CS345 Final Project
Hockey Database Schema/Functional Dependency Analysis

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Tables *(Primary keys for each table are underlined)*

Affiliations (club_name, team_id, city, affiliate_owner, active_flag)

1. {club_name, team_id, city} → {affiliate_owner, active_flag}
2. Since it is possible that lower level club affiliations can share the same name and city name, {club_name, team_id, city} correctly determines affiliate owner and the active status of an affiliate club.
3. FD is in BCNF, key is on the left.

Coaches (team_id, first_name, last_name, type, active_flag)

1. {team_id, first_name, last_name} → {type, active_flag}
2. It is possible for coaches to share the same first and/or last name, so {team_id, first_name, last_name} correctly determines what type of coach and the active status of a particular coach for a given team.
3. FD is in BCNF and 4NF, key is on the left.

Equipment (player_id, team_id, type, color)

1. {player_id, team_id} → {type, color}
2. Different teams and different players like to have specific equipment that may not be shared by other teams. So {player_id, team_id} correctly determines the type and color of each piece of equipment.
3. FD is in BCNF, key is on the left.

Games (date, time, home_team, away_team, h_score, a_score, game_type, venue_name)

1. {date, time, home_team, away_team} → {h_score, a_score, game_type, venue_name}
2. Since it is possible that teams can play in multiple games on a given date at different times that don't conflict (in the event of lower level tournaments), {date, time, home_team, away_team} correctly determines final scores, game type, and the venue at which the game is being played.
3. FD is in BCNF, key is on the left.

Leagues (league_name, active_flag)

1. {league_name} → {active_flag}
2. The league name is unique enough to determine the only other attribute in the table: active_flag. The league name determines its active status.
3. BCNF and 4NF, key on left side of only FD, and only two columns.

Owners (owner_id, last_name, first_name, active_flag)

1. {owner_last, owner_first} → { active_flag}
2. It is possible for owners to share first and last names, so these two attributes on their own aren't enough to be the key for the table. We need to implement a unique ID.
3. {owner_id} → {owner_last, owner_first, active_flag}
4. Since we have implemented an ID as a unique identifier, this ID can uniquely identify all other attributes in the table.
5. FD is in both BCNF and 4NF. Cannot be broken down further.

Players (player_id, first_name, last_name, team_id, age, gender, level, nationality, height, position, number, handedness, active_flag)

1. {first_name, last_name, team_id} → {age, gender, level, nationality, height, position, number, handedness, active_flag}
2. Since it is possible that players can share the same name on a given team, the above FD doesn't hold. We need to implement a unique ID.
3. {player_id} → {first_name, last_name, team_id, age, gender, level, nationality, height, position, number, handedness, active_flag}
4. Since we have implemented an ID as a unique identifier for players, this ID can uniquely identify all other attributes in the table.
5. Player_id uniquely identifies each row therefore player_id is a superkey so the FD is in BCNF.

Salaries(player_id, salary, years_remaining)

1. {player_id} → {salary, years_remaining}
2. Player ID is unique enough to determine all other attributes in the table.
3. Left side is superkey so the FD is in BCNF and 4NF.

Sponsors (sponsor_name, team_id, year, amount)

1. {sponsor_name, team_id, year} → {amount}
2. The sponsor name for a given team and year determines the amount that they sponsored a particular team for.
3. The FD is in BCNF, key is on left side.

Records (team_id, league_name, year, wins, losses, ties, points, place)

1. {team_id} → {league_name, year, wins, losses, ties, points, place}
2. The team ID is unique enough to determine all other attributes in the table about a team such as type of league and the team record for a given year.
3. Key is on left so the FD is in BCNF.

Statistics(player_id, team_id, year, goals, assists, shots, points, shooting_percentage, PIM, saves, GAA, games_played)

1. {player_id, team_id, year} → {goals, assists, shots, points, shooting_percentage, PIM, saves, GAA, games_played}
2. Since Players can have multiple stats over their career, their player ID, their team ID (team they played for during a season) and year they played can correctly determine all other statistical attributes in the table about a player.
3. Left side is superkey and is in BCNF.

Awards(award_name, year, team_id, description)

1. {award_name, year} → {team_id, description}
2. Since award names are more than often unique, the award name and year it is given is enough to determine the description of the award and the team it was given to.
3. Superkey is on left side so FD is in BCNF.

Teams (team_id, team_name, city, active_flag, owner_id, league_name)

1. {team_id} → {team_name, city, active_flag, owner_id, league_name}
2. Since it is possible that team names and their corresponding cities aren't unique enough (could have teams with same name and same city across different states/countries) to determine everything about a team, it is necessary to incorporate a team ID to uniquely identify a team and all other attributes about a team.
3. Key is on left. FD is in BCNF.

Venues (venue_name, city, active_flag, team_id)

1. {venue_name, city} → {team_id, active_flag}
2. It is possible that venues with the same name can co-exist, and city names aren't always unique. Together, {venue_name, city} can correctly determine the active status of a venue and it's home team.
3. Key is on left side of FD so BCNF and 4NF.

Apparel(team_id, name, color)

1. {team_id} → {name, color}
2. Team_id is the key for apparel, it determines the type of apparel that a team has and in which colors based on a given team.
3. Key is on the left, so FD is in BCNF. FD is also in 4NF.