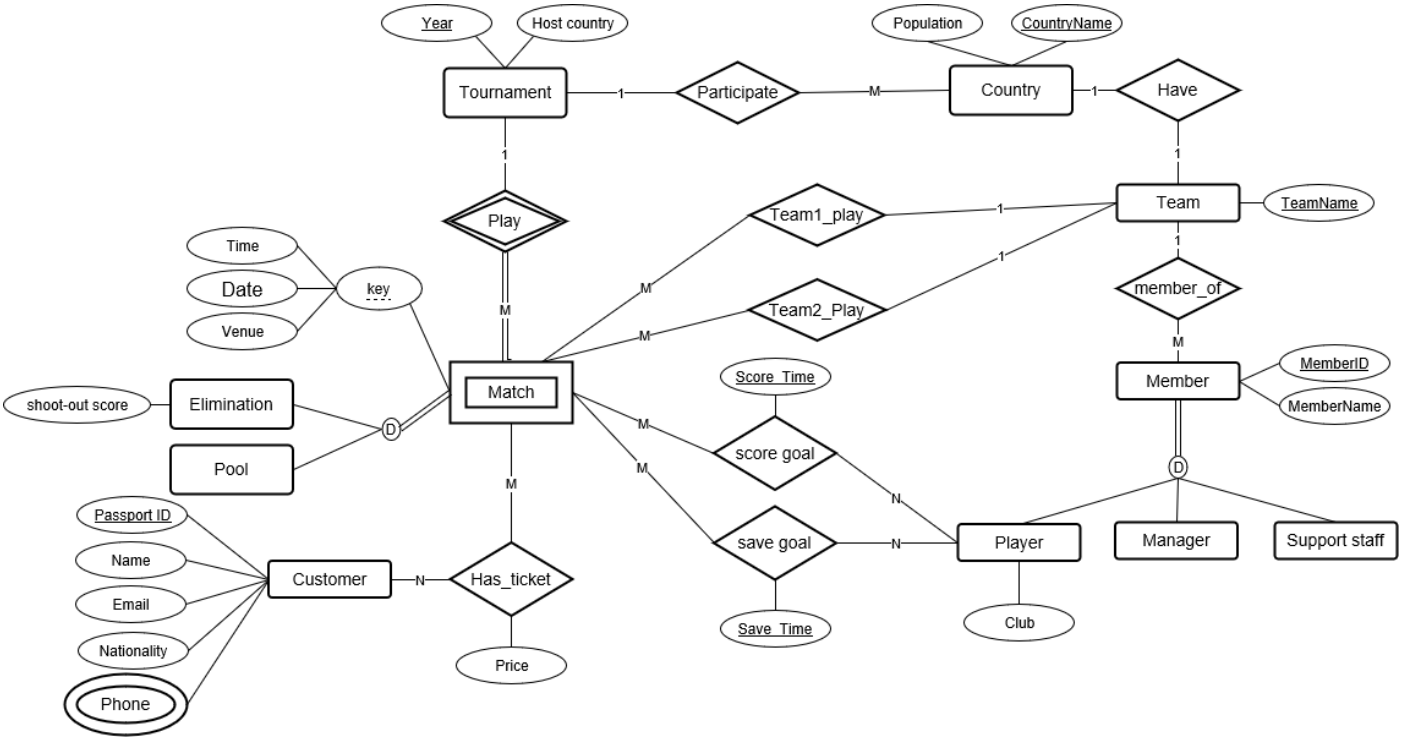
Assignment 1

Group Member 1: Yueer Chen, 45345177

Group Member 2: Xin Chen, 45189915

YOUR ER DIAGRAM MUST FIT ON THIS PAGE



Assume all members have a unique ID, and we will record the name of members. Each customer has a unique passport ID, and we will record the name, email, phone numbers and nationality. Customer can have multiple phone numbers.

YOUR FINAL MAPPING MUST FIT ON THIS PAGE

Tournament[Year, HostCountry]

Country[CountryName, Population, Year]

Team[TeamName, CountryName]

Customer[PassportID, Name, EmailAddr, Nationality]

Member[MemberID, MemberName, TeamName]

Player[PlayerID, Club]

Manager[ManagerID]

SupportStaff[SupportStaffID]

Match[Year, Venue, Date, Time, Team1_Name, Team2_Name]

Pool[Year, Venue, Date, Time]

Elimination[Year, Venue, Date, Time, Penalty Shoot-out score]

Save_goal[Year, Venue, Date, Time, PlayerID, SaveTime]

Score_goal[Year, Venue, Date, Time, PlayerID, ScoreTime]

PhoneNumbers[PassportID, PhoneNumbers]

