

Waterford Institute *of* Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

# Ice Hockey Statistics Database Implementation

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# Normalized Tables

Conferences(conference\_ID, conference\_name)

Divisions(division\_ID, division\_name, conference\_ID)

Teams(team\_ID, team\_Name, team\_Location, team\_Record, points, conference\_ID, division\_ID)

Coaches(coach\_ID, first\_name, last\_name, date\_of\_birth, career\_Record, team\_ID)

Players(player\_ID, player\_first\_name, player\_last\_name, draft\_year, player\_dob, height, weight, player\_type, goals, assists, points, pim, p\_m, save\_percentage, gaa, shots\_against, goals\_against, shutouts, team\_ID)

Games(game\_ID, away\_team, final\_score, location, team)

# Table Mapping

## Conference

Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
conference_id	Number	5	NOT NULL		Unique	pk	UID for conference
conference_name	Varchar	20	NOT NULL				Name of conference

## Division

Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
division_id	Number	5	NOT NULL		Unique	pk	UID for division
division_name	Varchar	20	NOT NULL				Name of division
conference_id	Number	5	NOT NULL			fk	ID for conference division is in

## Coaches

Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
coach_id	Number	5	NOT NULL		Unique	pk	UID for coach
first_name	Varchar	20	NOT NULL				Coach first name
last_name	Varchar	20	NOT NULL				Coach last name
date_of_birth	Date		NOT NULL				Date of birth of coach
career_record	Varchar	14	NOT NULL				Career record for coach
team_id	Number	5				fk	ID of team coach belongs to

## Team

Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
team_id	Number	5	NOT NULL		Unique	pk	UID for team
team_name	Varchar	20	NOT NULL				Name of team
team_location	Varchar	20	NOT NULL				Location of team
team_record	Varchar	8	NOT NULL				Wins-losses record for team
Points	Number	3	NOT NULL				Points team has this season
conference_id	Number	5	NOT NULL			fk	ID of conference team is in
division_id	Number	5	NOT NULL			fk	ID of division team is in

## Game

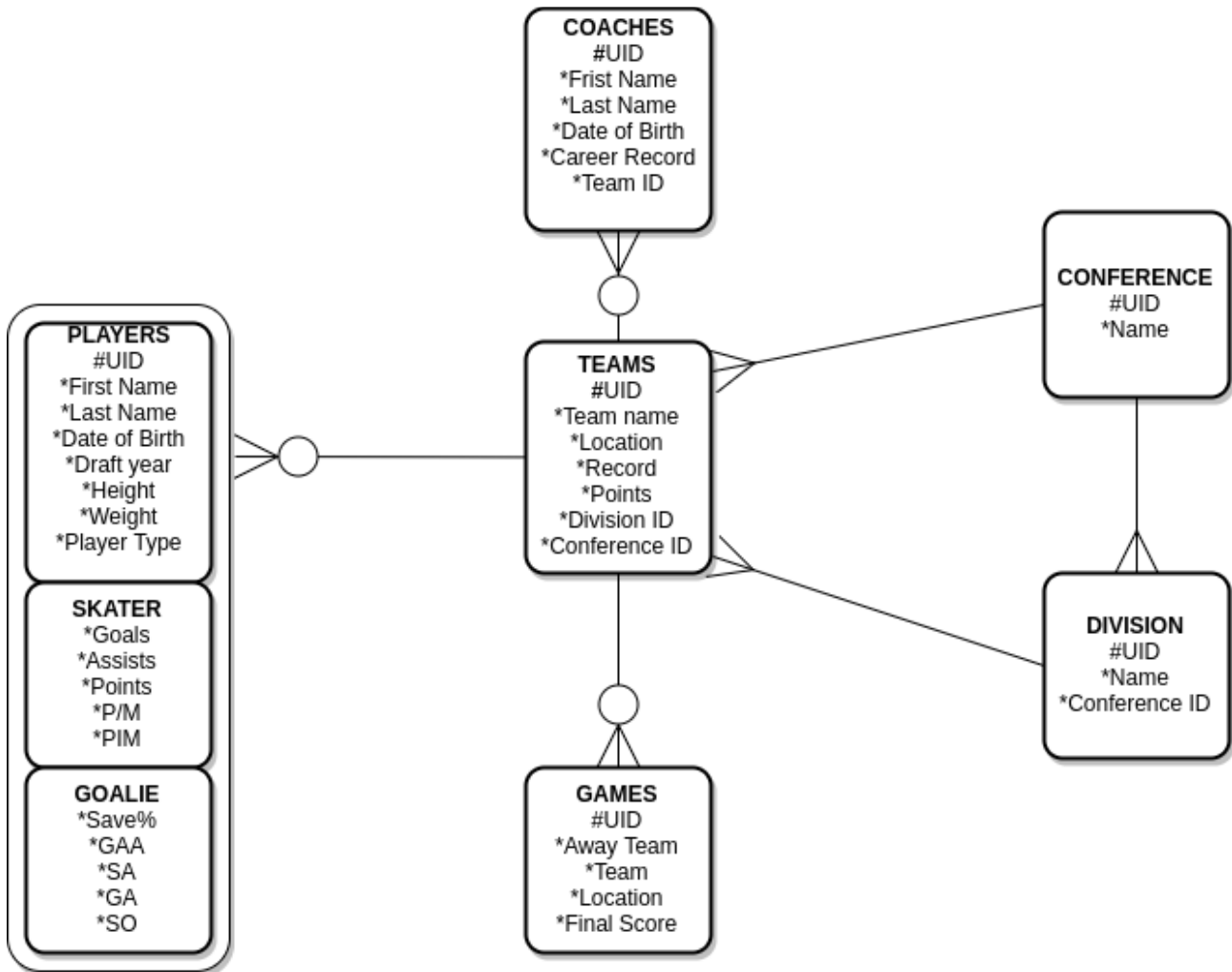
Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
game_id	Number	5	NOT NULL		Unique	pk	UID for game
Team	Number	5	NOT NULL			fk	ID for team in game
away_team	Varchar	20	NOT NULL				Name of opponent
location	Varchar	4	NOT NULL		home or away		Location of match
final_score	Varchar	5	NOT NULL				Score of game

