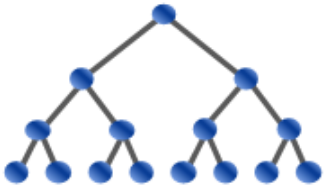

USACO 2023 January Contest, Bronze
Problem 2. Air Cownditioning II

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Contest has ended.

Log in to allow submissions in analysis mode

English (en)

With the hottest recorded summer ever at Farmer John's farm, he needs a way to cool down his cows. Thus, he decides to invest in some air conditioners.

Farmer John's N cows ($1 \leq N \leq 20$) live in a barn that contains a sequence of stalls in a row, numbered $1 \ldots 100$. Cow i occupies a range of these stalls, starting from stall s_i and ending with stall t_i. The ranges of stalls occupied by different cows are all disjoint from each-other. Cows have different cooling requirements. Cow i must be cooled by an amount c_i, meaning every stall occupied by cow i must have its temperature reduced by at least c_i units.

The barn contains M air conditioners, labeled $1 \ldots M$ ($1 \leq M \leq 10$). The ith air conditioner costs m_i units of money to operate ($1 \leq m_i \leq 1000$) and cools the range of stalls starting from stall a_i and ending with stall b_i. If running, the ith air conditioner reduces the temperature of all the stalls in this range by p_i ($1 \leq p_i \leq 10^6$). Ranges of stalls covered by air conditioners may potentially overlap.

Running a farm is no easy business, so FJ has a tight budget. Please determine the minimum amount of money he needs to spend to keep all of his cows comfortable. It is guaranteed that if FJ uses all of his conditioners, then all cows will be comfortable.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line of input contains N and M.

The next N lines describe cows. The ith of these lines contains s_i, t_i, and c_i.

The next M lines describe air conditioners. The ith of these lines contains a_i, b_i, p_i, and m_i.

For every input other than the sample, you can assume that $M = 10$.

OUTPUT FORMAT (print output to the terminal / stdout):

Output a single integer telling the minimum amount of money FJ needs to spend to operate enough air conditioners to satisfy all his cows (with the conditions listed above).

SAMPLE INPUT:

```
2 4
1 5 2
7 9 3
2 9 2 3
1 6 2 8
1 2 4 2
6 9 1 5
```

SAMPLE OUTPUT:

```
10
```

One possible solution that results in the least amount of money spent is to select those that cool the intervals $[2, 9]$, $[1, 2]$, and $[6, 9]$, for a cost of $3 + 2 + 5 = 10$.

Problem credits: Aryansh Shrivastava and Eric Hsu

Contest has ended. No further submissions allowed.

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