IF100
For Loops - Practice #2

Introduction

The aim of this example is to practice sequences (i.e. list, string, range) and loops (for and while statements, and nested loops). The use of sequences and loops is due to the nature of the problem; that is, you cannot finish this practice assignment without using sequences and loops.

Story

It is the New Year's night and you made the biggest mistake: You stayed at home for some family time. Ultimately, you have been assigned by your family for playing Tombala (a traditional Turkish game for New Year's night) with your grandmother, in an inevitable way. You, your grandma, countless number of numbers and one card to rule them all!

Description

In this exercise, you will write a Python program that simulates a simplification of the Tombala game with two players. Upcoming explanations will clarify why it is a **simplification** of the original game.

In **this** Tombala game, each player receives a card in the beginning, and each card has 12 numbers on it (normally there are 15 numbers in each card, but for simplicity cards will have 12 numbers in our game). In our case, we have only two players (remember, only grandma and you!). The numbers on the cards range from 1 to 30 (both included), and a particular number can appear only once on a single card (normally numbers range from 1 to 90, but for simplicity numbers range from 1 to 30 in our game). Both players has only one single card. Afterwards, a sack with 30 stones, each of which has a unique number in the range 1 to 30 (both included), is brought into the game.

The Tombala game is played in rounds. During the game, in each round, one stone is pulled from the sack and the players having the number on their cards are said to achieve that number. The **winner** of the game is/are the one(s) who has/have **achieved all the numbers** on his/her/their card(s) **the first**. In the case with these two players, the probabilities are: (i) You win, (ii) Grandma wins, or (iii) Tie. Yes, <u>a tie may happen</u> if both players have the same one number remaining on their cards unachieved and ultimately that number is picked at some point.

Some of you, who have played Tombala before, may ask about the "Çinko" concept. The original Tombala game includes such a concept, meaning the completion of a full row (cards are thought to have 3 rows in the original game), that is used in determining the winner of the game. However, we totally omit the "Çinko" concept in this homework. *In the program that you will write to simulate a Tombala game between 2 players, the **winner** will be designated as **described** in the **previous paragraph***. Here, you may think about the Tombala cards as having 12 numbers coming sequentially one after another.

Inputs

The inputs of the program and their order are explained below. Please see "Sample Runs" section for some examples.

There are three inputs to your program, in the order given below:

1. A string representing the 12 numbers on Grandma's card,
2. A string representing the 12 numbers on your card, and
3. A string representing all the numbers in the range 1 to 30 (both including) in the order they are drawn.

<u>The prompts of the input statements to be used has to be exactly the same as the prompts of the "Sample Runs".</u>

In all of the inputs and outputs, the numbers are separated by a single "-" (dash) character.

Flow, Gameplay and Rules

Your program should start by asking all of the inputs one by one in the order defined above. After obtaining all the inputs from the user, the numbers that appear in the third input are simulated to be drawn in the order as in the input. At this point, you should iterate over each number in the third input (there are multiple ways to get the next number in the third input), check whether the players have the current number on their card and make a process accordingly.

As we have all the numbers in the sack, the game has to end one way or another. Your program should determine the winner _as soon as_ either one of the players complete their cards and must __not__ continue with the simulation of drawing the remaining numbers from the third input.

After the game is announced to end, if it is __not a tie__, your program should print the remaining numbers of the loser as well. Again there are many ways to do this, but your algorithm should be able to get the remaining numbers of losing player at the end of the game.

In order to simplify the game, we have some very good assumptions on the input formats and game rules, as given below:

1. All the numbers from 1 to 30 (both including) will appear exactly once in the sack and all will be given in the input (even though some numbers in the end may not be needed).

2. Each card will have exactly 12 numbers and the order of those numbers is important (it matters while printing the remaining numbers of the loser).
3. Numbers less than 10 will always be represented with a single digit and numbers greater than or equal to 10 will always be represented with two digits (e.g., there are no heading zeros or anything).

4. A card cannot have any number from out of the range and it cannot repeat a number (it cannot have the same number twice).

Sample Runs

Below, we provide some sample runs of the program that you will develop. The *italic* and **bold** phrases are inputs taken from the user. You may <u>not</u> change any of the prompt sentences. Your program should be presented exactly like these sample runs.

Sample runs are not %100 comprehensive. You are required to read the whole documentation and decide on what other cases you might try your program with.

Sample Run 1

```
Welcome to the New Year's night fun(!)
Please enter the Tombala card for Grandma: 5-7-22-29-6-26-23-19-11-30-4-27
Please enter the Tombala card for You: 7-25-14-23-9-15-26-17-1-11-12-5
Please enter the numbers drawn in the order:
5-7-22-29-6-26-23-19-11-30-4-27-24-17-28-15-10-3-16-14-1-2-12-13-21-9-25-20-8-
18
----
Number 5 is drawn. Grandma has it. You have it.
Number 7 is drawn. Grandma has it. You have it.
Number 22 is drawn. Grandma has it.
Number 29 is drawn. Grandma has it.
Number 6 is drawn. Grandma has it.
Number 26 is drawn. Grandma has it. You have it.
Number 23 is drawn. Grandma has it. You have it.
Number 19 is drawn. Grandma has it.
Number 11 is drawn. Grandma has it. You have it.
Number 30 is drawn. Grandma has it.
Number 4 is drawn. Grandma has it.
Number 27 is drawn. Grandma has it.
----
Grandma wins.
Remaining numbers of You: 25-14-9-15-17-1-12
```

