# Lab 7: Designing a sports league program

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## Theme

**Hockey**

Consider what we learned on:

* RDD
  + Hockey team has its own well-defined role
  + The goal of the larger program is realized when each of the smaller parts fulfills its purpose
* Cohesion
  + Refers to the number of diversity of tasks that a single unit is responsible for. We aim for HIGH COHESION
* Coupling
  + Avoid Coupling – we aim for loose coupling
  + Links between separate units of a program
  + When for example two players depend on each other so closely that neither can function on their own so we lose cohesion and the role gets confused
* Duplication
  + When the same or very similar code sequence appears more than once in the same class or in different classes within the same program

## Questions to consider:

### For players:

1. What attributes does a hockey player have?
   1. firstName
      1. This is the first name of the player. This is in a string format.
   2. lastName
      1. This is the last name of the player. This is in a string format.
   3. jerseyNumber
      1. This is the number that will be shown on their jersey. This is in integer format.
   4. baseSalary
      1. This is the amount the player will be paid based in Canadian dollars. This is in a double format.
   5. age
      1. The age of the individual in years
   6. contractDays
      1. the number of days left on their contract
   7. speed
      1. How fast the individual can finish a 50m sprint in seconds
   8. PuckControl
      1. How capable are they out of a score of 100 can they control the puck
   9. Discipline
      1. How much Discipline the individual has playing hockey and training for games. This is a score out of 100.
   10. Defence awareness
       1. How much awareness does the individual have when it comes to defence for their team. This is a score out of 100.
   11. Slap Shot Accuracy
       1. How accurate can the individual do a slapshot out of a score of 100.
   12. Goal tender accuracy
       1. What is the goal saver average. Make this a score out of 100.
   13. Injury status
       1. Is the player injured or are they fit to play?
       2. Make this a Boolean.
2. What fields would be required?
   1. The required fields would be the persons first name, last name, jersey number, and baseSalary because they all create the unique ID of that individual.
3. What constructors are required to create players?
   1. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed, puckControl, discipline, defence awareness, slapShotAccuracy)
   2. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed, puckControl, discipline, defence awareness,)
   3. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed, puckControl, discipline, defence)
   4. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed, puckControl, discipline)
   5. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed, puckControl)
   6. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays, speed)
   7. Players(firstName, lasttName, jerseyNumber, baseSalary, age, ContractDays)
   8. Players(firstName, lasttName, jerseyNumber, baseSalary, age)
   9. Players(firstName, lasttName, jerseyNumber, baseSalary)

* Depending on what information is given to us we need to make sure that the required fields are always given to us. After it is given to us then we can use that specific constructor. If some values are not given to us then we can set default values.

1. What validations are required?

Check this is String firstName

* Shouldn’t be null or empty
* Only can enter in a maximum of 15 characters

Check this is String lastName

* Shouldn’t be null or empty
* Can only enter in a maximum of 15 characters

Check this is double baseSalary

* Can check to see if the salary is between a range of 1 million to 10 million

Check this is int jerseyNumber

* Shouldn’t be a negative number. It must be greater than or equal to 1.

1. What functions does a player perform?
   1. Forward
      1. There are a maximum of 3 people here.
      2. Only at left wing
      3. One at center
      4. One at right wing
   2. Defence
      1. There are two defence players that are before the forward players on either side
   3. Goaltender/goalie
      1. This is the goalie who is in charge of preventing the puck from going into the net.
   4. scoreGoal (Player method)
      1. score based on accuracy
   5. checkPlayer (Player method)
      1. hip check, board check, cross check etc
   6. saveGoalGoalie (Player method)
      1. save goal based on goal tender accuracy

### For Team

1. What attributes does a team have?
   1. teamName/homeCity
      1. The city the team belongs to or the name of the team.
   2. leadershipStyle
      1. How the team is able to lead itself within the public eye. This is rated on a scale out of 100.
   3. participation
      1. How each members within the team participate within the game. This is rated on a scaled out of 100.
   4. interdependence
      1. How well each player works together. This is rated on a scaled out of 100.
   5. communication
      1. How each player communicates with one another. This is rated on a scale out of 100.
   6. teamMembers
      1. The list of players that are on the team. This will be an object.
   7. minPlayers/maxPlayers
      1. what positions and respective number of players are needed in each position
         1. one goalie
         2. two defence
         3. three forward players
   8. wins/losses/tiesStats
      1. How many games the team ahs won, lost and tied?
2. What fields would be required for a team?
   1. Which province or states does a team belong to is the required field
3. What constructors are required to create a team?
   1. Team(leagueLocation, leadershipStyle, participation, interdependence, communication)
   2. Team(leagueLocation, leadershipStyle, participation, interdependence)
   3. Team(leagueLocation, leadershipStyle, participation)
   4. Team(leagueLocation, leadershipStyle)
   5. Team(leagueLocation)
4. What validations are required for a team?
   1. Need to validate that there are the exact number of teams per province or state
   2. All required player positions are filled with the minimum number of players
5. What functions does a team perform?
   1. Passing the puck to the right team members based on their position and strengths
   2. How the defence team members help grab the puck back and pass to the front end players
   3. How the team is able to play against other teams in a professional yet competitive way
   4. Ability to add/remove/trade players
   5. Win/lose/tire a game
      1. Update the stats associated with the game

### For League

1. What attributes does a league have?
   1. There are there major Canadian hockey leagues
      1. Western Hockey League has 22 teams
         1. British Columbia – 5 teams
         2. Alberta – 5 teams
         3. Saskatchewan – 5 teams
         4. Manitoba – 2 teams
         5. Washington – 4 teams
         6. Oregon – 1 teams
      2. Ontario Hockey League with 20 teams
         1. Ontario – 17 teams
         2. Michigan – 2 teams
         3. Pennsylvania – 1 team
      3. Quebec Major Junior Hockey League which ahs 18 teams total
         1. Quebec – 12 teams
         2. New Brunswick – 3 teams
         3. Nova Scotia -2 teams
         4. Prince Edward Island – 1 team
   2. Countries
      1. Canada
      2. United states
   3. TV Partners
      1. TSN
      2. RDS
      3. CBC
      4. Shaw TV
      5. Rogers TV
      6. Eastlink TV/TVA Sports
   4. Trophies and awards
2. What fields would be required for a league?
   1. Which Canadian Hockey League they are a part of
   2. Which country are they in
   3. Max number of teams in a league is not exceeded
3. What constructors are required to create a league?
   1. League(canadianHockeyLeague, countries, tvPartners)
   2. League(canadianHockeyLeague, countries)
   3. League(canadianHockeyLeague)
4. What validations are required for a league?
   1. Making sure the right Canadian hockey league is entered. This means just auto formatting with the first letter of each word to be capitalized.
5. What functions does a league perform?
   1. who is the first place winner
   2. how teams rank below first place
   3. points each Team scored
   4. scheduleGame
      1. matches the current teams in the league to play a game

## Additional things to consider

1. What are the relationships between the three classes? How do teams track players and how does the league track team?
   1. The relation ship between the three classes for leagues, teams and players are how each player makes up the whole of a particular team. Then each team plays within a league to compete for the final cup. Based on how many goals they score the higher their points and they will win the trophy at the end.
2. Is the design reusable?
   1. Yes, if I add more team players then it does the same checks
3. Is the design extendable?
   1. Yes, because you can add or remove more team members, leagues or skills
4. Clarity. It should be clear to the Customer what you have designed. Remember, they won’t be programmers so you have to be reasonably detailed in your descriptions and explanations.