Concordia University
Dept. of Computer Science & Software Engineering

Comp 353 - Databases
Winter 2025

Warm-up Project

Title: A simple database application for Montréal Youth Volleyball Club (MYVC)
Due: February 17, 2025, at 23:55 (submission through Moodle only)
Maximum Mark: 6%

In this project, you and your group are required to develop a miniature database application system, described below, and evaluate a number of queries and transactions against the database. For this, you should use the MySQL DBMS maintained by the faculty AITS. The lab instructors will help you during the lab sessions to resolve possible problems you may have, for instance, for connecting or interacting with the DB server.

Project Description

> The application is to develop a database system to help the Montreal Youth Volleyball Club (MYVC) manage and organize their activities and operations by keeping track of the club members. MYVC is an organization that develops, promotes and enhances youth Volleyball in different areas. It provides services to its members long-term to become professional Volleyball players. The desired Volleyball program is offered by the club to the members of ages between 11 and 18 years old. The club can have one main location as the Head location and several other locations or branches spread over different areas. The players are joined by either Boys teams or Girls teams. Every club member can be associated with only one location at any given time, however, a member can move to a different branch if/when desired.

To become a member, at least a family member should be registered into the system. A registered family member can then help any number of his/her child(ren) register as a club member.

The system should record and maintain all the information related to the club, including the General head of the club, the club locations, the manager and other personnel working at each location, the members and other possible family members of each location, and information about the teams at each location.

The information maintained by the system is used to monitor and keep track of the members' progress made since they joined and the skills acquired.

A location could be the head of the club or a branch of the club. The information for each location could include type (Head, Branch), name, address, city, province, postal code, phone number(s), web address, and the maximum capacity of active club members that the location can handle at any time. At any time, a location can have a manager and any number of other personnel working

at the location. The head location has the following personnel: the General manager, deputy manager, treasurer, secretary, and one or more administrators. The general manager of the head location is the president of the club.

The application must maintain information about every personnel working at each location. The information includes first-name, last-name, date of birth, Social Security Number, Medicare card number, telephone number, address, city, province, postal code, email address, role and mandate.

There are some constraints to be considered: No two personnel can have the same Medicare card number. Social Security Number cannot be null. Also, no two people can have the same Social Security Number. The role of every personnel must be recorded and maintained by the system. The role could be either an administrator, Captain, Coach, assistant Coach, or another (including all other tasks). A general manager is an administrative personnel. The mandate could be either volunteer or salaried (paid). Personnel can have only one role at any given time.

A Personnel can operate at only one location at any time. Personnel can operate at different locations at different times. For every personnel, the start date and end date operating at each location must be maintained. If the end date is null, it indicates that the personnel are still active at the location. Personnel can operate at the same location at different time periods. For example, Roger Smith who is a trainer could have worked at location Montréal from Jan. 15th, 2022, to June 30th, 2022, then worked at location Laval from July 5th, 2022, to Dec. 15th, 2022, and then returned to location Montréal from Dec. 20th, 2022, till now.

The application must maintain information about every family member registering her/his child into the system. The information includes first-name, last-name, date of birth, Social Security Number, Medicare card number, telephone-number, address, city, province, postal code, email address, and the location. The family member can be associated with only one location at a given time, and be associated with different locations at different times. A family member can have one or many children as members of the club. The relationship between the family member and each child must be maintained. The relationship could be one of the following: Father, Mother, Grandfather, Grandmother, Tutor, Partner, Friend, and Other.

The application must maintain information about every club member. The application assigns a global unique auto increment club member number for every new club member. This number is unique at all locations and not just at a single location. That is, no two club members could have the same membership number in the whole system. A new club member must be between 11 and 18 years old at the time of registration. Every club member must be associated with one family member and the relationship with the family member must be maintained. A club member can be associated with different family members at different times. The application must maintain information about every club member in the system. The information includes club membership number, first-name, last-name, date of birth, height, weight, Social Security Number, Medicare card number, telephone number, address, city, province, postal code, and the family member with whom s/he is associated. A club member is active if her/his age ranges between 11 years and 18 years old.

