

Easy as ACB

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C++ — 2 SEC — 512 MB

Tina is again playing with her childhood wooden blocks, each inscribed with a single letter of the alphabet. She has taken one block each from the first n letters of the alphabet and is arranging them into words. Tina has chosen only words in which it is not possible to find three (not necessarily adjacent) letters, from left to right, that are in alphabetical order.

For example, if $n = 4$, the possible words that Tina could create (in lexicographic order) are:

ADCB BADC BDAC BDCA CADB CBAD CBDA CDAB CDBA DACB DBAC DBCA DCAB DCBA

Tina has already arranged one such word. She wants to know what word comes p places after her current word in lexicographic order.

INPUT You will be given two integers, n and p . This will be followed by a valid word, s , constructed from the first n letters of the alphabet. You will always be given a valid input.

$1 \leq n \leq 26$
 $1 \leq p \leq 2^{60}$

OUTPUT Output the word (of n letters) that comes p places after s in lexicographic order.

SAMPLE Suppose that Tina has arranged 4 blocks into the word BADC and she wants to know what word comes 6 places later in lexicographic order. This word would be CDAB.

INPUT

4 6
BADC

6 1
FEDCAB

10 3000
FEJIDBHGAC

OUTPUT

CDAB

FEDCBA

HEJIDAGFCB