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Longge's problem

Language:

Time Limit: 1000MS **Memory Limit:** 65536K
Total Submissions: 8707 **Accepted:** 2917

Description

Longge is good at mathematics and he likes to think about hard mathematical problems which will be solved by some graceful algorithms. Now a problem comes: Given an integer $N (1 < N < 2^{31})$, you are to calculate $\sum_{1 \leq i \leq N} \gcd(i, N)$.

"Oh, I know, I know!" Longge shouts! But do you know? Please solve it.

Input

Input contain several test case.
A number N per line.

Output

For each N , output $\sum_{1 \leq i \leq N} \gcd(i, N)$, a line

Sample Input

2
6

Sample Output

3
15

Source

[POJ Contest](#), Author: Mathematica@ZSU

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