

D • Non-divisible 2-3 Power Sums

Every positive integer N can be written in at least one way as a sum of terms of the form $(2_a)(3_b)$ where no term in the sum exactly divides any other term in the sum. For example:

$$1 = (2_0)(3_0)$$

$$7 = (2_2)(3_0) + (2_0)(3_1)$$

$$31 = (2_4)(3_0) + (2_0)(3_2) + (2_1)(3_1) = (2_2) + (3_3)$$

Note from the example of 31 that the representation is not unique.

Write a program which takes as input a positive integer N and outputs a representation of N as a sum of terms of the form $(2_a)(3_b)$.

Input

The first line of input contains a single integer C , ($1 \leq C \leq 1000$) which is the number of datasets that follow.

Each dataset consists of a single line of input containing a single integer N , ($1 \leq N < 2_{31}$), which is the number to be represented as a sum of terms of the form $(2_a)(3_b)$.

Output

For each dataset, the output will be a single line consisting of: The dataset number, a single space, the number of terms in your sum as a decimal integer followed by a single space followed by representations of the terms in the form $[\langle 2 \text{ exponent} \rangle, \langle 3 \text{ exponent} \rangle]$ with terms separated by a single space. $\langle 2 \text{ exponent} \rangle$ is the power of 2 in the term and $\langle 3 \text{ exponent} \rangle$ is the power of 3 in the term.

Sample Input	Sample Output
6	1 1 [0,0]
1	2 2 [2,0] [0,1]
7	3 3 [4,0] [0,2] [1,1]
31	4 1 [5,5]
7776	5 1 [0,12]
531441	6 8 [3,13] [4,12] [2,15] [7,8] [9,6] [0,16] [10,5] [15,2]
123456789	

