COSC344 Assignment 2

Team: 12
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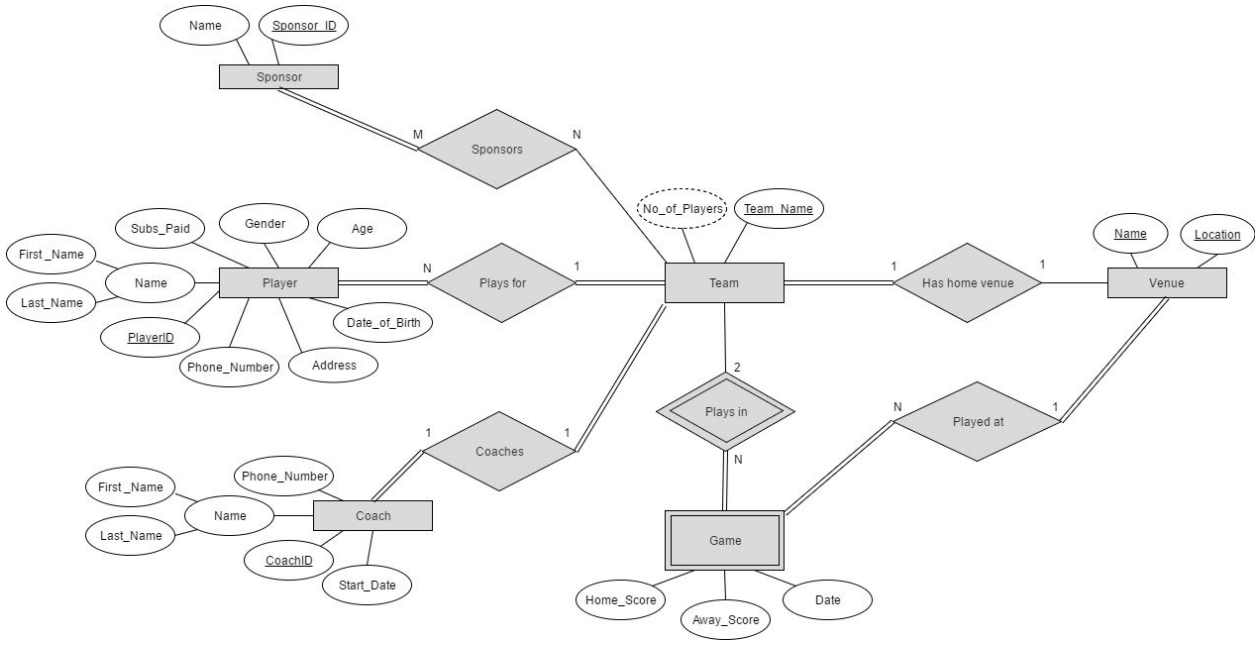
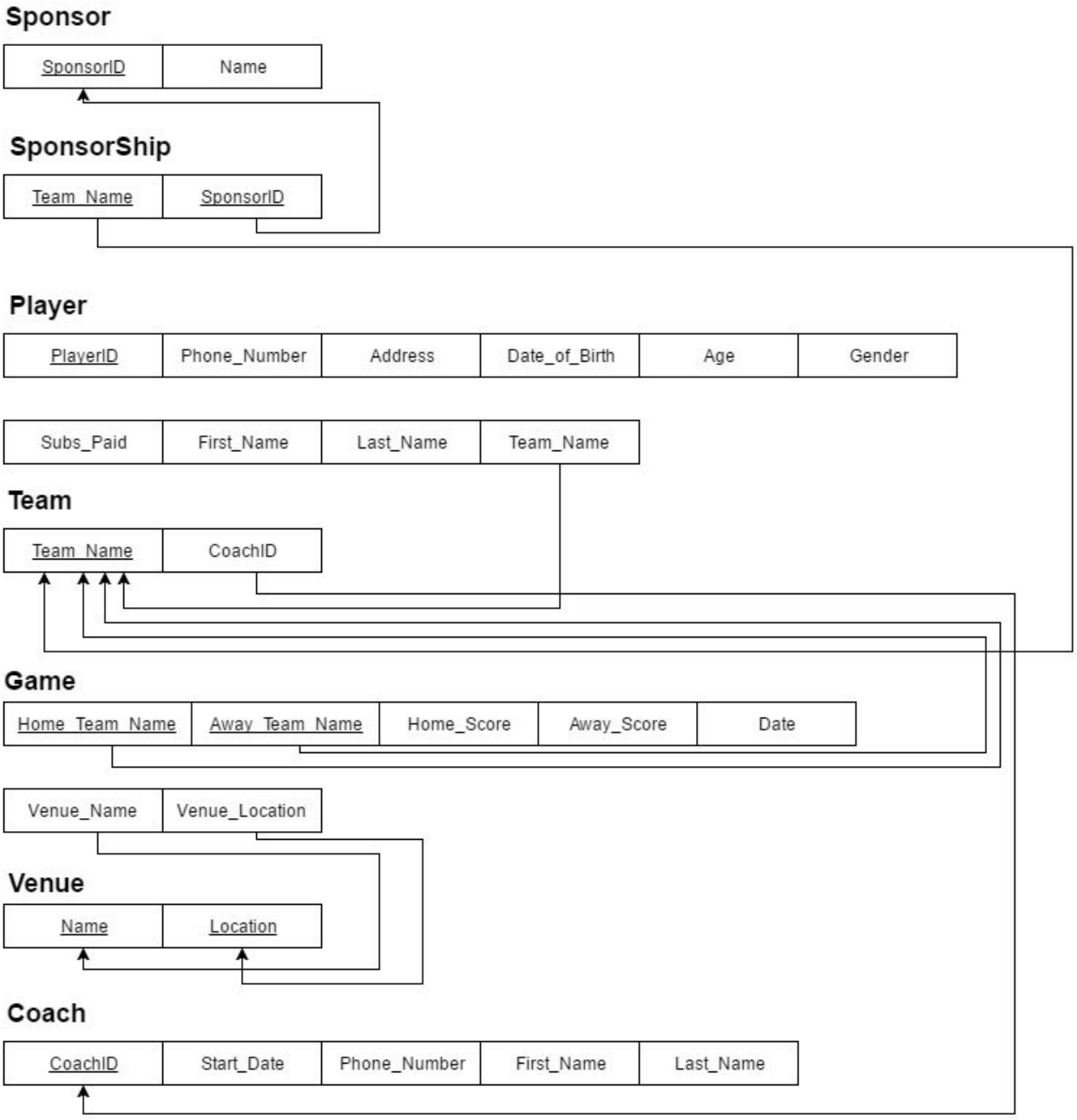
Members: Zac Gardner, Tate Kennington, Meiqi Sun

