

## 2960 Entropy

In 1948 Claude E. Shannon in “The Mathematical Theory of Communication” has introduced his famous formula for the entropy of a discrete set of probabilities  $p_1, \dots, p_n$ :

$$H = - \sum p_i \log_2 p_i.$$

We will apply this formula to an arbitrary text string by letting  $p_i$  be the relative frequencies of occurrence of characters in the string. For example, the entropy of the string “Northeastern European Regional Contest” with the length of 38 characters (including 3 spaces) is 3.883 with 3 digits after decimal point. The following table shows relative frequencies and the corresponding summands for the entropy of this string.

char	occurs	$p_i$	$-p_i \log_2 p_i$	char	occurs	$p_i$	$-p_i \log_2 p_i$
space	3	0.079	0.289	i	1	0.026	0.138
C	1	0.026	0.138	l	1	0.026	0.138
E	1	0.026	0.138	n	4	0.105	0.342
N	1	0.026	0.138	o	4	0.105	0.342
R	1	0.026	0.138	p	1	0.026	0.138
a	3	0.079	0.289	r	3	0.079	0.289
e	5	0.132	0.385	s	2	0.053	0.224
g	1	0.026	0.138	t	4	0.105	0.342
h	1	0.026	0.138	u	1	0.026	0.138

Your task is to find a string with the given entropy.

### Input

Input consists of several datasets. Each dataset consists of a single real number  $H$  ( $0.00 \leq H \leq 6.00$ ) with 2 digits after decimal point.

### Output

For each dataset, write to the output file a line with a single string of at least one and up to 1000 characters ‘0’-‘9’, ‘a’-‘z’, ‘A’-‘Z’, ‘.’ (dot), and spaces. This string must have the entropy within 0.005 of  $H$ .

### Sample Input

3.88

### Sample Output

Northeastern European Regional Contest