The application must maintain information about every club member's financial status. The annual membership fee is $100 for each club member. A club member cannot participate in any game or activity if his/her membership is not yet renewed and the membership fees to date is not paid. Details of every payment by every club member must be maintained by the system. Payment details include club member number, payment date, amount of payment, method of payment (Cash, debit or credit card), date of the membership payment (for example, payment could be done by Dec. 31, 2024 for the membership in 2025. Payments can be made in maximum 4 installments. If total payments of a member within a year exceed $100, then the excess will be considered as donations to the club. A club member whose membership fees is not paid is considered to be an inactive club member.

These are the minimum requirements for the application. Some more details are welcome to be added, if you found to be suitable, to make the system more elaborate and realistic.

1. Express the MYVC data using the E/R model. Use arrows to indicate the constraints on relationships. Underline the key attributes for the entity and relationship sets.

2. Convert the E/R diagram into at least five relations: Locations, Personnel, FamilyMembers, ClubMembers, and Payments. Other relations might be needed to capture all the requirements.

3. Write SQL scripts to create the MYVC database and populate the tables with appropriate data. Include at least 10 representative tuples in each database table/relation such that the result of each of the queries below contain at least two tuples.
   Also write SQL scripts for the following queries and transactions. Note that the Graphical User-Interface (GUI) is not required in this project but encouraged.

   i. Get complete details for every location in the system. Details include address, city, province, postal code, phone number, web address, type (Head, Branch), capacity, general manager name, number of personnel, and the number of club members associated with that location. The results should be displayed sorted in ascending order by Province, then by city.

   ii. For a given location, provide a report that lists for every family member who is currently registered in the location, the number of related active club members. Information includes family members' first name, last name, and the number of active club members that are associated with the family member.

   iii. For a given location, provide a report that displays information about the personnel who are currently operating in that location. The information includes first-name, last-name, date of birth, Social Security Number, Medicare card number, telephone number, address, city, province, postal code, email address, role (General manager, deputy manager, Coach, etc.) and mandate (Volunteer or Salaried).

   iv. Get a detailed list of all club members registered in the system. The list should include the location name that the club member that is currently associated with, the membership number of the club member, first-name, last-name, age, city,

province, and status (active or inactive). The results should be displayed sorted in ascending order by location name, then by age.

v. For a given family member, get details of all club members associated with him/her. Information includes club membership number, first-name, last-name, date of birth, Social Security Number, Medicare card number, telephone number, address, city, province, postal code, relationship with the family member, and status (active or inactive).

vi. For a given location, get the list of all family members who have currently active club members associated with them and are also an operator personnel member for the same location. Information includes first-name, last-name, and phone number of the family member.

vii. For a given club member, give details of all payments for the membership fees. Information includes date of payment, amount of payment, and year of payment. The results should be displayed sorted in ascending order by date.

viii. Get the sum of membership fees paid and the sum of donations that are collected by the club in the year 2024.

Note: **You can use multiple queries to answer any of the nine transaction queries above if necessary.**

Project Report: Structure and Contents

Each group should submit a single project report in PDF through Moodle by the due date. Please check the course Moodle for more information and access the "expectation of originality" document. The report should include the following parts:

(1) DESIGN: The E/R diagram of the design of the database given in the project description (or a revised version, if deemed necessary).
(2) The SQL statements formulated and used to create the database. Pick appropriate data types for the attributes, identify the key attribute(s), the relationship among the tables, and include this information in your report.
(3) The SQL statements formulated to express the required queries and transactions mentioned.
(4) Populate each table in the database with at least ten representative and appropriate tuples.
(5) For each relation **R** created in your database, report the result of the following SQL statement:

SELECT COUNT(*) FROM R;

A Final Note: Your report should also include the originality FORM as the cover page, **signed** by svsdy member of the group. The cover page should also include the "Group Account" assigned to you by AITS, and the full name and ID of every group member.