1. ER Diagram



2. Relational Schema



3. Normalization

Sponsor
This relation only has one functional dependency:

- (sponsor_id -> name)

These values are both atomic and this dependency is fully dependent. In addition this dependency is non-transitive and clearly has a superkey as the LHS, therefore the relation is in BCNF.

Sponsorship
In this relation both values, that is Sponsor_ID and Team_Name are functionally independent of one another, as they both atomic and part of the primary key of the relation this means that this relation is in BCNF.

Player
The functional dependencies in this relation are:

- (player_id ->phone_number)
- (player_id ->address)
- (player_id ->Date_of_Birth)
- (player_id ->Age)
- (player_id ->Gender)
- (player_id ->Subs_paid)
- (player_id ->first_name)
- (player_id ->last_name)
- (player_id ->team_name)

In this relation all values are atomic only, and are a value from the domain of the attribute meaning the relation is in 1nf. There is , however, a partial dependency present with age, while it is partially dependant of player_id it can also be derived from the date_of_birth, making its presence in the relation redundant. Any age can be easily obtained with a quick calculation to date of birth. By removing age the relation is in 2nf. There exists no transitive dependencies in the relation allowing it to be in 3nf and there exists no dependencies with a non_superkey LHS therefore making this relation BCNF.

Team
In this relation there is a single functional dependency:

- (Team_Name -> CoachID)

These values are atomic and clearly this dependency is fully dependent, non-transitive, and has a superkey of the relation as its LHS. Therefore we can determine that the team relation is in BCNF.

