



## Task Overview Sheet

	<b>Fortune</b>	<b>Fast and Furious</b>	<b>Divisors</b>	<b>Bridge</b>
<b>Type</b>	Batch (stdin/stdout)	Batch (stdin/stdout)	Batch (stdin/stdout)	Batch (stdin/stdout)
<b>Time Limit (per test case)</b>	0.5 seconds	0.5 seconds	0.5 seconds	1 second
<b>Memory Limit (per test case)</b>	16 MB	16 MB	16 MB	16 MB
<b>Points</b>	100	100	100	100



## Fortune

Hareedi, along with his **X** brothers and **Y** sisters, wants to distribute the inheritance left behind after his father's death. All the inheritance, which constitutes **N** pounds, should be distributed among Hareedi and his brothers and sisters such that all males receive equal amounts of money, all females receive equal amounts of money and a male receives **twice as much as** a female.

### TASK

Write a program that given the integers **N**, **X** and **Y**, calculates the amount of money received by any of Hareedi's brothers and the amount of money received by any of his sisters.

### CONSTRAINTS

$5 \leq N \leq 1,200,000,000$	The total inheritance.
$1 \leq X \leq 1,000,000$	The number of Hareedi's brothers excluding Hareedi.
$1 \leq Y \leq 1,000,000$	The number of Hareedi's sisters.

**NOTE:** It is guaranteed that the result will always be an integer.

### INPUT

- Line 1 contains the integer **N**, the total inheritance.
- Line 2 contains the integer **X**, the number of Hareedi's brothers excluding Hareedi.
- Line 3 contains the integer **Y**, the number of Hareedi's sisters.

### OUTPUT

- A single line containing the amount of money received by any of Hareedi's brothers, then the amount of money received by any of his sisters separated by a single space.

### EXAMPLE

Sample Input	Sample Output
700 5 2	100 50

The 700 pounds are distributed among 6 males (Hareedi and his 5 brothers) and 2 females. Each female receives 50 pounds and each male receives 100 pounds. The total amount received by all of them is  $(50 \cdot 2) + (100 \cdot 6)$  which is equal to 700, the total inheritance.



## Fast and Furious

Hareedi bought a new truck and thought of going on a road trip to try the truck. Hareedi's trip can be divided into stages; each stage has a length  $L_i$ , and a speed limit  $H_i$ . Hareedi's truck has a speed limit  $S$ . The time Hareedi spent to finish a stage  $i$  is  $\text{ceil}(L_i \text{ divided by } M_i)$ , where  $M_i$  is the maximum speed Hareedi can drive at, according to the stage speed limit and the truck speed limit.

**NOTE:** if  $X$  is an integer then  $\text{ceil}(X) = X$ , if  $X$  is not an integer then  $\text{ceil}(X) = (X \text{ rounded up to the nearest integer})$ , for example  $\text{ceil}(6) = 6$ ,  $\text{ceil}(6.1) = 7$ ,  $\text{ceil}(6.7) = 7$ .

### TASK

Write a program that given the speed limit of the truck, the length of each stage and the speed limit at each stage; finds the time taken by Hareedi to finish his trip.

### CONSTRAINTS

$1 \leq N \leq 1,000$	The number of stages.
$1 \leq L_i \leq 10,000$	The Length of each stage.
$1 \leq H_i \leq 1,000,000,000$	The Speed limit of each stage.
$1 \leq S \leq 1,000,000,000$	The Speed limit of the truck.

### INPUT

- Line 1 contains the integer  $N$ , the number of stages.
- Line 2 contains the integer  $S$ , the Speed limit of the truck.
- Line 3 contains  $N$  integers, the speed limit of each stage.
- Line 4 contains  $N$  integers, the length of each stage.

### OUTPUT

- A single line containing a single integer which is the time taken by Hareedi to finish the trip.



