## **Description**

For this project, you will be writing a program called LegoSetCompetition that allows two players to compete against each other in building legos. There will be three lego sets each with a specified number of pieces. Players will start by building the first lego set. Once they have built enough pieces to complete the current set, they will move on to the next set. Each day, a player will build a certain number of pieces. The number of pieces a player builds each day may vary depending on the difficulty of the features built on that specific day. The competition ends when one of the players has completed all three lego sets. A class called CompetitionLog will also be written to log information about the results of the competition.

This project is worth 7% of your final grade. We recommend that you take it, along with the other projects in the class, very seriously.

Note: 5 points of your grade is based on Coding Style. Use the "Run" button to check your Coding Style without using one of your 4 submissions.

## **Instructions**

There is no starter code for this assignment.

### **CompetitionLog.java**

Complete the CompetitionLog class. The fields, constructor, and method to implement for this class are listed below.

### **Fields**

playerNumber(private int): The player number (1 or 2) corresponding to the information in this log

completeSets(private String): A list of all lego sets the player completed

incompleteSets(private String): A list of all lego sets the player did not complete

piecesBuilt(private int): The number of pieces the player built throughout the competition

### **Constructor**

The constructor is public and the parameters in order are int playerNumber, String completeSets, String incompleteSets, int piecesBuilt

### **Methods**

public int getPlayerNumber(): Takes no parameters and returns player number corresponding to log

public String getCompleteSets(): Takes no parameters and returns sets completed by the player

public String getIncompleteSets(): Takes no parameters and returns sets not completed by the player

public int getPiecesBuilt(): Takes no parameters and returns pieces built by the player

public void setCompleteSets(String completeSets): Updates completedSets field with input parameter

public void setIncompleteSets(String incompleteSets): Updates incompleteSets field with input parameter

public void setPiecesBuilt(int piecesBuilt): Updates piecesBuilt field with input parameter

public String toString(): Takes no parameters and returns information about the player's competition results in the format given below. A new line character should be included after each line and at the end of the String.

Player <playerNumber> completed the following sets: <completeSets>

Player <playerNumber> did not complete the following sets: <incompleteSets>

Player <playerNumber> built a total of <piecesBuilt> pieces

### **LegoSetCompetition.java**

Complete the LegoSetCompetition class. All the code for this class will be written in the main method.

Your solution must do the following:

* Use a scanner to collect the names of the three lego sets and the number of pieces in each of them.
* On each day, prompt player 1 and player 2 for the number of pieces they built until a player has completed all three sets. **If player 1 and player 2 complete the final set on the same day, there is a tie and a tiebreaking competition starts with three brand new lego sets.** There will be as many tiebreaker rounds as needed until a winner is determined. Whenever a round ends in a tie, the message "The competition ended in a tie! There will be a tiebreaker round" is printed before the new round starts. See sample test 3 below.
* At the end of the competition, print the winner and log results about which sets each player completed, which sets each player did not complete, how many pieces each player built, and the duration of the competition. Creating a CompetitionLog object for each player and calling the toString() method written earlier will be very helpful for printing the information corresponding to a specific player.
* If any tiebreaker rounds were necessary, the duration of the competition should be the sum of the duration of each round and any lego sets completed in any of the rounds should be listed as completed sets as shown in sample test 3.
* When listing sets that a player completed or did not complete, the sets should be separated by commas. **If a player has not completed any sets, print "None" for the completed sets. Similarly, if a player completed, all the sets, print "None" for the incomplete sets.**
* You are not required to use all of the methods in CompetitionLog in your implementation of LegoSetCompetition but you may find some of them helpful depending on your approach and the toString() method will be useful for printing the output as mentioned above.
* You may assume all inputs will be valid.

Output examples are in the next section. Follow the same formats and be sure to include the prompts! An explanation is also given for each example.

#### **Output**

**Sample Test 1**

Welcome to the Lego Set Competition!

