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## Firefighters and grannies (2)

P65894\_en

Examen parcial d'Algorísmia, FME (2017-11-06)

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The firefighters of a distant country want to protect the grannies inside  $n$  schools. All the schools are in a row on a street, numbered in order from 1 to  $n$ . At each school  $j$  there are  $i_j$  grannies. The firefighters can form  $g$  groups, and each group can only go to a single school. If a group goes to school  $j$ , it protects all the grannies there. In addition, it also indirectly protects half the grannies in school  $j - 1$ , assuming that it exists and that it is not already fully protected by another group; and similarly with school  $j + 1$ .

What is the maximum number of grannies that can be protected?

### Input

Input consists of several cases, each one with  $g$  and  $n$ , followed by the  $i_j$ 's. You can assume  $1 \leq g \leq n \leq 3000$ , and that all the  $i_j$ 's are even natural numbers between 2 and  $10^5$ .

### Output

For every case, print how many grannies can be protected.

### Hint

The expected solution for this problem is a dynamic programming code with two mutual recurrences and cost  $O(g \cdot n)$ .

### Sample input

```
1 1 100000
1 2 10 20
1 3 10 80 20
1 3 10 20 80
3 3 10 20 80
3 9 4 8 2 4 8 8 6 2 8
9 9 2 2 2 2 2 2 2 2 2
```

### Sample output

```
100000
25
95
90
110
36
18
```

### Problem information

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