

CPSC 304 Project Cover Page

Milestone #: 2

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Group Number: 11

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

ER Diagram

Project Description

This project revolves around a database system that tracks various aspects of basketball leagues, including sponsors, teams, revenue, and players. The domain of the application is sports league management. The program will capture the interactions between different entities within the league. It gives the user both a broad overview of the current status of the league and detailed insights into player and team performance, enabling cost and performance analysis to improve the overall quality of the league.

Changes to ER Diagram

We decided to implement all the changes suggested by the feedback we received to our Milestone 1 submission. We forgot to include the relationship “Works for” between our entities Team and Staff, so we added that in. We added the “ID” as the primary key for the entity Sponsor, and added an additional attribute “Slogan”.

Furthermore, we also decided to change the attribute to our entity Doctor so that its attribute is now Field instead of Specialty, this is to avoid duplication between Doctor and Trainer. We deleted the “Starting Date” attribute from the entity Contract and added the attribute “Signed Date” to the relation Signed between the Contact entity and Player Entity as we felt it was more accurate to what actually happens between the player and contract. We also changed the attribute name “Location” in entity Game to “City” to better represent the data.

Schema derived from ER

Sponsor(SID, Name, Slogan)

Not null: Name

Team(Division_Name, Name, Cap_Space, Arena, Conference, City)

Not null: Division_Name

League(Name, Revenue, Commissioner)

Game(Venue, Date, City)

Season(Start_Date, **LName**, End_Date)

Not Null: LName

Staff(StID, Name, Salary)

Not Null: Name

Coach(**StID**, Number_Of_Rings)

Doctor(**StID**, Field)

Trainer(**StID**, Specialty)

Manager(**StID**, years_of_experience)

Signed_Contract(**PID**, CID, Signed_Date, Value, Length, Bonus)

Not Null: PID

Player_Plays_for_Team(Debut_Year, Date_of_Birth, Height, Name, Jersey#, PID, **TName**, **City**)

Not Null: Name

Sponsor_Sponsors_Team(Sponsored_Amount, SID, **TName**, **City**)

Works_For(**StID**, **TName**, **City**)

Team_Plays_Team(**HomeTeamName**, **HomeTeamCity**, **AwayTeamName**, **AwayTeamCity**, **Date**, **Venue**)

Game_Happens_In(**Start_Date**, **LName**, **Venue**, **Play_Date**)

Wins_Season(**Start_Date**, **TName**, **City**)

Functional Dependencies

Sponsor.SID -> Sponsor.Name, Sponsor.Slogan

Team.City, Team.Name -> Team.Cap_Space, Team.Arena, Team.Division_Name,
Team.Conference

Team.Arena -> Team.City

Team.Division_Name -> Team.Conference

League.Name -> League.Revenue, League.Commissoner

Game.Venue, Game.Date -> Game.City

Game.Venue -> Game.City

Season.Start_Date, Season.LName -> Season->End_Date

Staff.StID -> Staff.Name, Staff.Salary

Coach.StID -> Coach.Number_Of_Rings

Doctor.StID -> Doctor.Field

Trainer.StID -> Trainer.Specialty

Manager.StID -> Manager.Years_Of_Experience

Signed_Contract.CID ->

Signed_Contract.Signed_Date,

Signed_Contract.PID,

Signed_Contract.Signed_Date,

Signed_Contract.Value,

Signed_Contract.Length,

Signed_Contract.Bonus

Player_Plays_for_Team.PID ->

Player_Plays_for_Team.Debut_Year,

Player_Plays_for_Team.Date_of_Birth,

Player_Plays_for_Team.Height,

Player_Plays_for_Team.Name,

Player_Plays_for_Team.Jersey#,

Player_Plays_for_Team.Name,

Player_Plays_for_Team.City

Sponsor_Sponsors_Team.City,
Sponsor_Sponsors_Team.TName,
Sponsor_Sponsors_Team.SID ->
Sponsor_Sponsors_Team.Sponsored_Amount

Normalization

Relation: Game(Venue, City, Date)

FD:

Game.Venue, Game.Date -> Game.City,

Game.Venue -> Game.City

Normalized Form:

Location(Venue, City)

