Task: TES
Treat Exchange System

AACPP SuSe 2025 Round 2 Memory: 4MiB 2025.05.13 – 2025.05.27

The neighborhood adores Dexter the Cat, and he often receives many treats. Over time, he developed a system for managing these treats, sharing them with other cats in exchange for small errands or lending them to others. Dexter himself participates in this system as well. Now, it's time to settle the monthly paw-counts and determine who owes whom. Since treats often spill or crack when carried and distributed, Dexter aims to settle the debts with the **fewest treats exchanged** possible.

Input

First line of input contains two integers n and d, the number cats (including Dexter) and the number of recorded debts between them, respectively. d next lines of input describe the debts, where i-th line contains three integers x_i, y_i and t_i, denoting a debt of cat x_i owing t_i treats to cat y_i.

Output

Output a line containing s, the minimal number of treats that need to be given away in order to settle all debts. Furthermore, output a list of exchanges such that:

1. the total sum of these exchanges equals s and
2. all debts are settled.

Each exchange is specified by a line containing three integers x, y, t, denoting that cat x gives t treats to y. Each line of the output should end with a line break.

Example

For input:

```
3 2
1 2 5
2 3 5
```

Give output:

```
5
1 3 5
```

Additional examples

The following initial tests are also available:

- `0b` – $n = 3$, $d = 3$, $t_i \leq 5$ for all i;
- `0c` – $n \leq 5$, $d \leq 10$, $10 \leq t_i \leq 100$ for all i;
- `0d` – $n \leq 150$, $d \leq 550$, $100 \leq t_i \leq 10000$ for all i;
- `0e` – $n \leq 5000$, $d \leq 5000$, $100 \leq t_i \leq 10^8$ for all i;

Limits

Your solution will be evaluated on a number of hidden test cases divided into groups. Points for a group are awarded if and only if the submission returns the correct answer for each of the tests in the group within the allotted time limit. These groups are organised into subtasks with the following limits and points awarded.

Partial points

If your solution outputs the correct sum (first line of output), and the second line is left blank or not correct, it will receive 50% of the points for a given test group.

Subtask	Limits	Points
1.	$2 \leq n, d \leq 10$, $1 \leq s \leq 10^3$, $10 \leq t_i \leq 100$ for all $1 \leq i \leq d$	2
2.	$2 \leq n, d \leq 10^3$, $1 \leq s \leq 10^7$, $10 \leq t_i \leq 10^5$ for all $1 \leq i \leq d$	3
3.	$2 \leq n, d \leq 10^5$, $1 \leq s \leq 10^9$, $1 \leq t_i \leq 10^8$ for all $1 \leq i \leq d$	5