7134 Speed Trap

The Swamp County Sheriff's Department has stepped up its speed law enforcement, but it has a problem: years of changing speed signs, lack of signage repairs, and downright bad planning have led to contradictory speed markings. Many tickets issued are unenforceable because the cited driver was obeying the last posted speed limit rather than the intended limit. Your team is to write a program that will determine and report which streets have inconsistent speed markings.

Consider the map in Figure 1, as described by the sample input. A driver on 2nd Street approaching Cherry Avenue from the south sees a posted speed limit of 50 MPH, and turns right (east) onto Cherry; according to the marked signs, that driver can continue along at up to 50 MPH without exceeding the limit. However, a driver approaching the intersection of 2nd Street and Cherry Avenue from the north or west must obey a marked 30 MPH speed limit. The eastbound section of Cherry Avenue between 2nd Street and 1st Street has conflicting speed limit markings.

One other problem stymies Swamp County Deputy Sheriffs. Some road segments have portions without any posted speed limits. This usually occurs at roads inbound from neighboring counties or where pavement begins. Segments with significant lengths of unknown speed limits must be reported. In Figure 1, southbound 1st Street towards Ash Avenue lacks explicit Swamp County speed markings for a significant distance, and must be reported.

There are some important considerations for your solution:

- There is a short threshold distance that a street can have contradictory or missing speed limits, typically at intersections or where drivers can see the upcoming speed signs. For contradictory and unknown speed conditions less than or equal to a specified threshold, do not report any problem. For example, in Figure 1, southbound 1st Street south of Cherry Avenue does not have conflicting speed limits. The 10-foot portion that could have a speed limit of either 30 MPH or 50 MPH is less than the 50-foot threshold distance specified in the sample input.
- A road segment that has both conflicting AND unknown speed limits is considered conflicted.
- U-turns are illegal in Swamp County. The county does not have any cul-de-sacs.
- Swamp County traffic judges have decreed that each segment must be analyzed for all possible paths into that segment, including circling, to determine the speed limit.

Input

Input to your program is a street map described as road segments. Each segment has beginning and ending points identfied by two numbers. One-way streets have only one segment between two points. Twoway streets have two separate segments with reversed beginning and end points. All numbers in the input are integers.

The first line of input is the threshold distance, in feet. Each remaining line contains a single road segment starting with three numbers separated by whitespace: beginning point number, end point number, and the length of the segment in feet. If any speed signs are present on the segment of road, each sign specification follows as whitespace then a '*distance*,*limit*' pair. The *distance* is expressed as feet from the beginning point of the segment. The *limit* is in miles per hour. Consecutive signs on a road segment are always listed in ascending distance from the beginning point. A road segment may have 0 or more pairs. Road segments are not guaranteed to be sorted. There will be at most 100 road segments.

Output

For any street segments that have a speed conflict or an unknown limit, your program is to print a line containing the beginning point, exactly one space, the end point, exactly one space, then a single character for the problem. The lower case letter '`c`' denotes a conflict, and the lower case letter '`u`' denotes an unknown speed limit. Display problem segments in the order supplied in the input. No leading or trailing whitespace is to appear on an output line.

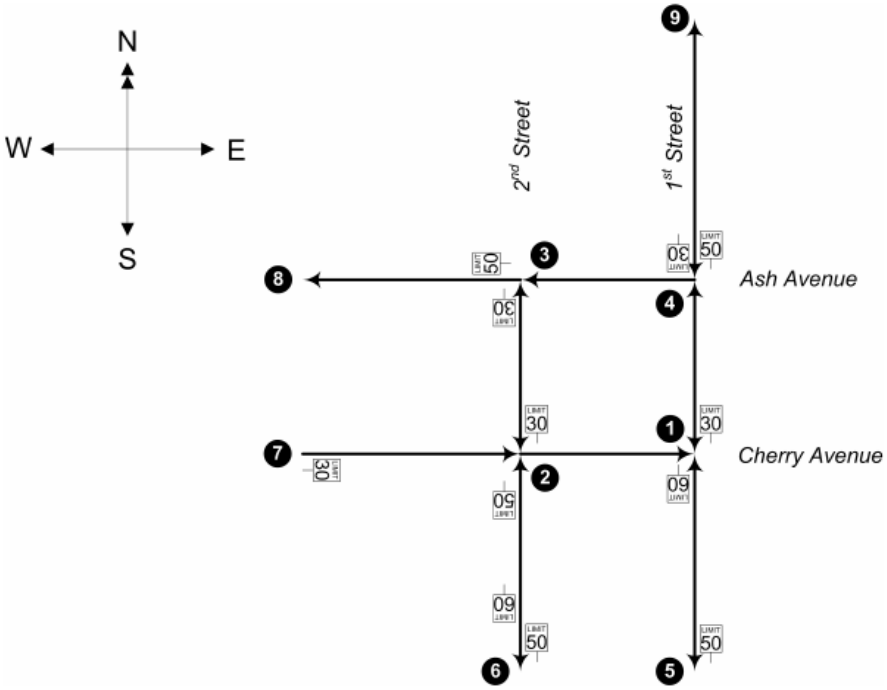

Figure 1. The street map described by the Sample Input.

Sample Input

```
50
1 5 500 10,60
1 4 400 10,30
2 6 500 10,50 300,60
2 3 400 10,30
2 1 400
3 2 400 10,30
3 8 500 10,50
4 1 400
4 3 400
4 9 600 10,50
5 1 500 0,50
6 2 500 10,50
7 2 500 0,30
9 4 600 580,30
```

Sample Output

```
2 1 c
9 4 u
```