Maximum path

Let R be an unempty string over alphabet $A = \{a, b, c, ..., z\}$. We denote the first character of R by $R(0)$, the second character of R by $R(1)$, the third character of R by $R(2)$ etc.

Let K be a positive integer, $K \leq |R|$. We define **index vector associated with *R* and *K*** to be any strictly increasing sequence of K integers $X = (x_0, x_1, ..., x_{K-1})$ for which holds
$0 \leq x_0, x_{K-1} \leq |R|-1$.
We define ***R*-image of index vector *X* associated with *R* and *K*** to be a sequence of K characters $(c_0, c_1, ..., c_{K-1})$ for which holds
$0 \leq i \leq K-1 \Rightarrow c_i = R(x_i)$.
We denote R-image of index vector X associated with R and K by symbol $\mathrm{Im}(X, R)$.
Example: $\mathrm{Im}((0,1,4,5), abacba) = (a, b, b, a)$.

We say that two index vectors X and Y associated with R and K are **equivalent** if $\mathrm{Im}(X, R) = \mathrm{Im}(Y, R)$.
Example: $R = abacba$, $K = 4$. Index vectors $X = (0,3,4,5)$ and $Y = (2,3,4,5)$ associated with R and K are equivalent because $\mathrm{Im}(X, R) = \mathrm{Im}(Y, R) = (a, c, b, a)$.

We represent each equivalence class T of index vectors associated with R and K by that element of T which is lexicographically smallest among all elements of T. We denote the representative of equivalence class T by symbol $\mathrm{rep}(T)$.
Example: $R = abacbaa$, $K = 4$. $\mathrm{rep}(\{(0,3,4,5), (2,3,4,5), (0,3,4,6), (2,3,4,6)\}) = (0,3,4,5)$.

Let D and L be nonnegative integers. We define weighted directed graph $G(R, K, D, L)$ as follows:
The nodes of $G(R, K, D, L)$ are all equivalence classes of all index vectors associated with R and K. We say that node m is smaller than node n if $\mathrm{Im}(\mathrm{rep}(m), R)$ is lexicographically smaller than $\mathrm{Im}(\mathrm{rep}(n), R)$. There is a directed edge from node m to node n if all three following conditions hold:
1. m is smaller than n.
2. Hamming distance between $\mathrm{Im}(\mathrm{rep}(m), R)$ and $\mathrm{Im}(\mathrm{rep}(n), R)$ is smaller or equal to D.
3. There are at most L nodes w such that m is smaller than w and w is smaller than n.
The weight of the edge (m, n) is defined as follows:
Let $\mathrm{rep}(m) = (x_0, x_1, ..., x_{K-1})$ be the representative of the class m and let $\mathrm{rep}(n) = (y_0, y_1, ..., y_{K-1})$ be the representative of the class n. If there is an edge (m, n) its weight is equal to
$x_0 + x_1 + ... + x_{K-1} + y_0 + y_1 + ... + y_{K-1}$.
In other words the weight of (m, n) is the sum of all components of $\mathrm{rep}(m)$ increased by the sum of all components of $\mathrm{rep}(n)$.

The task
The problem is to find the maximum weight of all directed paths in $G(R, K, D, L)$. The weight of any directed path p is equal to the sum of all edge weights along p.

Input

Input contains two text lines. The first line contains string R, the second line contains numbers K, D, L in this order, separated by space. You may assume that following holds:
$1 \leq D \leq K \leq |R| \leq 50$. Number of nodes of $G(R, K, D, L)$ does not exceed 10^5, number of edges of $G(R, K, D, L)$ does not exceed 10^6.

Output

Output contains one text line with single integer denoting the maximum weight of all directed paths in $G(R, K, D, L)$.

Example 1

Input:

```
ccaabb
4 2 2
```

Output:

```
78
```

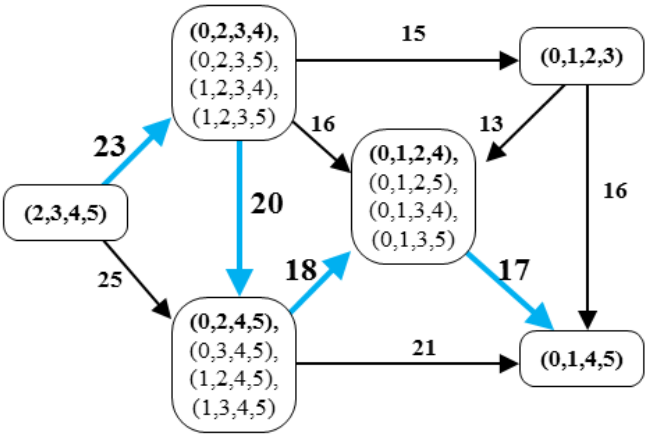

Image 1. There are exactly 15 different index vectors associated with $R = ccaabb$ and $K = 4$. All those vectors are also listed in the picture which depicts the graph $G(ccaabb, 4, 2, 2)$. Each node contains exactly one equivalence class of vectors associated with R and K. The representatives of each class are printed in bold. The maximum weight path is denoted by bold blue arrows and large edge weights.

Example 2

Input:

```
ccaabba
4 1 2
```

Output:

```
97
```

Example 3

Input:

```
abababababcdcdcdcdefefefef
6 1 1000
```

Output:

```
3668
```

Example 4

Input:

```
abababababcdcdcdcdefefefef
6 2 1000
```

Output:

```
62435
```

The public data set is intended for easier debugging and approximate program correctness checking. The public data set is stored also in the upload system and each time a student submits a solution it is run on the public dataset and the program output to stdout a stderr is available to him/her.

Public data