Game

The functional dependencies in this relation are:

- (Home_Team_Name, Away_Team_Name -> Home_Score)
- (Home_Team_Name, Away_Team_Name -> Away_Score)
- (Home_Team_Name, Away_Team_Name -> Date)
- (Home_Team_Name, Away_Team_Name -> Venue_Name)
- (Home_Team_Name, Away_Team_Name -> Venue_Location)

All of these values are atomic so the relation is in 1NF, and although the primary key consists of multiple values each dependency is fully dependent and so the relation is also in 2NF. Also note that the LHS of each of these dependencies is the primary key of the relation, and so is also a superkey of the relation, therefore the relation satisfies the requirements for being in BCNF/3NF, that is there are no transitive functional dependencies and no dependencies that have a non-superkey LHS.

Venue

LIke with the sponsorship relation this table has only two, functionally independent attributes, which are both part of the primary key, that is Name and Location. So by the same logic as with the sponsorship relation we can conclude that this relation is in BCNF.

Coach

In this relation the functional dependencies are:

- (CoachID -> Start_Date)
- (CoachID -> Phone_Number)
- (CoachID -> First_Name)
- (CoachID -> Last_Name)

It is clear that all of these attribute are atomic, so the relation is already in 1NF. Also they all only have one attribute on the LHS and so are fully functionally dependent, by definition. Additionally all of these dependencies have the primary key on the LHS so we can also say that they are all non-transitive, so the relation also satisfies the requirement to be in 3NF and BCNF.

