OLYMICS 2016



Database Management Design Project

5th December 2014

Ronald Dartey

Table of Contents

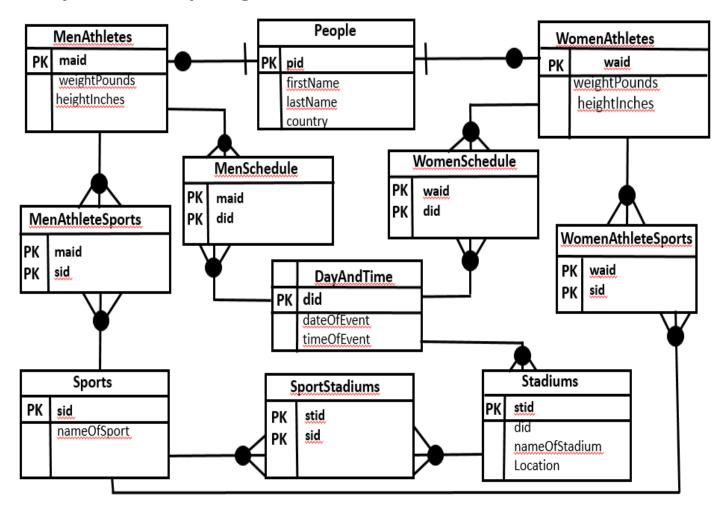
l.	Executive Summary	2
II.	Entity Relationship Diagram	.3
III.	Tables3—	-18
	1. People	
	2. DayAndTime	
	3. MenAthletes	
	4. WomenAthletes	
	5. MenSchedule	
	6. WomenSchedule	
	7. Sports	
	8. MenAthleteSports	
	9. WomenAthleteSports	
	10. Stadiums	
	11. SportStadium	
IV.	Views19-	-21
V.	Reports and Queries21-	-22
VI.	Stored Procedures23-	
VII.	Triggers24-	-25
VIII.	Security	25
IX.	Implementation Notes	
Χ.	Known Problem	
ΧI	Future Enhancement	26

Executive Summary

Spain is hosting Olympics in 2016 and the city for this event is Madrid. There will be different athletes from different countries to participate in this event. Athletes will be grouped into sexes in each sport (which can be swimming or handball). An athlete is allowed to play a sport with people in his or her gender group. There are days and times in which theses sports are played. There are also different stadiums to host this event.

This database is designed to keep track of the days and time each in which each athlete has a game. This will prevent athletes from different genders to play together in a sport. This database is also designed to prevent confliction, thus an event occurring at the same time in the same stadium.

Entity Relationship Diagram



Tables

1. People

Create Statement:

```
DROP TABLE IF EXISTS People;
-- People --
CREATE TABLE People(
pid char(4) not null,
firstName varchar(30) not null,
lastName varchar(30) not null,
country varchar(30),
primary key (pid)
);
```

Insert Statements:

```
-- People --
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p001', 'Theo', 'Walcot', 'Kenya');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p002', 'Peter', 'Barkley', 'England');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p003', 'Jenn', 'Dephna', 'Crotia');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p004', 'Luiz', 'Suarez', 'Uraguy');
INSERT INTO People (pid, firstName, lastName, country)
 VALUES('p005', 'Linda', 'Smith', 'England');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p006', 'Mary', 'Fisher', 'Denmark');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p007', 'Ronald', 'Dartey', 'Ghana');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p008', 'Kevin', 'Krapah', 'Ghana');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p009', 'Kristie', 'Blake', 'Jamaica');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p010', 'Recardo', 'Kaka', 'Brazil');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p011', 'Park', 'Song', 'Japan');
INSERT INTO People(pid, firstName, lastName, country)
 VALUES('p012', 'Mehdi', 'Owdji', 'Iran');
```

INSERT INTO People(pid, firstName, lastName, country)

VALUES('p013', 'Elsie', 'Brown', 'Netherland');

Sample data Output:

Data	Output	Explair	n Messages	History	,			
	pid charac	ter(4)	firstname character vary	/ing(30)	lastname character v	arying(30)	country character varying(30)	
1	p001		Theo		Walcot		Kenya	
2	p002		Peter	eter			England	
3	p003		Jenn		Dephna		Crotia	
4	p004		Luiz		Suarez		Uraguy	
5	p005		Linda		Smith		England	
6	p006 Mary		Mary	ary			Denmark	
7	p007 Ronald		Ronald	ld Dartey			Ghana	
8	800q	p008 Kevin			Krapah		Ghana	
9	p009 Kristie			Blake		Jamaica		
10	p010 R		Recardo	ecardo			Brazil	
11	p011		Park		Song		Japan	
12	p012		Mehdi		Owdji		Iran	
13	p013		Elsie		Brown		Netherland	

