Dukker The Topper

Dukker is topper in his class. To prove this he always used to participate in math competition. This time in math competition he was given a number(N) and asked to write the prime factorization of N in given way:-

$N = P_1^{e_1} * P_2^{e_2} * P_3^{e_3} * ..... * P_k^{e_k}$

where P_1 , P_2 , P_3 .... , P_k are distinct primes arranged in non decreasing order and e_1 , e_2 , e_3 , ... , e_k are powers to P_1 , P_2 , P_3 .... , P_k respectively.

Dukker was asked to write only e_1 & P_k . This time Dukker has to go for Holi vacation so he asksd for your help.

Input

First line of input contain T(T<=100000). T is number of test cases and following T line will contain N.

(2<=N<=1000000).

Output

For each test cases output a single line containing space seprated e_1 & P_k .

Example

Input:

3

30

13

20

Output:

1 5

1 13

2 5