Sample Run 2

```
Welcome to the New Year's night fun(!)
Please enter the Tombala card for Grandma: 17-2-24-19-29-8-26-4-12-14-10-28
Please enter the Tombala card for You: 14-2-27-21-25-23-29-24-5-3-4-20
Please enter the numbers drawn in the order:
10-5-18-3-22-1-20-2-14-6-13-25-27-15-4-26-8-24-21-23-28-12-29-7-17-16-11-19-9-
30
----
Number 10 is drawn. Grandma has it.
Number 5 is drawn. You have it.
Number 18 is drawn.
Number 3 is drawn. You have it.
Number 22 is drawn.
```

```
Number 1 is drawn.
Number 20 is drawn. You have it.
Number 2 is drawn. Grandma has it. You have it.
Number 14 is drawn. Grandma has it. You have it.
Number 6 is drawn.
Number 13 is drawn.
Number 25 is drawn. You have it.
Number 27 is drawn. You have it.
Number 15 is drawn.
Number 4 is drawn. Grandma has it. You have it.
Number 26 is drawn. Grandma has it.
Number 8 is drawn. Grandma has it.
Number 24 is drawn. Grandma has it. You have it.
Number 21 is drawn. You have it.
Number 23 is drawn. You have it.
Number 28 is drawn. Grandma has it.
Number 12 is drawn. Grandma has it.
Number 29 is drawn. Grandma has it. You have it.
----
You win.
Remaining numbers of Grandma: 17-19
```

Sample Run 3

```
Welcome to the New Year's night fun(!)
Please enter the Tombala card for Grandma: 22-24-28-23-7-11-6-29-17-21-16-4
Please enter the Tombala card for You: 4-11-24-26-22-19-15-14-20-12-29-7
Please enter the numbers drawn in the order:
21-20-26-2-8-23-18-30-12-1-16-17-24-3-28-7-10-4-14-11-27-25-13-29-6-9-5-15-19-
22
----
Number 21 is drawn. Grandma has it.
Number 20 is drawn. You have it.
Number 26 is drawn. You have it.
Number 2 is drawn.
Number 8 is drawn.
Number 23 is drawn. Grandma has it.
Number 18 is drawn.
Number 30 is drawn.
Number 12 is drawn. You have it.
Number 1 is drawn.
Number 16 is drawn. Grandma has it.
Number 17 is drawn. Grandma has it.
Number 24 is drawn. Grandma has it. You have it.
Number 3 is drawn.
Number 28 is drawn. Grandma has it.
Number 7 is drawn. Grandma has it. You have it.
```

```
Number 10 is drawn.
Number 4 is drawn. Grandma has it. You have it.
Number 14 is drawn. You have it.
Number 11 is drawn. Grandma has it. You have it.
Number 27 is drawn.
Number 25 is drawn.
Number 13 is drawn.
Number 29 is drawn. Grandma has it. You have it.
Number 6 is drawn. Grandma has it.
Number 9 is drawn.
Number 5 is drawn.
Number 15 is drawn. You have it.
Number 19 is drawn. You have it.
Number 22 is drawn. Grandma has it. You have it.
----
Grandma and You finish at the same round. It's a tie!
```

Sample Run 4

```
Welcome to the New Year's night fun(!)
Please enter the Tombala card for Grandma: 21-10-22-8-30-6-23-3-27-5-15-25
Please enter the Tombala card for You: 12-21-22-24-27-10-2-13-30-25-7-19
Please enter the numbers drawn in the order:
19-29-20-23-1-16-22-27-18-30-24-15-14-12-9-7-13-4-2-11-5-25-28-26-8-10-6-21-3-
17
----
Number 19 is drawn. You have it.
Number 29 is drawn.
Number 20 is drawn.
Number 23 is drawn. Grandma has it.
Number 1 is drawn.
Number 16 is drawn.
Number 22 is drawn. Grandma has it. You have it.
Number 27 is drawn. Grandma has it. You have it.
Number 18 is drawn.
Number 30 is drawn. Grandma has it. You have it.
Number 24 is drawn. You have it.
Number 15 is drawn. Grandma has it.
Number 14 is drawn.
Number 12 is drawn. You have it.
Number 9 is drawn.
Number 7 is drawn. You have it.
Number 13 is drawn. You have it.
Number 4 is drawn.
Number 2 is drawn. You have it.
Number 11 is drawn.
Number 5 is drawn. Grandma has it.
Number 25 is drawn. Grandma has it. You have it.
```

```
Number 28 is drawn.
Number 26 is drawn.
Number 8 is drawn. Grandma has it.
Number 10 is drawn. Grandma has it. You have it.
Number 6 is drawn. Grandma has it.
Number 21 is drawn. Grandma has it. You have it.
----
You win.
Remaining numbers of Grandma: 3
```

Programming and Coding Advice

It would be easier for you to implement the algorithm of this problem if you **first** try to **draw the flowchart** or **write the pseudocode** so that you can go over your solution to see if there are any errors.

Additionally, this homework is not short to implement and it will be very difficult and problematic to code the solution without decomposing the process into smaller pieces. Indeed, it is always a good idea to **use decomposition and pattern recognition** in programming, regardless of the length of the problem. Just define subproblems in the whole problem, and try to solve these subproblems before.