Functional Dependencies

Pid → firstName, lastName, country

2. DayAndTime

Create Statement:

```
DROP TABLE IF EXISTS DayAndTime;
-- DayAndTime --
CREATE TABLE DayAndTime (
did char(4) not null,
DateOfEvent date,
TimeOfEventGMT time,
primary key(did)
);
```

Insert Statements:

```
-- DayAndTime --
INSERT INTO DayAndTime( did, DateOfEvent, TimeOfEventGMT)
VALUES('d001', '06/07/2014', '13:05');
INSERT INTO DayAndTime( did, DateOfEvent, TimeOfEventGMT)
VALUES('d002', '06/07/2014', '18:05');
```

INSERT INTO DayAndTime(did, DateOfEvent, TimeOfEventGMT)

VALUES('d003', '06/08/2014', '14:05');

INSERT INTO DayAndTime(did, DateOfEvent, TimeOfEventGMT) VALUES('d004', '06/08/2014', '20:45');

INSERT INTO DayAndTime(did, DateOfEvent, TimeOfEventGMT) VALUES('d005', '06/09/2014', '12:30');

INSERT INTO DayAndTime(did, DateOfEvent, TimeOfEventGMT) VALUES('d006', '06/09/2014', '19:05');

INSERT INTO DayAndTime(did, DateOfEvent, TimeOfEventGMT) VALUES('d007', '06/10/2014', '20:05');

Sample data output:

Output pane									
Data	Output	Explair	n	Messages		History			
	did character(4)				timeofeventgmt time without time zon				
1	d001		201	14-06-07	13	:05:00			
2	d002		201	14-06-07	18	:05:00			
3	d003		201	14-06-08	14	:05:00			
4	d004		201	14-06-08	20	:45:00			
5	d005		201	14-06-09	12	:30:00			
6	d006		201	14-06-09	19	:05:00			
7	d007		201	14-06-10	20	:05:00			

Functional Dependencies:

did ----- dateOfEvent, timeOfEventGMT

3. MenAthletes

Create Statement:

DROP TABLE IF EXISTS MenAthletes;
-- MenAthletes -CREATE TABLE MenAthletes (
maid char(4) references People(pid),
weightPounds int,

```
heightInches int,
primary key(maid),
unique (maid)
);
```

Insert Statements:

```
-- MenAthletes -- INSERT INTO MenAthletes (maid, weightPounds, heightInches) VALUES ('p001', 75, 185);
```

```
INSERT INTO MenAthletes (maid, weightPounds, heightInches) VALUES ('p002', 75, 185);
```

```
INSERT INTO MenAthletes( maid, weightPounds, heightInches) VALUES('p004', 72, 191);
```

INSERT INTO MenAthletes(maid, weightPounds, heightInches) VALUES('p007', 77, 181);

INSERT INTO MenAthletes(maid, weightPounds, heightInches) VALUES('p008', 73, 178);

INSERT INTO MenAthletes (maid, weightPounds, heightInches) VALUES ('p010',69, 175);

INSERT INTO MenAthletes(maid, weightPounds, heightInches) VALUES('p011', 75, 189);

INSERT INTO MenAthletes(maid, weightPounds, heightInches) VALUES('p012', 71, 185);

Sample data output:

Output pane								
Data	Output	Explair	n	Messages	History			
	maid charac	ter(4)			heightinches integer			
1	p001			75	185			
2	p002			75	185			
3	p004			72	191			
4	p007			77	181			
5	800g			73	178			
6	p010			69	175			
7	p011			75	189			
8	p012			71	185			

Functional dependencies:

maid → weightPounds, heightInches.

