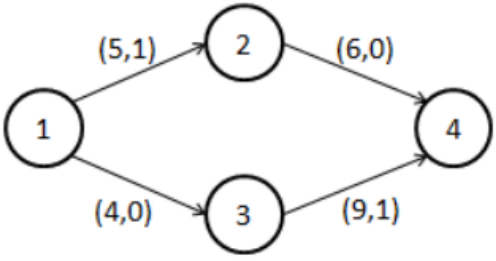
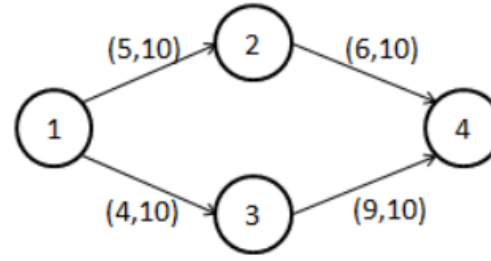
Alice and Bob are walking in an ancient maze with a lot of caves and one-way passages connecting them. They want to go from cave 1 to cave n. All the passages are difficult to pass. Passages are too small for two people to walk through simultaneously, and crossing a passage can make it even more difficult to pass for the next person. We define d_i as the difficulty of crossing passage i for the first time, and a_i as the additional difficulty for the second time (e.g. the second person's difficulty is $d_i + a_i$).

Your task is to find two (possibly identical) routes for Alice and Bob, so that their total difficulty is minimized.





For example, in figure 1, the best solution is $1 \to 2 \to 4$ for both Alice and Bob, but in figure 2, it's better to use $1 \to 2 \to 4$ for Alice and $1 \to 3 \to 4$ for Bob. **It's always possible to reach cave n from cave 1**.

Input

There will be at most 200 test cases. Each case begins with two integers n, m ($1 \le n \le 500$, $1 \le m \le 2000$), the number of caves and passages. Each of the following m lines contains four integers u, v, d_i and a_i ($1 \le u, v \le n$, $1 \le d_i \le 1000$, $0 \le a_i \le 1000$). Note that there can be multiple passages connecting the same pair of caves, and even passages connecting a cave and itself.

Output

For each test case, print the case number and the minimal total difficulty.

Sample Input

```
4 4
1 2 5 1
2 4 6 0
1 3 4 0
3 4 9 1
4 4
1 2 5 10
2 4 6 10
1 3 4 10
3 4 9 10
```

Sample Output

```
Case 1: 23
Case 2: 24
```