Pacific Western Athletic Association Database

Databases Final Project

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Submitted to

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April 5, 2025

Application Domain

This database application project is for tracking and handling information for the PacWest. The PacWest is the athletics league that VIU and many other BC colleges and universities are a part of. School teams play each other throughout the year and at the end of their season have a championship tournament to decide on a winner, and who will go play at the national's tournament. The PacWest contains men's and women's volleyball, basketball, and soccer teams. Every school has a team composed of talented athletes from around the world, and every school has multiple teams. Every sport can be split into men's and women's divisions and treated as different sports as men's teams never play against women's teams.

It is assumed that whoever uses the database application has at least this understanding of post-secondary athletics in Canada in order to get the most out of the application. This application is designed for managers of the PacWest to be able to quickly access information about the league and make modifications if players transfer in or out of the league. It can also be used by athletes to gain information about other players in the league and learn some interesting facts about the league, such as who has the same number, or is from the same hometown.

Business Data Description

The PacWest is composed of many BC schools, each of these schools has many teams in the league. Each team has athletes. There are many sports in the PacWest and each school can have one of each of these sports teams. Each athlete is part of a team, a school, and a sport. A team can be described by what school they're from and what sport they play.

Application (Business Logic) Requirements

This application's main purpose is to allow organizers of the PacWest to be able to have an updated database of information about everything in their league, allowing them to make adjustments when they need to be made. There are functionalities implemented to let athletes scan through the database to learn about the league, but this is not the key purpose. The application can do the following:

- Add an athlete to the league by specifying their metrics and what sport/team they belong to
- Remove an athlete from the league by specifying their athlete number, a confirmation message will be given with the name of the athlete before they are removed.
- Modify an athletes information to account for between season changes, like year of eligibility, jersey number, or position
- List a general query about the contents of a table, allowing the user to specify a condition to query by
- Select an option from a list of pre-structured queries, providing additional information if needed.

These functionalities are implemented as they are the most vital operations for correctly performing the tasks that a PacWest DB manager or athlete would want to perform. Actions like adding a team or school to the league are extremely unlikely so are not implemented.

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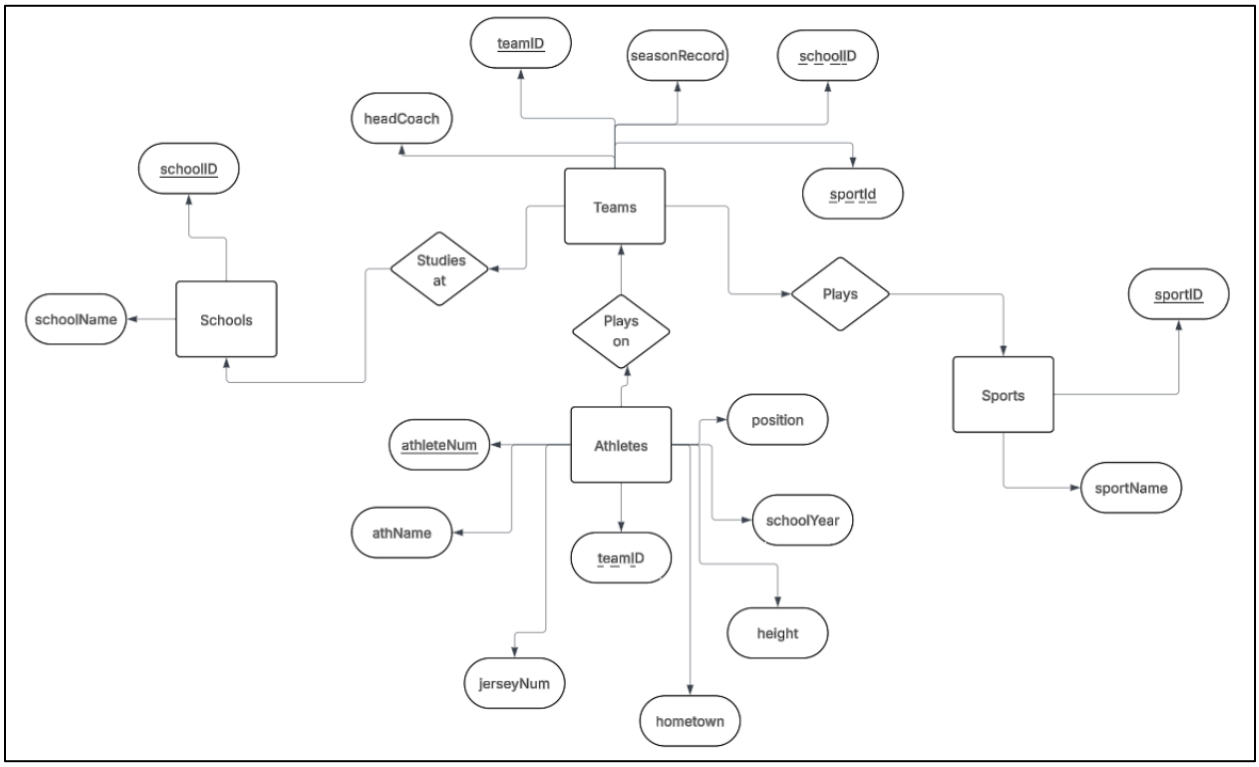
Database Design

The PacWest database contains all information listed on a teams roster about an athlete, including their name, height, hometown, year, position, jersey number, team ID as well as an athlete number used to identify them. Team information is given by their unique teamID, their school's ID, their sport's ID, as well as their head coach and season record. School information is their unique school ID and their school name. Lastly, sport information is given a name and a unique sport ID.

