

**Towson University  
Computer and Information Sciences  
ITEC 315**

**Entity Relationship (ER) Modeling exercise:**

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

**A. Entities required:**

- Team
- Player
- Coach
- Parent

**B. 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).

**C. The following relationships must be defined:**

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

**D. Connectivities (cardinalities) 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.

1. Create the preliminary conceptual Crow's Foot ERD without foreign keys using Visio (copy/paste diagram into your Word document) that depicting the data model described above. Note the preliminary conceptual model may contain M:N relationships which will need to be resolved later. Include all appropriate entities, attributes, primary keys, relationships, connectivities (cardinalities in crow's foot notation).
2. Revise the model created in #1 to remove the the M:N relationship. Create the conceptual Crow's Foot ERD with foreign keys using Visio (copy/paste diagram into your Word document) that depicting the data model described above. Include all appropriate entities, attributes, primary and foreign keys, relationships, connectivities (cardinalities in crow's foot notation).
3. Revise the model created in #2 to allow TEAMs to have more than 1 colors. Create the conceptual Crow's Foot ERD with foreign keys using Visio (copy/paste diagram into your Word document) that depicting the data model described. Include all appropriate entities, attributes, primary and foreign keys, relationships, connectivities (cardinalities in crow's foot notation).