Lab 09

1.) Leagues
league_name -> * none *

Teams
team_name -> the set and all subsets of {league_name,age_group,cid}

Players
pid -> the set and all subsets of {fname,lname,address,phonenumber}

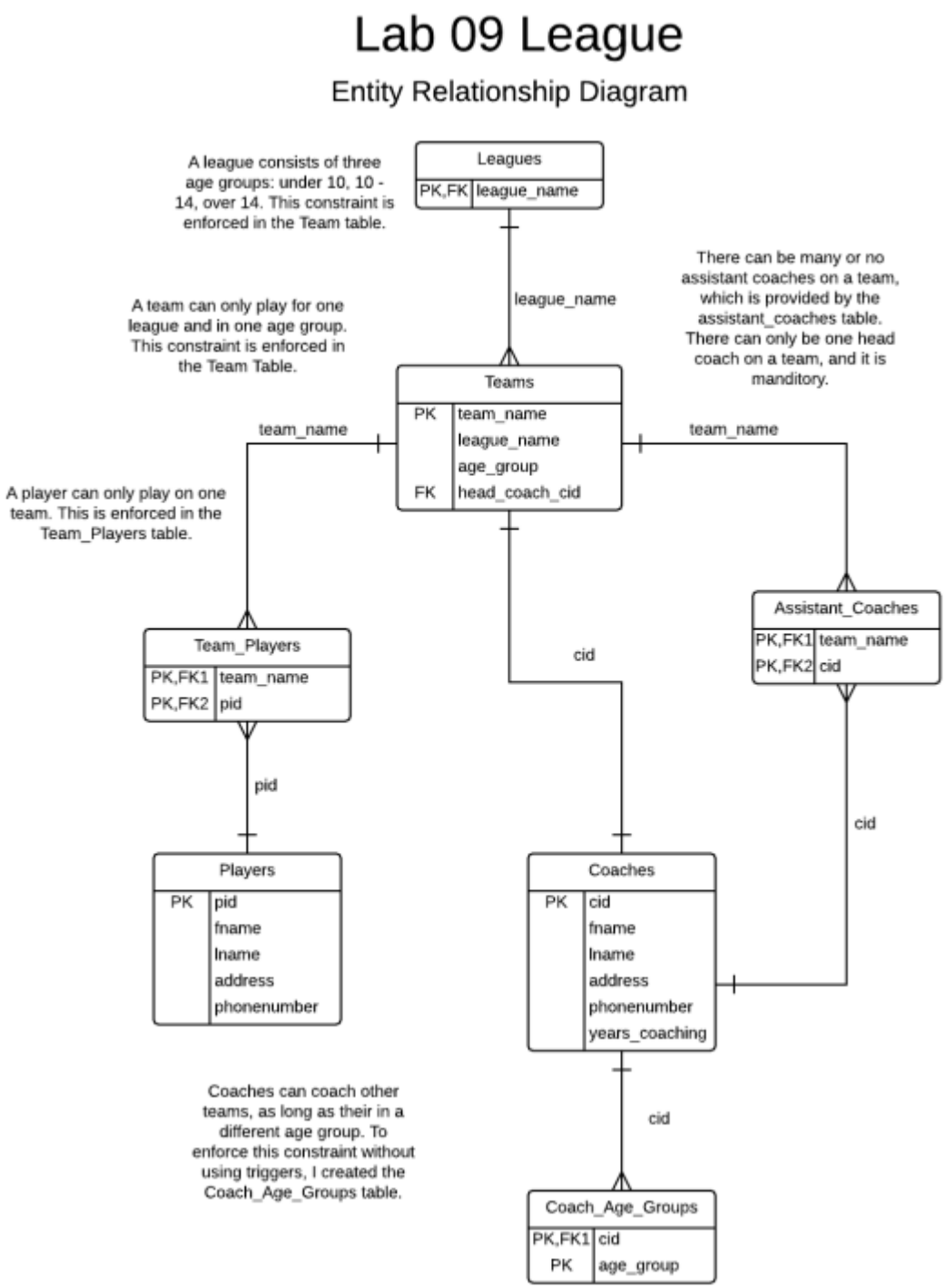
Coaches
cid -> the set and all subsets of
{fname,lname,addres,phonenumber,years_coached}

Assistant_Coaches
team_name,cid -> * none *

Team_Players
pid -> team_name due to UNIQUE(pid) constraint
team_name,pid -> * none *

Coach_Age_Groups
cid, age_group -> * none *

2.)


Lab 09 League
Entity Relationship Diagram
A league consists of three age groups: under 10, 10 - 14, over 14. This constraint is enforced in the Team table.
Leagues
PK,FK league_name
league_name
There can be many or no assistant coaches on a team, which is provided by the assistant_coaches table. There can only be one head coach on a team, and it is manditory.
A team can only play for one league and in one age group. This constraint is enforced in the Team Table.
Teams
PK team_name
league_name
age_group
FK head_coach_cid
team_name
team_name
A player can only play on one team. This is enforced in the Team_Players table.
Team_Players
PK,FK1 team_name
PK,FK2 pid
Assistant_Coaches
PK,FK1 team_name
PK,FK2 cid
cid
pid
cid
Players
PK pid
fname
lname
address
phonenumber
Coaches
PK cid
fname
lname
address
phonenumber
years_coaching
Coaches can coach other teams, as long as their in a different age group. To enforce this constraint without using triggers, I created the Coach_Age_Groups table.
cid
Coach_Age_Groups
PK,FK1 cid
PK age_group

3.) To prove my database is in NF3, first I must prove its in NF1. Its in NF1 as all data is atomic. Next I prove its in NF2. Its in NF2 as its in NF1, and using the dependencies I see there are no non-primary attributes dependent on just one part of a subset of a candidate key. Finally I prove its in NF3. Its in NF3 as its in NF2, and their are no transient dependencies in the form A-> B and B-> C so A -> C where A != C. In fact, their are no transient dependencies so its in BCFR.