

# Zig-Zag Permutation 2

See [ZZPERM](#) problem description. This is an improved version with more demanding test cases.

## Input

The input consists of at most 15 test cases. Each case contains a word (W) not longer than 64 letters and one positive number (D <= 1000000000). The letters of each word are in increasing order. Input is terminated by EOF.

## Output

For each case output all of the zig-zag permutations of W whose rank is divisible by D, in increasing lexicographic order, one word per line. In the next line print the total number of zig-zag permutations of W. There is no case that produces more than 365 lines of output. Print an empty line after each case.

## Example

### Input:

```
j 1
abc 2
aaabc 1
aaabb 2
aaaaaaaaaaaaaaaaaaaaaaaaaaaaabbbbbbbbbbccccdd 123456
aaaaaaaaabbbbbbbcccddddd 1000000000
```

### Output:

```
j
1

bac
cab
4

abaca
acaba
2

1

babacbcabacabadababababababababababababababab
213216

abacbcacbdadcdcbcadbdacbdacbdadbcad
abadadcdcdcdbdbdadbocabacacbdbcbcacab
acabacbcbdbcbdcadadacbcadbcadadadbd
acacbcbdadcdbdacbcadbdcbcadadbdabab
acadbcadbdbcacadbdbcacbdbdacbdbcadac
acbcacbcadbdadadadbdcbdcdbacacbdbdbc
acbcdbadbdcdcbcbcacbdadadaddbcacab
acbdadcdcadadbdababacbcacbdbdac
acbdcdbdcbcacbcacbdbdacad
```



dbcdbdacbcadbdacbdadbdacbcadbcacacab  
dbdacacbdadbcbcbbcadbdadbcadbcadaca  
dbdbcacacabacbcadacbdadcdbdbcbca  
dbdcabacacadbcbcdcbcacacbcbdbdabcaba  
dcdacadadbcbcabcacbcadbcadbadc  
dcdbcadadbcbcadbcadababdcdcbcacaba  
dcdcdacabdbdbdacacbcacbdabababdcbdc  
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