



USACO 2016 JANUARY CONTEST, SILVER PROBLEM 1. ANGRY COWS

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English (en) ▾

Bessie the cow has designed what she thinks will be the next big hit video game: "Angry Cows". The premise, which she believes is completely original, is that the player shoots cows with a slingshot into a one-dimensional scene consisting of a set of hay bales located at various points on a number line. Each cow lands with sufficient force to detonate the hay bales in close proximity to her landing site. The goal is to use a set of cows to detonate all the hay bales.

There are N hay bales located at distinct integer positions x_1, x_2, \dots, x_N on the number line. If a cow is launched with power R landing at position x , this will cause a blast of "radius R ", destroying all hay bales within the range $x - R \dots x + R$.

A total of K cows are available to shoot, each with the same power R . Please determine the minimum integer value of R such that it is possible to use the K cows to detonate every single hay bale in the scene.

INPUT FORMAT (file angry.in):

The first line of input contains N ($1 \leq N \leq 50,000$) and K ($1 \leq K \leq 10$). The remaining N lines all contain integers $x_1 \dots x_N$ (each in the range $0 \dots 1,000,000,000$).

OUTPUT FORMAT (file angry.out):

Please output the minimum power R with which each cow must be launched in order to detonate all the hay bales.

SAMPLE INPUT:

```
7 2
20
25
18
8
10
3
1
```

SAMPLE OUTPUT:

```
5
```

Problem credits: Brian Dean

Contest has ended. No further submissions allowed.