CPSC 304 Project Cover Page

Milestone #: <u>2</u>

Date: <u>Jul 27, 2023</u>
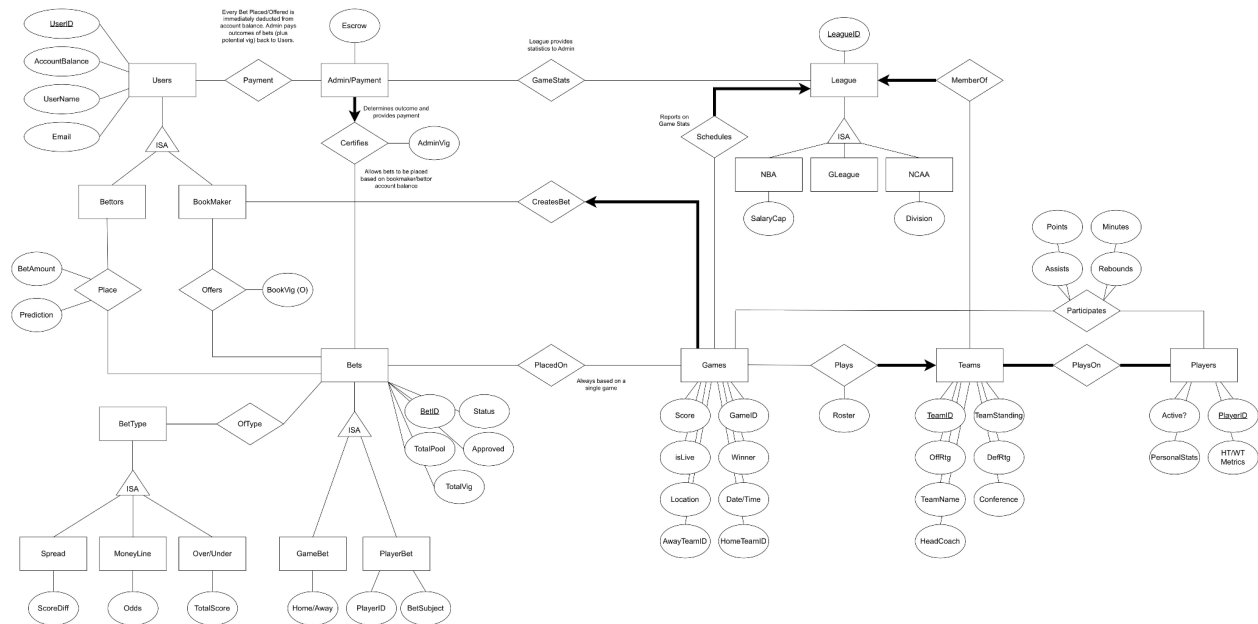
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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this 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.)
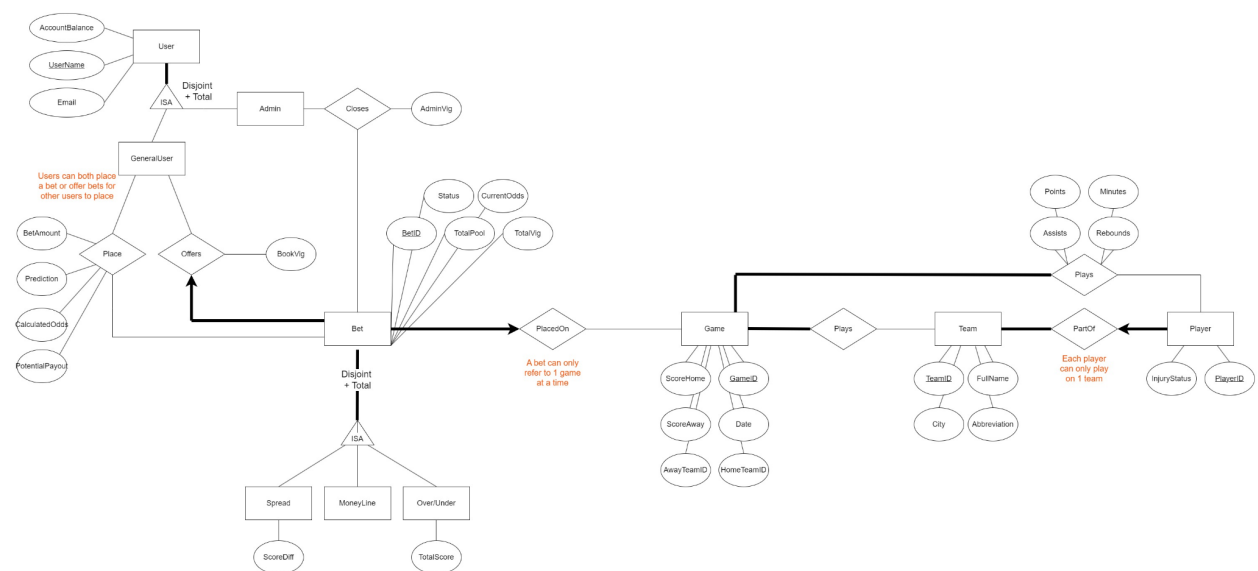In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

