Problem 2
Cookies

Input File: `cookiesin.txt`
Output File: `cookiesout.txt`

Time and Memory Limits: 1 second, 1 GB

After amassing millions of virtual cookies playing Cookie Clicker, you have decided to try your luck entering the lucrative real-life cookie industry. However, due to your busy schedule of informatics competitions, you do not have time to bake any of the cookies yourself.

You have already set up one factory, called *factory 0*, which automatically produces C_0 cookies per day. Due to your entrepreneurial spirit, you wish to increase the cookie production. At the end of each day, after that day's cookies have been produced, you can choose to buy additional factories. There are two new factories available to you, conveniently named *factory 1* and *factory 2*.

- Factory 1 costs P_1 cookies and increases your production rate by C_1 cookies per day.

- Factory 2 costs P_2 cookies and increases your production rate by C_2 cookies per day.

Unfortunately, no banks are willing to loan you cookies, and so you can only buy a new factory if you have enough cookies to pay for it. *Each new factory can only be bought once*; however, you are allowed to buy both new factories, potentially on the same day. You can buy the factories in any order, or choose not to buy them at all.

You start with **0** cookies. What is the maximum number of cookies you can have after **D** days?

Input

- The first line contains two integers D and C_0.

- The second line contains two integers P_1 and C_1 which describe factory 1.

- The third line contains two integers P_2 and C_2 which describe factory 2.

Output

Your program should output a single integer, the maximum number of cookies you can have after **D** days.

Sample Input 1	Sample Input 2	Sample Input 3
4 2	4 2	30 3
1 3	4 1	25 13
10 5	6 0	5 4

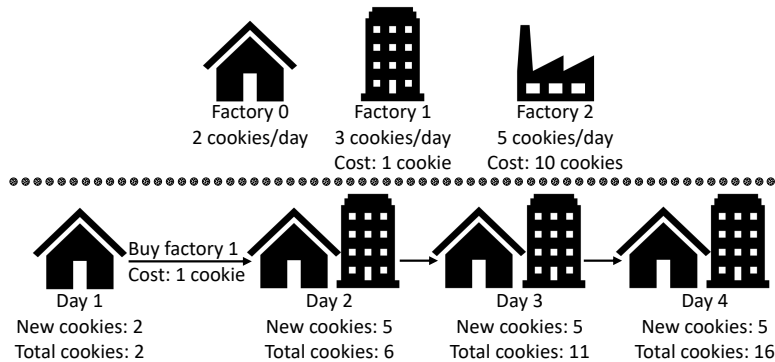| Sample Output 1	Sample Output 2	Sample Output 3
16	8	484

Explanation

In the first sample input, you have $D = 4$ days to produce cookies. You begin with a production rate of $C_0 = 2$ cookies per day.

- At the end of the first day, you have 2 cookies, and can afford to buy factory 1 for $P_1 = 1$ cookie. This leaves you with 1 cookie left over, and your production rate is increased by $C_1 = 3$ cookies. You will now produce 5 cookies per day.

- You produce 15 cookies over the remaining 3 days, causing you to finish with 16 cookies. This is the maximum number of cookies you can produce.


In the second sample input, you have $D = 4$ days to produce cookies. You begin with a production rate of $C_0 = 2$ cookies per day.

If you do not buy any upgrades, you finish with 8 cookies after 4 days. This is the maximum number of cookies you can produce.

In the third sample input, you have $D = 30$ days to produce cookies. You begin with a production rate of $C_0 = 3$ cookies per day.

- After day 2 you have 6 cookies, and can afford to buy factory 2 for $P_2 = 5$ cookies. This leaves you with 1 cookie left over, and your production rate is increased by $C_2 = 4$. You will now produce 7 cookies per day.

- After day 6, you have 29 cookies and can afford to buy factory 1 for $P_1 = 25$ cookies. This leaves you with 4 cookies left over, and your production rate is increased by $C_1 = 13$. You will now produce 20 cookies per day.

- Over the next 24 days, you produce 480 cookies, causing you to finish with 484 cookies. This is the maximum number of cookies you can produce.
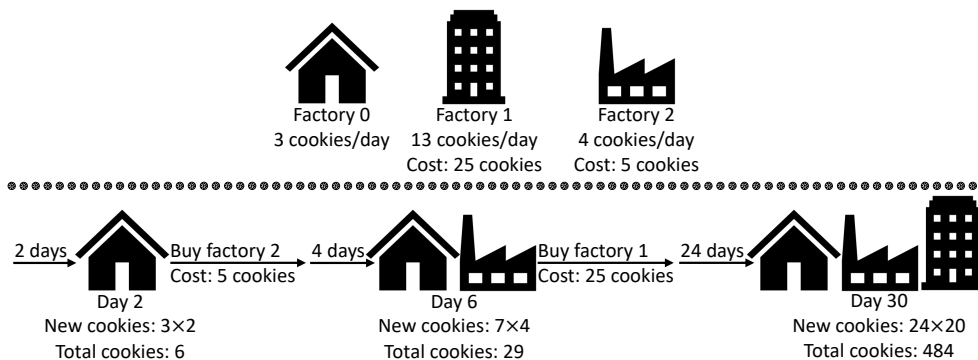
Subtasks & Constraints

For all test cases, $1 \leq D, C_0, P_1, P_2 \leq 10\,000$ and $0 \leq C_1, C_2 \leq 10\,000$. Additionally:

- For Subtask 1 (15 marks), $D = 12, C_0 = 5, P_1 = 20, C_1 = 3, P_2 = 50, C_2 = 10$. That is, there is only one test case in this subtask. In this test case, you have $D = 12$ days to produce cookies, with an initial production rate of $C_0 = 5$ cookies per day.
  Factory 1 costs $P_1 = 20$ cookies and increases your production rate by $C_1 = 3$ cookies.
  Factory 2 costs $P_2 = 50$ cookies and increases your production rate by $C_2 = 10$ cookies.

  Hint: There is only one test case in this subtask, so try working out the answer by hand.

- For Subtask 2 (15 marks), $D = 25, C_0 = 5, P_1 = 20, C_1 = 3, P_2 = 50, C_2 = 10$. That is, this subtask is similar to subtask 1, however $D = 25$ (instead of 12).

  Hint: There is only one test case in this subtask, so try working out the answer by hand.

- For Subtask 3 (15 marks), $C_1 = C_2 = 0$. That is, neither new factory increases your production rate.

  Hint: You never have to worry about buying factories. If you make C_0 cookies per day and produce cookies for D days, how many cookies will you have?

- For Subtask 4 (25 marks), $C_2 = 0$. That is, factory 2 does not increase your production rate.

  Hint: Try simulating the scenario where you don't buy factory 1, and comparing it with the scenario where you buy factory 1 as soon as you can afford it.

- For Subtask 5 (30 marks), there are no special constraints.

  Hint: Like Subtask 4, you should try simulating all the possible scenarios. While Subtask 4 had two scenarios, this subtask has five scenarios. Can you figure out what they are?