Position

Problem Description

You are given a sequence which is expanding. This sequence starts from "a" and in every upcoming row we are replacing

"a" with "ab"

"b" with "cd"

"c" with "cd"

"d" with "ab"

Sequence will look like this:

1: a

2: ab

3: abcd

4: abcdcdab

5: abcdcdabcdababcd

... so on and so forth. The string is processed from left to right.

Your task is to calculate the N^{th} character in the string. The N^{th} character has to be identified as depicted below.

The starting alphabet *a* will be considered as the first character. The transformation of *a* into *ab* will form the second and the third character respectively. In the third iteration, *ab* will be transformed into *abcd*, which will be characters at four, five, six and seven respectively.

Below is the computation for N corresponding to the example shown above.

1: 1

2: 2 3

3: 4 5 6 7

4: 8 9 10 11 12 13 14 15

5: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

...

Constraints

0 < N < 2 ^ 63

Input

Single integer N

Output

Single character which corresponds to N^{th} character in the sequence

Time Limit (secs)

1

Examples

Example 1

Input

7

Output

d

Explanation:

1: 1

2: 2 3

3: 4 5 6 **7**

corresponds to

1: a

2: ab

3: abc**d**

Hence 7^{th} character is d.

Example 2

Input

17

Output

b

Explanation:

1: 1

2: 2 3

3: 4 5 6 7

4: 8 9 10 11 12 13 14 15

5: 16 **17**

corresponds to

1: a

2: ab

3: abcd

4: abcdcdab

5: **ab**cdcdabcdababcd

Hence 17^{th} character is b.