Question 1:
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.

Answer:
Without any indications, the player might have to estimate every number between 1 and 10 in the worst case before figuring out the right one. Thus, ten guesses is the worst-case scenario.

Question 2:
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)?
Hint: In your answer, show this mathematically with the log function.Links to an external site.

Answer:
However, we can employ a binary search method if we are given the indication to guess "higher or lower" and we guess wisely by consistently choosing the middle of the remaining set of numbers. The logarithm of the number of possible outcomes to the base 2 determines the number of guesses required for a binary search.

In our situation, ceil(log2(10)) = 4 guesses would be required in the worst-case binary search scenario with integers ranging from 1 to 10. This is due to the fact that every accurate estimate cuts the number of possible answers in half.

The formula for the worst-case number of guesses (G) in a binary search is given by:
$G=[\log_2 N]$, N is the number of possible outcomes.In this case N is 10,
So $G=[\log_2 10] = [3.32192]=4$. Therefore, the worst-case scenario with "higher or lower" hints and intelligent guessing is 4 guesses, and this is mathematically represented by the logarithmic function.