

Project Euler #167: Investigating Ulam sequences

This problem is a programming version of [Problem 167](#) from [projecteuler.net](#)

For two positive integers a and b , the Ulam sequence $U(a, b)$ is defined by $U(a, b)_1 = a$, $U(a, b)_2 = b$ and for $k > 2$, $U(a, b)_k$ is the smallest integer greater than $U(a, b)_{(k-1)}$ which can be written in exactly one way as the sum of two distinct previous members of $U(a, b)$.

For example, the sequence $U(1, 2)$ begins with

$$1, 2, 3 = 1 + 2, 4 = 1 + 3, 6 = 2 + 4, 8 = 2 + 6, 11 = 3 + 8;$$

5 does not belong to it because $5 = 1 + 4 = 2 + 3$ has two representations as the sum of two previous members, likewise $7 = 1 + 6 = 3 + 4$.

Find $U(2, 2n + 1)_k$

Input Format

Two space-separated integers n and k are given on first line.

Constraints

- $2 \leq n \leq 10$
- $1 \leq k \leq 10^{11}$

Output Format

Print one integer which is the answer to the problem.

Sample Input 0

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2 10
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Sample Output 0

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23
```

Explanation 0

Beginning of $U(2, 5)$ is

$$2, 5, 7, 9, 11, 12, 13, 15, 19, 23, 27, 29, 35, 37, 41, 43, \dots$$