ER Diagram



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Database Diagram

The database schema can be described by the following SQL create table statements:

```
CREATE TABLE Sports (
   sportID     CHAR(3) PRIMARY KEY,
   sportName   VARCHAR(20)
);

CREATE TABLE Schools (
   schoolID    CHAR(3) PRIMARY KEY,
   schoolName  VARCHAR(30)
);

CREATE TABLE Teams (
   teamID      CHAR(3) PRIMARY KEY,
   schoolID    CHAR(3) REFERENCES Schools,
   sportID     CHAR(3) REFERENCES Sports,
   headCoach   VARCHAR(50),
   seasonRec   VARCHAR(10)
);

CREATE TABLE Athletes (
   athleteNum  VARCHAR(4) PRIMARY KEY,
   athName     VARCHAR (50),
   jerseyNum   NUMBER(2,0),
   teamID      CHAR(3) REFERENCES Teams,
   position    VARCHAR (30),
   schoolYear  NUMBER (1,0),
   height      NUMBER(3,2), --Format feet.inches '5.11'
```

```
    hometown    VARCHAR(80)
);
```

Implementation Notes

The general list function, pre-structured query function, and modify functions are all successfully implemented. The database was seeded with information on Vancouver Island University, Camosun College, Capilano University, College of the Rockies, Columbia Bible College, and Douglas College. All the athletes from these schools have been entered into the database according to the information available online on their roster website. I went through and copied the information of every athlete and converted them into sql insert statements. Testing of my application was done on this database, I have attached the sql file with all the athlete information and below I have given the results of some example queries and then modification statements:

Query functions and their output.

1. Find tallest athletes

Name	Height	School
Zach Klim	6.11	Capilano University
…		

2. Find team with highest season record

Team ID	School	Sport	Record
018	Vancouver Island University	Womens Basketball	21-1
…			

3. Find athletes from specific provinces (MB)

Name	Hometown	Team ID
Luke Sigurdson	Oakbank, MB, CA	001
…		

4. Find athletes sharing same jersey number (18)

Jersey #	Name	School Sport	
18	Nate Raabe	Camosun College	Mens Volleyball
18	Jenna Grewal	Douglas College	Womens Voleyball
…			

5. Find athletes sharing same position (Middle)

Name	Position	Team
Rowan Macpherson	Middle	001
Dylan Buehler	Middle	005
…		

6. List the head coaches for a school (001)

Team ID	Sport	Head Coach
001	Mens Volleyball	Abe Avender
007	Womens Volleyball	Shane Hyde
…		

To test my *modify* functions I would create a new athlete with athlete number 999, name *John Doe*, Jersey number 77, team ID 001, position *Setter*, school year 3, height 6.05, hometown *townroad, BC*. To check that they got added correctly I used my *list all* function to "select *" on athletes where athlete number = 999, check that all information got added. After it worked correctly, I proceeded with using the *update athlete* function to change the test athlete's hometown to *roadtown, AB*, and then checked that it got updated correctly following the same steps as before. Finally, after seeing the correct updates, I tested the *delete athlete* function by deleting athletes in the table where athlete number = 999 and then again checked that no information came up after using the same steps.

Summary of Test Results

The overall testing of the application was fairly easy because despite dealing with almost 700 athletes, I know enough about athletes in mens volleyball and athletes at VIU to be able to tell when the query I was using gave me wrong information or slightly incorrect results. This meant it was fairly easy for me to go into my code to see where my logic was wrong and correct my SQL prepared statements. I used try and catch statements to stop incorrect SQL execution.

Conclusion

This project has been very successful in providing a tool that would allow athletes and league organizers to quickly be able to bring up information about any athlete, team, or school in the league. Going through and modifying every individual page or website from different schools that contains PacWest information takes a very long time, but by including this database into their websites, schools and the PacWest league would save hours of correcting information, as the database allows for instant updates.

Future Work

To improve on this database, the sample data could be expanded to include men's and women's soccer teams in the PacWest, or even further to include all schools in Canada and include a new table called leagues, adding a league ID to each school to account for the many leagues that are part of the Canadian Collegiate Athletics Association. There could also be more functions added to the application itself, giving the user more pre structured queries and/or freedom in finding the data they want to find, including subqueries and more fine-tuned searching.