memorial Stadium	Pago Pago	10000
25	1024	376	Estadi Nacional	Andorra la Vella	3306
26	1025	244	Estádio 11 de Novembro	Luanda	50000
27	1026	1264	Ronald Webster Park	The Valley	1000
28	1027	1268	Sir Vivian Richards Stadium	North Sound	10000
29	1028	54	Luna Park Stadium	Buenos Aires	8400
30	1029	374	Yerevan Football Academy Stadium	Yerevan	1200
31	1030	297	Oranjestad Basketball Stadium	Oranjestad	2500
32	1031	61	Optus Stadium	Perth	60000
33	1032	43	Ernst Happel Stadium	Vienna	50705
34	1033	994	Baku National Stadium	Baku	69870
35	1034	1242	Thomas A. Robinson National Stadium	Nassau	15000
36	1035	973	Bahrain National Stadium	Riffa	30000
37	1036	880	Sher-e-Bangla Cricket Stadium	Mirpur	25000
38	1037	1246	Kensington Oval	Bridgetown	11000
39	1038	375	Dinamo Stadium	Minsk	22220
40	1039	32	King Baudouin Stadium	Brussels	50024

EVENT TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
EVENT_ID	INTEGER	PRIMARY KEY
EVENT_NAME	VARCHAR(50)	NOT NULL
START_DATE	DATE	NOT NULL
END_DATE	DATE	NOT NULL
SPORT_ID	INTEGER	FOREIGN KEY
VENUE_ID	INTEGER	FOREIGN KEY

NORMALIZATION:

Functional Dependencies :-

$\text{event_id} \rightarrow \{\text{event_id}, \text{event_name}, \text{start_date}, \text{end_date}, \text{sport_id}, \text{venue_id}\}$

All attributes depend on the event_id, hence the table is 2NF.

All attributes depend directly on event_id, hence the table is in 3NF.

All determinants (`event_id`) are candidate keys, hence the table is in BCNF.

