Lab 3: Guess the Combination! V1

What you will need to know before you start this lab:

Input, Processing and Output, Modules and Functions, Decision Structures with Compound Conditions, Loops

Requirements:

Use modules and functions as much as possible, but don't create 1 line modules or functions. Create generalized functions wherever possible. Review and make your program follow the sample program execution shown below. Design the program using a hierarchy chart and some pseudocode. After you are clear on everything you must do, begin writing the program in java and test ALL the conditions in the provided test plan.

How the program will work:

The player is a locksmith who is trying to open a door with a 3-digit combination from 900 through 999. The locksmith will have 5 tries to guess the combination.

Each time the locksmith makes a guess, restrict the next guess to numbers between their closest guessed numbers. For example, if the player's first guess is 955, and that is too low, then their next guess can only be 956 to 999. See the sample output for examples.

If the player guesses the correct number, congratulate them appropriately. If the locksmith does not guess the number after 5 tries, display the 3-digit combination they were trying to guess, and reduce their credibility as a locksmith by 1/3. Each round of guesses starts with a new random combination. For testing you can display the combination, but be sure to comment out the display line before turning it in.

Display an error message if player tries to enter a number outside the allowed range of guesses. Use the standard generalized input routine to be input of the type required. It is up to you to write the validation routines to validate the input is correct.

After the game ends, in either victory or defeat, ask the player if they want to try again. See the sample output to see how it should look. End the program normally in main without using a System.exit(0) statement.

There are many ways to create a program that works – the beautiful, the good, the bad, and the ugly. Full credit will only go to code that are formatted as expected in this class, and fully documented programs with comments explaining the purpose of the code, not just repeating what each line of code in comment form.

This assignment requires, for any credit, the use of at least **two functions** and at least **two loops** and **two decision structures**. Do not use any coding techniques we have not covered in class! The code for each round must be in a loop, as must be the code for the number of guesses. **Use global constants** for the number of rounds, the number of guesses in each round, the amount of status lost after each round, and the starting high and low values**.**

Requirement: Code the program so you can change the constants and the program will still run successfully (Test: 2 rounds of 9 guesses between 300 and 800, for example).

Sample Input/Output: (code for all these situations!)

Example 1:

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Guess the Combination!

← Note the text in **RED**!

You are a great locksmith trying to open a door by guessing its combination.
If you can guess the number that opens the door, you will solve the case.
If you have not opened the door after 5 guesses, you will lose 33% of your credibility.
After 3 rounds, you will have lost all your credibility and will retire in defeat.
Good luck - you'll need it!

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What are you called in your city? **Sherlock**

Note the name of the user is displayed here.

OK, let's do this, Sherlock.

Guess #1: What is your guess from 900 to 999? **99**
You have entered a number out of range.
Guess #1: What is your guess from 900 to 999? **900**
Guess #2: What is your guess from 901 to 999? **950**
Guess #3: What is your guess from 951 to 999? **10**
You have entered a number out of range.
Guess #3: What is your guess from 951 to 999? **140**
You have entered a number out of range.
Guess #3: What is your guess from 951 to 999? **990**
Guess #4: What is your guess from 951 to 989? **970**
Last Guess: What is your guess from 971 to 990? **980**
Wrong, Sherlock! The 3-digit combination was 972
Your credibility as a locksmith is now at 66%

Note a new combination is created for the new round.

Note the numbers the user can enter change after each guess!

Let's try again with a new combination…

Note the name of the user is displayed here.

Guess #1: What is your guess between 900 and 999? **972**
Guess #2: What is your guess between 900 and 971? **943**

That's it! Well done, Sherlock!
Sherlock opens the door and solves the case!

Does a new locksmith want to try to open the lock? **No**

Use a variation of the do-you-want-to-continue loop.

Goodbye, Sherlock. Until we meet again.

Example 2:

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Guess the Combination!

You are a great locksmith trying to open a door by guessing its combination.
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After 3 rounds, you will have lost all your credibility and will retire in defeat.

Good luck - you'll need it!

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What are you called in your city? **Sherlock**

OK, let's do this, Sherlock.

Guess #1: What is your guess from 900 and 999? **925**
Guess #2: What is your guess from 926 and 999? **950**
Guess #3: What is your guess from 951 and 999? **990**
Guess #4: What is your guess from 951 and 989? **970**
Last Guess: What is your guess from 971 and 989? **980**

Note the numbers changing after each guess!

Wrong, Sherlock! The 3-digit combination was 972
Your credibility as a locksmith is now at 66%

Let's try again with a new combination…

Guess #1: What is your guess from 900 and 999? **920**
Guess #2: What is your guess from 921 and 999? **950**
Guess #3: What is your guess from 951 and 999? **980**
Guess #4: What is your guess from 951 and 179? **960**
Last Guess: What is your guess from 961 and 179? **978**

Wrong, Sherlock! The 3-digit combination was 971
Your credibility as a locksmith is now at 33%

Let's try again with a new combination…

Guess #1: What is your guess from 900 and 900? **925**
Guess #2: What is your guess from 926 and 900? **950**
Guess #3: What is your guess from 951 and 900? **990**
Guess #4: What is your guess from 951 and 989? **960**
Last Guess: What is your guess from 959 and 989? **980**

Wrong, Sherlock! The 3-digit combination was 962
Your credibility as a locksmith is now at 0%

The light fades as you lower your head in defeat.
Goodbye, Sherlock. Maybe you should brush up on your lock-picking skills!

Does a new locksmith want to try to open the lock? **Yes**

Note the text is different for victory or defeat.

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Good luck - you'll need it!

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What are you called in your city? **007**

Etc….

Lab Deliverables

- A completed Test Plan. (Modify the test plan given to you!)
- A Java program (a .java file)

For examples of java, refer to the textbook *Java Programming to accompany Programming Logic and Design*.

Grading

If you don't turn this in or you turn in the assignment and it doesn't work at an acceptable level, you will receive a zero on the assignment.