Problem G. Rod Cutting

Problem Description

There are a rod of length $3n$ meters, you want to cut the rod and pack it into n bags of rods which lengths sum up to 3 meters each.

A cut at i^{th} meter mark costs c_i dollars, and a cut on a rod of ℓ meters costs $C \cdot \ell$ dollars.

Please find out the minimum cost to pack the rod into n bags of rods.

Input Format

- line 1: $n \;\; C$
- line 2: $c_1 \;\; c_2 \;\; \ldots \;\; c_{3n-1}$

Output Format

- line 1: ans

Constraints

- $1 \leq n \leq 800$.
- $0 \leq C \leq 10^6$.
- $0 \leq c_i \leq 10^6$ for $i = 1, 2, \ldots, 3n-1$.
- All input values are integers.

Subtasks

1. (20 points) $n \leq 6$.
2. (20 points) $n \leq 15$.
3. (15 points) $n \leq 30$.
4. (15 points) $n \leq 50$.
5. (10 points) $c_i = 0$ for $i = 1, 2, \ldots, 3n-1$.
6. (10 points) $C = 0$.
7. (5 points) $n \leq 300$.
8. (5 points) No additional constraints.

No.	Testdata Range	Time Limit (ms)	Memory Limit (KiB)
Samples	1-6	2000	262144
1	1-42	2000	262144
2	1-48	2000	262144
3	1-54	2000	262144
4	1-60	2000	262144
5	61-66	2000	262144
6	67-74	2000	262144
7	1-60,75-80	2000	262144
8	1-92	2000	262144

Samples

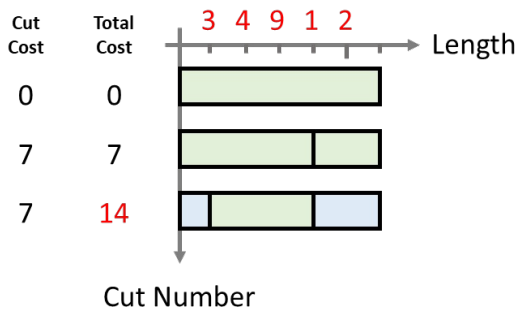
Sample Input 1

```
2 1
3 4 9 1 2
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 7, 8.

Sample Output 1

```
14
```



Sample Input 1

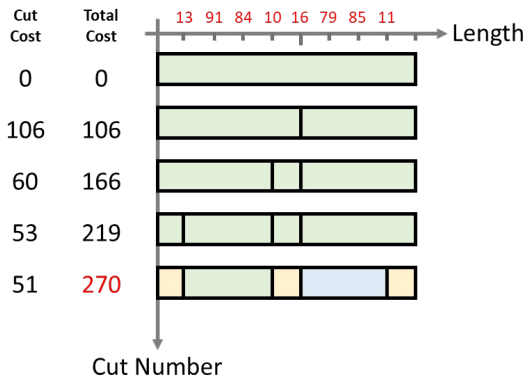
Sample Input 2

```
3 10
13 91 84 10 16 79 85 11
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 7, 8.

Sample Output 2

```
270
```



Sample Input 2

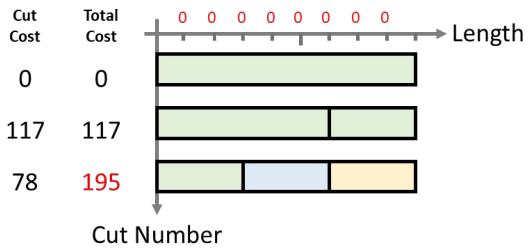
Sample Input 3

```
3 13
0 0 0 0 0 0 0 0
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 5, 7, 8.

Sample Output 3

```
195
```



Sample Input 3

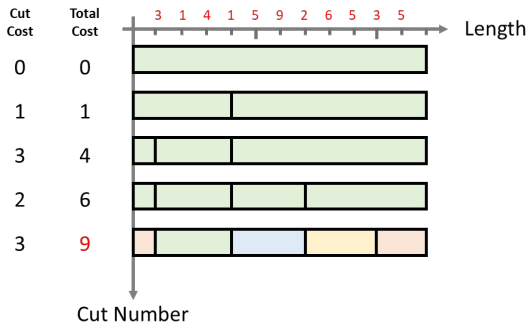
Sample Input 4

```
4 0
3 1 4 1 5 9 2 6 5 3 5
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 6, 7, 8.

Sample Output 4

```
9
```



Sample Input 4

Sample Input 5

```
6 12
17 79 30 85 87 10 15 62 81 99 13 71 18 23 85 11 35
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 7, 8.

Sample Output 5

```
785
```

Sample Input 6

```
2 1000000
1000000 1000000 1000000 1000000 1000000
```

This sample input satisfies the constraints of Subtasks 1, 2, 3, 4, 7, 8.

Sample Output 6

```
7000000
```