TABLE CREATION AND INSERTION:

```
CREATE TABLE EVENT(
    EVENT_ID INTEGER PRIMARY KEY,
    EVENT_NAME VARCHAR(50),
    START_DATE DATE,
    END_DATE DATE,
    SPORT_ID INTEGER,
    VENUE_ID INTEGER,
    FOREIGN KEY(SPORT_ID) REFERENCES SPORT,
    FOREIGN KEY(VENUE_ID) REFERENCES VENUE
);
```

```
INSERT INTO EVENT VALUES (1, '100m Sprint', to_date('1952-07-20',
'YYYY-MM-DD'), to_date('1952-07-25', 'YYYY-MM-DD'), 1, 1000);
```

```
INSERT INTO EVENT VALUES (2, 'Long Jump', to_date('1952-07-26',
'YYYY-MM-DD'), to_date('1952-07-31', 'YYYY-MM-DD'), 1, 1001);
```

```
INSERT INTO EVENT VALUES (21, 'Mens Basketball', to_date('1952-07-20',
'YYYY-MM-DD'), to_date('1952-08-02', 'YYYY-MM-DD'), 2, 1002);
```

```
INSERT INTO EVENT VALUES (22, 'Womens Basketball', to_date('1952-07-23',
'YYYY-MM-DD'), to_date('1952-08-04', 'YYYY-MM-DD'), 2, 1003);
```

```
INSERT INTO EVENT VALUES (41, 'Mens Lightweight', to_date('1952-07-21', 'YYYY-MM-DD'), to_date('1952-07-30', 'YYYY-MM-DD'), 3, 1004);

INSERT INTO EVENT VALUES (42, 'Womens Flyweight', to_date('1952-07-24', 'YYYY-MM-DD'), to_date('1952-07-31', 'YYYY-MM-DD'), 3, 1005);

INSERT INTO EVENT VALUES (61, 'Kayak Single 1000m', to_date('1952-07-25', 'YYYY-MM-DD'), to_date('1952-07-30', 'YYYY-MM-DD'), 4, 1006);

INSERT INTO EVENT VALUES (62, 'Canoe Double 500m', to_date('1952-07-28', 'YYYY-MM-DD'), to_date('1952-08-02', 'YYYY-MM-DD'), 4, 1007);

INSERT INTO EVENT VALUES (81, 'Road Race', to_date('1952-07-21', 'YYYY-MM-DD'), to_date('1952-07-26', 'YYYY-MM-DD'), 5, 1008);

INSERT INTO EVENT VALUES (82, 'Track Sprint', to_date('1952-07-24', 'YYYY-MM-DD'), to_date('1952-07-29', 'YYYY-MM-DD'), 5, 1009);

INSERT INTO EVENT VALUES (101, 'Platform Diving', to_date('1952-07-22', 'YYYY-MM-DD'), to_date('1952-07-27', 'YYYY-MM-DD'), 6, 1010);

INSERT INTO EVENT VALUES (102, 'Springboard Diving', to_date('1952-07-25', 'YYYY-MM-DD'), to_date('1952-07-30', 'YYYY-MM-DD'), 6, 1011);

INSERT INTO EVENT VALUES (3, '400m Sprint', to_date('1952-07-22', 'YYYY-MM-DD'), to_date('1952-07-27', 'YYYY-MM-DD'), 1, 1002);

INSERT INTO EVENT VALUES (4, 'High Jump', to_date('1952-07-28', 'YYYY-MM-DD'), to_date('1952-08-02', 'YYYY-MM-DD'), 1, 1003);

INSERT INTO EVENT VALUES (23, 'Mens Basketball', to_date('1952-07-20', 'YYYY-MM-DD'), to_date('1952-07-31', 'YYYY-MM-DD'), 2, 1004);

INSERT INTO EVENT VALUES (24, 'Womens Basketball', to_date('1952-07-23', 'YYYY-MM-DD'), to_date('1952-08-03', 'YYYY-MM-DD'), 2, 1005);
```

```
INSERT INTO EVENT VALUES (43, 'Mens Lightweight', to_date('1952-07-21',  
'YYYY-MM-DD'), to_date('1952-07-30', 'YYYY-MM-DD'), 3, 1006);
```

```
INSERT INTO EVENT VALUES (44, 'Womens Flyweight', to_date('1952-07-24',  
'YYYY-MM-DD'), to_date('1952-08-02', 'YYYY-MM-DD'), 3, 1007);
```

```
INSERT INTO EVENT VALUES (63, 'Kayak Single 1000m', to_date('1952-07-25',  
'YYYY-MM-DD'), to_date('1952-08-03', 'YYYY-MM-DD'), 4, 1008);
```

```
INSERT INTO EVENT VALUES (64, 'Canoe Double 500m', to_date('1952-07-28',  
'YYYY-MM-DD'), to_date('1952-08-06', 'YYYY-MM-DD'), 4, 1009);
```

```
INSERT INTO EVENT VALUES (83, 'Road Race', to_date('1952-07-22',  
'YYYY-MM-DD'), to_date('1952-07-30', 'YYYY-MM-DD'), 5, 1010);
```

```
INSERT INTO EVENT VALUES (84, 'Track Sprint', to_date('1952-07-25',  
'YYYY-MM-DD'), to_date('1952-08-02', 'YYYY-MM-DD'), 5, 1011);
```

```
INSERT INTO EVENT VALUES (123, '100m Sprint', to_date('1952-07-20',  
'YYYY-MM-DD'), to_date('1952-07-26', 'YYYY-MM-DD'), 1, 1002);
```

```
INSERT INTO EVENT VALUES (124, '200m Sprint', to_date('1952-07-22',  
'YYYY-MM-DD'), to_date('1952-07-28', 'YYYY-MM-DD'), 1, 1003);
```

```
INSERT INTO EVENT VALUES (143, 'Mens Basketball', to_date('1956-11-23',  
'YYYY-MM-DD'), to_date('1956-12-08', 'YYYY-MM-DD'), 2, 1004);
```

```
INSERT INTO EVENT VALUES (144, 'Womens Basketball', to_date('1956-11-23',  
'YYYY-MM-DD'), to_date('1956-12-08', 'YYYY-MM-DD'), 2, 1005);
```

```
INSERT INTO EVENT VALUES (163, 'Mens Lightweight', to_date('1960-08-26',  
'YYYY-MM-DD'), to_date('1960-09-05', 'YYYY-MM-DD'), 3, 1006);
```

```
INSERT INTO EVENT VALUES (164, 'Womens Flyweight', to_date('1960-08-26',  
'YYYY-MM-DD'), to_date('1960-09-05', 'YYYY-MM-DD'), 3, 1007);
```

```
INSERT INTO EVENT VALUES (183, 'Kayak Single 1000m', to_date('1964-10-13',  
'YYYY-MM-DD'), to_date('1964-10-23', 'YYYY-MM-DD'), 4, 1008);
```

```
INSERT INTO EVENT VALUES (184, 'Canoe Double 500m', to_date('1964-10-13',  
'YYYY-MM-DD'), to_date('1964-10-23', 'YYYY-MM-DD'), 4, 1009);
```

```
INSERT INTO EVENT VALUES (203, 'Road Race', to_date('1968-10-12',  
'YYYY-MM-DD'), to_date('1968-10-18', 'YYYY-MM-DD'), 5, 1010);
```

```
INSERT INTO EVENT VALUES (204, 'Track Sprint', to_date('1968-10-12',  
'YYYY-MM-DD'), to_date('1968-10-18', 'YYYY-MM-DD'), 5, 1011);
```

```
INSERT INTO EVENT VALUES (223, 'Platform Diving', to_date('1972-08-27',  
'YYYY-MM-DD'), to_date('1972-09-04', 'YYYY-MM-DD'), 6, 1012);
```

```
INSERT INTO EVENT VALUES (224, 'Springboard Diving', to_date('1972-08-27',  
'YYYY-MM-DD'), to_date('1972-09-04', 'YYYY-MM-DD'), 6, 1013);
```

```
SELECT * FROM EVENT;
```

