

# CPSC 5021 Database Systems

## Fall 2017

### Homework 2

**Due: 6:00 pm, Thursday, Oct 12 (start of class)**

#### Written Problems (Total points: 30)

Make sure that your writing is legible, or else, please type your answers.

1. (10 points) The local city youth league needs a database system to help track children who sign up to play soccer. Data need to be kept on each team and the children who will be playing on each team and their parents. Also, data need to be kept on the coaches for each team.

Draw an ERD for this database system using the Crow's Foot notation.

Entities required: Team, Player, Coach, and Parent. **You can add other linking entities as needed.**

Attributes required:

Team: Team ID number, Team name, and Team colors.

Player: Player ID number, Player first name, Player last name, and Player age.

Coach: Coach ID number, Coach first name, Coach last name, and Coach home phone number.

Parent: Parent ID number, Parent last name, Parent first name, Home phone number, and Home Address (Street, City, State, and ZIP Code).

The following relationships must be defined:

- Team is related to Player.
- Team is related to Coach.
- Player is related to Parent.

Connectivities and participations are defined as follows:

- A Team may or may not have a Player.
- A Player must have a Team.
- A Team may have many Players.
- A Player has only one Team.
- A Team may or may not have a Coach.
- A Coach must have a Team.
- A Team may have many Coaches.
- A Coach has only one Team.
- A Player must have a Parent.

- A Parent must have a Player.
- A Player may have many Parents.
- A Parent may have many Players.

2. (10 points) Please draw an ERD to represent the following generalization/specialization hierarchy using the Crow's Foot notation. (i.e. entity supertypes and entity subtypes).

Superclass: **Product**. Common attributes are: Prod\_Num, Prod\_Title, Prod\_ReleaseDate, Prod\_Price, Prod\_Type.

Subclasses:

(1) **Book**. Unique attributes are: Book\_CoverType, Book\_PageCount.

(2) **CD**. Unique attributes are: CD\_Genre, CD\_Artist.

(3) **Movie**. Unique attributes are: Movie\_Rating, Movie\_Director.

A product is either a book, or a CD, or a movie. There are no other products.

3. (10 points) Use the following business rules to create a Crow's Foot ERD. Write all appropriate connectivities and cardinalities in the ERD.

- A department employs many employees, but each employee is employed by one department.
- Some employees, known as "rovers," are not assigned to any department.
- A division operates many departments, but each department is operated by one division.
- An employee may be assigned many projects, and a project may have many employees assigned to it.
- A project must have at least one employee assigned to it.
- One of the employees manages each department, and each department is managed by only one employee.
- One of the employees runs each division, and each division is run by only one employee.