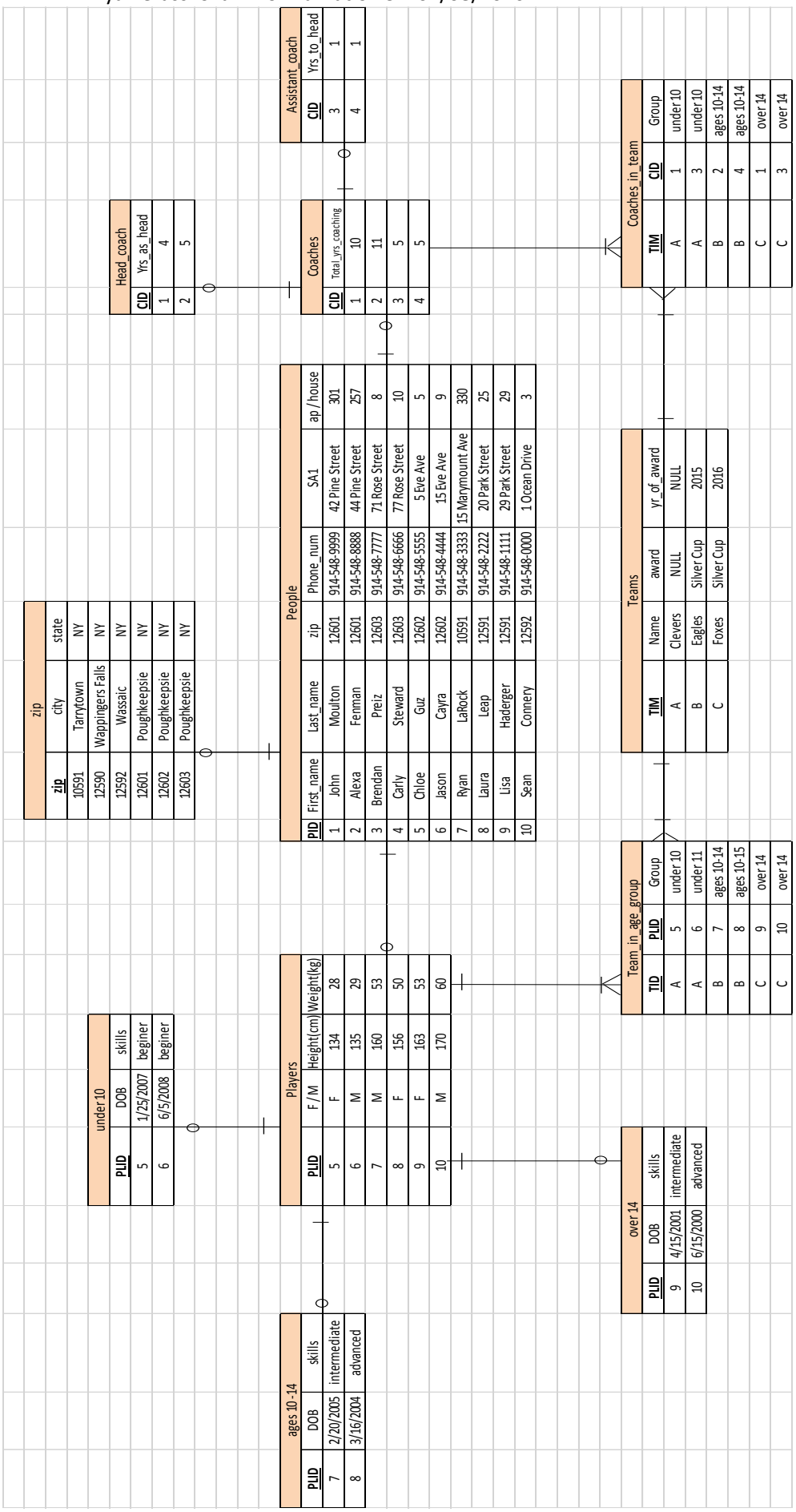

E / R diagram.

A separate PDF file looks better ☺

Liliya Yerassilova Normalization 9 04/08/2016

Functional Dependencies:

People:
(PID) → First_name, Last_name, zip, SA1, ap / house

Zip:
(zip) → city, state

Coaches:
(CID) → Total_yrs_coaching

Head_coach:
(CID) → Yrs_as_head

Assistant_coach:
(CID) → Yrs_to_head

Coaches_in_team:
(TIM, CID) → group

Players:
(PLID) → F/M, Height(cm), Weight(kg)

Under 10:
(PLID) → DOB, skills

Ages 10 – 14:
(PLID) → DOB, skills

Over 14:
(PLID) → DOB, skills

Team_in_age_group:
(TIM, PLID) → group

Teams:
(TIM) → name, award, yr_of_award

The database is in Boyce_Codd normal form. Since all the columns have atomic, single-valued attributes, the database is in the 1st normal form. There are no partial key dependencies in any of the tables; for each table there is an entire primary key that determines everything else. There are two tables (Coaches_in_team and Team_in_age_groups) that have composite primary keys, and in both cases, the entire key determines group. Therefore, the tables are in the 2nd normal form. There are no multiple key dependencies, since there is no attribute that is dependent on more than one key in the database. Thus, the 3rd normal form is met. Lastly, there are no interior transitive dependencies. There are transitive dependencies among tables, but not interior ones. The address zip code is separated from People table in order to avoid interior transitive dependency that could have resulted, had there be no separate zip table. Thus, the database is in the Boyce-Codd normal form.

An additional note:

In order to make sure the database and the relations work, certain constraints should be implemented when creating the tables in SQL. For example, for the age tables, there should be a constraint for date of birth for each category.