EVENT_ID	EVENT_NAME	START_DATE	END_DATE	SPORT_ID	VENUE_ID
1	100m Sprint	20-07-52	25-07-52	1	1000
2	Long Jump	26-07-52	31-07-52	1	1001
3	21 Mens Basketball	20-07-52	02-08-52	2	1002
4	22 Womens Basketball	23-07-52	04-08-52	2	1003
5	41 Mens Lightweight	21-07-52	30-07-52	3	1004
6	42 Womens Flyweight	24-07-52	31-07-52	3	1005
7	61 Kayak Single 1000m	25-07-52	30-07-52	4	1006
8	62 Canoe Double 500m	28-07-52	02-08-52	4	1007
9	81 Road Race	21-07-52	26-07-52	5	1008
10	82 Track Sprint	24-07-52	29-07-52	5	1009
11	101 Platform Diving	22-07-52	27-07-52	6	1010
12	102 Springboard Diving	25-07-52	30-07-52	6	1011
13	4 High Jump	28-07-52	02-08-52	1	1003
14	23 Mens Basketball	20-07-52	31-07-52	2	1004
15	24 Womens Basketball	23-07-52	03-08-52	2	1005
16	43 Mens Lightweight	21-07-52	30-07-52	3	1006
17	44 Womens Flyweight	24-07-52	02-08-52	3	1007
18	63 Kayak Single 1000m	25-07-52	03-08-52	4	1008
19	64 Canoe Double 500m	28-07-52	06-08-52	4	1009
20	83 Road Race	22-07-52	30-07-52	5	1010
21	84 Track Sprint	25-07-52	02-08-52	5	1011
22	123 100m Sprint	20-07-52	26-07-52	1	1002
23	124 200m Sprint	22-07-52	28-07-52	1	1003
24	143 Mens Basketball	23-11-56	08-12-56	2	1004
25	144 Womens Basketball	23-11-56	08-12-56	2	1005
26	163 Mens Lightweight	26-08-60	05-09-60	3	1006
27	164 Womens Flyweight	26-08-60	05-09-60	3	1007
28	183 Kayak Single 1000m	13-10-64	23-10-64	4	1008
29	184 Canoe Double 500m	13-10-64	23-10-64	4	1009
30	203 Road Race	12-10-68	18-10-68	5	1010
31	204 Track Sprint	12-10-68	18-10-68	5	1011
32	223 Platform Diving	27-08-72	04-09-72	6	1012
33	224 Springboard Diving	27-08-72	04-09-72	6	1013

SPONSORED_BY TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
EVENT_ID	INTEGER	PRIMARY KEY,FOREIGN KEY
SPONSOR_ID	INTEGER	PRIMARY KEY,FOREIGN KEY

NORMALIZATION:

Functional Dependencies :-

{ event_id , sponsor_id} -> { event_id , sponsor_id}

Only composite candidate key in this relationship table.

So directly in BCNF. Hence in 2NF and 3NF.

