

Barbarians

There are N Barbarians living on an unknown island. On the island there are M caves, we can number them $1, 2, \dots, M$ clockwise. When we find the island, the barbarians are living in N distinct caves numbered C_1, C_2, \dots, C_N . Every year each barbarian walks out of his cave and goes along the road, passes P_i caves and then go into that cave. Every Barbarian has a living time: L_i years, after L_i years the i th barbarian died.

We are surprised to find out that no two barbarians live in one cave in the same year so no conflicts have happened. We are interesting about the minimum number of caves on the island.

Please note that this problem has a somewhat strict source limit and time limit.

Input

The very first line contains a single integer T , the number of test cases. T blocks follow.

For each test case, the first line contains a single integer N ($N \leq 15$). N lines follow, each contains 3 integers C_i ($1 \leq C_i \leq 100$), P_i ($1 \leq P_i \leq 100$), L_i ($1 \leq L_i \leq 1,000,000$).

Output

For each test case, the first and only line contains a single integer M - the answer. You may assume $M \leq 1,000,000$.

Example

Input:

```
1
3
1 3 4
2 7 3
3 2 1
```

Output:

```
6
```

Hints

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| Year | Barb. No.1 | Barb. No. 2 | Barb. No. 3 |
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```
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| 0 | 1 | 2 | 3 |
```

```
-----
| 1 | 4 | 3 | 5 |
```

```
-----
| 2 | 1 | 4 | Died |
```

```
-----
| 3 | 4 | 5 | Died |
```

```
-----
| 4 | 1 | Died | Died |
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```