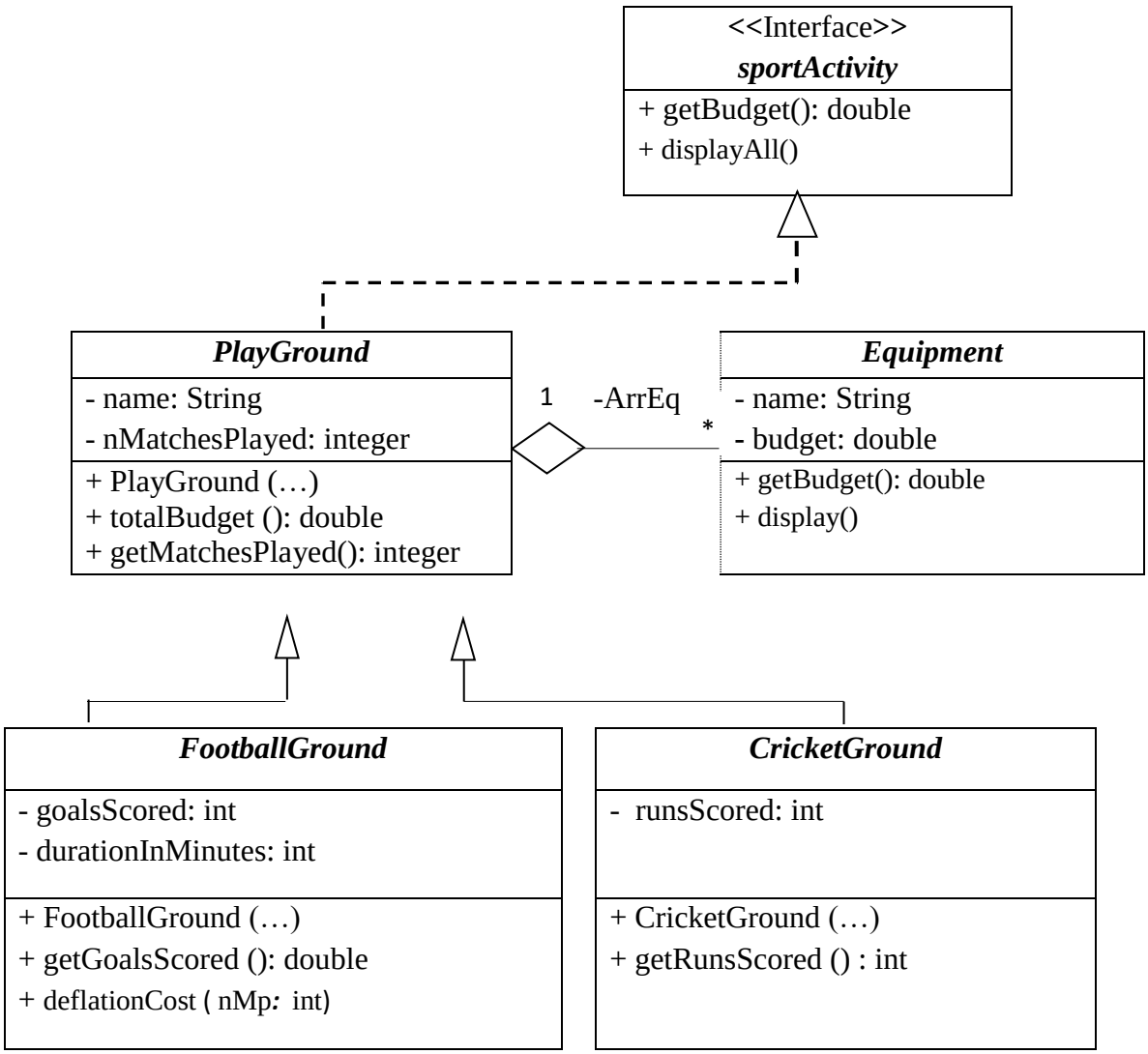
King Saud University
College of Computer and Information Sciences
Department of Computer Science
CSC113 – Computer Programming II – Midterm (2) Exam – Fall 2021

Name :_____ ID:_____

EXERCISE 1:

Consider the above UML and read the following description.



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Interface ***sportActivity***:

- ***displayAll():*** This method performs following.
  For ***PlayGround***, this method displays all the equipment of the ***PlayGround***.
- ***getBudget()****:* This method returns the budget of the ***sportActivity***. The budget of the ***PlayGround*** is computed as follows:
  - For ***cricketGround****:* The budget of the PlayGround = 0.18 * (the total budget of all equipment of the ***PlayGround)***
  - For ***FootBallGround****:* The budget of the PlayGround = (the total budget of all equipment of the ***PlayGround)*** – (deflation cost).

Class ***Equipment***:

- Attributes:
  - ***name***: The name of the ***Equipment***
  - ***budget:*** budget of the ***Equipment.***
- Methods:
  - ***Equipment***(***name : String, budget: double***) : Constructor
  - ***getBudget() :*** This method returns the budget of the ***Equipment.*** If the budget is between 10,000 SAR and 100,000 SAR, it is returned otherwise the method throws an ***Exception*** with the following message **"Budget Error".**
  - ***Display()*:** This method displays the name and the price of the ***Equipment***.