## Player

Field	Type	Size	NULL/ NOT NULL	Default	Constraints	Index	Description
player_id	Number	5	NOT NULL		Unique	pk	UID for player
player_first_name	Varchar	20	NOT NULL				Player first name
player_last_name	Varchar	20	NOT NULL				Player last name
draft_year	Number	4	NOT NULL				Year player was drafted
player_dob	Date		NOT NULL				Date player was born
height	Number	3	NOT NULL				Height of player
weight	Number	3	NOT NULL				Weight of player
player_type	Varchar	4	NOT NULL		skater or goalie		Player type
goals	Number	2					Goals scored
assists	Number	2					Assists scored
points	Number	3					Total points
pim	Number	4					Penalty minutes
p_m	Number	2					Plus/minus
save_percentage	Number	3					Percentage of shots saves
gaa	Number	3					Goals against average
shots_against	Number	3					Shots against
goals_against	Number	3					Goals againts
shutouts	Number	2					Shutouts
team_ID	Varchar	20	NOT NULL				Name of conference

# Implementation

## New ER Diagram:



## Changes made to design

1. Relationship between Games and Teams has become a many optional to 1. Where one team is referenced in a single Game entity. There is a Game entity for each game one team plays this means there is duplicates of games stored.
2. Points( $2 \times \text{Games won} + \text{OT losses}$ ) is now stored in Teams.
3. Points( $\text{Assists} + \text{Goals}$ ) is now stored in Skater.
4. Location and Away Team now stored in Games

## Useful queries and Commands

1. **SELECT player\_last\_name, player\_first\_name, points, assists, goals FROM PLAYERS WHERE player\_type = 'skater' ORDER BY -POINTS**

This command returns a list of all players listed by the number of points highest to lowest.. By changing ORDER BY -POINTS you can chose the primary stat the list will be ordered by for example ORDER BY -GOALS would list the players by number of goals, highest to lowest.

2. **SELECT player\_last\_name, player\_first\_name, save\_percentage, gaa, shutouts FROM PLAYERS WHERE player\_type = 'goalie' ORDER BY -SAVE\_PERCENTAGE**

This command returns a list of all goalies listed by save percentage highest to lowest. By changing ORDER BY --SAVE\_PERCENTAGE you can chose the primary stat the list will be ordered by for example ORDER BY -SHOTS\_AGAINST would list the goalies by number of shots they have faced in game, highest to lowest.

3. **SELECT TEAM\_NAME, TEAM\_LOCATION, TEAM\_RECORD, POINTS, CONFERENCE\_NAME FROM TEAMS JOIN CONFERENCES USING (CONFERENCE\_ID) ORDER BY -POINTS**

This command returns a list of all the teams listed by points highest to lowest. It displays the conference name using the a using clause.

4. **SELECT TEAM\_NAME, TEAM\_LOCATION, TEAM\_RECORD, POINTS, CONFERENCE\_NAME FROM TEAMS JOIN CONFERENCES USING (CONFERENCE\_ID) WHERE CONFERENCE\_NAME = 'Eastern Conference' ORDER BY -POINTS**

This command refines the teams list returned by the last command to a specific conference.

5. **SELECT player\_last\_name, player\_first\_name, points, assists, goals FROM PLAYERS WHERE player\_type = 'skater' AND player\_first\_name = 'Matt'**

This command is used to search for specific players based on their first name. The command can be altered by changing 'skater' to 'goalie' this will return a list of goalies with the first name 'Matt'. The second condition can be changed based on which stat or data you want to base the search on i.e. player\_last\_name, points, save\_percentage etc.

6. **SELECT AVG(points) FROM Players**

This command returns the average amount of goals scored by players. Can also be used for many other stats like save percentage.

7. **SELECT team\_name, away\_team, final\_score, location FROM GAMES JOIN TEAMS ON (team = team\_id) WHERE team = 1**

This command will return a list of all the games a team has played. The team ID is used to select which teams games you want to view.



#### 8. **UPDATE PLAYERS set team\_id = 8 WHERE player\_id = 12**

This command is used to change the team a player is on.

## Privileges

Due to the business there isn't many privilege levels. All tables are view-able by any user. Tables can only be change (insert, update, delete etc.) by the hockey league. Teams can request trades but the changes will only be made by admins at the league. Games and Player statistics are recorded by the league and inputted into the system.