Online, December 14th, 2021



tractor • EN

Plowing Fields (tractor)

Marco is tired of preparing the OIS rounds, so he decided to quit his job and become a farmer.



Figure 1: Marco's new tractor.

As a farmer, he now has to plow his field. The field is divided into N rows, and to plow the field Marco has to plow each row one at a time. Every row must be plowed **exactly once**.

Marco starts from row 0 on one side of the field, he plows the row to the other side, then turns the tractor and repeats in another row. If the tractor is in row x, when it turns it can go to row y with cost abs(x-y). However, the tractor is very large hence needs space to turn around. Then, it can only go from row x to row y iff $abs(x-y) \ge K$.

Help Marco find a way to plow the field **minimizing** the total cost.

Among the attachments of this task you may find a template file tractor.* with a sample incomplete implementation.

Input

The first line contains the integers N and K.

Output

You need to write two lines. The first line containts a single integer: the cost of plowing the field. The second line consists N integers: the order in which the rows are plowed.

Constraints

- $1 \le N \le 100000$.
- $1 \le K \le 8$.
- Marco starts from row 0, however, he can end on any row.
- It is guaranteed that exists at least one way to plow the field.

tractor Page 1 of 3

Scoring

Your program will be tested against several test cases grouped in subtasks. Your score on a subtask will be equal to the minimum score for one of its testcases multiplied by the value of the subtask. Your score on a test case will be:

- 0 if your output doesn't represent a valid solution;
- 1 if $T_{\text{out}} \leq T_{\text{ref}}$;
- $0.9 \cdot \left(\frac{T_{\text{ref}}}{T_{\text{out}}}\right)^{1.5}$ otherwise.

Where T_{out} is the cost of plowing the field of your solution and T_{ref} is the cost of a reference solution (not necessarily optimal).

- **Subtask 1** (0 points) Examples.
- Subtask 2 (20 points) $N \le 10, K \le 5.$
- Subtask 3 (20 points) $N \leq 30, K \leq 5.$
- Subtask 4 (20 points) $N \le 100, K \le 5.$
- Subtask 5 (20 points) $K \leq 3$.
- **Subtask 6** (20 points) No additional limitations.

Examples

input	output
8 3	23 0 3 6 2 5 1 4 7
10 3	33 0 3 6 9 5 8 2 7 4 1

Explanation

In the first sample case, Marco can plow the field in the following way:

- start from row 0;
- go to row 3 with cost |3 0| = 3;
- go to row 6 with cost |6 3| = 3;
- go to row 2 with cost |2 6| = 4;
- go to row 5 with cost |5 2| = 3;
- go to row 1 with cost |1-5|=4;
- go to row 4 with cost |4 1| = 3;
- go to row 7 with cost |7 4| = 3.

tractor Page 2 of 3

The total cost is 3+3+4+3+4+3+3=23.

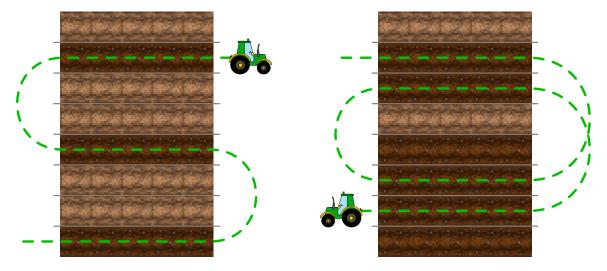


Figure 2: Step 1

Figure 3: Step 2

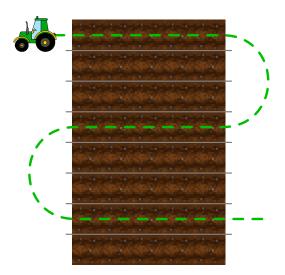


Figure 4: Step 3

In the **second sample case**, Marco can plow the field in the following way:

- start from row 0;
- go to row 3 with cost |3 0| = 3;
- go to row 6 with cost |6 3| = 3;
- go to row 9 with cost |9 6| = 3;
- go to row 5 with cost |5 9| = 4;
- go to row 8 with cost |8 5| = 3;
- go to row 2 with cost |2 8| = 6;
- go to row 7 with cost |7 2| = 5.
- go to row 4 with cost |4 7| = 3.
- go to row 1 with cost |1-4|=3.

The total cost is 3+3+3+4+3+6+5+3+3=33.

tractor Page 3 of 3