Problem 2 – Cable Merchant

You're a merchant of the "Jicata" cable. You are given different lengths of "Jicata" {1, 2, 3, …, n} each with a different price. For example, we are given the sequence **K = { 3, 8, 13, 15, 18, 20, 22 }**:

Length	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Price	3	8	13	15	18	20	22

Instead of selling a 5m cable for 18$, you noticed you can cut that cable into parts of lengths **2m** (8$) and **3m** (13$). Then you could use 2 connectors (to connect the cables) for a price of 2 * 1$ = 2$ and make a profit of **8 + 13 – 2 * 1 = 19$**. Sneaky little bastard, aren't you?

Your task is to calculate the best price for each length.

Input

- On the first input line you are given the sequence **K** – the prices for each length of cable. The prices will be separated by a single space. Each price will always refer to a length equal to it's position in the sequence (ex. the first price will always be for a length of 1, the second always for a length of 2 and so on, check the table above).
- On the second line you are given the number **C** – the price for a single connector.

Output

Print a new sequence with the maximum prices for each length of in the original sequence **K.**

The prices should follow the original sequence order (i.e. first print the price for length 1, then the price for length 2, etc.).

Constraints

- Each price in K will be an integer between **[1…100000]**.
- The amount of elements in **K** will be between **[1…100]**.
- The price for a connector **C** will be an integer between **[0…10000]**.
- Time limit: **100 ms**. Allowed memory: **16 MB**.

Sample Input / Output

<table>
<tr><th>Input</th><th>Output</th><th>Comments</th></tr>
<tr><td>3 8 13 15 18 20 22
1</td><td>3 8 13 15 19 24 26</td><td>The prices of cables we have are:

<table><tr><td>Length</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Price</td><td>3</td><td>8</td><td>13</td><td>15</td><td>18</td><td>20</td><td>22</td></tr></table>
The 4m cable which is sold for 15$ can be split into</td></tr>
</table>

		2m (8$) + 2m (8$) = 16$. But because of the 2 connectors * 1$ = 2$, the total price is **16 – 2 = 14$.** That is worse than the current price 15$. We can split 5m into **2m (8$) + 3m (13$) – 2 * 1$ for connectors = 19$.** That is a better price than 18$. Applying the same idea for all lengths will give us the best prices: **Length** | **1** | **2** | **3** | **4** | **5** | **6** | **7** **Price** | 3 | 8 | 13 | 15 | 19 | 24 | 26

Input	Output
391 705 1005 1493 1775 2229 2505 3010 3112 2334 38	391 706 1021 1493 1808 2229 2544 3010 3325 3646