Assignmet 3: functions and random numbers

In this assignment you need to program the "Bulls and Cows" game[1].

The program will create a "target" - random number with 4 different digits. The user will try to guess the number. For each guess the program will print to screen the number of "bulls" (matching digits which are on their right position compared to target) and "cows" (matching digits on different position compared to target). The game will end when user guesses the right number (4 bulls) or when no number was inserted (user pressed enter - "\n" as input).

In order to create the game you need to implement these functions:

Int randNum()
Functionality: creates random 4 digits number [1000 … 9999]. The number <u>can</u> have identical digits
Arguments: none
Returned value: The created number

Int isValidNum(int checkedNum, int printError)
Functionaliy: checks if checkedNum is valid
- In range [1000 … 9999]
- With no identical digits
- If icheckedNum is invalid and printError equals 1 the function will print to screen: "Invalid guess. Number should have four different digits!!" If printError is not 1 nothing will be printed

Arguments:
- checkedNum – the number to be checked
- printError – if 1 an error message will be printed for invalid number

Returned value: 1 for valid number OR 0 for Invalid number

int countOccurences(int checkedNum, int digit)
Functionality: checks how many times digit appears in checkedNum
Arguments:
- checkedNum – the number to be checked
- digit – the digit to be checked if exists in checkedNum

Returned value: number of occurrences of digit in checkedNum

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[1] See: http://en.wikipedia.org/wiki/Bulls_and_cows

int getNumBulls(int target, int guess)

Functionality: checks how many bulls appear in guess when compared to target

Arguments:
- target – the computer's number
- guess – the user's number

Returned value: number of bulls in guess

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int getNumCows(int target, int guess)

Functionality: checks how many cows appear in guess when compared to target

Arguments:
- target – the computer's number
- guess – the user's number

Returned value: number of cows in guess

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void printBullsAndCows(int bulls, int cows)

Functionality: prints to screen how many bulls and cows where in last user's guess

Arguments:
- bulls – number of bulls in last user's guess
- cows – number of cows in last user's guess

Returned value: none

Int main()

Functionality: the main function will be responsible for the flow of the program while calling the relevant functions
- creating the target number until a valid number created
- getting the input guess number from the user in loop until user guessed the target number (4 bulls) or pressed enter with no number ("\n")
- Checking validity of each user's guess. If invalid, the user should be informed and new guess should be acquired
- For valid guess checking number of bulls and cows and print the result to the user

Running example for target number 3621 (user in **red**)

Guess a number: **1127**

Invalid guess. Number should have four different digits!!

Guess a number: **3729**

You have 2 bulls and 0 cows

Guess a number: **7526**

You have 1 bulls and 1 cows

Guess a number: **3513**

Invalid guess. Number should have four different digits!!

Guess a number: **3518**

You have 1 bulls and 1 cows

Guess a number: **3621**

You have 4 bulls and 0 cows

Your guess is right!!!

See you next game... press enter to exit