This is an easy problem

This is a really easy problem. All you are required to do is to implement Huffman coding. Given a single string, find the codes for all the characters. To make it more simple, it is guaranteed that all characters from 'a-z' are present in the string. As output, you just need to print the codes for the characters in the lexicographical order.

Input
The only line of input consists of one string.

Output
In 26 lines, print the code for each character from 'a-z'.

Sample Input
abcdefghiijklmnopqrstuvwxyzwewewewewtototop

Sample Output
00110
110011
111000
111011
100
111001
00010
110000
0010
111101
01101
111110
111111
00011
1101
0000
110001
01111
111100
010
01100
01110
101
111010
110010
00111