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Dashboard ❯ **Algorithms** ❯ **Strings** ❯ **Build a String**

Build a String

🖼️ by nikasvanidze

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Greg wants to build a string, S of length N. Starting with an empty string, he can perform 2 operations:

1. Add a character to the end of S for A dollars.

2. Copy any substring of S, and then add it to the end of S for B dollars.

Calculate minimum amount of money Greg needs to build S.

Input Format

The first line contains number of testcases T.

The $2 \times T$ subsequent lines each describe a test case over 2 lines:
The first contains 3 space-separated integers, N, A , and B, respectively.
The second contains S (the string Greg wishes to build).

Constraints

- $1 \leq T \leq 3$

- $1 \leq N \leq 3 \times 10^4$

- $1 \leq A, B \leq 10000$

- S is composed of lowercase letters only.

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Submissions: 765
Max Score: 80
Difficulty: Hard

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Output Format

On a single line for each test case, print the minimum cost (as an integer) to build S.

Sample Input

```
2
9  4  5
aabaacaba
9  8  9
bacbacacb
```

Sample Output

```
26
42
```

Explanation

Test Case 0:
$S_{initial} = $ ""; $S_{final} = $ "$aabaacaba$"
Append "a"; $S = $ "a"; cost is 4
Append "a"; $S = $ "aa"; cost is 4
Append "b"; $S = $ "aab"; cost is 4
Copy and append "aa"; $S = $ "$aabaa$"; cost is 5
Append "c"; $S = $ "$aabaac$"; cost is 4
Copy and append "aba"; $S = $ "$aabaacaba$"; cost is 5

Summing each cost, we get $4 + 4 + 4 + 5 + 4 + 5 = 26$, so our output for *Test Case 1* is 26.

Test Case 1:
$S_{initial} = $ ""; $S_{final} = $ "$bacbacacb$"
Append "b"; $S = $ "b"; cost is $\$8$
Append "a"; $S = $ "ba"; cost is $\$8$
Append "c"; $S = $ "bac"; cost is $\$8$
Copy and append "bac"; $S = $ "$bacbac$"; cost is $\$9$
Copy and append "acb"; $S = $ "$bacbacacb$"; cost is $\$9$

Summing each cost, we get $8 + 8 + 8 + 9 + 9 = 42$, so our output for *Test Case 2* is 42.

Need Help? Get advice from the discussion forum for this challenge. Or check out the environments page

C++ ⌄

```cpp
 1  #include <cmath>
 2  #include <cstdio>
 3  #include <vector>
 4  #include <iostream>
 5  #include <algorithm>
 6  using namespace std;
 7
 8
 9  int main() {
10      /* Enter your code here. Read input from STDIN. Print output to STDOUT */
11      return 0;
12  }
13
```

Line: 1 Col: 1

⬆ Upload Code as File   ☐ Test against custom input

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