C. Bus

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

A bus moves along the coordinate line Ox from the point $x = 0$ to the point $x = a$. After starting from the point $x = 0$, it reaches the point $x = a$, immediately turns back and then moves to the point $x = 0$. After returning to the point $x = 0$ it immediately goes back to the point $x = a$ and so on. Thus, the bus moves from $x = 0$ to $x = a$ and back. Moving from the point $x = 0$ to $x = a$ or from the point $x = a$ to $x = 0$ is called a *bus journey*. In total, the bus must make k journeys.

The petrol tank of the bus can hold b liters of gasoline. To pass a single unit of distance the bus needs to spend exactly one liter of gasoline. The bus starts its first journey with a full petrol tank.

There is a gas station in point $x = f$. This point is between points $x = 0$ and $x = a$. There are no other gas stations on the bus route. While passing by a gas station in either direction the bus can stop and completely refuel its tank. Thus, after stopping to refuel the tank will contain b liters of gasoline.

What is the minimum number of times the bus needs to refuel at the point $x = f$ to make k journeys? The first journey starts in the point $x = 0$.

Input

The first line contains four integers a, b, f, k ($0 < f < a \le 10^6$, $1 \le b \le 10^9$, $1 \le k \le 10^4$) — the endpoint of the first bus journey, the capacity of the fuel tank of the bus, the point where the gas station is located, and the required number of journeys.

Output

Print the minimum number of times the bus needs to refuel to make k journeys. If it is impossible for the bus to make k journeys, print `-1`.

Examples

input	Copy
6 9 2 4	

output	Copy
4	

input	Copy
6 10 2 4	

output	Copy
2	

input	Copy
6 5 4 3	

output	Copy

Codeforces Round #436 (Div. 2)

Finished

→ **Practice?**

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

Register for practice

→ **Virtual participation**

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ **Problem tags**

greedy implementation math *1500

No tag edit access

→ **Contest materials**

- Announcement #1
- Announcement #2 (en)
- Tutorial (ru)

```
-1
```

Note

In the first example the bus needs to refuel during each journey.

In the second example the bus can pass 10 units of distance without refueling. So the bus makes the whole first journey, passes 4 units of the distance of the second journey and arrives at the point with the gas station. Then it can refuel its tank, finish the second journey and pass 2 units of distance from the third journey. In this case, it will again arrive at the point with the gas station. Further, he can refill the tank up to 10 liters to finish the third journey and ride all the way of the fourth journey. At the end of the journey the tank will be empty.

In the third example the bus can not make all 3 journeys because if it refuels during the second journey, the tanks will contain only 5 liters of gasoline, but the bus needs to pass 8 units of distance until next refueling.