

## 3573 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 ' $[< 2 \text{ exponent } >, < 3 \text{ exponent } >]$ ' with terms separated by a single space.  $< 2 \text{ exponent } >$  is the power of 2 in the term and  $< 3 \text{ exponent } >$  is the power of 3 in the term.

### Sample Input

```
6
1
7
31
7776
531441
123456789
```

### Sample Output

```
1 1 [0,0]
2 2 [2,0] [0,1]
3 3 [4,0] [0,2] [1,1]
4 1 [5,5]
5 1 [0,12]
6 8 [3,13] [4,12] [2,15] [7,8] [9,6] [0,16] [10,5] [15,2]
```