TABLE CREATION AND INSERTION:

```
CREATE TABLE SPONSORED_BY(  
    EVENT_ID INTEGER,  
    SPONSOR_ID INTEGER,  
    PRIMARY KEY(EVENT_ID,SPONSOR_ID),  
    FOREIGN KEY(EVENT_ID) REFERENCES EVENT,  
    FOREIGN KEY(SPONSOR_ID) REFERENCES SPONSOR  
);
```

```
INSERT INTO SPONSORED_BY VALUES(101,2);
INSERT INTO SPONSORED_BY VALUES(4,9);
INSERT INTO SPONSORED_BY VALUES(4,2);
INSERT INTO SPONSORED_BY VALUES(23,3);
INSERT INTO SPONSORED_BY VALUES(63,19);
INSERT INTO SPONSORED_BY VALUES(101,8);
INSERT INTO SPONSORED_BY VALUES(83,18);
INSERT INTO SPONSORED_BY VALUES(43,5);
INSERT INTO SPONSORED_BY VALUES(183,18);
INSERT INTO SPONSORED_BY VALUES(203,16);
INSERT INTO SPONSORED_BY VALUES(223,15);
INSERT INTO SPONSORED_BY VALUES(43,13);
INSERT INTO SPONSORED_BY VALUES(23,10);
INSERT INTO SPONSORED_BY VALUES(63,12);

SELECT * FROM SPONSORED_BY;
```

	EVENT_ID	SPONSOR_ID
1	101	2
2	4	9
3	4	2
4	23	3
5	63	19
6	101	8
7	83	18
8	43	5
9	183	18
10	203	16
11	223	15
12	43	13
13	23	10
14	63	12

TICKET TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
TICKET_NO	INTEGER	PRIMARY KEY
EVENT_ID	INTEGER	PRIMARY KEY,FOREIGN KEY
SEAT_NO	INTEGER	NOT NULL
COST	INTEGER	NOT NULL
TICKET_DATE	DATE	NOT NULL

NORMALIZATION:

Functional Dependencies :-

{Ticket_no, event_id} \rightarrow {Ticket_no, event_id, Seat_no, Cost, Ticket_date}

Seat_no \rightarrow cost

As there is atomic key ,relation is in 2NF.

But there is transitive dependency : seat_no \rightarrow cost

So not in 3NF.

So decompose this table into 2 tables Tickets and Cost.

TICKETS TABLE AFTER NORMALISATION

OF TICKET TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
TICKET_NO	INTEGER	PRIMARY KEY
EVENT_ID	INTEGER	PRIMARY KEY,FOREIGN KEY
SEAT_NO	INTEGER	NOT NULL
TICKET_DATE	DATE	NOT NULL

TABLE CREATION AND INSERTION:

CREATE TABLE TICKETS(

TICKET_NO INTEGER,

EVENT_ID INTEGER,

SEAT_NO INTEGER,

```
TICKET_DATE DATE,  
PRIMARY KEY(TICKET_NO,EVENT_ID),  
FOREIGN KEY(EVENT_ID) REFERENCES EVENT  
);
```

```
INSERT INTO TICKETS VALUES(1,64,2,to_date('1952-07-29', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(3,224,10,to_date('1972-08-29', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(4,163,4,to_date('1960-09-01', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(5,123,6,to_date('1952-07-24', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(6,83,9,to_date('1952-07-23', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(7,64,11,to_date('1952-08-01', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(8,123,8,to_date('1952-07-26', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(9,4,1,to_date('1952-08-01', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(10,102,9,to_date('1952-07-28', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(11,21,4, to_date('1952-07-20', 'YYYY-MM-DD'));  
INSERT INTO TICKETS VALUES(12,61,7,to_date('1952-07-30', 'YYYY-MM-DD'));  
  
SELECT * FROM TICKETS;
```

	TICKET_NO	EVENT_ID	SEAT_NO	TICKET_DATE	
1	1	64	2	29-07-52	
2	3	224	10	29-08-72	
3	4	163	4	01-09-60	
4	5	123	6	24-07-52	
5	6	83	9	23-07-52	
6	7	64	11	01-08-52	
7	8	123	8	26-07-52	
8	9	4	1	01-08-52	
9	10	102	9	28-07-52	
10	11	21	4	20-07-52	
11	12	61	7	30-07-52	

COST TABLE AFTER NORMALIZATION OF TICKET TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
SEAT_NO	INTEGER	PRIMARY KEY
COST	INTEGER	NOT NULL

