Solution 1:

Number of A’s: 25,000,000,000

Number of B’s: 25,000,000,000

Number of C’s: 25,000,000,000

Number of D’s: 25,000,000,000

A’s + B’s + C’s +D’s = 100,000,000,000

What is the average number of array locations to inspect to find the first D? Give your answer using a formula or result mentioned in the class note. Please give the Slide number as a reference.

Number of Elements to get first D = ¼ \* 25,000,000,000

= 6,250,000,000

1. What is the average number of array locations to inspect to find 10 D’s? Give your answer using a formula or result mentioned in the class note. Please give the Slide number as a reference.

Number of elements to get 10 D’s = 6,250,000,000 \* 10

= 60,250,000,000

1. (c) What is the “average time complexity” to find **k** Ds in an array?

O (6,250,000,000 \* k )

Question 2:

Prove: 1 + 1/2 + 1/3 + …+ 1/n = O(log n).

Sum = 1 over n d n = log n Proved.

A picture containing text, nature

Description automatically generatedQuestion 3