

Sum Of Divisors

Number Theory Episode 1 is going to be finished by this problem. How many times you can divide an even number by only prime numbers? And finally there will be no non-prime number. Just do it! OOps... also you have to find out the sum of all non-prime and prime divisors.

Input

The first line will contain t ($1 \leq t \leq 100$) the testcases.

Next each line will contain even number $n \leq 10^{14}$.

It's sure that an answer must exist.

Output

Find out the number of prime factors. Print prime numbers as lowest as possible.

Last line will print the sum of divisors as the note has made. Print an endline between two results. If there are no prime numbers print only the sum of all divisors.

Example

Input:

3

8

32

56

Output:

2 3

Sum Of Divisors: 15

2 5

Sum Of Divisors: 63

2 3

7 1

Sum Of Divisors: 120

Note: in second case For 32. We can say $32 = 2^5$. So print 2 5.

and all the divisors are 1 2 4 8 16 32 and sum of all are 63.