ER Diagram

Old

New

ERD Changes

1. CombinedBettor and BookMaker into GeneralUser, users can both place and offer bets for other users, categorized admin under user, to inherit User's attributes
2. Added participation constraint on User Offers Bet, a bet must be offered by exactly 1 user
3. Added participation constraint on Bet PlacedOn Game, a bet created must be placed on exactly 1 game
4. Removed Admin Pay User and Admin receiving GameStats from League relationship, only keeping Admin closes Bets for simplicity
5. Added CalculatedOdd sand PotentialPayout attributes in GeneralUser places bet , CurrentOdds for Bet entity for more details
6. Removed Bets OfType BetType relationship, GameBet and PlayerBet entity, every bet must be game based and one of spread, moneyline, overUnder for simplicity
7. Removed League Entity and League schedule games, League member Of relationship as the team decides to limit the scope to NBA only
8. Added and Removed attributes in Game, Team, Player Entity, the keys GameID, TeamID, PlayerID should link to Nba site for example a PlayerID 202710 would link to https://www.nba.com/stats/player/202710
9. Edited the participation constraint of Team plays Game, Game must be played by at least 1 team
10. Edited the participation constraint of Player plays Game, Game must be played by at least 1 player
11. Edited the participation constraint of Player PartOf Team, Players must be part of exactly 1 team

Schema

Bold: Foreign Key
<u>Underlined</u>: Primary Key

GeneralUser (<u>UserName</u>: String, AccountBalance: Double, Email: String)
UserPlaces (**<u>UserName</u>**: String, **<u>BetID</u>**: Integer, BetAmount: Integer, Prediction: String, CalculatedOdds: Double, PotentialPayout: Integer)
Admin (<u>UserName</u>: String, AccountBalance: Double, Email: String)
Closes (**<u>UserName</u>**: String, **BetID**: Integer, AdminVig: Double)
Spread (<u>BetID</u>: Integer, **GameID**: Integer, **UserName**: String, Status: String, TotalPool: Integer, TotalVig: Integer, CurrentOdds: Double, ScoreDifference: Integer)
GameID, UserName cannot be null

OverUnder (<u>BetID</u>: Integer, **GameID**: Integer, **UserName**: String, Status: String, TotalPool: Integer, TotalVig: Integer, CurrentOdds: Double, TotalScore: Integer)
GameID, UserName cannot be null

MoneyLine (<u>BetID</u>: Integer, **GameID**: Integer, **UserName**: String, Status: String, TotalPool: Integer, TotalVig: Integer, CurrentOdds: Double)
GameID, UserName cannot be null

Game (<u>GameID</u>: Integer, ScoreHome: Integer, ScoreAway: Integer, Date: Date, HomeTeamID: Integer, AwayTeam: Integer)
TeamPlays (**<u>GameID</u>**: Integer, **<u>TeamID</u>**: Integer)
Team (<u>TeamID</u>: Integer, FullName: String, Abbreviation: String, City: String)

Player (<u>PlayerID</u>: Integer, **TeamID**: Integer InjuryStatus: String)
TeamID cannot be null
PlayerPlays (**<u>PlayerID</u>**: Integer, **<u>GameID</u>**: Integer, Minutes: Time, Points: Integer, Assists: Integer, Rebounds: Integer)

FD:
GeneralUser (AccountBalance: Integer, <u>Username</u>: String, Email: String)
<u>Username</u> -> AccountBalance, Email

Admin (AccountBalance: Integer, <u>Username</u>: String, Email: String)
<u>Username</u> -> AccountBalance, Email

UserPlace

BetAmount, CalculatedO dds-> PotentialPayout

UserPlace (__UserID__ , __BetID__ , Bet Amount , Prediction , Calculated Odds , Potential Payout)   [FK above BetID]

U, BI → BA, P, C, PP

BA, C → PP

$(BA, C)^+ = (BA, C)$

PP is not part of minimal key
BA → C violates BCNF or 3NF

(U, BI, P, PP (BA) C)

R1 (U, BI, P, PP, BA)
R2 (BA, C)

Before normalization: UserPlaces (**UserName**: String, **BetID**: Integer, BetAmount: Integer, Prediction: String, CalculatedOdds: Double, PotentialPayout: Double)

After: UserPlaces (**UserName**: String, **BetID**: Integer, BetAmount: Integer, Prediction: String, CalculatedOdds: Double), PotentialPayout (BetAmount: Integer, CalculatedOdds: Double, PotentialPayout: Double)

