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...{S_r}t_r, where 1 <= 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

Sample Input	Output for Sample Input
`I_am_WhatWhat_is_WhatWhat`	`19 I_am_[What]4{_is_}2`
`aaaabaaaaaaaabaaaaaaaabaaaa`	`11 [[a]8{b}4]3`
`??????????`	`4 [?]10`

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