Elevator Rides

Saturday, 4 December 2021 8:07

n, x, WEIGHTS

Time limit: 1.00 s **Memory limit:** 512 MB

There are n people who want to get to the top of a building which has only one elevator. You know the weight of each person and the maximum allowed weight in the elevator. What is the minimum number of elevator rides?

Input

The first input line has two integers n and x: the number of people and the maximum allowed weight in the elevator.

The second line has n integers $w_1, w_2, \ldots, w_n$: the weight of each person.

Output

Print one integer: the minimum number of rides.

Constraints

- $1 \le n \le 20$
- $1 \le x \le 10^9$
- $1 \le w_i \le x$

Example

Input:
```
4 10
4 8 6 1
```

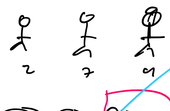
Output:
```
2
```

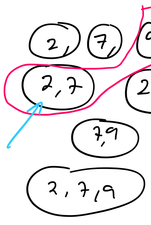
n=3 W=[2,7,9] x=10

ESTADO : ① NUM RIDES
② WEIGHT OF LAST RIDE

3

x=10

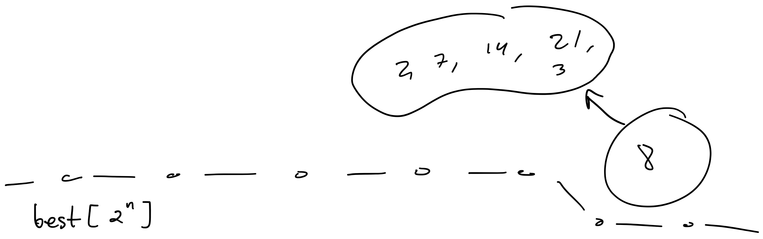




2: (2,7)
(9)

→ {2,9}

[2, 7, 14, 21, 1, 8, 3]



best[2^n]

↳ best[i] = { RIDES(i), LAST(i) }

↑

SUBCONJUNTO

1, 2, 3, 7

001, 010, 100, 111

↑↑↑

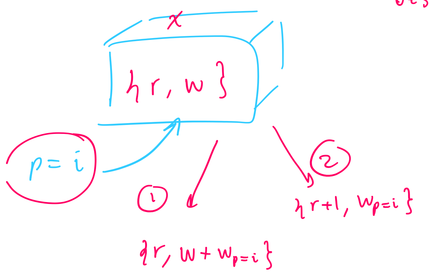
p

best[7] = mejor opción (
p=0,
p=1,
p=2
)

n=3 [2,7,9]

x=10

best[7] = min(A, B, C)



estado al que llego si agrego a LA PERSONA p=0

p=1 {r+1, w}

p=2 {r, w+w_2}

{r, w+w_0}

n=3 w=[2,7,9]

x=10

n				
0	0	0	0	
1	0	0	1	= {1,2}
2	0	1	0	= {1,7}
3	0	1	1	= {1,9}
4	1	0	0	= {1,9}
5	1	0	1	= min({2,2}, {2,9}) = {2,2}
6	1	1	0	= min({2,7}, {2,9}) = {2,7}
7	1	1	1	= min({3,2}, {2,9}, {2,9}) = {2,9}

hor

→ {1,0}

{0,1,0} → {0,0,0}

best[2] = {1,7}

best[7].first

hor

option = best[s ∩ (1 << i)]

if (option.second + weights[i] ≤ x) {

option.second += weights[i]

} else {

option.first ++;

option.second = weights[i]

}

BUENA IDEA PROVISIONAL S SI NO CONSIDERO A LA PERSONA i