FAKULTAS ILMU KOMPUTER

CSGE602040 - Struktur Data dan Algoritma
Semester Gasal - 2019/2020
WS 5 - Jumat
Deadline: Jumat, 22-11-2019, 18.00 WIB

Beating Monster

Sumber: https://en.meming.world/

Description

Namron ★ is a hardworking student. After hours of studying Data Structure and Algorithms, he finally decided to rest by playing a game. There are N monsters, each of which has a level and damage. Namron ★ initially has level 1 and health point (HP) H. In each match, Namron ★ can **choose to attack one monster that has never been attacked, its monster level is not higher than its level and the damage is less than its current HP.** After attacking the monster, Namron ★'s HP will go down as much as the monster's damage and Namron ★ will go up 1 level. Of course if there are no more monsters that fulfill all three conditions to be attacked, Namron ★ can't level up again and the game is over. What is the highest level Namron ★ can reach?

You are asked to use the minimum binary heap you made yourself to solve this problem. To check your implementation, enter damage from the first monster to the Nth monster. After that, output an array which is a representation of your artificial binary heap.

Note: make sure the implementation of the binary heap you make is the same as that taught in class. Different algorithms can make a difference in the binary heap array representation!

Input

The first line consists of two numbers N and H that indicate the number of monsters and HP Namron ★ at first.
Second line consist of **N** buah bilangan $\mathbf{D_i}$ which is the *damage* monster ke-i.
Third line consist ofi **N** buah bilangan $\mathbf{L_i}$ yaitu level monster ke-i.

Output

The first line contains a number that represents the maximum level that Namron can reach ★.
The second line contains N numbers that represent the minimum representation of your binary heap after performing the operations mentioned in the description.

Limitation

$1 \leq \mathbf{N}, \mathbf{L_i} \leq 100.000$
$0 \leq \mathbf{H} \leq 10^{14}$
$0 \leq \mathbf{D_i} \leq 1.000.000.000$
$\mathbf{L_{i-1}} \leq \mathbf{L_i}$ untuk $2 \leq \mathbf{i} \leq \mathbf{N}$

Input Example 1

```
5 20
3 5 2 9 7
1 2 2 3 3
```

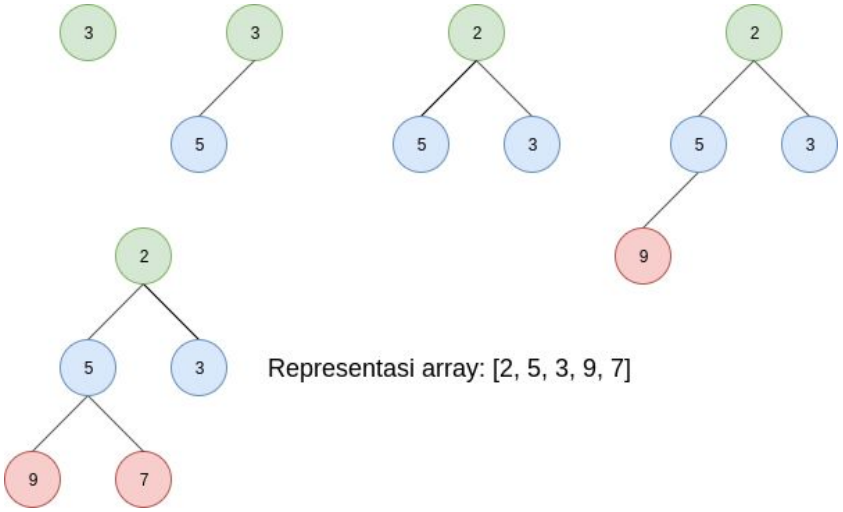
Output Example 1

```
5
2 5 3 9 7
```

Explaination

1. Initially, Namron ★ has 20 HP and can only attack the first monster. He attacked the monster and is now level 2 with 17 HP
2. Now he can attack the second and third monster. He chose to attack the third monster and is now level 3 with 15 HP.
3. Then he can attack the second, fourth and fifth monster. He chose to attack the second monster and is now level 4 with 10 HP.
4. Now he can attack the fourth and fifth monsters. He chose to attack the fifth monster and is now level 5 with HP 3.
5. The fourth monster is left. Unfortunately, his HP which is 3 is not enough to attack the monster. The game stopped at level 5.

Meanwhile, here are the heap conditions after inserting operations 3, 5, 2, 9, 7 **after percolating up**.



Input Example 2

```
5 20
5 1 3 2 1
1 1 2 4 6
```

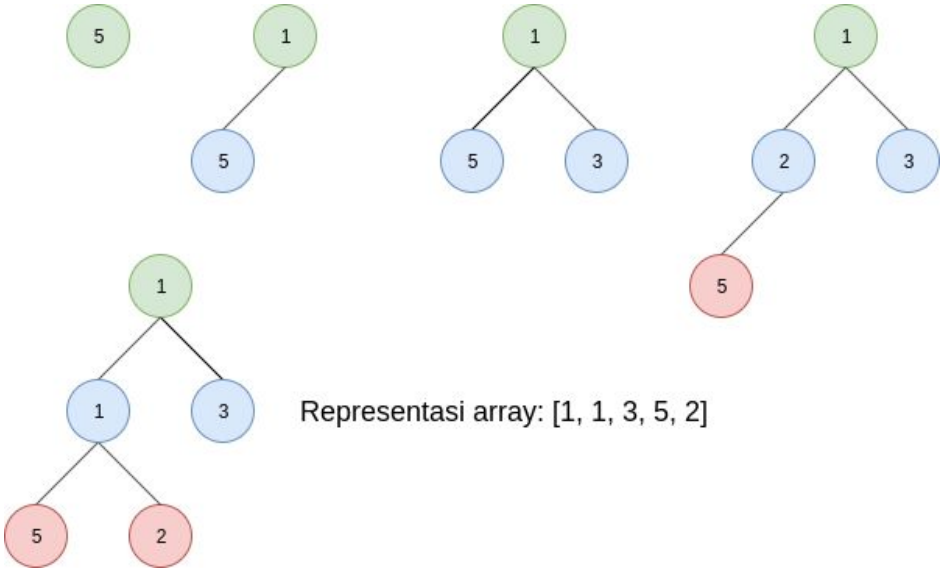
Output Example 2

```
5
1 1 3 5 2
```

Penjelasan

1. Initially, Namron ★ can attack the first and second monsters. He chose the second monster and now reaches level 2 with 19 HP.
2. Now, he can attack the first and third monsters. He chose to attack the third monster and now reaches level 3 with 16 HP.
3. Selanjutnya, dia hanya dapat menyerang monster pertama. Dia menyerangnya dan sekarang mencapai level 4 dengan HP 11.
4. Now, he can only attack the fourth monster. He attacked him and reached level 5 with HP 9.
5. Furthermore, he cannot attack any monsters. Only the remaining five new monsters can be attacked if the level is at least 6. The game stops at level 5.

Meanwhile, here are the heap conditions after inserting operations 5, 1, 3, 2, 1 **after percolating up.**



Representasi array: [1, 1, 3, 5, 2]