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