Session(Venue, Date)

Relation: Team(Division, Name, Cap_Space, Arena, Conference, City)

FD:

Team.City, Team.Name -> Team.Cap_Space, Team.Arena, Team.Division, Team.Conference

Team.Division -> Team.Conference

Normalized Form:

Team(Division_Name, Name, Cap_Space, Arena, City)

Division(Division_Name, conference)

SQL DDL Statements

```
CREATE TABLE Sponsor (  
    SID                INTEGER PRIMARY KEY,  
    Name               VARCHAR NOT NULL,  
    Slogan              VARCHAR  
);
```

```
CREATE TABLE Division (  
    Division_Name      VARCHAR,  
    Conference         VARCHAR,  
    FOREIGN KEY (Division_Name)  
        REFERENCES Team  
);
```

```
CREATE TABLE Team(  
    Name               VARCHAR,  
    Cap_Space          VARCHAR,  
    Arena              VARCHAR,  
    City               VARCHAR,  
    Division_Name      VARCHAR NOT NULL,  
    PRIMARY KEY (Name, City)  
);
```

```
League (  
    Name               VARCHAR PRIMARY KEY,  
    Revenue            INTEGER,  
    Commissioner       VARCHAR  
);
```

```
CREATE TABLE Location(  
    Venue              VARCHAR    PRIMARY KEY,  
    City               VARCHAR    PRIMARY KEY  
);
```

```
CREATE TABLE Session (  
    Venue              VARCHAR,  
    Date              DATE,  
    PRIMARY KEY (Venue)  
    FOREIGN KEY (Venue)  
        REFERENCES Location  
);
```

```

CREATE TABLE Season (
    Start_Date          DATE,
    LName               VARCHAR,
    End_Date            DATE,
    PRIMARY KEY(Start_Date, LName),
    FOREIGN KEY(LName)
        REFERENCE League
);

```

```

CREATE TABLE Staff(
    StID               INTEGER    PRIMARY KEY,
    Name               VARCHAR    NOT NULL,
    Salary             INTEGER)

```

```

CREATE TABLE Doctor (
    StID               INTEGER    PRIMARY KEY,
    Field              VARCHAR
);

```

```

CREATE TABLE Coach (
    StID               INTEGER    PRIMARY KEY,
    number_of_rings    INTEGER
);

```

```

CREATE TABLE Trainer (
    StID               INTEGER    PRIMARY KEY,
    Specialty           VARCHAR
);

```

```

CREATE TABLE Manager (
    StID               INTEGER    PRIMARY KEY,
    Years_of_Experience INTEGER
);

```



```

CREATE TABLE Signed_Contract (
    Bonus          INTEGER,
    PID            INTEGER    NOT NULL,
    Length         INTEGER,
    Value          INTEGER,
    Signed_Date    DATE,
    CID            INTEGER    PRIMARY KEY,
    FOREIGN KEY (PID) REFERENCES Player
        ON DELETE SET NULL
        ON UPDATE CASCADE
);

CREATE TABLE Player_Plays_for_Team (
    Debut_Year      DATE,
    Date_of_Birth   DATE,
    Height          INTEGER,
    Name            VARCHAR    NOT NULL,
    Jersey#         INTEGER,
    PID             INTEGER    PRIMARY KEY,
    TName           VARCHAR,
    City            VARCHAR,
    FOREIGN KEY (TName, City) REFERENCES Team
        ON DELETE SET NULL
        ON UPDATE CASCADE
);

CREATE TABLE Sponsor_Sponsors_Team (
    Sponsored_Amount  INTEGER,
    SID              INTEGER,
    TName            VARCHAR,
    City             VARCHAR,
    PRIMARY KEY (TName, City, SID)
    FOREIGN KEY (SID) REFERENCES Sponsor
    FOREIGN KEY (TName, City) REFERENCES TEAM
);

CREATE TABLE Works_For (
    StID           INTEGER,
    TName          VARCHAR,
    City           VARCHAR,
    PRIMARY KEY (StID, TName, City)
    FOREIGN KEY (StID) REFERENCES Staff
    FOREIGN KEY (TName, City) REFERENCES Team
);

