**Bonus Project: Cows and Bulls**

**Specifications:** Create a program that will play the "cows and bulls" game with the user. The game works like this:
1. Randomly generate a 4-digit number.
2. Ask the user to guess a 4-digit number.
3. For every digit that the user guessed correctly *in the correct place*, they have a "cow".
4. For every digit the user guessed correctly *in the wrong place* is a "bull." Every time the user makes a guess, tell them how many "cows" and "bulls" they have.
5. Once the user guesses the correct number, the game is over. Keep track of the number of guesses the user makes throughout the game and tell the user at the end.

For example, say the number generated by the computer is 7903. An interaction could look like this:

```
Welcome to the cows and bulls game!
Guess a 4-digit number or type exit to leave: 0124
You have 0 cows and 1 bulls.
Try again!
Guess a 4-digit number or type exit to leave: 7124
You have 1 cows and 0 bulls.
Try again!
Guess a 4-digit number or type exit to leave: 7034
You have 1 cows and 2 bulls.
Try again!
Guess a 4-digit number or type exit to leave: 7903
You have 4 cows and 0 bulls.
You won the game after 4 guesses.
```

**Pseudo-Code**

*# initialize variables*

initialize 3 variables:

- Random 4-digit number (this is done for you)
- one Boolean (true/false) to control the loop
- one integer to count the number of guesses

print welcome a message

*# start game loop*

Start a while loop based on your loop control variable from above. Inside the while loop:

1. Ask the user to input a 4-digit guess OR exit, and store their input as a variable

2. If the user types "exit", break the loop to end the game

3. Create two empty lists: one to store the digits in the guess from the user, and one to store the digits from the computer's randomly generated number

4. Use a for loop to append the digits from the user's guest to the user-guess-list and the digits from the computer's number to the computer-number-list

5. Create two variables, cows and bulls, and set each to 0

6. Find the number of cows:
For each number in range 0-4 (because there are 4 digits in each number):
    A. If the value of the user-guess-list at that index is the same as the value of the computer-number list at that index:
        a. Add 1 to cows, because you found a matching digit in the user-guess-list and the computer-number-list
        b. Set the user-guess-list at this index to a symbol (like "%"), so you don't double count this number
        c. Set the computer-number-list at this index to a different symbol (like "*"), so you don't double count this number

7. Find the number of bulls:
For each item1 in the user-guess-list:
    A. Set a counter equal to 0 (to keep track of your index):
    B. Use a for-loop to loop over each item2 in the computer-number-list:
        a. If the item1 in the user-guess-list is equal to the item2 in the computer-number-list:
            I. Add 1 to bulls, because you just found a match!
            II. Set the computer-number-list at the index [counter] to the same symbol as before (like "*"), so you don't double count this number
            III. Break the loop, so that you don't double-count a second match later in the list
        b. Add 1 to the counter to move to the next index

8. Add one to the guesses to update the number of guesses the user has make

9. Give the user feedback: print the number of cows and bulls

10. Check to see if the game is over:
    A. If the number of cows is 4, that means they guessed the number exactly right! Set the loop control variable to False, and print a message that tells them that they won the game and how many guesses they used.
    B. Else, print a message that tells the user to try again!