Estimate $\log_{10}$a with bisection (Ver.1)

We can estimate $\log_{10} a$ by bisection (you can read about bisection in textbook), which starts with prescribing range [L, U] where $\log_{10} a$ is actually in. For finding $\log_{10} a$, starting with [0, a]. Then you can estimate $\log_{10} a$ by bisection by following these steps.

1. Receive input as a
2. Prescribe L = 0
3. Calculate x as (L+U)/2
4. Check if abs(10**x-a) > 1e-10*max(a,10**x) if yes (True)
    4.1 Check if 10**x > a if yes, update x to U
    4.2 If not, update x to L
5. Iterate over steps 3.-4. Until the condition in 4 is false.
6. Print x as the output.

Input

A real number *a* (*a* must be between 1 to 600)

Output

Estimation of $\log_{10} a$ round to 6 decimal places.

Example

Input (from keyboard)	Output (on screen)
1	0.0
100	2.0
250.0	2.39794
500.0	2.69897