```

```

CREATE TABLE Team_Plays_Team(
    HomeTeamName      VARCHAR,
    HomeTeamCity      VARCHAR,
    AwayTeamName      VARCHAR,
    AwayTeamCity      VARCHAR,
    Date              DATE,
    Venue             VARCHAR,
    PRIMARY KEY (HomeTeamName, HomeTeamCity, AwayTeamName, AwayTeamCity,
Date, Venue)
    FOREIGN KEY (HomeTeamName, HomeTeamCity, AwayTeamName, AwayTeamCity)
        REFERENCES Team
    FOREIGN KEY (Date, Venue) REFERENCES Game
);

```

```

CREATE TABLE Happens_In (
    Start_Date    date,
    CName         VARCHAR,
    Venue         VARCHAR,
    Play_Date     VARCHAR,
    PRIMARY KEY (Start_Date, CName, Venue, Play_Date),
    FOREIGN KEY (Start_Date) REFERENCES Season,
    FOREIGN KEY (Venue, Date) REFERENCES Game
);

```

```

CREATE TABLE Wins_Season(
    Start_Date    date,
    TName         VARCHAR,
    City          VARCHAR,
    PRIMARY KEY (Start_Date, TName, City),
    FOREIGN KEY (Start_Date) REFERENCES Season,
    FOREIGN KEY (TName, City) REFERENCES Team
);

```

INSERT Statements:

INSERT INTO Sponsor VALUES

(1, 'EcoFusion Solutions', 'Harmony in Every Innovation – Where Green Meets Ingenuity'),
(2, 'Quantum Quench Beverages', 'Taste the Future, One Quantum Leap at a Time!'),
(3, 'Galactic Gearworks', 'Universe's Finest Creations, Engineered for the Stars!'),
(4, 'Paws & Play Pet Resorts', 'Where Tails Wag and Whiskers Purr – Your Pet's Paradise!'),
(5, 'InfiniTech Labs', 'Limitless Possibilities, Crafted in Every Code!')

INSERT INTO Division VALUES

('Atlantic', 'Eastern'),
('Central', 'Eastern'),
('Pacific', 'Western'),
('Southwest', 'Western'),
('Southeast', 'Eastern')

INSERT INTO Team VALUES

('Toronto Raptors', 136000000, 'ScotiaBank Arena', 'Toronto', 'Atlantic'),
('Indiana Pacers', 136123345, 'Gainbridge Fieldhouse', 'Indiana', 'Central')
('Oklahoma City Thunder', 123123123, 'Paycom Center', 'Oklahoma City', 'Northwest')
('Los Angeles Lakers', 139242132, 'Crypto Arena', 'Los Angeles', 'Pacific')
('Los Angeles Clippers', 139242134, 'Crypto Arena', 'Los Angeles', 'Pacific');

INSERT INTO League VALUES

('NBA', 1234000123, 'Adam Silver'),
('WNBA', 123400012, 'Cathy Engelbert'),
('G-League', 1234001, 'Shareef Abdur-Rahim'),
('NBA', 2234000123, 'David Stern'),
('NBA', 9234000123, 'Lebron James');

INSERT INTO Location VALUES

('Madison Square Garden', 'New York City'),
('Crypto Arena', 'Los Angeles'),
('Scotia Bank Arena', 'Toronto'),
('Paycom Center', 'Oklahoma City'),
('Gainbridge Fieldhouse', 'Indiana');

```
INSERT INTO Session VALUES
('Madison Square Garden', '2022-02-03'),
('Crypto Arena', '2012-05-13'),
('Scotia Bank Arena', '2011-09-08'),
('Paycom Center', '2022-01-14'),
('Gainbridge Fieldhouse', '2006-05-23');
```

```
INSERT INTO Season VALUES
('2022-08-23', 'NBA', '2023-06-20'),
('2020-08-27', 'NBA', '2023-06-23'),
('2022-08-26', 'NBA', '2023-06-26'),
('2022-08-24', 'NBA', '2023-06-29'),
('2022-08-29', 'NBA', '2023-06-21');
```

```
INSERT INTO Staff VALUES
(1, 'John Smith', 50000),
(2, 'Jane Doe', 55000),
(3, 'Michael Johnson', 60000),
(4, 'Emily Davis', 48000),
(5, 'Christopher Lee', 52000);
```

```
INSERT INTO Doctor VALUES
(1, 'Cardiology'),
(2, 'Pediatrics'),
(3, 'Neurology'),
(4, 'Orthopedics'),
(5, 'Psychiatry');
```

```
INSERT INTO Coach VALUES
(1, 3),
(2, 5),
(3, 2),
(4, 4),
(5, 6);
```

```
INSERT INTO Trainer VALUES
(1, 'Strength and Conditioning'),
(2, 'Sports Rehabilitation'),
(3, 'Nutrition and Dietetics'),
(4, 'Yoga and Flexibility'),
(5, 'High-Intensity Interval Training');
```

