

# Problem B

## Compressor

**Input:** Standard Input  
**Output:** Standard Output

Your task is to compress a string of no more than 200 characters, using the following scheme:

- adjacent repeats:  $[S]k$

which means:  $S$  repeated  $k$  times (where  $k$  is a one-byte integer. recall that the length of the string does not exceed 200)

- repeats with gaps:  $[S]k\{S_1\}t_1\{S_2\}t_2\dots\{S_r\}t_r$ , where  $1 \leq t_i < k$ ,  $t_i < t_{i+1}$

which means: write  $S$  for  $k$  times, then insert string  $S_i$  after the  $t_i$ -th occurrence of  $S$ .

Note that the compressing is done recursively, so  $S$ ,  $S_1$ , ...,  $S_r$  mentioned above can all be compressed further.

e.g. for the original string

I\_am\_WhatWhat\_is\_WhatWhat

the optimal compressed string is:

I\_am\_[What]4{is\_}2

## Input

There are at most 20 test cases, each test case is a string containing no more than 200 printable characters, without whitespace characters (i.e., no spaces, no tabs), brackets (i.e. not in  $\{('), '[, ], '{, }'\}$ ) and digits.

Letters are case-sensitive.

## Output

For each case, print the length of the minimal string, and a compressed string. Note that every one-byte integer should be counted as one character, even if it has two or three digits in its decimal form.

## Sample Input

## Output for Sample Input

I_am_WhatWhat_is_WhatWhat	19 I_am_[What]4{is_}2
aaaabaaaaaaaaabaaaaaaaaabaaaa	11 [[a]8{b}4]3
???????????	4 [?]10

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Special Thanks: Yiming Li