



Task 2: Knapsack

There is a housewife who recently won a prize to “shop for free as long as your shopping basket is not full” in a department store.

This housewife is given a shopping basket that can carry a maximal weight of S kilograms.

There are N item types in the department store and the i -th item is worth V_i SGD, weighs W_i kilograms, and there are K_i copies (of exactly same value and weight) of such item i .

For example, there are $N = 3$ item types: meat, milk, and bread; of which there are: 1 pack of meat, 3 bottles of milk, and 4 loaves of bread (see the last sample test case).

What items should the housewife take to maximize the total value of the items in her shopping basket?

Input format

Your program must read from standard input.

The first line of input contains two positive integers, S and N .

The next N lines of input will each contain three integers, where the i -th line contains V_i , W_i and K_i , the value in SGD, weight in kilograms and number of the i -th item respectively.

Output format

Your program must print to standard output.

Your program should print one integer, representing the maximum total value in SGD of the items that this housewife can take while ensuring the total weight does not exceed S kilograms.



Subtasks

The maximum execution time on each instance is 1.0s.

For all subtasks, $1 \leq S \leq 2000$, $1 \leq V_i \leq 1000000$, $1 \leq W_i \leq S$.

Your program will be tested on sets of input instances as follows:

Subtask	Marks	Limits
1	12	$N = 1$
2	17	$1 \leq N \leq 100, K_i = 1$
3	20	$1 \leq N \leq 100, 1 \leq K_i \leq 10$
4	24	$1 \leq N \leq 100, 1 \leq K_i \leq 10^9$
5	27	$1 \leq N \leq 100000, 1 \leq K_i \leq 10^9$



Sample Testcase 1

This testcase is valid for subtasks 2-5.

Input	Output
15 5 4 12 1 2 1 1 10 4 1 1 1 1 2 2 1	15

Explanation

The housewife can take one of items 2, 3, 4, 5 giving a total weight of $1 + 4 + 1 + 2 = 8$ and a total value of $2 + 10 + 1 + 2 = 15$.

Sample Testcase 2

This testcase is valid for subtasks 3-5.

Input	Output
20 3 5000 15 1 100 1 3 50 1 4	5400

Explanation

The housewife take one of item 1, three of item 2 and two of item 3 for a total weight of $15 \times 1 + 1 \times 3 + 1 \times 2 = 20$ and a total value of $5000 \times 1 + 100 \times 3 + 50 \times 2 = 5400$.