4. Load.sql

```
DROP TABLE venue;
```

```
DROP TABLE game;
DROP TABLE sponsorship;
DROP TABLE sponsor;
DROP TABLE player;
DROP TABLE team;
DROP TABLE coach;

CREATE TABLE coach(
        CoachID int PRIMARY KEY,
        Start_Date date DEFAULT sysdate,
        Phone_Number int NOT NULL,
        First_Name varchar(25) NOT NULL,
        Last_Name varchar(25) NOT NULL
);

INSERT INTO coach VALUES
('1001',TO_DATE('22-05-2008','DD-MM-YYYY'),0123456,'Andrew','Trotman');
INSERT INTO coach VALUES
('1002',TO_DATE('22-05-2009','DD-MM-YYYY'),6543210,'Richard','Keefe');
INSERT INTO coach VALUES
('1003',TO_DATE('22-05-2010','DD-MM-YYYY'),0123654,'Nick','Meek');
INSERT INTO coach VALUES
('1004',TO_DATE('22-05-2010','DD-MM-YYYY'),3210456,'Haibo','Zhang');

CREATE TABLE team(
        Team_Name varchar(25) PRIMARY KEY,
        CoachID int,
        CONSTRAINT FK_TeamCoach FOREIGN KEY (CoachID)
        REFERENCES coach(CoachID)
);

INSERT INTO team VALUES
('Team 1', 1001);
INSERT INTO team VALUES
('Team 2', 1002);
INSERT INTO team VALUES
('Team 3', 1003);
INSERT INTO team VALUES
('Team 4', 1004);
```

```
CREATE TABLE player(
        PlayerID int PRIMARY KEY,
        Phone_Number int NOT NULL,
        Address varchar(50),
        Date_of_Birth date NOT NULL,
        Gender varchar(10) NOT NULL,
        Subs_Paid int DEFAULT 0,
        First_Name varchar(25) NOT NULL,
        Last_Name varchar(25) NOT NULL,
        Team_Name varchar(25) NOT NULL,
        CONSTRAINT FK_TeamName FOREIGN KEY (Team_Name)
        REFERENCES team(Team_Name)
);

INSERT INTO player VALUES
(10001,12345678,'20 mill street', TO_DATE('22-05-1988','DD-MM-YYYY'),'M',1, 'Alex',
'Baker', 'Team 1');
INSERT INTO player VALUES
(10002,87654321,'29 queen street', TO_DATE('22-06-1988','DD-MM-YYYY'),'M',1,
'Bob', 'Clark', 'Team 1');
INSERT INTO player VALUES
(10003,13572468,'29 sederick street', TO_DATE('22-07-1988','DD-MM-YYYY'),'M',1,
'Charles', 'Dyer', 'Team 2');
INSERT INTO player VALUES
(10004,24681357,'100 may street', TO_DATE('22-08-1988','DD-MM-YYYY'),'M',1,
'David', 'Fisher', 'Team 2');
INSERT INTO player VALUES
(10005,86427531,'290 goerge street', TO_DATE('22-09-1988','DD-MM-YYYY'),'M',1,
'Edwin', 'Grant', 'Team 3');
INSERT INTO player VALUES
(10006,75318642,'150 park street', TO_DATE('10-10-1988','DD-MM-YYYY'),'M',1,
'Fred', 'Harmon', 'Team 3');
INSERT INTO player VALUES
(10007,12348765,'10 union street', TO_DATE('10-11-1988','DD-MM-YYYY'),'M',1,
'Goerge', 'Jackson', 'Team 4');
INSERT INTO player VALUES
(10008,56784321,'50 main street', TO_DATE('10-12-1988','DD-MM-YYYY'),'M',1,
'Herbert', 'Kingston', 'Team 4');
```

```
CREATE TABLE sponsor(
        SponsorID int PRIMARY KEY,
        Name varchar(25) NOT NULL
);

INSERT INTO sponsor VALUES
(001,'anz');
INSERT INTO sponsor VALUES
(002,'bnz');
INSERT INTO sponsor VALUES
(003,'air new zealand');
INSERT INTO sponsor VALUES
(004,'Whitcoulls');

CREATE TABLE sponsorship(
        Team_Name varchar(25) NOT NULL UNIQUE,
        SponsorID int,
        CONSTRAINT FK_TeamSponsor FOREIGN KEY (SponsorID)
        REFERENCES sponsor(SponsorID),
        CONSTRAINT FK_SupportTeam FOREIGN KEY (Team_Name)
        REFERENCES team(Team_Name)
);


INSERT INTO sponsorship VALUES
('Team 1', 001);
INSERT INTO sponsorship VALUES
('Team 2', 002);
INSERT INTO sponsorship VALUES
('Team 3', 003);
INSERT INTO sponsorship VALUES
('Team 4', 004);


CREATE TABLE game(
        Home_Team_Name varchar(25) NOT NULL,
```

```
	Away_Team_Name varchar(25) NOT NULL,
	Home_Score int DEFAULT 0 NOT NULL,
	Away_Score int DEFAULT 0 NOT NULL,
	Game_Date date DEFAULT sysdate NOT NULL,
	CONSTRAINT PK_Game PRIMARY KEY (Home_Team_Name,
Away_Team_Name),
	CONSTRAINT CHK_Score CHECK (Home_Score >= 0 AND Away_Score >= 0)
);

INSERT INTO game VALUES
('Team 1','Team 2',2,0,TO_DATE('22-05-2016','DD-MM-YYYY'));
INSERT INTO game VALUES
('Team 2','Team 3',1,1,TO_DATE('22-06-2016','DD-MM-YYYY'));
INSERT INTO game VALUES
('Team 3','Team 4',0,3,TO_DATE('22-07-2016','DD-MM-YYYY'));
INSERT INTO game VALUES
('Team 4','Team 1',3,1,TO_DATE('22-08-2016','DD-MM-YYYY'));

CREATE TABLE venue(
	Name varchar(50) NOT NULL UNIQUE,
	Location varchar(50) NOT NULL,
	CONSTRAINT PK_Venue PRIMARY KEY (Name, Location)
);

INSERT INTO venue VALUES
('Sir Woolf Fisher Arena Vodafone Events Centre','Auckland');
INSERT INTO venue VALUES
('The trust arena','Auckland');
INSERT INTO venue VALUES
('TSB Bank Arena','Wellington');
INSERT INTO venue VALUES
('Westpac Stadium','Wellington');
INSERT INTO venue VALUES
('Forsyth Barr Stadium','Dunedin');
INSERT INTO venue VALUES
('AMI Stadium','Christchurch');

COMMIT;
```

```
SET LINESIZE 1000;

SELECT * FROM venue;
SELECT * FROM coach;
SELECT * FROM team;
SELECT * FROM game;
SELECT * FROM sponsor;
SELECT * FROM sponsorship;
SELECT * FROM player;
```

5. Teamwork Summary

- All the team members have participated actively in the discussion. Details were decided among everyone and consensus was reached.
- Everyone contributed an equal amount of work and finished their assigned tasks on time.