

Report of Homework 1

Chaoyi Jiang

1、P In the worse case, how many guesses would our guessing game take to get the right answer if we had no hints at all? Explain.

we would have to guess every number in the range of 1-10, starting from 1 and ending with 10, in order to determine the correct number with certainty. so it would take a maximum of 10 guesses to get to the correct number.

2、R In the worst case, how many guesses does it take to get the right number if we get a hint of "higher or lower" when guessing numbers 1-10 and guess intelligently (always picking in the middle of the remaining set of numbers)?

The number of guesses it takes to find the correct answer in this case can be expressed mathematically using the log function. Specifically, in the worst case scenario, it takes $\log_2(n)$ guesses to find the correct number out of n possible options, where \log_2 is the base-2 logarithm.

For this case, with 10 possible numbers, it would take $\log_2(10) = 3.32192809488736218170856773213$ guesses to find the correct number.

However, since we can only make integer guesses, we round up to the nearest integer to get 4 guesses. So in the worst case, it would take 4 guesses to find the correct number.