CUNY Baruch College

Relational Model

Group # 3 Submission

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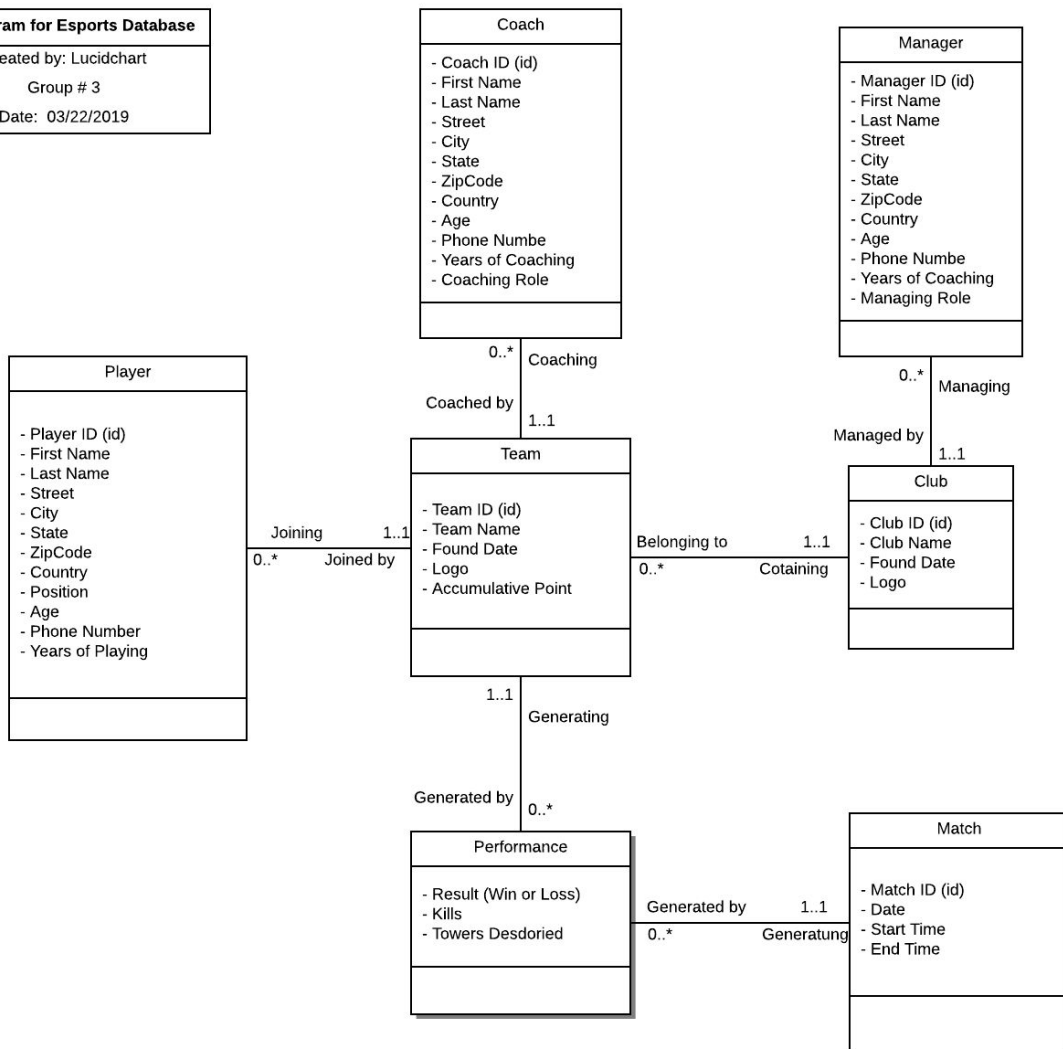Richard Holowczak

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ER Diagram for Esports Database
Created by: Lucidchart
Group # 3
Date: 03/22/2019

Coach
- Coach ID (id)
- First Name
- Last Name
- Street
- City
- State
- ZipCode
- Country
- Age
- Phone Numbe
- Years of Coaching
- Coaching Role

Manager
- Manager ID (id)
- First Name
- Last Name
- Street
- City
- State
- ZipCode
- Country
- Age
- Phone Numbe
- Years of Coaching
- Managing Role

Player
- Player ID (id)
- First Name
- Last Name
- Street
- City
- State
- ZipCode
- Country
- Position
- Age
- Phone Number
- Years of Playing

Team
- Team ID (id)
- Team Name
- Found Date
- Logo
- Accumulative Point

Club
- Club ID (id)
- Club Name
- Found Date
- Logo

0..* Coaching
Coached by 1..1

0..* Managing
Managed by 1..1

Joining 1..1
0..* Joined by

Belonging to 1..1
0..* Cotaining

1..1 Generating
Generated by 0..*

Generated by 1..1
0..* Generatung

Performance
- Result (Win or Loss)
- Kills
- Towers Desdoried

Match
- Match ID (id)
- Date
- Start Time
- End Time

A: Club(ClubID(key), ClubName, FoundDate, Logo)
B: Manager(ManagerID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, ManagingRole, ClubID(fk))
C: Coach (CoachID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID(fk))
D: Team(TeamID(key), TeamName, FoundDate, LogoName, AccumulativePoint, ClubID(fk))
E: Match(MatchID(key), Date, StartTime, EndTime)
F: Performance(TeamID(fk)(key), MatchID(fk)(key), TeamResult (Win or Loss), Kills, Towers Destroyed)
G: Player(PlayerID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Position, Age, PhoneNumber, Years_of_Playing, TeamID(fk))

Normalization:

==Club(ClubID, ClubName, FoundDate, Logo) key: ClubID==
FD1: ClubID → ClubName, FoundDate, Logo

