F - Amazing Carry

Run-time Limit: 1 second
Memory Limit: 32 MB

DESCRIPTION

Petruk and his friends are playing a Multiplayer Online Battle Arena game. Multiplayer Online Battle Arena (MOBA) is a genre of game where a player controls a single character in a team that competes versus another team of players. Petruk who has been playing the game since he was 10 years old is very well respected by his teammates. So he usually takes the role of "carry", the player who carried his team to win the battle by getting many kills, gold, and items. This time, Petruk and his teammates are playing against a powerful team.

During the game, Petruk will be collecting gold by defeating monsters. There are two places where Petruk can find monsters. Those are the "Lane" and the "Jungle". Petruk can move from the Jungle to the Lane or vice versa by spending one minute. At the beginning of the game, Petruk will be automatically teleported to the Lane.

In the Lane, a group of small monsters will come at the beginning of the i^{th} minute (i=1,2…). If Petruk is in the Lane, he can spend one minute to defeat those monsters and gain L_i gold. Otherwise, the monsters will be destroyed by the "Tower" defense mechanism and Petruk will not gain gold from them.

In the Jungle, there are two spots where big monster could spawn. Petruk and his teammates usually call these spots "The First Camp" and "The Second Camp". At the beginning of the i^{th} minute (i=1,2…), a monster will spawn in each of those two camps, which worth A_i gold in The First Camp and B_i gold in The Second Camp. If Petruk is in the Jungle, he can spend one minute to defeat all monsters in either one of those two camps. If the monster(s) in a camp were not defeated, they will be replaced by another monster that will be spawned at the beginning of the next minute.

Fortunately, Petruk has Semar in his team, a very talented support player. At the end of some k^{th} minutes (k=1,2,…), Semar will come to either The First Camp or The Second Camp of the Jungle. If the monsters in the camp which he is visiting were not defeated by Petruk, Semar will use magic to temporarily banish the monster which was spawned at the beginning of k^{th} minute, then returns it right after the beginning of the $(k+1)^{th}$ minute, so it can coexist with the monster that has just been spawned. Thus increasing the total worth of monsters in that particular camp because there are two monsters at the same time that can be defeated in a minute. After that Semar will leave the jungle without defeating any of those monsters.

Now Petruk is wondering about the best course of actions he would take to win the game. Your task is to help Petruk determine the maximum gold he could gain after N minutes of the game.

INPUT FORMAT

The first line of input contains an integer T denoting the number of cases.

For each case, the first line contains two integers N and P denoting the duration of the game in minutes and the number of times Semar will come to the Jungle, respectively. The next N lines, each contains three integers L_i, A_i, and B_i ($1 \leq i \leq N$). For the next P lines, each contains two space-separated integers S_j ($1 \leq j \leq P$; $1 \leq S_j \leq N$) and integer 1 if Semar will visit the First Camp at the end of S_j^{th} minute, or integer 2 if Semar will visit the Second Camp.

It is guaranteed that when Semar comes the Jungle at the end of a minute, he will visit either one of the two camps. There is no case when Semar comes to both camps at the same minute.

OUTPUT FORMAT

For each case, output in a line "Case #X:" where X is the case number, starts from 1. Then followed by an integer denoting the maximum gold that Petruk could gain after N minutes of the game.

SAMPLE INPUT

```
2
4 1
10 4 7
4 9 4
5 15 4
10 7 11
3 1
5 2
7 10 3
10 25 18
15 20 10
12 15 13
40 22 21
1 2
2 2
```

SAMPLE OUTPUT

```
Case #1: 36
Case #2: 93
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EXPLANATION

In the first case, Petruk's best course of actions would be:

- 1^{st} minute: Defeat monster at Lane, gain 10 gold
- 2^{nd} minute: Move to Jungle
- 3^{rd} minute: Defeat one monster at Second Camp, gain 4 gold. Then Semar will come to the First Camp and perform his supporting action. Making the total worth of monster in the First Camp for the next minute to 15+7=22 gold.
- 4^{th} minute: Defeat two monsters at the First Camp, gain 22 gold

- Total gold = 36.

In the second case, Petruk's best course of actions would be:

- 1^{st} minute: Move to Jungle. Then Semar will come to the Second Camp, make the total worth of monster in Second Camp for the next minute to be 3+18=21 gold.
- 2^{nd} minute: Defeat monster in First Camp, gain 25 gold. Then Semar will come to the Second Camp again, make the total worth of monsters in Second Camp for the next minute to be 18+10=28 gold.
- 3^{rd} minute: Defeat two monsters in the Second Camp, gain 28 gold.
- 4^{th} minute: Move to Lane
- 5^{th} minute: Defeat monsters in Lane, gain 40 gold.
- Total gold = 93.

CONSTRAINTS

- $1 \leq T \leq 100$
- $1 \leq N \leq 10000$
- $0 \leq P \leq N$
- $0 \leq L_i, A_i, B_i \leq 10^8$
- $1 \leq S_j \leq N$