4. WomenAthletes

Create Statement:

```
DROP TABLE IF EXISTS WomenAthletes;
-- WomenAthletes --
CREATE TABLE WomenAthletes (
waid char(4) references People(pid),
weightPounds int,
heightInches int,
primary key(waid),
unique (waid)
);
```

Insert Statements:

-- WomenAthletes -- INSERT INTO WomenAthletes(waid, weightPounds, heightInches) VALUES('p003', 69, 169);

INSERT INTO WomenAthletes(waid, weightPounds, heightInches) VALUES('p005', 70, 171);

INSERT INTO WomenAthletes(waid, weightPounds, heightInches) VALUES('p006', 67, 169);

INSERT INTO WomenAthletes(waid, weightPounds, heightInches) VALUES('p009', 70, 177);

INSERT INTO WomenAthletes(waid, weightPounds, heightInches) VALUES('p013', 73, 173);

Sample data output:

Data Output Explain Messages History								
	waid character(4	weightpounds) integer	heightinches integer					
1	p003	69	169					
2	p005	70	171					
3	p006	67	169					
4	p009	70	177					
5	p013	73	173					

Functional dependencies:

waid weightPounds, heightInches.

5. MenSchedule

Create Statement:

```
DROP TABLE IF EXISTS MenSchedule;
CREATE TABLE MenSchedule (
maid char(4) references MenAthletes(maid),
did char(4) references DayAndTime(did),
primary key (maid, did)
);
```

Insert Statements:

```
--MenSchedule--
INSERT INTO MenSchedule(maid, did)
VALUES('p001', 'd001');
INSERT INTO MenSchedule(maid, did)
VALUES('p001', 'd006');
INSERT INTO MenSchedule(maid, did)
VALUES('p002', 'd001');
INSERT INTO MenSchedule(maid, did)
```

VALUES('p004', 'd002');

INSERT INTO MenSchedule(maid, did) VALUES('p004', 'd006');

INSERT INTO MenSchedule(maid, did) VALUES('p007', 'd002');

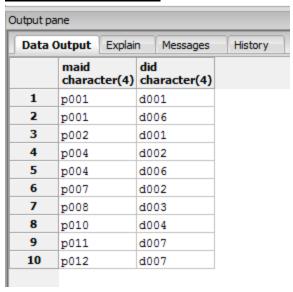
INSERT INTO MenSchedule(maid, did) VALUES('p008', 'd003');

INSERT INTO MenSchedule(maid, did) VALUES('p010', 'd004');

INSERT INTO MenSchedule(maid, did) VALUES('p011', 'd007');

INSERT INTO MenSchedule(maid, did) VALUES('p012', 'd007');

Sample data output:



Functional Dependencies:

maid and did are the composite key for this table.

6. WomenSchedule

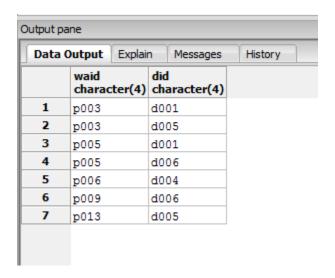
```
Create Statement:
```

```
DROP TABLE IF EXISTS WomenSchedule;
-- WomenSchedule --
CREATE TABLE WomenSchedule (
  waid char(4) references WomenAthletes(waid),
  did char(4) references DayAndTime(did),
  primary key (waid, did)
);
```

Insert Statements:

```
--WomenSchedule--
INSERT INTO WomenSchedule(waid, did)
VALUES('p003', 'd001');
INSERT INTO WomenSchedule(waid, did)
VALUES('p003', 'd005');
INSERT INTO WomenSchedule(waid, did)
VALUES('p005', 'd001');
INSERT INTO WomenSchedule(waid, did)
VALUES('p005', 'd006');
INSERT INTO WomenSchedule(waid, did)
VALUES('p006', 'd004');
INSERT INTO WomenSchedule(waid, did)
VALUES('p009', 'd006');
INSERT INTO WomenSchedule(waid, did)
VALUES('p009', 'd006');
INSERT INTO WomenSchedule(waid, did)
VALUES('p013', 'd005');
```

Sample data output:



Functional Dependencies:

waid and did are the composite key for this table.

