Primes and moduli **P45675_en**

Setè Concurs de Programacio de la UPC - Semifinal (2009-06-29)

Let p_n be the nth prime number (starting at 0): $p_0 = 2, p_1 = 3, p_2 = 5, p_3 = 7, \ldots$ Define r_n as the remainder of $(p_n + 1)^n + (p_n - 1)^n$ modulo $(p_n)^2$. For instance, $r_3 = 42$, because

$$(7+1)^3 + (7-1)^3 \;=\; 512 + 216 \;=\; 728 \;=\; 14 \cdot 49 + 42 \;.$$

Given two integer numbers a and b, find the largest r_i such that $i \in [a, b]$.

Input

Input consists of several cases, each one with two integer numbers a and b, where $0 \leq a \leq b$ and $p_b \leq 10^7$.

Output

For every case, print the largest r_i such that $i \in [a, b]$.

Sample input

```
1 1
2 2
1 2
3 3
1 10
1 100
1 1000
600000 600002
```

Sample output

```
6
2
6
42
522
107118
15822162
10752590320954
```

Problem information

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