American Computer Science League

6. Weird Numbers

PROBLEM: Given an integer, solve the following problems using the definitions below:

1. Prime number – an integer greater than 1 whose only divisors are 1 and itself.

2. Twin primes – two integers, K and K+2, that are both primes.

3. Amicable numbers – two positive integers such that the sum of the proper divisors of the first equals the second and the sum of the divisors of the second equals the first.

4. Perfect number – a positive integer K is perfect if the sum of all its proper divisors (all integer divisors except the number itself) equals K.

5. Semi-perfect number – a positive integer K is semi-perfect if the sum of a proper subset of its proper divisors equals K. The number 12 is semi-perfect. Its proper divisors are 1,2,3,4,6. 6+4+2 = 12.

6. Abundant number – a positive integer K is abundant if the sum of its proper divisors is greater than K

7. Deficient number - a positive integer K is deficient if the sum of its proper divisors is less than K

8. Weird number – a positive integer K is weird if it is abundant but not semi-perfect

INPUT: There will be 10 inputs. Each input will consist of 2 positive integers. The first integer will be a rule number (1 – 8 above). The second integer will provide a boundary condition.

OUTPUT: For each pair of integers on the input line print the largest occurrence of an integer that fits the definition of the rule and that is less than the second integer. For rules 2 & 3, both numbers must be less than the boundary integer with the larger being the greatest possible less than the boundary integer.

SAMPLE INPUT

1. 1, 372
2. 2, 625
3. 3, 307
4. 4, 517
5. 6, 671
6. 5, 107
7. 8, 71

SAMPLE OUTPUT

1. 367
2. 617, 619
3. 220, 284
4. 496
5. 666
6. 104
7. 70