7. Sports

Create Statement

```
DROP TABLE IF EXISTS Sports;
-- Sports --
CREATE TABLE Sports (
sid char(4) not null,
nameOfSport text,
primary key(sid)
);
```

Insert Statements:

```
-- Sports --
INSERT INTO Sports(sid, nameOfSport)
VALUES('s001', 'Soccer');
INSERT INTO Sports(sid, nameOfSport)
VALUES('s002', 'Swimming');
INSERT INTO Sports(sid, nameOfSport)
VALUES('s003', 'Boxing');
INSERT INTO Sports(sid, nameOfSport)
VALUES('s004', 'Hockey');
```

```
INSERT INTO Sports(sid, nameOfSport)
VALUES('s005', 'Handball');
INSERT INTO Sports(sid, nameOfSport)
```

Sample data output:

VALUES('s006', 'Volleyball');

output pane								
Data	n Messages	History						
	sid character(4)	nameofsport text						
1	s001	Soccer						
2	s002	Swimming						
3	s003	Boxing						
4	s004	Hockey						
5	s005	Handball						
6	s006	Volleyball						

Functional Dependencies:

sid → nameOfSport

8. MenAthleteSports

Create Statement:

```
DROP TABLE IF EXISTS MenAthleteSports;
--MenAthleteSports--
CREATE TABLE MenAthleteSports (
    maid char(4) references MenAthletes(maid),
    sid char(4) references Sports(sid),
    primary key (maid, sid),
    unique (maid)
);
```

Insert Statements:

```
--MenAthleteSports--
INSERT INTO MenAthleteSports(maid, sid)
VALUES('p001', 's001');
```

INSERT INTO MenAthleteSports(maid, sid)

VALUES('p002', 's002');

INSERT INTO MenAthleteSports(maid, sid) VALUES('p004', 's001');

INSERT INTO MenAthleteSports(maid, sid) VALUES('p007', 's002');

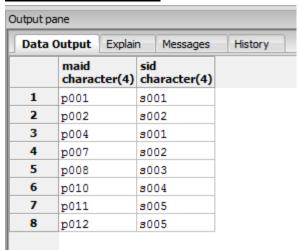
INSERT INTO MenAthleteSports(maid, sid) VALUES('p008', 's003');

INSERT INTO MenAthleteSports(maid, sid) VALUES('p010', 's004');

INSERT INTO MenAthleteSports(maid, sid) VALUES('p011', 's005');

INSERT INTO MenAthleteSports(maid, sid) VALUES('p012', 's005');

Sample data output:



Functional Dependencies:

maid and sid are the composite key for this table.

9. WomenAthleteSports

Create Statement:

DROP TABLE IF EXISTS WomenAthleteSports;

```
-- WomenAthleteSports --
CREATE TABLE WomenAthleteSports (
waid char(4) references WomenAthletes(waid),
sid char(4) references Sports(sid),
primary key (waid, sid),
unique (waid)
);
```

Insert Statements:

```
--WomenAthleteSports--
INSERT INTO WomenAthleteSports(waid, sid)
VALUES('p003', 's002');
```

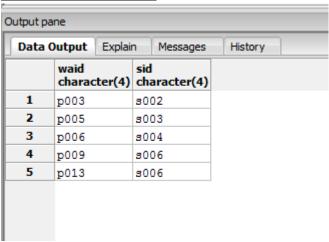
INSERT INTO WomenAthleteSports(waid, sid)
VALUES('p005', 's003');

INSERT INTO WomenAthleteSports(waid, sid)
VALUES('p006', 's004');

INSERT INTO WomenAthleteSports(waid, sid)
VALUES('p009', 's006');

INSERT INTO WomenAthleteSports(waid, sid)
VALUES('p013', 's006');

Sample data output:



Functional Dependencies:

waid and sid are the composite key for this table.

10. Stadiums

```
Create Statements:
DROP TABLE IF EXISTS Stadiums;
-- Stadiums --
CREATE TABLE Stadiums (
stid char(4) not null,
      char(4) not null references DayAndTime(did),
nameOfStadium varchar(120),
Location varchar(120),
primary key(stid),
unique (stid)
);
Insert Statements:
-- Stadium --
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st01', 'd001', 'Emirites Stadium', '329 St, London');
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st02', 'd001', 'White Atlain', '214 St, London');
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st03', 'd002', 'Craven Cott', '431 St, London');
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st04', 'd002', 'White Atlain', '214 St, London');
INSERT INTO Stadiums (stid, did, nameOfStadium, Location)
VALUES('st05', 'd003', 'Stamford Stadium', '121 St, London');
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st06', 'd004', 'Emirites Stadium', '329 St, London');
INSERT INTO Stadiums( stid, did, nameOfStadium, Location)
VALUES('st07', 'd005', 'Craven Cott', '431 St, London');
INSERT INTO Stadiums (stid, did, nameOfStadium, Location)
VALUES('st08', 'd006', 'Craven Cott', '431 St, London');
INSERT INTO Stadiums (stid, did, nameOfStadium, Location)
VALUES('st09', 'd007', 'Emirites Stadium', '329 St, London');
```

