Estimate square root a with bisection (Ver.1)

We can estimate $log_{10}a$ by bisection (you can read about bisection in the 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*a 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