### EXAMPLE

Sample Input	Sample Output
5 100 50 150 75 125 90 300 125 150 200 250	15

Maximum speed Hareedi can drive at, for each stage  $M_i$ :

Stage 1: 50

Stage 2: 100 because the speed limit of the truck is 100 which is less than 150.

Stage 3: 75

Stage 4: 100 because the speed limit of the truck is 100 which is less than 125.

Stage 5: 90

Time spent during each stage:

Stage 1:  $\text{ceil}(300 / 50) = 6$

Stage 2:  $\text{ceil}(125/100) = \text{ceil}(1.25) = 2$

Stage 3:  $\text{ceil}(150/75) = 2$

Stage 4:  $\text{ceil}(200/100) = 2$

Stage 5:  $\text{ceil}(250/90) = \text{ceil}(2.7777...) = 3$

Therefore, the time needed for Hareedi to finish his trip is  $6+2+2+2+3=15$



## Divisors

Hanadi is preparing her daughter Haidi to participate in the IOI (International Olympiad in Informatics). Hanadi is explaining the basics of number theory to her, Hanadi is teaching her how to find the divisors of an integer; she asked her to calculate the sum of divisors of some integers.

**NOTE:** If integer  $X$  divided by  $Y$  equals an integer then  $Y$  is a divisor of  $X$ , for example 12 divided by 5 = 2.4, so 5 is not a divisor of 12, another example 12 divided by 4 = 3, 3 is an integer, so 4 is a divisor of 12.

### TASK

Write a program that given two integers  $S$  and  $E$ , finds the sum of the divisors of each integer between  $S$  and  $E$  inclusive.

### CONSTRAINTS

$1 \leq S \leq 10,000$   
 $S \leq E \leq 10,000$

### INPUT

- Line 1 contains two integers  $S$  and  $E$  separated by a single space.

### OUTPUT

- $(E-S)+1$  lines, the  $i^{\text{th}}$  line contains the sum of the divisors of  $(S + i)$ .

### EXAMPLE

Sample Input	Sample Output
12 15	28 14 24 24

The divisors of 12 are 1, 2, 3, 4, 6 and 12 so the sum of the divisors of the 1<sup>st</sup> integer is  $1+2+3+4+6+12=28$ ; the divisors of 13 are 1 and 13 so the sum of the divisors of the 2<sup>nd</sup> integer is  $1+13 = 14$ , etc.



## Bridge

Hareedi decided to take his family to camp in the woods. Unfortunately, on their way back, they were lost! After cruising for many hours, searching for the right path, they found themselves in front of a river that separated them from their home. Hareedi found  $N$  pieces of wood; he decided to attach exactly 2 of them to form a bridge that they can use to pass over to their home. The bridge's length has to be exactly  $Y$  meters.

### TASK

Write a program that given the lengths of  $N$  pieces of wood sorted in ascending order, finds 2 pieces that the sum of their lengths is exactly  $Y$  and prints the lengths of the 2 pieces sorted in ascending order. If more than one solution exist print the solution that when ordered will have the smaller first number.

### CONSTRAINTS

$$3 \leq N \leq 1,000,000$$

$$1 \leq Y \leq 1,000,000,000$$

$$1 \leq K_i \leq 1,000,000,000$$

The length of each piece of wood.

### INPUT

- Line 1 contains the integer  $Y$ .
- Line 2 contains the integer  $N$ .
- Line 3 contains  $N$  integers: the lengths of the wood pieces sorted in ascending order, separated by spaces.

### OUTPUT

- A single line containing the lengths of the 2 wood pieces that their lengths sum up to  $Y$ , or -1 if there is no 2 wood pieces that their lengths sum up to  $Y$ .

### GRADING

- For some test cases, worth **30 points**  $N$  will not exceed 10,000.



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**EXAMPLE**

Sample Input	Sample Output
13 6 1 3 5 6 7 10	3 10

There are 2 possible solutions 3 and 10, or 6 and 7, both sum up to 13. 3 is smaller than 6, so the required solution is 3 and 10.