AdminCloses
UserName, **BetID** -> AdminVig

Game
GameID -> ScoreHome, ScoreAway, Date, HomeTeamID, AwayTeamID

TeamPlays
No non-trivial FDs

Team
TeamID -> FullName, Abbreviation, City
FullName -> Abbreviation

Team (TeamID , Fullname , Abbreviation , City)
Team (T, F, A, C)

T → F, A, C
F → A
F^+ = (F, A) & A is not part of minimal key

F → A   violates BCNF or 3NF

T C   F A

R1 (T, C, F)   R2 (F, A)

Before Normalization: Team (TeamID: Integer, FullName: String, City: String, Abbreviation: String)

After: Team (TeamID: Integer, FullName: String, City: String,), Abbreviation(FullName: String, Abbreviation: String)

Player
PlayerID -> InjuryStatus

PlayerPlays
PlayerID, GameID -> Points, Minutes, Assists, Rebounds

Spread
BetID -> Status, TotalPool, TotalVig, ScoreDifference, CurrentOdds

MoneyLine
BetID -> Status, TotalPool, TotalVig, CurrentOdds

OverUnder
BetID -> Status, TotalPool, TotalVig, TotalScore, CurrentOdds

SQL CREATE TABLE statements

CREATE TABLE GeneralUser (
        UserName VARCHAR(20) PRIMARY KEY,
        AccountBalance DOUBLE DEFAULT 100.00 NOT NULL,
        Email VARCHAR(40) UNIQUE NOT NULL
        );

GeneralUser

UserName	AccountBalance	Email
MichaelScott	20	greatestBoss@hotmail.com
JimHalpert	50	JimHalpert123@gmail.com
PamHalpert	10	PamPam@yahoo.com
BballGod	100000	CreedNinja@gmail.com
KevinMalone69	3000	kevinisthesmartest@hotmail.com

CREATE TABLE UserPlacesBet (
        UserName VARCHAR(20)
        BetID INT,
        BetAmount INT,
        Prediction VARCHAR(100),
        InitialOdds DOUBLE,
        PRIMARY KEY (Username, BetID),
        FOREIGN KEY (Username) REFERENCES User (UserName)
        FOREIGN KEY (BetID) REFERENCES Bet (BetID)
);

UserName	BetID	BetAmount	Prediction	InitialOdds
MichaelScott	1	500	OVER	100
JimHalpert	2	2000	HOME	100
PamHalpert	3	300	AWAY	-200

| BballGod | 4 | 500000 | UNDER | 100 |
| KevinMalone69 | 5 | 20000 | HOME | 450 |

CREATE TABLE PotentialPayout (
    BetAmount INT NOT NULL,
    InitialOdds DOUBLE NOT NULL,
    PotentialPayout DOUBLE NOT NULL
);

BetAmount	InitialOdds	PotentialPayout
500	100	1000
2000	100	4000
300	-200	450
500000	100	500000
20000	450	11000000

CREATE TABLE Admin (
    UserName VARCHAR(20) PRIMARY KEY,
    AccountBalance DOUBLE DEFAULT 100000.00 NOT NULL,
    Email VARCHAR(40) UNIQUE NOT NULL
);

UserName	AccountBalance	Email
AdminOscar	1000	martinez001@gmail.com
AdminAngela	500	catLoverMeow@yahoo.com
AdminBobV	60000	refrigerators4life@gmail.com

| AdminDarryl | 500 | darryltheman@gmail.com |
| AdminPhyllis | 400 | bobfan1@hotmail.com |

```
CREATE TABLE Certifies (
      UserName VARCHAR(20),
      BetID INT,
      AdminVig DOUBLE NOT NULL,
      PRIMARY KEY (UserName, BetID),
      FOREIGN KEY (UserName) REFERENCES User (UserName),
      FOREIGN KEY (BetID) REFERENCES Bet (BetID)
);
```

UserName	BetID	AdminVig
AdminOscar	1	10.0
AdminAngela	2	15.5
AdminBobV	3	8.0
AdminDarryl	4	5.0
AdminPhyllis	5	10.5

```
CREATE TABLE Spread (
      BetID INT PRIMARY KEY,
      GameID INT NOT NULL,
      UserName VARCHAR(20) NOT NULL,
      Status VARCHAR(40),
      TotalPool INT,
      TotalVig INT,
      ScoreDifferenc FLOAT,
      FOREIGN KEY (GameID) REFERENCES Game (GameID),
      FOREIGN KEY (UserName) REFERENCES GeneralUser(UserName)
);
```

BetID	GameID	UserName	Status	TotalPool	TotalVig	ScoreDifference
1	001	JimHalpert	InProgress	500	10	17.5
2	002	PamHalpert	Won	241	8.0	-5.5

