Lab – Informational aspect modelling

Monday 27th Feb and Wednesday 1st March

This lab includes 2 parts. Part 1 relates to an exercise on data modelling. You are provided a user requirements description of a ARENA system. You need to develop the class diagram to represent the informational aspect of the system. You should work on this part for 45 minutes, then you can access the solution to compare with your work.

Part 2 is about modelling the informational aspect of your MusicSpace project.

The Assignment 1 submission due date is Wednesday 8th March 7pm.

You need to submit a System Analysis Document for MusicSpace system (template is provided) which includes:

- The description of the system
- Functional aspect modelling: Use case diagrams and use case narrative – where applicable
- Informational aspect modelling: Class diagram
- Behavioural aspect modelling: Sequence diagrams and Activity diagrams.

Part 1 – Develop the class diagram for this application

You try this part for the first 45 minutes of the lab time, after that you can access the solution.

ARENA Application

I. **Problem**

The popularity of the Internet and the World Wide Web has enabled the creation of a variety of virtual communities, groups of people sharing common interests, but who have never met each other in person.
Many multi-player computer games now include support for the virtual communities that are players of the given game. Players can receive news about game upgrades, new game maps and characters; they can announce and organize matches, compare scores and exchange tips. The game company takes advantage of this infrastructure to generate revenue or to advertise its products.
However, currently each game company develops such community support in each individual game, this results in many disadvantages such as learning curve for players when joining new community, for advertisers who need to contact each individual community separately, etc.

II. **Objectives**

A company would like to develop a software project, which aims to:
- Provide an infrastructure for operating an arena, including registering new games and players, organizing tournaments, and keeping track of the players' scores.

- Provide a framework for game developers for developing new games, or for adapting existing games into this framework.

III. **Functional requirements**

The functions of the system are structured based on the user types. The following types of users are involved in this system:

1. The *operator* shall be able to define new games, define new tournament styles (e.g. knock-out, championships, best of series or round-robin), define new expert rating formulas and manage users.

2. *League owners* shall be able to organise a league such as define a new league, create and announce new tournaments within a league, conduct a tournament, and declare a winner.

3. *Players* shall be able to participate in the arena such as register in a league, apply for tournaments, play the matches that are assigned to the player, or drop out of the tournament.

Anonymous users register with an arena/the system as a Player, League Owner, or Operator

User accounts are required before any actions performed with the system such as organizing a league , applying for a tournament, playing a match, , defining a new game or uploading new advertisement, etc.

Regarding organizing a league, the League Owner must define a league first, then creates and announces a new tournament, accepts player applications, schedule matches, and kick off the tournament. During the tournament, players play matches. At the end of the tournament, players are accredited with points.

IV. **Glossary in the business domain is as follows:**

Game: In the arena, the term Game (or sport) refers to a piece of software that enforces the set of rules, players must follow the rules when play the game. A Game has a name, description of rules. For example, chess, tic tac toe are games.

Match: a Match is a contest between two or more Players following the rules of a Game. The outcome of a Match can be a single winner or a tie. A match has a unique number, start date/time, end date/time.

Tournament: A tournament is a series of Matches (of the same Game) among a set of Players. Tournament ends with a single winner. The way Players accumulate points and Matches are scheduled is dictated by the League in which the Tournament is organized. A tournament has a name, an application start date, and application end date for players to apply to. It also indicates the play start date and the play end date and a maximum number of players.

League: A league represents a community for running Tournaments. A league is associated with a specific Game/sport and a Tournament Style. Players registered with the League accumulate points according to the ExpertRating defined in the League. Each league has a start and an end period of time.

TournamentStyle: The TournamentStyle defines the number of Matches and their sequence for a given set of players. For example, Players face all other Players in the Tournament exactly once in a round-robin TournamentStyle.

Question: Develop the class diagram for this application.

Part 2 – Develop the class diagram for your MusicSpace project.