Enter the name of Lego Set 1

[Tower Bridge]

Enter the number of pieces in Lego Set 1

[4000]

Enter the name of Lego Set 2

[Eiffel Tower]

Enter the number of pieces in Lego Set 2

[2000]

**Enter the name of Lego Set 3**

**[Ship in Bottle]**

**Enter the number of pieces in Lego Set 3**

**[1000]**

Enter the number of pieces player 1 used for building on day 1

[900]

Enter the number of pieces player 2 used for building on day 1

[600]

Enter the number of pieces player 1 used for building on day 2

[500]

Enter the number of pieces player 2 used for building on day 2

[600]

Enter the number of pieces player 1 used for building on day 3

[500]

Enter the number of pieces player 2 used for building on day 3

[500]

Enter the number of pieces player 1 used for building on day 4

[400]

Enter the number of pieces player 2 used for building on day 4

[900]

Enter the number of pieces player 1 used for building on day 5

[700]

Enter the number of pieces player 2 used for building on day 5

[700]

Enter the number of pieces player 1 used for building on day 6

[800]

Enter the number of pieces player 2 used for building on day 6

[800]

Enter the number of pieces player 1 used for building on day 7

[600]

Enter the number of pieces player 2 used for building on day 7

[500]

Enter the number of pieces player 1 used for building on day 8

[700]

Enter the number of pieces player 2 used for building on day 8

[1000]

Enter the number of pieces player 1 used for building on day 9

[350]

Enter the number of pieces player 2 used for building on day 9

[550]

Enter the number of pieces player 1 used for building on day 10

[550]

Enter the number of pieces player 2 used for building on day 10

[850]

Congratulations to player 2 for winning the Lego Set Competition!

Additional information about the competition results is below

Player 1 completed the following sets: Tower Bridge, Eiffel Tower

Player 1 did not complete the following sets: Ship in Bottle

Player 1 built a total of 6000 pieces

Player 2 completed the following sets: Tower Bridge, Eiffel Tower, Ship in Bottle

Player 2 did not complete the following sets: None

Player 2 built a total of 7000 pieces

The competition lasted 10 days

**Explanation of Sample Test 1**: The total number of pieces between all three lego sets is 7000 (4000 + 2000 + 1000). When considering the number of pieces built each day, player 2 had built a total of 7000 pieces after day 10 so the competition ended and player 2 was declared the winner.

**Sample Test 2**

Welcome to the Lego Set Competition!

Enter the name of Lego Set 1

[Ferris Wheel]

Enter the number of pieces in Lego Set 1

[800]

Enter the name of Lego Set 2

[Taj Mahal]

Enter the number of pieces in Lego Set 2

[1550]

Enter the name of Lego Set 3

[Space Shuttle]

Enter the number of pieces in Lego Set 3

[2150]

Enter the number of pieces player 1 used for building on day 1

[900]

Enter the number of pieces player 2 used for building on day 1

[200]

Enter the number of pieces player 1 used for building on day 2

[1000]

Enter the number of pieces player 2 used for building on day 2

[200]

Enter the number of pieces player 1 used for building on day 3

[972]

Enter the number of pieces player 2 used for building on day 3

[50]

Enter the number of pieces player 1 used for building on day 4

[928]

Enter the number of pieces player 2 used for building on day 4

[100]

Enter the number of pieces player 1 used for building on day 5

[700]

Enter the number of pieces player 2 used for building on day 5

[150]

Congratulations to player 1 for winning the Lego Set Competition!

Additional information about the competition results is below

Player 1 completed the following sets: Ferris Wheel, Taj Mahal, Space Shuttle

Player 1 did not complete the following sets: None

Player 1 built a total of 4500 pieces

Player 2 completed the following sets: None

Player 2 did not complete the following sets: Ferris Wheel, Taj Mahal, Space Shuttle

Player 2 built a total of 700 pieces

The competition lasted 5 days

**Explanation of Sample Test 2**: The total number of pieces between all three lego sets is 4500 (800 + 1550 + 2150). When considering the number of pieces built each day, player 1 had built a total of 4500 pieces after day 5 so the competition ended and player 1 was declared the winner. Note that the log indicates "None" for the sets player 2 completed. Since Lego Set 1 (Ferris Wheel) has 800 pieces and player 2 only built a total of 700 pieces, player 2 did not complete any of the lego sets.

