

## Sort and &

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         1024 megabytes

You are given a permutation of size  $N$ . You want to sort it. In one operation you can swap the  $i^{\text{th}}$  and the  $j^{\text{th}}$  elements ( $1 \leq i, j \leq N$ ) of the array and it will cost you  $\mathbf{i\&j}$  (bitwise **AND** of  $i$  and  $j$ ). Total sum of sorting the permutation is the sum of the cost of all the operations you will make. You can't make more than  $3N$  operations. Print the minimum cost to sort the permutation and also print one sequence of swap operations which will sort the permutation in the minimum cost.

### Input

The first line will contain a single integer  $T$  ( $1 \leq T \leq 10^4$ ). Each test case will start with one integer  $N$  ( $1 \leq N \leq 10^4$ ), the length of the permutation. The next line will contain  $N$  integers  $a_1, a_2, \dots, a_N$  ( $1 \leq a_i \leq N$ ).

It is guaranteed that the sum of  $N$  is at most  $10^5$  across all the test cases.

### Output

For each test case, the first line of the output should contain the minimum cost to sort the array. The next line should contain the number of required operations. Then each next line should contain two integers describing the indices being swapped. Please see the sample for details.

### Example

standard input	standard output
1	0
4	3
3 1 4 2	1 4 4 3 1 2

### Note

Permutation of size  $N$  is an array of size  $N$  where each number from 1 to  $N$  appears exactly once.