**Lab 9**

In this exercise you are required to write a program that simulates a fan listening for updates of a football match on a mobile phone. In order to simulate a person listening for updates, you will write an interface that will include the relevant methods required for these updates:

**Interface IFootball**

Define 5 methods as follows:

void homeTeamScored(int points);

void visitingTeamScored(int points);

void endOfQuarter(int quarter);

void setHomeTeam(String name);

void setVisitingTeam(String name);

**MobilePhone class**

The MobilePhone is the class that will listen to the football game. In order to do that the MobilePhone class must implement the IFootball interface.

Member Variables

* 3 private strings to represent the home team, visitor team and owner of the mobile phone
* 2 private integers to represent the home and visiting scores
* 1 private integer to represent the current quarter

Constructor

* The constructor should initialise the first quarter to 1 and should initialise the owner using a parameter list
* No other initialisation is necessary

Setter methods (setHomeTeam & setVisitingTeam)

* Override these two methods to set the home and visitor teams

displayQuarter method

* This method is void and takes no parameters
* If the current quarter is greater than 0 then display a message showing the current quarter that the game is in e.g. “Hi John Game is in quarter 3”, otherwise display a message saying “Hi John Final Score”. The quarter number is available in the member variable current quarter.

updateScore method

* This method is void and takes no parameters
* This method should print out the scores for the home and visitor teams – see sample output
* You should then call the method displayQuarter to display the current quarter

Sample output

Ireland: 7

Australia: 0

Game is in quarter 1 (This line of output is generated by the displayQuarter method)

endOfQuarter method (Overridden)

* If the quarter (parameter) is between 1 and 3 then increment the current quarter, otherwise set the current quarter to -1
* Print out a message indicating that the quarter has just ended e.g. Hi John Quarter 2 has just ended. Use the local variable here to print out the quarter number
* Call the updateScore method

homeTeamScored method

* Takes 1 parameter representing the points scored
* Override this method to print out a message indicating that the home team has just scored e.g. “Hi John The home team has just scored 3points
* These points should be added to the home points
* Call the updateScore method

visitingTeamScored method

* Takes 1 parameter representing the points scored
* Override this method to print out a message indicating that the home team has just scored e.g. “Hi John The visiting team has just scored 3points
* These points should be added to the visitor points
* Call the updateScore method

**FootBallGame class**

This class represents a live football game, and as events happen during the game, the listeners of the game receive updated information. The FootBallGame uses an arraylist to keep track of all listeners. This arraylist should be defined to be of type Interface

Member Variables

* 2 private strings to represent the home and visiting teams
* Arraylist of type IFootball

Constructor

* Takes 2 string parameters and uses these to initialise the home and visiting teams
* Arraylist should also be initialised

addFootballListener method

* This method is void
* Takes one parameter of type IFootball (e.g. IFootball f) and adds it to the arraylist
* Call the setHomeTeam method passing in a string representing the name of the home team. Method will be called using the interface reference
* Call the setVisitingTeam method passing in a string representing the name of the visiting team. Method will be called using the interface reference

notifyHomeTeamScored method

* This method is used to notify the audience that the home team has scored
* This method is void
* Takes one parameter of type int representing the number of points just scored
* Use a for loop to iterate through the arraylist and call the homeTeamScored method.

notifyVisitingTeamScored method

* This method is used to notify the audience that the home team has scored
* This method is void
* Takes one parameter of type int representing the number of points just scored
* Use a for loop to iterate through the arraylist and call the visitingTeamScored method.

notifyQuarterEnded method

* This method is used to notify the audience that current quarter has just ended
* This method is void
* Takes one parameter of type int representing the quarter number
* Use a for loop to iterate through the arraylist and call the endOfQuarter method.

**TestFootball class**

* Display the following message to the screen:

Instantiating a new FootballGame

Welcome to the International Rules

* Create a FootballGame object with values Ireland and Australia
* Display the following message to the screen:

Instantiating a listener

Create a MobilePhone object for an owner called John

* Display the following message to the screen

Registering a listener to the game

Call the addFootballListener method and pass in the correct reference

* Display the following message to the screen

Simulating a game...

