The 2nd Japanese Olympiad in Informatics for Girls (JOIG 2021/2022)
Spring Training Camp/Qualifying Trial
March 20–23, 2022 (Komaba, Tokyo)

Contest 1 – Copy and Paste 3

Copy and Paste 3

JOI, Ltd. is a company known for their "just odd inventions." Recently, JOI, Ltd. developed a text editor called "Just Odd Editor."

Using this text editor, we can input a string of characters by performing the following operations several times. Let X be the string displayed on the screen of the text editor. Let Y be the string saved in the clipboard. In the beginning, both of X and Y are the empty string.

- **Operation A :** We add one character in the end of the string. Namely, we choose a character c, and update X to be $X + c$.
- **Operation B :** We select all the characters and cut them. Namely, we update Y to be X. After that, we set X to be the empty string.
- **Operation C :** We paste the string from the clipboard at the end of the string. Namely, we update X to be $X + Y$.

Here, for characters or strings x, y, the string $x + y$ means the string obtained by connecting x with y in this order. Performing an operation takes time. If we perform the operation A, B, C once, it takes A, B, C unit time, respectively.

You installed Just Odd Editor. You want to input a string S of length N as soon as possible. Performing operations, you want to make the string on the display be S as soon as possible.

Write a program which, given the length N, the string S, and the amount of unit time needed to perform an operation, calculates the least amount of time needed to input the string S.

Input

Read the following data from the standard input.

N
S
A
B
C

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Output

Write one line to the standard output. The output should contain the least amount of time needed to input the string S.

Constraints

- $1 \leq N \leq 2\,500$.
- S is a string of length N. Each character of S is a lower-case alphabet ('a' - 'z').
- $1 \leq A \leq 1\,000\,000\,000\ (= 10^9)$.
- $1 \leq B \leq 1\,000\,000\,000\ (= 10^9)$.
- $1 \leq C \leq 1\,000\,000\,000\ (= 10^9)$.
- N, A, B, C are integers.

Subtasks

1. (7 points) $N = 3$.
2. (18 points) Every character of S is 'a'.
3. (18 points) $N \leq 30$.
4. (11 points) $N \leq 200$.
5. (22 points) $N \leq 1\,000$.
6. (24 points) No additional constraints.

Sample Input and Output

Sample Input 1	Sample Output 1
11	88
mississippi	
10	
5	
2	

By performing the following operations, we can input `mississippi` by 88 unit time. Since it is the least amount of time needed to input `mississippi`, output 88.

Order	Operation	Explanation	X	Y	Time	Total Time
-	-	-	""	""	-	0
1	Operation A	Add a character in end	"s"	""	10	10
2	Operation B	Select all & Cut	""	"s"	5	15
3	Operation C	Paste at end	"s"	"s"	2	17
4	Operation C	Paste at end	"ss"	"s"	2	19
5	Operation A	Add a character in end	"ssi"	"s"	10	29
6	Operation B	Select all & Cut	""	"ssi"	5	34
7	Operation A	Add a character in end	"m"	"ssi"	10	44
8	Operation A	Add a character in end	"mi"	"ssi"	10	54
9	Operation C	Paste at end	"missi"	"ssi"	2	56
10	Operation C	Paste at end	"mississi"	"ssi"	2	58
11	Operation A	Add a character in end	"mississip"	"ssi"	10	68
12	Operation A	Add a character in end	"mississipp"	"ssi"	10	78
13	Operation A	Add a character in end	"mississippi"	"ssi"	10	88

This sample input satisfies the constraints of Subtasks 3, 4, 5, 6.

Sample Input 2	Sample Output 2
16 aaaaaaaaaaaaaaaa 1 1 1	9

By performing the following operations, we can input aaaaaaaaaaaaaaaa by 9 unit time. Since it is the least amount of time needed to input aaaaaaaaaaaaaaaa, output 9.

Order	Operation	Explanation	X	Y	Time	Total Time
-	-	-	""	""	-	0
1	Operation A	Add a character in end	"a"	""	1	1
2	Operation A	Add a character in end	"aa"	""	1	2
3	Operation A	Add a character in end	"aaa"	""	1	3
4	Operation A	Add a character in end	"aaaa"	""	1	4
5	Operation B	Select all & Cut	""	"aaaa"	1	5
6	Operation C	Paste at end	"aaaa"	"aaaa"	1	6
7	Operation C	Paste at end	"aaaaaaaa"	"aaaa"	1	7
8	Operation C	Paste at end	"aaaaaaaaaaaa"	"aaaa"	1	8
9	Operation C	Paste at end	"aaaaaaaaaaaaaaaa"	"aaaa"	1	9

This sample input satisfies the constraints of Subtasks 2, 3, 4, 5, 6.

Sample Input 3	Sample Output 3
18	8060200000
aababbbababbbaabbb	
1000000000	
100000	
10000000	

This sample input satisfies the constraints of Subtasks 3, 4, 5, 6.