**Sample Test 3**

Welcome to the Lego Set Competition!

Enter the name of Lego Set 1

[Pirate Ship]

Enter the number of pieces in Lego Set 1

[2000]

Enter the name of Lego Set 2

[Ice Skating Rink]

Enter the number of pieces in Lego Set 2

[500]

Enter the name of Lego Set 3

[Swimming Pool]

Enter the number of pieces in Lego Set 3

[1000]

Enter the number of pieces player 1 used for building on day 1

[900]

Enter the number of pieces player 2 used for building on day 1

[650]

Enter the number of pieces player 1 used for building on day 2

[1000]

Enter the number of pieces player 2 used for building on day 2

[1000]

Enter the number of pieces player 1 used for building on day 3

[800]

Enter the number of pieces player 2 used for building on day 3

[1050]

Enter the number of pieces player 1 used for building on day 4

[500]

Enter the number of pieces player 2 used for building on day 4

[550]

Enter the number of pieces player 1 used for building on day 5

[300]

Enter the number of pieces player 2 used for building on day 5

[250]

The competition ended in a tie! There will be a tiebreaker round

Enter the name of Lego Set 1

[Soccer Field]

Enter the number of pieces in Lego Set 1

[1800]

Enter the name of Lego Set 2

[Camper Van]

Enter the number of pieces in Lego Set 2

[1500]

Enter the name of Lego Set 3

[Waterpark]

Enter the number of pieces in Lego Set 3

[1000]

Enter the number of pieces player 1 used for building on day 6

[900]

Enter the number of pieces player 2 used for building on day 6

[900]

Enter the number of pieces player 1 used for building on day 7

[800]

Enter the number of pieces player 2 used for building on day 7

[560]

Enter the number of pieces player 1 used for building on day 8

[940]

Enter the number of pieces player 2 used for building on day 8

[200]

Enter the number of pieces player 1 used for building on day 9

[1000]

Enter the number of pieces player 2 used for building on day 9

[1500]

Enter the number of pieces player 1 used for building on day 10

[560]

Enter the number of pieces player 2 used for building on day 10

[210]

Enter the number of pieces player 1 used for building on day 11

[100]

Enter the number of pieces player 2 used for building on day 11

[200]

Congratulations to player 1 for winning the Lego Set Competition!

Additional information about the competition results is below

Player 1 completed the following sets: Pirate Ship, Ice Skating Rink, Swimming Pool, Soccer Field, Camper Van, Waterpark

Player 1 did not complete the following sets: None

Player 1 built a total of 7800 pieces

Player 2 completed the following sets: Pirate Ship, Ice Skating Rink, Swimming Pool, Soccer Field, Camper Van

Player 2 did not complete the following sets: Waterpark

Player 2 built a total of 7070 pieces

The competition lasted 11 days

**Explanation of Sample Test 3**: By the end of day 5, both players completed all lego sets. A message was printed indicating that there is a tiebreaker round and a new round started with brand new lego sets. Player 1 won the tiebreaker. Both rounds are considered for the purpose of printing completed sets and the duration of the competition.

Note: Brackets [] indicate input.

Note: Match this output exactly. Spelling mistakes will result in lost points.

## **Testing**

We have included a program that will allow you to create and run output tests automatically in the Starter Code. This will make it easier for you to verify that each possible progression through your solution is correct. Take a look at RunLocalTest.java. There are many utility features and tools that you do not need to worry about at the moment, instead, focus on the test case. It is included in the Starter Code. Read through it.

### **Public Test Cases Note**

You should think of other test cases to use that will fully test every aspect of every feature of your program.