Lab#: 0

Course: CS 5123

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3. Compare the number of guesses necessary, on average for 1-10, 1-100, 1-1000

If the information is available to the player whether his guess was above or below the randomly generated number, to the worst it would take half of the total number of possible random number outcomes number of guesses to guess it correctly. For example, if there are 10 possible random number of outcomes, the user could guess the number correctly with the maximum of 5 trials. In general for N number of possible outcomes, the outcome shrinks in the following pattern:

N/2 - N/4 –N/8 – N/16 -….-N/N

So the best outcome is if the user guesses correctly in his first attempt (N/N =1) and the worst outcome is it takes the user N/2 number of trials to guess correctly. And the user could also guess correctly in all other possible number of trials between these two extremes.

4. What would it take to change the game to guessing a letter from the alphabet? Give me details to how your algorithm would change and how the code would have to change, but it is not necessary to implement it.

The following things should be changed to change the number guessing game to a letter guessing game:

* The data type of the variable to be guessed should be changed from int to char.
* Instead of randomly generating numbers using: int randomNumber = rand()%100+1, random characters should be generated using: char randomLetter = ‘a’+ rand()%26.
* The if else statement used to control only integer inputs are inserted should be taken out.

6. Analyze the strategy of guessing from at least three different users and compare them in a few paragraphs. How does this strategy work within the algorithm you developed? What would you change within your algorithm or code to make the game easier or harder, based on this information?

In order to make the game easier the absolute value of the difference between the guess and the randomly generated number could be provided to the player. It is also possible to make it easier by allowing the user to determine the range of the random number. In order to make it difficult, part of the information that tells the player whether his/her guess is above or below the randomly generated number could be removed. It is also possible to make it harder by making the program to produce dynamic random number every time the player entered his guess.