

CS-2001 Data Structures

Project: Emergency Travelling Plan

A traveler is visiting different places and suddenly receives a call from the office to reach back office due to an emergency meeting. Now the traveler is required to move back as soon as possible but he has certain constraints. There are some cities that are connected through road networks, and some are also connected through air connections. The traveler may not stop in a city where there is an aerial route taking him back to previous visited cities. As he is in far remote areas and the roads are not that good so he can travel to a maximum of 6 cities in one day if he travels by road. Once he reaches the city having the aerial route, he reaches the other destination of the aerial route by the end of the same day.

Let us take an example given in the figure given below. In figure all cities are connected through road network shown with arrow. There are some cities that also have aerial route shown as dotted lines such as from city 2 to city 21. Consider the traveler wants to move from city 1 to city 30 in as minimum days as possible. The traveler can travel up to six cities by road, but there is an aerial route available at city 2 so take one day to travel to city 2, take a flight to city 21 on day 1. After that he can take the road, but he should not stop at city 26 as he does not want to fly back (In case of such case the traveler should either stay on previous city or next city in case if maximum 6 cities are not covered). So, on day 2, he reaches city 27, covering 6 cities by road and on 3rd day he reaches his destination i.e., city 30. (Same can be achieved by travelling from city 1 to city 7 then on second day reaching city 25 through city 10 and on third day reaching destination). So, in total the minimum days that is required to reach destination is 3 days.

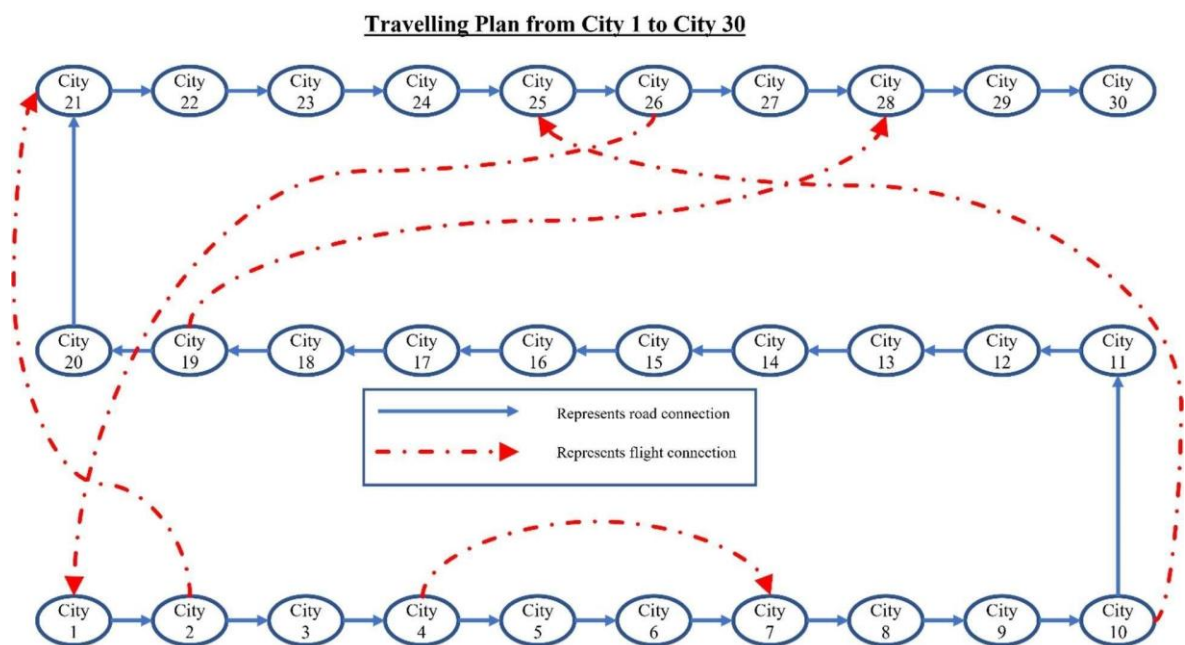


Figure: Emergency Travel plan

Hints:

- Start number of cities with zero i.e., city 0 and last city will be city (N-1) where N is the number of cities.

Input

The first line should contain the number of cases. For each test case, the starting line contains the number of cities, the next line shows the number of aerial routes (n), and the subsequent n lines will show the source and destination of the aerial route, separated by a space.

Output

There would be as many outputs as the number of test cases. The output displays the minimum number of days required to travel from city 1 to city N.

| Sample input | Sample Output |
|--------------|---------------|
| 2 | 3 |
| 30 | 4 |
| 5 | |
| 2 21 | |
| 4 7 | |
| 10 25 | |
| 19 28 | |
| 26 0 | |
| 98 | |
| 3 | |
| 5 29 | |
| 35 23 | |
| 24 95 | |