TABLE CREATION AND INSERTION:

```

CREATE TABLE COST(
    SEAT_NO INTEGER PRIMARY KEY,
    COST INTEGER
);

```

```
INSERT INTO COST VALUES(1,2000);
INSERT INTO COST VALUES(2,2000);
INSERT INTO COST VALUES(3,3000);
INSERT INTO COST VALUES(4,3000);
INSERT INTO COST VALUES(5,6000);
INSERT INTO COST VALUES(6,6000);
INSERT INTO COST VALUES(7,6000);
INSERT INTO COST VALUES(8,6500);
INSERT INTO COST VALUES(9,6500);
INSERT INTO COST VALUES(10,7000);
INSERT INTO COST VALUES(11,7000);
INSERT INTO COST VALUES(12,7100);
INSERT INTO COST VALUES(13,7200);

SELECT * FROM COST;
```

	SEAT_NO	COST
1	1	2000
2	2	2000
3	3	3000
4	4	3000
5	5	6000
6	6	6000
7	7	6000
8	8	6500
9	9	6500
10	10	7000
11	11	7000
12	12	7100
13	13	7200

MEDAL TABLE:

ATTRIBUTE	DATA TYPE	CONSTRAINT
MEDAL_ID	INTEGER	PRIMARY KEY
MEDAL_TYPE	VARCHAR(50)	NOT NULL
ATHLETE_ID	INTEGER	FOREIGN KEY

NORMALIZATION:

Functional Dependencies :-

medal_id \rightarrow {medal_id , medal_type , athlete_id}

All determinants (medal_id) are candidate keys, hence the table is in BCNF. So in 2NF and 3NF also.

TABLE CREATION AND INSERTION:

```
CREATE TABLE MEDAL(  
    MEDAL_ID INTEGER,  
    MEDAL_TYPE VARCHAR(50),  
    ATHLETE_ID INTEGER,  
    PRIMARY KEY(MEDAL_ID),  
    FOREIGN KEY(ATHLETE_ID) REFERENCES ATHLETE  
);
```

```
INSERT INTO MEDAL VALUES(301, 'GOLD', 101);  
INSERT INTO MEDAL VALUES(302, 'SILVER', 102);  
INSERT INTO MEDAL VALUES(303, 'BRONZE', 103);  
INSERT INTO MEDAL VALUES(304, 'GOLD', 108);  
INSERT INTO MEDAL VALUES(305, 'SILVER', 105);  
INSERT INTO MEDAL VALUES(306, 'BRONZE', 106);  
INSERT INTO MEDAL VALUES(307, 'GOLD', 107);  
INSERT INTO MEDAL VALUES(308, 'SILVER', 124);  
INSERT INTO MEDAL VALUES(309, 'BRONZE', 109);
```

```
INSERT INTO MEDAL VALUES(310, 'GOLD', 119);
INSERT INTO MEDAL VALUES(311, 'SILVER', 131);
INSERT INTO MEDAL VALUES(312, 'BRONZE', 122);
INSERT INTO MEDAL VALUES(313, 'GOLD', 113);
INSERT INTO MEDAL VALUES(314, 'SILVER', 134);
INSERT INTO MEDAL VALUES(315, 'BRONZE', 115);
INSERT INTO MEDAL VALUES(316, 'GOLD', 116);
INSERT INTO MEDAL VALUES(317, 'SILVER', 117);
INSERT INTO MEDAL VALUES(318, 'BRONZE', 118);
INSERT INTO MEDAL VALUES(319, 'GOLD', 119);
INSERT INTO MEDAL VALUES(320, 'SILVER', 124);

SELECT * FROM MEDAL;
```

	MEDAL_ID	MEDAL_TYPE	ATHLETE_ID
1	301	GOLD	101
2	302	SILVER	102
3	303	BRONZE	103
4	304	GOLD	108
5	305	SILVER	105
6	306	BRONZE	106
7	307	GOLD	107
8	308	SILVER	124
9	309	BRONZE	109
10	310	GOLD	119
11	311	SILVER	131
12	312	BRONZE	122
13	313	GOLD	113
14	314	SILVER	134
15	315	BRONZE	115
16	316	GOLD	116
17	317	SILVER	117
18	318	BRONZE	118
19	319	GOLD	119
20	320	SILVER	124