1NF Yes b/c it is a relation with a key;
2NF Yes b/c all non-key attributes are dependent on all of the key;
3NF Yes b/c there's no transitive dependency;

==Manager(ManagerID, FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, Managing_Role, ClubID(fk)) key: ManagerID==
FD1: ManagerID → FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, Managing_Role, ClubID
FD2: ZipCode → City, State

1NF Yes b/c it is a relation with a key;
2NF Yes b/c all non-key attributes are dependent on all of the key;
3NF No b/c ZipCode → City, State is a transitive dependency;

Solution: Split Manager into Manager_Info and ZipCode; Remove City, State and copy ZipCode
==Manager_Info(ManagerID, FirstName, LastName, Street, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, Managing_Role, ClubID(fk)) key: ManagerID==
FD1: Manager ID → FirstName, Last Name, Street, ZipCode, Country, Age, Phone Number, Years of Coaching, Managing Role, Club ID
1NF b/c it meets the definition of a relation;
2NF b/c all non-key attributes are dependent on all of the key;
3NF b/c there's no transitive dependency;

==ZipCode(ZipCode, City, State) key: ZipCode==
FD1: ZipCode → City, State
1NF b/c it meets the definition of a relation;
2NF b/c all non-key attributes are dependent on all of the key;
3NF b/c there's no transitive dependency;

==Coach (CoachID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID(fk))==
FD1: CoachID → FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID
FD2: ZipCode → City, State
1NF b/c it meets the definition of a relation;
2NF b/c all non-key attributes are dependent on all of the key;
3NF No b/c CoachID → ZipCode → State and Street is a transitive dependency;

Solution: Split Coach into Coach_Info and ZipCode; Remove City, State and copy ZipCode

Coach_Info (CoachID, FirstName, LastName, Street, ZipCode(fk), Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID(fk)) key: CoachID
FD1: CoachID → FirstName, LastName, Street, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID
1NF b/c it meets the definition of a relation;
2NF b/c all non-key attributes are dependent on all of the key;
3NF b/c there's no transitive dependency;

ZipCode(ZipCode, City, State) key: ZipCode
FD1: ZipCode → City, State
1NF b/c it meets the definition of a relation;
2NF b/c all non-key attributes are dependent on all of the key;
3NF b/c there's no transitive dependency;

Team(TeamID, TeamName, FoundDate, LogoName, AccumulativePoint, ClubID(fk)) Key:TeamID
FD1: TeamID → TeamName, FoundDate, LogoName, AccumulativePoint, ClubID

1NF Yes b/c it is a relation with a key;
2NF Yes b/c all non-key attributes are dependent on all of the key;
3NF Yes b/c there's no transitive dependency;

Match(MatchID(key), Date, StartTime, EndTime)
FD1: MatchID → Date, StartTime, EndTime

1NF: Yes, b/c it is a normal relation with a key
2NF: Yes, b/c no partial key dependencies
3NF: Yes, b/c no transitive dependencies

Performance(TeamID(key), MatchID(fk), TeamResult, Kills, TowersDestroyed)
FD1: TeamID, MatchID → TeamResult, Kills, TowersDestroyed
1NF: Yes, b/c it is a normal relation with a key
2NF: Yes, b/c no partial key dependencies
3NF: Yes, b/c no transitive dependencies

Player (PlayerID, FirstName, LastName, Street, City, State, ZipCode, Country, Position, Age, Phone Number, Years_of_Playing, TeamID(fk))   Key: PlayerID
FD1: PlayerID → FirstName, LastName, Street, City, State, ZipCode, Country, Position, Age, PhoneNumber, Years_of_Playing, TeamID
FD2: ZipCode → City, State

1NF: Yes, b/c it meets the definition of a relation;
2NF: Yes, b/c all non-key attributes are dependent on all of the key;

3NF: No, b/c PlayerID → ZipCode → State and Street is a transitive dependency;

Solution: Split Player into Player_Info and ZipCode; Remove City, State and copy ZipCode
      Player_Info (PlayerID, FirstName, Last Name, Street, ZipCode(fk), Country, Position, Age, PhoneNumber, Years_of_Playing, TeamID(fk)) key: PlayerID
      FD1: PlayerID → PlayerID, FirstName, LastName, Street, ZipCode, Country, Position, Age, PhoneNumber, Years_of_Playing, TeamID
      1NF Yes, b/c it meets the definition of a relation;
      2NF Yes, b/c all non-key attributes are dependent on all of the key;
      3NF Yes, b/c there's no transitive dependency;

      ZipCode(ZipCode, City, State) key: ZipCode
      FD1: ZipCode → City, State
      1NF Yes, b/c it meets the definition of a relation;
      2NF Yes, b/c all non-key attributes are dependent on all of the key;
      3NF Yes, b/c there's no transitive dependency;

Because it is a small dataset, we decided to denormalize the ZipCode table. The final relations are :

A: Club(ClubID(key), ClubName, FoundDate, Logo)
B: Manager(ManagerID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, ManagingRole, ClubID(fk))
C: Coach (CoachID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Age, PhoneNumber, Years_of_Coaching, CoachingRole, TeamID(fk))
D: Team(TeamID(key), TeamName, FoundDate, LogoName, AccumulativePoint, ClubID(fk))
E: Match(MatchID(key), Date, StartTime, EndTime)
F: Performance(TeamID(fk)(key), MatchID(fk)(key), TeamResult (Win or Loss), Kills, Towers Destroyed)
G: Player(PlayerID(key), FirstName, LastName, Street, City, State, ZipCode, Country, Position, Age, PhoneNumber, Years_of_Playing, TeamID(fk))