

## 4273 Post Offices

There is a straight highway with  $N$  villages alongside it. The villages are numbered from 1 to  $N$  in one direction of the highway.

The government is planning to build at most  $M$  post offices in some of the villages.

The amount of money to build a post office in the  $i$ -th village is  $C_i$  and a post office in the  $i$ -th village can serve all villages within  $R_i$  kilometers to the left and right of it.

If the  $i$ -th village has no post office built and no post offices in other villages can serve it, the government has to compensate the villagers  $P_i$  money. Here  $C_i$ ,  $R_i$  and  $P_i$  are all non-negative integers. You are to help the government to find a strategy with minimum cost.

### Input

The input consists of multiple test cases. Each test case starts with a line containing two integers  $N$  ( $2 \leq N \leq 10000$ ) and  $M$  ( $1 \leq M \leq N$ ,  $M \leq 100$ ).

The following line contains  $N - 1$  positive integers, which are the distances between village 1 and villages 2, 3, ...,  $N$  in kilometers. The distances will be not greater than 1,000,000,000 and strictly increasing.

The third line of each test case contains  $N$  integers  $C_1, C_2, \dots, C_N$ , each of which is between 0 and 10,000, inclusive. The fourth line of each test case contains  $N$  integers  $R_1, R_2, \dots, R_N$ , each of which is between 0 and 1,000,000,000, inclusive. The last line of each test case contains  $N$  integers  $P_1, P_2, \dots, P_N$ , each of which is between 0 and 10,000, inclusive.

The last test case is followed by a line containing one zero.

### Output

For each test case, print a line containing the test case number (beginning with 1) followed by the minimum amount of money the government has to pay.

### Sample Input

```
3 2
1 2
2 3 2
1 1 0
10 20 30
3 2
10 20
100 2 300
5 6 7
10 100 400
0 0
```

### Sample Output

```
Case 1: 3
Case 2: 312
```