Sample data output:

Data	Output Explai	n Messages	History	
	stid character(4)	did character(4)	nameofstadium character varying(120)	location character varying(120)
1	st01	d001	Emirites Stadium	329 St, Madrid
2	st02	d001	White Atlain	214 St, Madrid
3	st03	d002	Craven Cott	431 St, Madrid
4	st04	d002	White Atlain	214 St, Madrid
5	st05	d003	Stamford Stadium	121 St, Madrid
6	st06	d004	Expreto Stadium	329 St, Madrid
7	st07	d005	Craven Cott	431 St, Madrid
8	st08	d006	Craven Cott	431 St, Madrid
9	st09	d007	Emirites Stadium	329 St, Madrid

Functional Dependencies:

stid ----- did, nameOfStadium, Location.

11. SportStadium

Create Statements:

```
DROP TABLE IF EXISTS SportStadium;
-- SportStadium --
CREATE TABLE SportStadium (
stid char(4) references Stadiums(stid),
sid char(4) references Sports(sid),
primary key (stid, sid)
);
```

Insert Statements:

```
--SportStadium--
INSERT INTO SportStadium(stid, sid)
VALUES('st01', 's001');
INSERT INTO SportStadium(stid, sid)
VALUES('st02', 's001');
INSERT INTO SportStadium(stid, sid)
```

```
VALUES('st03', 's001');

INSERT INTO SportStadium(stid, sid)
VALUES('st04', 's002');

INSERT INTO SportStadium(stid, sid)
VALUES('st05', 's003');

INSERT INTO SportStadium(stid, sid)
VALUES('st06', 's004');

INSERT INTO SportStadium(stid, sid)
VALUES('st07', 's005');

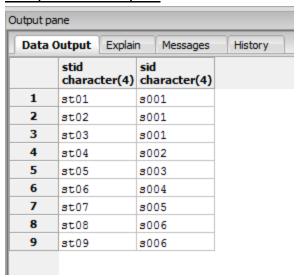
INSERT INTO SportStadium(stid, sid)
VALUES('st07', 's005');

INSERT INTO SportStadium(stid, sid)
VALUES('st08', 's006');
```

INSERT INTO SportStadium(stid, sid)

Sample data output:

VALUES('st09', 's006');



Functional Dependencies:

stid and sid are the composite key for this table.

Views:

1. Athlete Names

```
This view gets the names of all the athletes present at the Event.
```

```
--view 1—
```

DROP VIEW IF EXISTS athleteName;

create view athleteName AS

select distinct firstName, lastName

from People p,

MenAthletes ma,

WomenAthletes wa

where p.pid = ma.maid

or p.pid = wa.waid

select *

from athleteName

Sample data output:

Data	Output	Explain	Messa	ages	History	
	firstna charac		lastname character varying(30)			
1	Kevin			Krapa	h	
2	Peter			Barkl	еу	
3	Linda			Smith		
4	Jenn		Dephna			
5	Mehdi			Owdji		
6	Kristi	ie		Blake		
7	Luiz		Suare	z		
8	Recard	io		Kaka		
9	Park			Song		
10	Elsie			Brown	ı	
11	Ronald	i		Darte	У	
12	Theo			Walco	t	
13	Mary			Fishe	r	

2. <u>SoccerTime</u>

This view gets the date and time in which soccer is played.

```
--view 2—

DROP VIEW IF EXISTS SoccerTime;

create view SoccerTime AS

select distinct d.dateOfEvent, d.timeOfEventGMT

from DayAndTime d,

Stadiums st,

SportStadium sp,

Sports s

where d.did = st.did

and st.stid = sp.stid

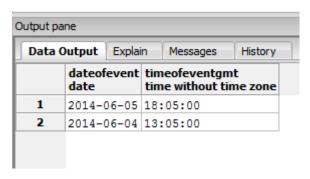
and sp.sid = s.sid

and s.nameOfSport = 'Soccer'
```

select *

from SoccerTime

Sample data output:



Reports and queries.

