

GCDEX - GCD Extreme

Given the value of N, you will have to find the value of G. The meaning of G is given in the following code

```
G = 0;
for (i = 1; i < N; i++)
    for (j = i+1; j <= N; j++)
        G += gcd(i, j);
```

Here gcd() is a function that finds the greatest common divisor of the two input numbers.

Input

The input file contains at most 20000 lines of inputs. Each line contains an integer N ($1 < N < 1000001$). The meaning of N is given in the problem statement. Input is terminated by a line containing a single zero.

Output

For each line of input produce one line of output. This line contains the value of G for the corresponding N. The value of G will fit in a 64-bit signed integer.

Example

Input:

10
100
200000
0

Output:

67
13015
143295493160

Time limit has been changed. Some AC solutions get TLE