Problem A. oeis A216264

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

A word of length n is «rich» if it contains, as subwords, exactly n distinct palindromes. You shoud find the number of binary rich words of length i for all i from 1 to n.

Input

The input contains number n ($1 \leqslant n \leqslant 60$).

Output

Print n integer numbers.

Example

input.txt	output.txt
4	2 4 8 16

Problem B. Pairs

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

Your task is to calculate number of triplets (i, j, k) such that $i \leqslant j < k$ and $s[i..j]$ is palindrome and $s[j+1..k]$ is palindrome.

Input

The input contains a line of n lowercase Latin letters ($1 \leqslant n \leqslant 3 \cdot 10^5$).

Output

Print one integer — requested number of triplets.

Example

input.txt	output.txt
abaa	5

Problem C. oeis A216264.30

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

A word of length n is «rich» if it contains, as subwords, exactly n distinct palindromes. You shoud find the number of binary rich words of length i for all i from 1 to n.

Input

The input contains number n ($1 \leqslant n \leqslant 30$).

Output

Print n integer numbers.

Example

input.txt	output.txt
4	2 4 8 16

Problem D. Not common palindromes

Input file:	input.txt
Output file:	output.txt
Time limit:	1.2 seconds
Memory limit:	256 mebibytes

You're given two strings (A and B).

Your task is to find 3 numbers:

1. count of non-empty palindromes p such that f(A, p) > f(B, p);
2. count of non-empty palindromes p such that f(A, p) = f(B, p) and f(A, p) is non-zero;
3. count of non-empty palindromes p such that f(A, p) < f(B, p),

where f(A, p) = count of occurrences p into A.

Input

The first line contains T, the number of tests to follow. The next $2T$ lines contain string A and B for each test. The length of A, B will not exceed 200 000. It is guaranteed the input file will be smaller than 8 MB.

Output

For each test i print **"Case #i: x y z"** on a separate line where x, y and z are the three numbers to compute.

Example

input.txt	output.txt
3 abacab abccab faultydogeuniversity hasnopalindromeatall abbacabbaccab youmayexpectedstrongsamplesbutnow	Case #1: 4 1 2 Case #2: 8 3 9 Case #3: 13 0 15

Problem E. oeis A216264.26

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

A word of length n is «rich» if it contains, as subwords, exactly n distinct palindromes. You shoud find the number of binary rich words of length i for all i from 1 to n.

Input

The input contains number n ($1 \leqslant n \leqslant 26$).

Output

Print n integers; i-th of them must be answer to the problem for length i.

Example

input.txt	output.txt
4	2 4 8 16

Problem F. 100500 Palindromes

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

For every prefix of some given string, determine whether it is possible to split it into $1, 2, 3, 4, 5, \ldots, n$ non-empty palindromes. Note that if we can split a string into k palindromes then we can split it into $k + 2$ palindromes.

Input

The input contains a line of n lowercase Latin letters ($1 \leqslant n \leqslant 3 \cdot 10^5$).

Output

Print $2n$ integers. The i-th line should contain minimal odd k (or -1 if it doesn't exist) and minimal even k (or -2 if it doesn't exist) such that we can split string $s[1..i]$ into k palindromes.

Example

input.txt	output.txt
abaa	1 -2 -1 2 1 -2 3 2

Note

$abaa = aba|a = a|b|aa = a|b|a|a$.

Problem G. oeis A216264.35

Input file:	input.txt
Output file:	output.txt
Time limit:	1 second
Memory limit:	256 mebibytes

A word of length n is «rich» if it contains, as subwords, exactly n distinct palindromes. You shoud find the number of binary rich words of length i for all i from 1 to n.

Input

The input contains number n ($1 \leqslant n \leqslant 35$).

Output

Print n integers; i-th of them must be answer to the problem for length i.

Example

input.txt	output.txt
4	2 4 8 16