CS F213 - Object Oriented Programming

Semester 2, 2020-21

Lab 7 – Packages

Birla Institute of Technology & Science Pilani, K.K. Birla Goa Campus

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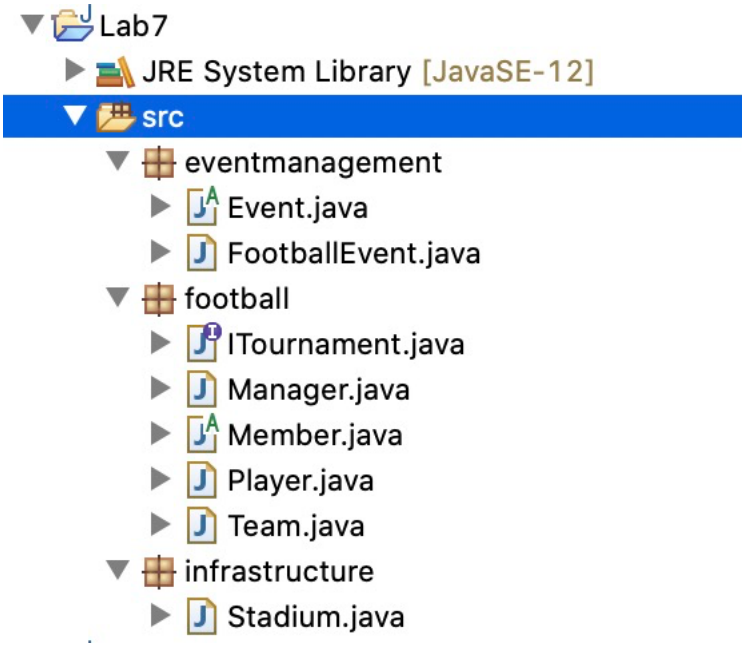
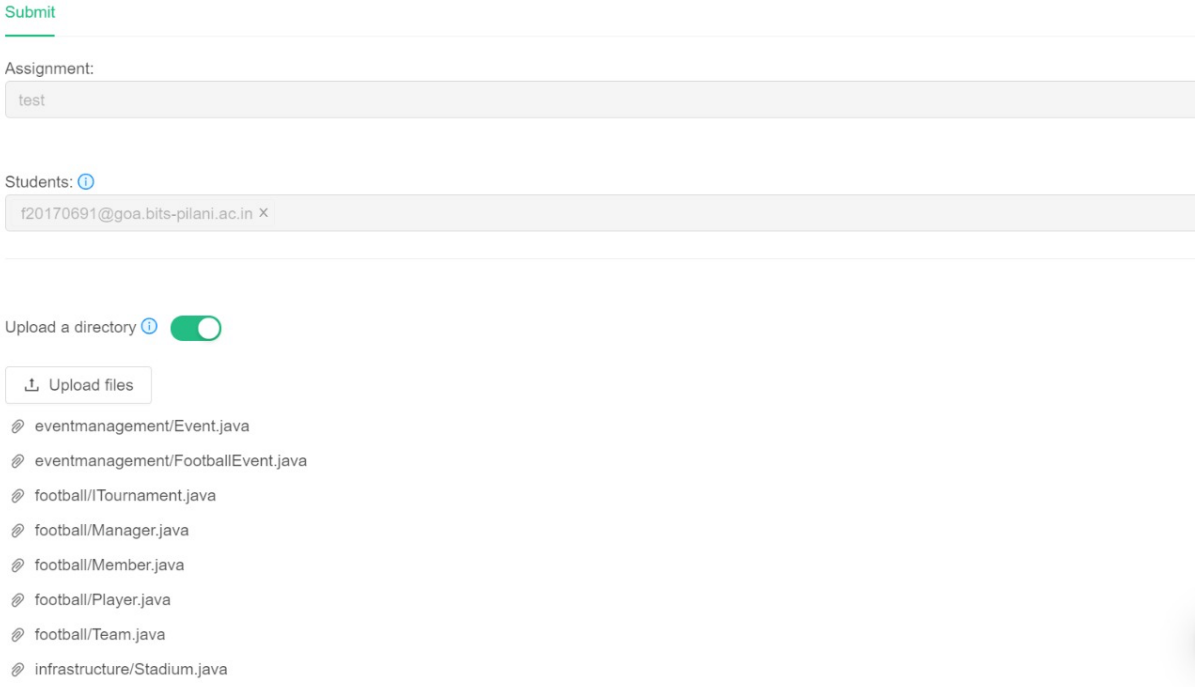
In this lab, you will be tested on Object Oriented Programming using packages in Java. You will be modelling a football tournament.

