Advanced Programming

Assignment 1

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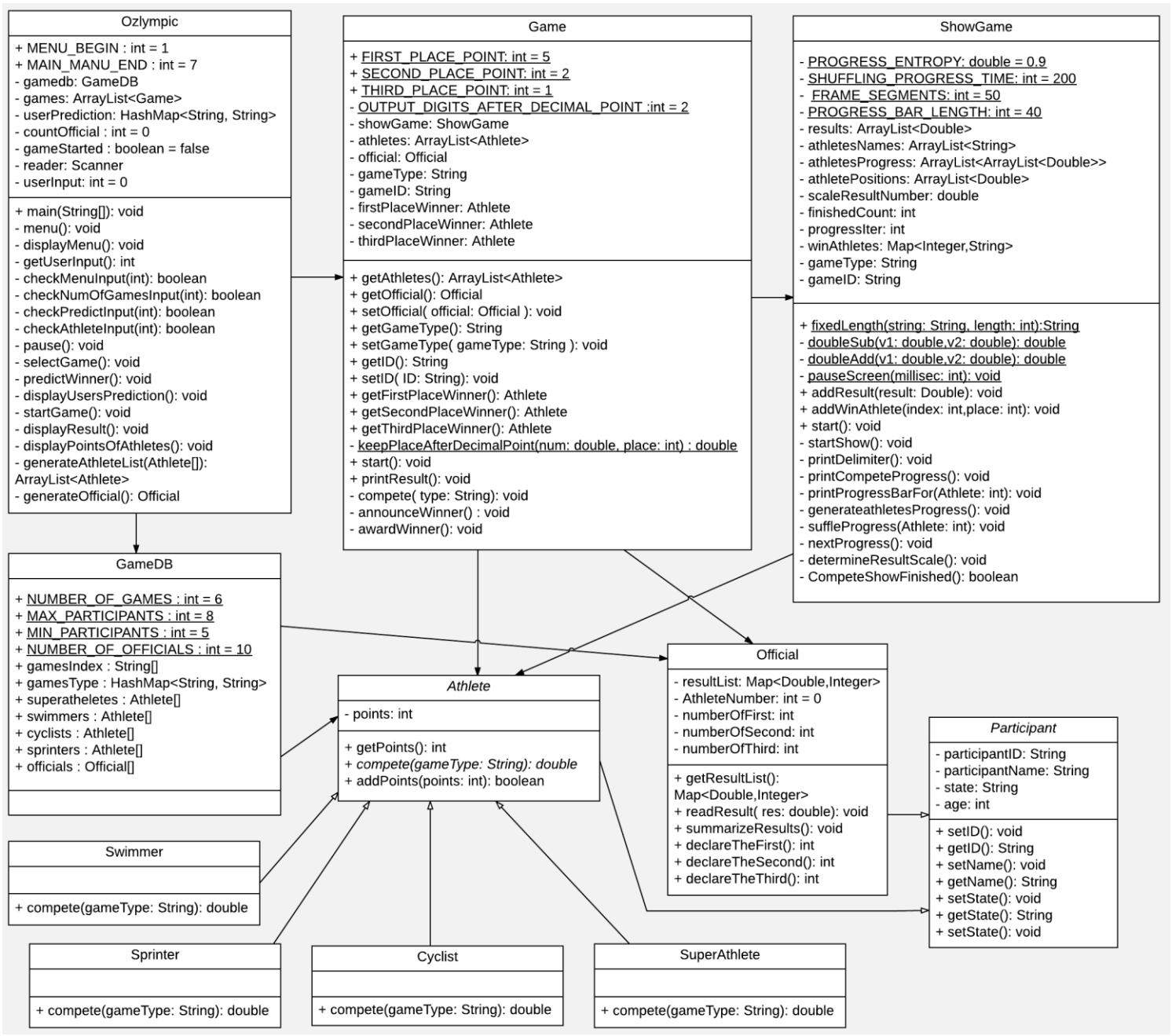
Course number: COSC1295

Date of submission: 03/04/2017

Class Diagram:



Question 1. Explain how your design will be able to store the information of games, athletes and user predictions.

Answer:

All games will be created and store in an ArrayList called games.

All athletes will be generated and store in an ArrayList called athletes inside the game object.

User's predictions are stored in a HashMap called userPrediction, which key is Game ID and value is Athlete Name.

Question 2. Explain how your class hierarchy will forbid a user from creating a "generic" type of participant (i.e. not a athlete nor an official)

Answer:

Base on the class diagram, all different types of athlete are inherited from the athlete class, and athlete class and official class are inherited from the participant class. Therefore, we make the participant class and athlete as an abstract class to prevent a participant or an athlete could be created.

Question 3. Explain the process by which your program will maintain a game and give correct score to athletes according to their performance.

Answer:

The game class contains a game ID, a group of athletes stored in an ArrayList, one official and its game type. There are other variables to store the top 3 players' data.

A game will be invoked by driver class – Ozlympic class, to begin competition between every athletes by sending game type to invoke compete method in each athlete's method. After all competitions finished, then the official will summarise the results of that game by using a TreeMap to sort out top 3 players, and announce the winner which means storing these top 3 players data into 3 specific variables. Finally, award these top 3 players by invoking its addPoints method with predefined value to store points in each athlete object.

Question 4. Explain how a user prediction can be checked with the actual game results.

Answer:

In each game, there is a variable which called firstPlaceWinner is used to store an athlete which is the first place winner of that game. After the game started, it will compare the data (athlete's Name in string format) in user's prediction HashMap to the data in firstPlaceWinner to check is it same or not.

Contribution:

Ying-Chieh Huang (s3598781): Ozlympic and GameDB classes, documentation.

Yuan-Hao Liu (s3583320): Game, Participant, Official, Athlete, SuperAthlete, Swimmer, Cyclist, Sprinter classes, and one extra ShowGame class which is used to display the process during the athlete's competition.

Comment:

Through this assignment we realised how to use different collections like ArrayList, HashSet, or TreeMap, and also learnt how to search the information in Java API Specification website. It is really helpful when we are first time to use these collections. In addition, we are getting more familiar with the idea of polymorphism like how to connect each classes and methods.