3	003	JimHalpert	Lost	300	3	-0.5
4	004	JimHalpert	Won	24	2	13.5
5	005	JimHalpert	Won	10	0	10

```
CREATE TABLE OverUnder (
        BetID INT PRIMARY KEY,
        GameID INT NOT NULL,
        UserName VARCHAR(20) NOT NULL,
        Status VARCHAR(40),
        TotalPool INT,
        TotalVig INT,
        TotalScore INT,
        FOREIGN KEY (GameID) REFERENCES Game (GameID),
        FOREIGN KEY (UserName) REFERENCES GeneralUser(UserName)
);
```

BetID	GameID	UserName	Status	TotalPool	TotalVig	TotalScore
1	001	JimHalpert	InProgress	500	10	113
2	002	PamHalpert	Won	241	8.0	87
3	003	JimHalpert	Lost	300	3	101
4	004	JimHalpert	Won	24	2	98
5	005	JimHalpert	Won	10	0	67

```
CREATE TABLE MoneyLine (
        BetID INT PRIMARY KEY,
        GameID INT NOT NULL,
        UserName VARCHAR(20) NOT NULL,

        Status VARCHAR(40),
        TotalPool INT,
        TotalVig INT,
        CurrentOdds INT,
        FOREIGN KEY (GameID) REFERENCES Game (GameID),
        FOREIGN KEY (UserName) REFERENCES GeneralUser(UserName)
);
```

BetID	GameID	UserName	Status	TotalPool	TotalVig	CurrentOdds
1	0022200650	JimHalpert	InProgress	1200	10.0	100
2	0022200606	PamHalpert	InProgress	241	8.0	-200
3	0022200623	JimHalpert	Won	300	3	130
4	0022200608	JimHalpert	Lost	24	2	-300
5	2022200086	JimHalpert	Won	10	0	120

```
CREATE TABLE Game (
        GameID INT PRIMARY KEY,
        ScoreHome INT,
        ScoreAway INT,
        Date DATE,
        HomeTeamID INT,
        AwayTeamID INT
);
```

GameID	ScoreHome	ScoreAway	Date	HomeTeam	AwayTeam
0022200650	132	118	2023-01-15	1610612741	1610612744
0022200606	107	99	2023-01-09	1610612738	1610612741
0022200623	135	129	2023-01-11	1610612763	1610612759
0022200608	121	113	2023-01-09	1610612763	1610612759
2022200086	104	112	2023-01-09	1612709914	1612709904

```
CREATE TABLE TeamPlays (
        GameID INT,
        TeamID INT,
        PRIMARY KEY (GameID, TeamID),
        FOREIGN KEY (GameID) REFERENCES GAME (GameID),
        FOREIGN KEY (TeamID) REFERENCES TEAM (TeamID)
);
```

GameID	TeamID
0022200650	1610612744
0022200606	1610612741
0022200650	1610612741
0022200606	1610612761
0022200576	1610612763

CREATE TABLE Team (
        TeamID INT PRIMARY KEY,
        FullName VARCHAR(50),
        City VARCHAR(30),
);

TeamID	TeamName	City
1610612744	"GSWarriors"	"San Francisco"
1610612748	"MiamiHeat"	"Miami"
1610612738	"Raptors"	"Toronto"
1610612761	"Celtics"	"Boston"
1610612741	"Bulls"	"Chicago"

CREATE TABLE Abbreviation(
        FullName VARCHAR(30),
        Abbreviation VARCHAR (3)
);

FullName	Abbreviation
"San Francisco"	"GSW"

"Miami"	"MIA"
"Toronto"	"TOR"
"Boston"	"BOS"
"Chicago"	"CHI"

```
CREATE TABLE Player (
        PlayerID INT PRIMARY KEY,
        TeamID INT NOT NULL,
        InjuryStatus VARCHAR(50),
        FOREIGN KEY (TeamID) REFERENCES TEAM (TeamID)
);
```

PlayerID	TeamID	**InjuryStatus**
201939	1610612744	Out
202710	1610612748	DayToDay
1627783	1610612738	Questionable
1628369	1610612761	Probable
203897	1610612741	Doubtful

```
CREATE TABLE PlayerPlays (
        PlayerID INT,
        GameID INT,
        Minutes TIME,
        Points INT,
        Assists INT,
        Rebounds INT,
        PRIMARY KEY (PlayerID, GameID)
        FOREIGN KEY (PlayerID) REFERENCES Player (PlayerID),
        FOREIGN KEY (GameID) REFERENCES Game (GameID)
);
```

PlayerID	GameID	Minutes	Points	Assists	Rebounds
203952	0022200650	28	11	3	5
203110	0022200650	30	8	7	4
1626172	0022200650	26	9	1	6
1629057	0022200606	22	6	2	7
1627759	0022200606	38	19	3	5