General Instructions:

1. **Make sure you create the packages as mentioned. Include the "package packagename;" line as the first line in each class. No code should be present in the default package.**
2. **Import the packages as required.**
3. **Create 3 packages in the eclipse project**: football, infrastructure and eventmanagement.
4. **The Stadium class has been implemented along with the nested class Stall. Do not modify the given code**. Copy the Stadium.java file and paste it into your_eclipse_project -> src -> infrastructure directory
5. This is how your eclipse project should look after all the java files are created:



6. Upload the 3 package directories having the respective classes onto codePost. Enable the “Upload a Directory” option before uploading. This is how the submission should look:



7. Read the Javadoc thoroughly.
8. File name should match the class name.
9. Names of classes, methods and data members should match the names in the Javadoc, else you may lose credit even if the implementation is correct.
10. **Do not** copy the method signatures given in the Javadoc. Type them manually.
11. Be sure to check your code on the test cases provided locally (as jar file), before submitting on Codepost. Remember that Codepost takes only the latest submission and not the best submission into consideration.
12. Suggested order of coding:
    i. Member
    ii. Player
    iii. Manager
    iv. Team
    v. ITournament
    vi. Stadium (implemented)
    vii. Stall (nested class) (implemented)
    viii. Event
    ix. FootballEvent

Overview

- There are three packages: football, infrastructure and eventmanagement
- football: A Team consists of Members – one Manager and a certain number of Players
- infrastructure: A Stadium has one particular team associated with it called a home team. A Stadium consists of few Stalls which generate revenue.
- eventmanagement: A FootballEvent consists of a certain number of Teams enrolled for the event/tournament. It also has a certain number of Stadiums in which the tournament matches can be played.

Class descriptions

Package football:

1) **Member**
   a) **Fields:**
      i) age
   b) **Methods:**
      i) getAge

2) **Player**
   a) **Fields:**
      i) isFit
      ii) rating
   b) **Methods:**
      i) getFitnessState
      ii) getRating

3) **Manager**
   a) **Fields:**
      i) experience
   b) **Methods:**
      i) getExperience

4) **Team**
   a) **Fields:**
      i) teamID
      ii) teamName
      iii) numberOfPlayers
      iv) teamPlayersArray
      v) MAX_PLAYERS
      vi) teamManager
   b) **Methods:**
      i) getTeamID
      ii) getTeamName
      iii) getNumberOfPlayers
      iv) getTeamPlayersArray
      v) getTeamManager
      vi) addPlayer
      vii) calculateTeamSkill
      viii) verifyTeamValidity

5) **ITournament**
   a) **Fields:**
      i) NUMBER_OF_TEAMS
   b) **Methods:**
      i) findMatchWinningTeam
      ii) simulateTournament
      iii) findTournamentWinningTeam

Package infrastructure:

1) **Stadium**
   a) **Fields:**
      i) stadiumID
      ii) homeTeamName
      iii) numberOfStalls
      iv) MAX_STALLS
      v) stallsArray
   b) **Methods:**
      i) getStadiumID
      ii) getHomeTeamName
      iii) getNumberOfStalls
      iv) getStallsArray
      v) addStall
      vi) getStadiumRevenue

2) **Stall**
   a) **Fields:**
      i) revenueGenerated
   b) **Methods:**
      i) getRevenueGenerated

Package eventmanagement:

1) **Event**
   a) **Fields:**
      i) amountInvestedOnEvent
      ii) sponsorshipAmount
   b) **Methods:**
      i) getAmountInvestedOnEvent
      ii) getSponsorshipAmount
      iii) calculateProfit

2) **FootballEvent**
   a) **Fields:**
      i) numberOfTeamsEnrolled
      ii) teamsEnrolledArray
      iii) pointsArray
      iv) numberOfStadiums
      v) MAX_NUMBER_OF_STADIUMS
      vi) stadiumsArray
      vii) minimumPlayerAge
      viii) minimumManagerExperience
   b) **Methods:**
      i) getNumberOfTeamsEnrolled
      ii) getTeamsEnrolledArray
      iii) getNumberOfStadiums
      iv) getStadiumsArray
      v) getMinimumPlayerAge
      vi) getMinimumManagerExperience
      vii) addEmptyTeam
      viii) addPlayerToTeam
      ix) addEmptyStadium
      x) addStallToStadium
      xi) verifyTournamentValidity
      xii) findMatchWinningTeam
      xiii) simulateTournament
      xiv) findTournamentWinningTeam
      xv) calculateProfit
      xvi) toString

Example of a tournament simulation

In this lab, exactly 12 matches will be simulated in a tournament (since NUMBER_OF_TEAMS is set to 4).

Example: 4 teams, 4 stadiums:

team1Index	team2Index	stadiumIndex
0	1	0
0	2	1
0	3	2
1	0	3
1	2	0
1	3	1
2	0	2
2	1	3
2	3	0
3	0	1
3	1	2
3	2	3

Example: 4 teams, 3 stadiums:

team1Index	team2Index	stadiumIndex
0	1	0
0	2	1
0	3	2
1	0	0
1	2	1
1	3	2
2	0	0
2	1	1
2	3	2
3	0	0
3	1	1
3	2	2

Marking scheme

Method	Marks
addPlayer	0.5
calculateTeamSkill	0.5
verifyTeamValidity	1
addEmptyTeam	0.5
addPlayerToTeam	1
addEmptyStadium	0.5
addStallToStadium	1
verifyTournamentValidity	2
findMatchWinningTeam	2
simulateTournament	2
findTournamentWinningTeam	1
calculateProfit	1
toString	1
Total	**14**

The final marks will be scaled down from 14 marks to 7 marks (same as previous labs)