Has_ticket[Year, Venue, Date, Time, PassportID, Price]

Foreign keys:

Player.PlayerID references Member.MemberID

Manager.ManagerID references Member.MemberID

SupportStaff.SupportStaffID references Member.MemberID

Match.Year references Tournament.Year

Pool.{Year, Venue, Date, Time} references Match.{Year, Venue, Date, Time}

Elimination.{Year, Venue, Date, Time} references Match.{Year, Venue, Date, Time}

Country.Year references Tournament.Year

Member.TeamName references Team.TeamName

Team.CountryName references Country.CountryName

Match.Team1_Name references Team.TeamName

Match.Team2_Name references Team.TeamName

Save_goal.{Year, Venue, Date, Time} references Match.{Year, Venue, Date, Time}

Save_goal.PlayerID references Player.PlayerID

Score_goal.{Year, Venue, Date, Time} references Match.{Year, Venue, Date, Time}

Score_goal.PlayerID references Player.PlayerID

PhoneNumbers.PassportID references Customer.PassportID

Has_ticket.{Year, Venue, Date, Time} references Match.{Year, Venue, Date, Time}

Has_ticket.PassportID references Cutomer.PassportID

YOUR FUNCTIONAL DEPENDENCIES MUST FIT ON THIS PAGE

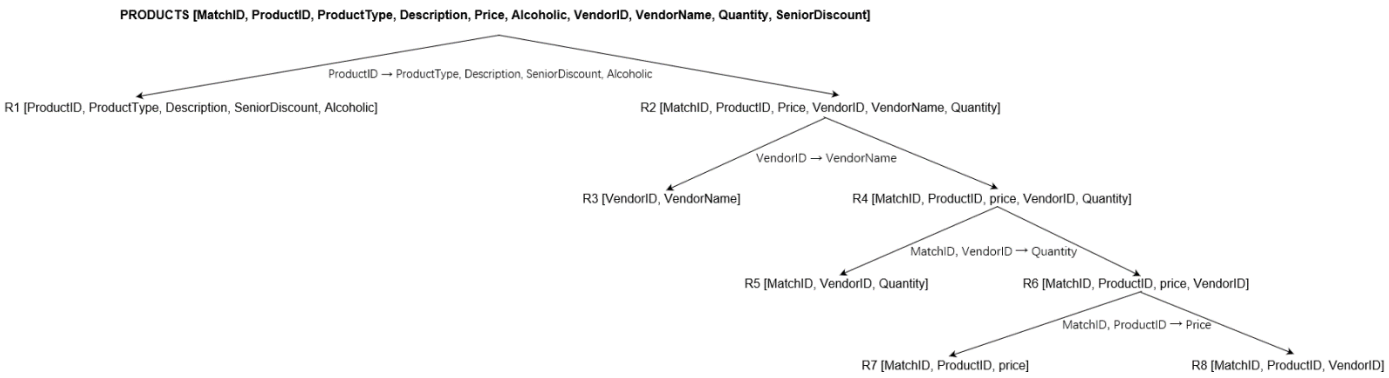
FD1: ProductID → {ProductType, Description, SeniorDiscount, Alcoholic}

FD2: VendorID → VendorName

FD3: {MatchID, VendorID} → Quantity

FD4: {ProductID, MatchID} → Price

YOUR NORMALISATION MUST FIT ON THIS PAGE



BCNF:

Candidate Key: {ProductID, VendorID, MatchID}

ProductID → {ProductType, Description, SeniorDiscount, Alcoholic} violates BCNF

So decompose,

R1[ProductID, ProductType, Description, SeniorDiscount, Alcoholic]

R2[MatchID, ProductID, Price, VendorID, VendorName, Quantity]

VendorID → VendorName violates BCNF in R2

So decompose,

R3[VendorID, VendorName]

R4[MatchID, ProductID, Price, VendorID, Quantity]

{MatchID, VendorID} → Quantity violates BCNF in R4

So decompose,

R5[MatchID, VendorID, Quantity]

R6[MatchID, ProductID, Price, VendorID]

{ProductID, MatchID} → Price violates BCNF in R6

So decompose,

R7[MatchID, ProductID, Price]

R8[MatchID, ProductID, VendorID]

Final Result:

R1[ProductID, ProductType, Description, SeniorDiscount, Alcoholic]

FD1: ProductID → {ProductType, Description, SeniorDiscount, Alcoholic}

R3[VendorID, VendorName]

FD2: VendorID → VendorName

R5[MatchID, VendorID, Quantity]

FD3: {MatchID, VendorID} → Quantity

R7[MatchID, ProductID, Price]

FD4: {ProductID, MatchID} → Price

R8[MatchID, ProductID, VendorID]

Non-trivial FD