Class ***PlayGround***:

- Attributes:
  - ***name***: The name of the ***PlayGround***.
  - ***nMatchesPlayed***: Total number of Matches Played on the ***PlayGround***
- Methods:
  - ***PlayGround (……, ……, …)***: Constructor with parameters.
  - ***totalBudget()****:* This method returns the total budget of all Equipment of the ***PlayGround***.
  - ***getMatchesPlayed():*** This method returns the total number of matches played on this ***PlayGround***.

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Class ***CricketGround:***

- Attributes:
  - ***runsScored***: The total number of runs scored in all matches played on this Cricket Ground.
- Methods:
  - ***CricketGround(……, ……, …..)***: constructor with parameters.
  - ***getRunsScored():*** This method returns the total runs scored.

Class ***FootballGround:***

- Attributes:
  - ***goalsScored***: The total number of goals scored in all matches played on this Football Ground.
- Methods:
  - ***FootballGround(……., ….., …..)***: constructor with parameters.
  - ***getGoalsScored():***This method returns the total goals scored.
  - ***deflationCost(nMp: int) :*** This method computes and returns the deflation cost computed as follows:

    *The deflation cost is 10000 SAR when the number of matches played is less or equal than 50 matches. Otherwise the deflation cost of the number of matches played nMp = 0.18 * deflation Cost of the number of matches played (nMp -1).*

Question 1: Translate into Java code the interface ***sportActivity*** and the classes:

PlaygGround and ***FootBallGround***

- For the method ***deflationCost***, give a recursive solution.

Answer:

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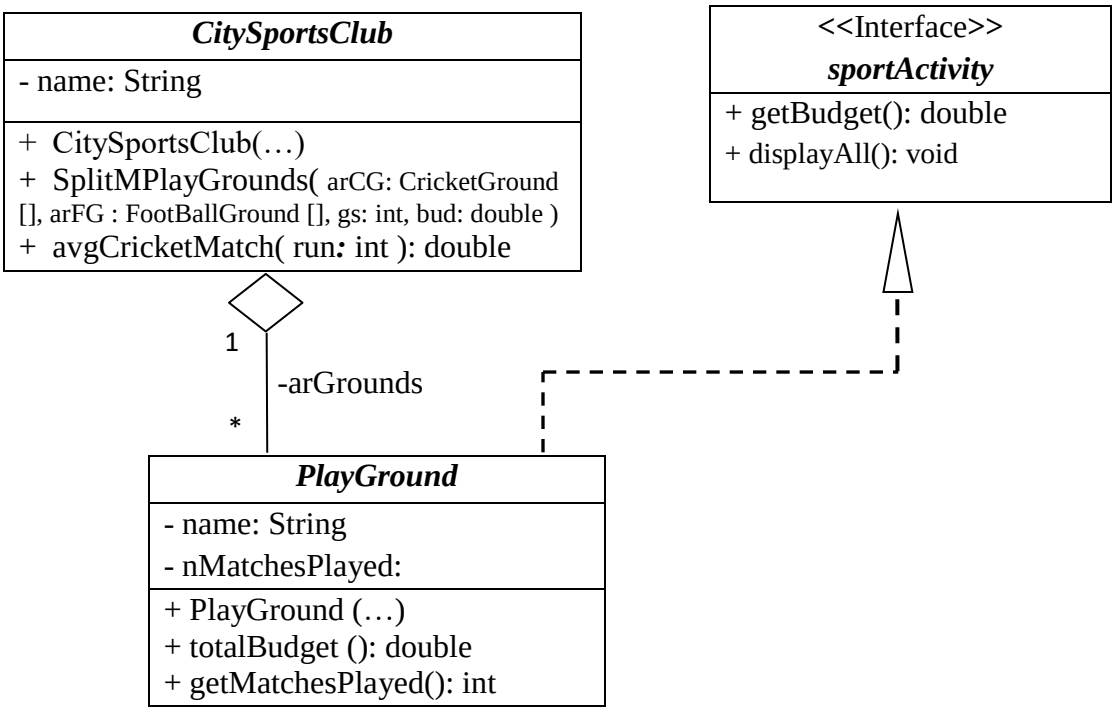
Exercise 2:



Class ***CitySportsClub***:

- Attributes:
  - ***name***: The name of the city that ***CitySportsClub*** represents.
- Methods:
  - ***CitySportsClub(……., …., …)***: Constructor with parameters.
  - ***SplitMPlayGrounds(arCG: CricketGround [], arFG : FootBallGround [], gs: int, bud: double)***: This method splits the array of ***PlayGround*** into two arrays:
    - ***i.*** ***arFG*** includes the ***FootBallGround*** grounds where the goals scored is equal to ***gs.*** If the number of Football grounds exceeds 10, this method throws an ***Exception*** with the following message "***Error: Number of FootBall grounds reached 10"***
    - ***ii.*** ***arCG*** includes the ***cricketlGround*** grounds in which the budget is equal to ***bud.*** If the array ***arCG*** is full , this method throws an ***Exception*** with the following message "***Error: Number of Cricket grounds exceeded"***

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- ***avgCricketMatch(run: int): double***
  This method calculates the average number of matches played in cricketGround in which runs scored is ***run***

Question 1: Translate into Java code the class ***CitySportsClub***

Answer:

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