

6077 Werewolves

You probably think that werewolves are a myth, but they're real. When there is a full moon at exactly midnight, werewolves change from human form to wolf form. However, since the Industrial Revolution, air pollution blocks the rays from the moon that cause this metamorphosis, which is why you don't see it regularly. The Apollo moon landings were actually a secret research programme to study the moon rays, and they're now well understood.

You've been asked to help plan the colonisation of another planet, and in particular predict how soon werewolves will metamorphose. Surveyors have divided the lunar cycle into N phases, numbered from 0 to $N - 1$. The moon is full during phases s to t , inclusive. When the colony lands at midnight on day 0, the moon will be in phase 0. From one midnight to the next, the lunar cycle advances by p phases.

Your task is to determine whether the werewolves will ever metamorphose, and if so, after how many days this will first happen.

Example

Suppose $N = 9$, $p = 5$, $s = 3$ and $t = 4$. The Table 1 shows the phase of the moon during the initial days of the colony. Note that the phase wraps from $N - 1$ back to 0.

Input

The input describes a number of planets (up to 100). Each planet is described by a line of the form

$N \ s \ t \ p$

where N , s , t and p are integers as described above, with $0 < s \leq t < N \leq 10^9$ and $0 < p < N$.

The end of input is marked by a line containing only the value '-1', equivalent to $N = -1$.

Table 1: Example phases of the moon at midnight.

| | | | | | | | |
|-------|---|---|---|---|---|---|---|
| Day | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Phase | 0 | 5 | 1 | 6 | 2 | 7 | 3 |

Output

For each planet, print out

D

if the first metamorphosis will happen after D days, or

NEVER

if there will never be a metamorphosis.

Sample Input

```
9 3 4 5
12 4 5 3
16 2 5 6
-1
```

Sample Output

6
NEVER
3