Binary search – theory

The program should find an answer in:

20 numbers	5 guesses
100 numbers	7 guesses
1,000 numbers	10 guesses
10,000 numbers	14 guesses
1,000,000 numbers	20 guesses
2,000,000 numbers	21 guesses
10,000,000 numbers	24 guesses

I know that this bit of the table doesn't seem possible, but it's honestly the right answer!

Note that with more than 10,000 numbers the first part of the program will take a while to generate the list of numbers to search. With more than 1,000,000 numbers it'll take ages

Binary search – theory

The formula for working out the number of guesses is

$$\log_2 n$$

Where n is the number of numbers in the search (so 20 in a 1 to 20 search)

There's a program where you can calculate the number of guesses needed for any number of numbers using this formula

log2 is a base-two logarithm, which is a way of thinking about exponents (powers of numbers – so 2^4, 2^6 etc…). They are above GCSE level, so don't worry about what they are for now…