

4674 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 the i -th village can be served by any post office within R_i kilometers to the left or right of it. If a 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 of minimum cost.

Input

The input consists of multiple test cases. Each test case starts with a line containing two integers N ($2 \leq N \leq 20,000$) and M ($1 \leq M \leq N, M \leq 100$).

The following line contains $N - 1$ positive integers, which are the distances of 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, \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, \dots, P_N , each of which is between 0 and 10,000, inclusive.

The last test case is followed by a line containing two zeros.

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

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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

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Case 1: 4
Case 2: 312
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