Problem E - Evil versus good

The good citizens of PokeCity and the evildoers of Team Plasma are at war! PokeCity has X cannons pointed at the opposite Team Plasma, and Team Plasma has Y cannons pointed at PokeCity. PokeCity starts with H_1 health and Team Plasma starts with H_2 health.

A cannon i has statistics:
- T_i, the type of cannon (either 1 or 2)
- S_i, when the cannon turns on an begins to charge
- C_i, how long it takes the cannon to charge before firing
- D_i, how much damage it deals to the opposing country
- W_i, if cannon i fires, it must wait W_i seconds before it begins to charge again

The two countries fight by shooting their cannons as soon as possible, whenever it is possible. The cannons activate and shoot according to their stats. You can assume that the flight time of the cannonballs are negligible. That is, ignore the time it takes for cannonballs to fly and hit the other country.

However, if a country X is hit by a Type 2 cannon shot from the other country, all of the cannons in X that are charging (not waiting) reset their charging, i.e. it is as if the charging just began. Type 1 cannon shots simply deal damage to the other side without resetting any cannon charges.

If at a time T, cannons are firing from both PokeCity and Team Plasma, the country that has a greater total cannon damage completely dominates and destroys the opposing country's cannon shots mid-air, so only the country with less total damage is hit. If each side's total damage is the same, the side with more HP dominates and destroys the opposing cannon shots. If their HP is tied as well, PokeCity dominates.

Note that C_i can equal 0. In this case, the charging finishes instantly and is not cancelled by a Type 2 shot.

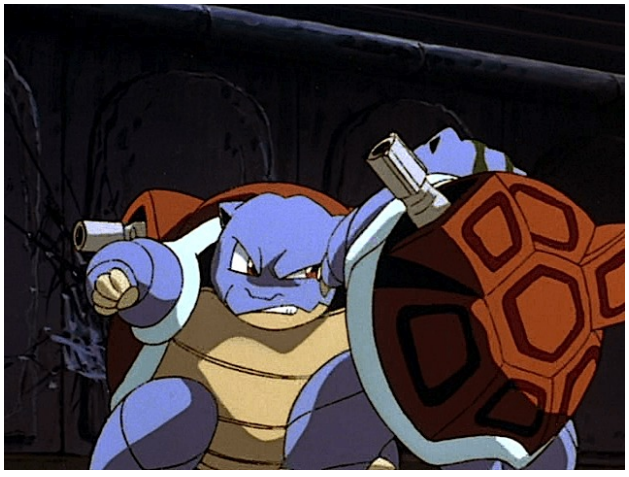
Input

The first line is an integer T, representing the number of test cases. T test cases follow. The first line of each test case contains four space-separated integers X, Y, H_1, H_2.

This line is then followed by X lines. Each line contains 5 space-separated integers T_i, S_i, C_i, D_i, W_i describing cannon i in PokeCity. The next Y lines describe the cannons in Team Plasma in the same way.
$1 \leq X, Y \leq 100$
$1 \leq H_1, H_2 \leq 10000$
$T_i = 1$ or 2
$0 \leq S_i, C_i, W_i \leq 100$
$1 \leq D_i \leq 100$
At least one of C_i or W_i will be non-zero.

Output

Output two lines. On the first line, output the character "A" (for PokeCity) or "B" (for Team Plasma) (without quotes) describing which country wins the war. On the next line, output how long the war lasts, i.e. how many seconds pass from $T = 0$ before the losing country has 0 HP.



Sample Input

```
2
2 2 20 10
1 3 2 5 6
2 5 0 1 2
2 4 2 2 20
1 0 5 2 15
1 2 3 2
1 0 1 1 0
1 1 1 1 5
2 1 1 1 0
```

Sample Output

```
A 13
A 3
```