Euler Totient Function Sieve

In number theory, the totient *phi(n)* of a positive integer n is defined to be the number of positive integers less than or equal to n that are coprime to n.

Input

The lonely line in input contains two integers *a*, *b*.

Output

Print *phi(n)* for n from *a* to *b* (inclusive).

Example

Input:
1 5

Output:
1
1
2
2
4

Constraints

0 < a < b < 10^14
b - a < 10^5

Python can get AC under half the time limit (for any test case). My total PY3.4 time is 3.23s for 5 input files.
Have fun ;-)