INSERT INTO Manager VALUES

(1, 15),
(2, 12),
(3, 20),
(4, 18),
(5, 22);

INSERT INTO Signed_Contract VALUES

(50000, 1, 5, 1000000, '2023-10-20', 1),
(60000, 2, 4, 800000, '2023-10-21', 2),
(70000, 3, 6, 1200000, '2023-10-22', 3),
(55000, 4, 3, 700000, '2023-10-23', 4),
(65000, 5, 7, 1500000, '2023-10-24', 5);

INSERT INTO Player_Plays_For_Team VALUES

('2018-06-21', '1999-02-28', 201, 'Luka Doncic', 77, 2473875, 'Mavericks', 'Dallas'),
('2015-06-25', '1993-03-14', 203, 'Stephen Curry', 30, 1729634, 'Warriors', 'Golden State'),
('2014-06-26', '1988-12-30', 206, 'LeBron James', 23, 1248756, 'Lakers', 'Los Angeles'),
('2013-06-27', '1989-03-29', 201, 'Anthony Davis', 3, 1342351, 'Lakers', 'Los Angeles'),
('2016-06-23', '1994-03-16', 193, 'Giannis Antetokounmpo', 34, 1534897, 'Bucks', 'Milwaukee');

INSERT INTO Sponsor_Sponsors_Team VALUES

(872913, 37, 'Bucks', 'Milwaukee'),
(561024, 19, 'Knicks', 'New York'),
(315789, 25, 'Clippers', 'Los Angeles'),
(999999, 12, 'Heat', 'Miami'),
(746821, 30, 'Suns', 'Phoenix');

INSERT INTO Works_For VALUES

(1, 'Bulls', 'Chicago'),
(7, 'Lakers', 'Los Angeles'),
(22, 'Celtics', 'Boston'),
(11, 'Raptors', 'Toronto'),
(4, 'Nuggets', 'Denver');

INSERT INTO Team_Plays_Team VALUES

('Bulls', 'Chicago', 'Hornets', 'Charlotte', '2022-03-26', 'United Center'),
('Rockets', 'Houston', 'Grizzlies', 'Memphis', '2023-08-14', 'FedEx Forum'),
('Suns', 'Phoenix', 'Warriors', 'San Francisco', '2024-06-02', 'Chase Center'),
('Timberwolves', 'Minneapolis', 'Jazz', 'Salt Lake City', '2023-11-19', 'Vivint Arena'),
('Thunder', 'Oklahoma City', 'Mavericks', 'Dallas', '2024-04-27', 'American Airlines Center');

```
INSERT INTO Happens_In VALUES
('2022-02-03', 'Chicago', 'United Center', '1967-01-04'),
('1967-01-04', 'Detroit', 'Little Caesars Arena', '2000-12-20'),
('2000-11-13', 'Washington', 'Capital One Arena', '2010-05-28'),
('1987-10-05', 'Los Angeles', 'Staples Center', '1998-03-17'),
('2021-04-05', 'Charlotte', 'Spectrum Center', '2003-09-11');
```

```
INSERT INTO Wins_Season VALUES
('2022-02-03', 'Bulls', 'Chicago'),
('1967-01-04', 'Pistons', 'Detroit'),
('2000-11-13', 'Wizards', 'Washington'),
('1987-10-05', 'Lakers', 'Los Angeles'),
('2021-04-05', 'Hornets', 'Charlotte');
```

ER Diagram