* Call the appropriate methods to reflect the following events

Home Team scored 7

Quarter 1 has ended

Visiting team scored 3

Visiting team scored 7

Quarter 2 has ended

Quarter 3 has ended

Home Team scored 3

Home Team scored 7

Quarter 4 has ended

Run your program and compare your output to the sample output shown below

If your output matches, then add a 2nd mobile phone user called Paul and register Paul to listen to the game – see 2nd sample output below

**Sample Output 1**

Instantiating a new Football Game

Welcome to the International Rules

Instantiating a listener

Registering a listener to the game

Simulating a game...

Hi John The home team just scored 7

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Ireland: 7

Australia: 0

Hi John Game is in quarter 1

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Hi John Quarter 1 just ended.

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Ireland: 7

Australia: 0

Hi John Game is in quarter 2

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Hi John The visiting team just scored 3

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Ireland: 7

Australia: 3

Hi John Game is in quarter 2

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Hi John The visiting team just scored 7

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Ireland: 7

Australia: 10

Hi John Game is in quarter 2

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Hi John Quarter 2 just ended.

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Ireland: 7

Australia: 10

Hi John Game is in quarter 3

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Hi John Quarter 3 just ended.

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Ireland: 7

Australia: 10

Hi John Game is in quarter 4

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Hi John The home team just scored 3

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Ireland: 10

Australia: 10

Hi John Game is in quarter 4

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Hi John The home team just scored 7

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Ireland: 17

Australia: 10

Hi John Game is in quarter 4

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Hi John Quarter 4 just ended.

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Ireland: 17

Australia: 10

Hi John Final score

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**Sample Output 2**

Instantiating a new Football Game

Welcome to the International Rules

Instantiating 1st listener

Instantiating 2nd listener

Registering 1st listener to the game

Registering 2nd listener to the game

Simulating a game...

Hi John The home team just scored 7

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Ireland: 7

Australia: 0

Hi John Game is in quarter 1

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Hi Paul The home team just scored 7

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Ireland: 7

Australia: 0

Hi Paul Game is in quarter 1

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Hi John Quarter 1 just ended.

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Ireland: 7

Australia: 0

Hi John Game is in quarter 2

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Hi Paul Quarter 1 just ended.

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Ireland: 7

Australia: 0

Hi Paul Game is in quarter 2

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Hi John The visiting team just scored 3

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Ireland: 7

Australia: 3

Hi John Game is in quarter 2

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Hi Paul The visiting team just scored 3

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Ireland: 7

Australia: 3

Hi Paul Game is in quarter 2

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Hi John The visiting team just scored 7

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Ireland: 7

Australia: 10

Hi John Game is in quarter 2

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Hi Paul The visiting team just scored 7

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Ireland: 7

Australia: 10

Hi Paul Game is in quarter 2

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Hi John Quarter 2 just ended.

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Ireland: 7

Australia: 10

Hi John Game is in quarter 3

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Hi Paul Quarter 2 just ended.

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Ireland: 7

Australia: 10

Hi Paul Game is in quarter 3

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Hi John Quarter 3 just ended.

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Ireland: 7

Australia: 10

Hi John Game is in quarter 4

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Hi Paul Quarter 3 just ended.

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Ireland: 7

Australia: 10

Hi Paul Game is in quarter 4

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Hi John The home team just scored 3

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Ireland: 10

Australia: 10

Hi John Game is in quarter 4

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Hi Paul The home team just scored 3

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Ireland: 10

Australia: 10

Hi Paul Game is in quarter 4

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Hi John The home team just scored 7

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Ireland: 17

Australia: 10

Hi John Game is in quarter 4

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Hi Paul The home team just scored 7

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Ireland: 17

Australia: 10

Hi Paul Game is in quarter 4

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Hi John Quarter 4 just ended.

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Ireland: 17

Australia: 10

Hi John Final score

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Hi Paul Quarter 4 just ended.

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Ireland: 17

Australia: 10

Hi Paul Final score

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