1. This query gets the first name, last name and country of athletes who are women and have a game on 2014-06-04.

```
--Get the names and countries of WomenAthletes who have a game on 2014-06-04--
```

select p.firstName, p.lastName, p.country

from People p

where p.pid in (select w.waid

from WomenAthletes w

where w.waid in (select ws.waid

from WomenSchedule ws

where ws.did in (select d.did

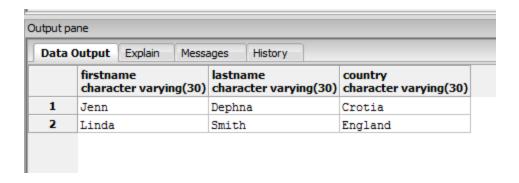
from DayAndTime d

where dateOfEvent = '2014-06-04')

)

order by p.firstName ASC

Sample data output:



2. This query gives the names and countries of men athletes who have a game the same date and time as women athletes.

select p.firstName, p.lastName, p.country

from People p

where p.pid in (select m.maid

from MenAthletes m,

MenSchedule ms,

WomenAthletes w,

WomenSchedule ws

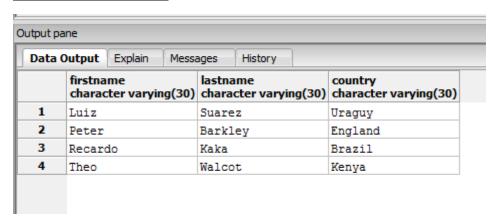
where m.maid = ms.maid

and w.waid = ws.waid

and ms.did = ws.did)

order by p.firstName ASC

Sample data output:



Stored Procedures:

This stored procedure has a function called athletesOfStadium. This function takes in a name of a stadium and returns the first and last names of athletes who have a game in that stadium.

```
--Stored Procedure--
create or replace function athletesOfStadium(varchar(120), REFCURSOR) returns refcursor as
$$
declare
 nameOfStadium varchar(120) := $1;
 resultset REFCURSOR := $2;
begin
 open resultset for
   select p.firstName, p.lastName
   from People p,
               MenAthletes ma
   where p.pid = ma.maid
   and ma.maid in (select mt.maid
                   from MenAthleteSports mt
                   where mt.sid in (select s.sid
                                      from Sports s
                                      where s.sid in (select sp.sid
                                                      from SportStadium sp
                                                      where sp.stid in (select st.stid
                                                                       from Stadiums st
                                                                       where st.nameOfStadium =
nameOfStadium))));
 return resultset;
end;
$$
```

```
language plpgsql;
```

select athletesOfStadium('Emirites Stadium', 'results');

Fetch all from results;

Sample data output:

Output pane									
Data Output Explain Messages History									
	firstna charac		ıg(30)	lastname 30) character varying(
1	Theo			Walcot					
2	Luiz		Suarez						

Triggers:

This trigger prevents user from inserting or updating data if the Olympic events are closed or have not started since the Olympics starts and closes on a specific date. It also helps to prevent feeding the database with wrong data.

```
DROP TRIGGER IF EXISTS dateTestTrigger on DayAndTime;

create or replace function dateTest()

returns trigger as

$BODY$

declare

account_type varchar;

begin

IF (NEW.DateOfEvent >'2014-06-10' or NEW.DateOfEvent <'2014-06-04') then

raise NOTICE 'WARNING : There are no events on this day %', NEW.DateOfEvent;

end if;

return null;

end;

$BODY$
```

```
language plpgsql volatile
cost 100;
alter function dateTest()
owner to postgres;

create trigger dateTestTrigger
after insert or update
on DayAndTime
for each row
execute procedure dateTest();
```

Security:

Database administrators will have access to all the database. Women and men athletes will be allowed to enter the kind of sports they play. Women athletes will not be allowed to view the men athlete table and vice versa.

```
--Database Administrator--
grant all privileges on all tables in schema public to bdAdministrator;
--Women Athletes--
grant insert on WomenAthletes to Sports;
revoke WomenAthletes from MenAthletes
```

--MenAthletes--

grant insert on MenAthletes to Sports;

revoke MenAthletes from WomenAthletes

Implementation Notes:

An athlete will be allowed to view his table and will, therefore know the time he or she has a game. An athlete should also know the kind of sports he or she plays.

Known Problem:

Each athlete is allowed to play only one sport. Men athletes and women athletes can play the same kind of sports. An athlete can play on different days and many athletes can play on the same day at the same time. Also a stadium can have more than one sport event but not the same time. Men and women athletes will not have a sport together at the same time and in the same stadium.

Future Enhancement:

People table could have weightPounds and heightInches to prevent the pain of entering the same column twice, thus in the men and women athlete's tables