Algorithms Lab

Exercise 3 – *Monkey Island*

Remember the old LucasArts adventure *The Secret of Monkey Island*? You have been elected as the new governor of Monkey Island^{TM} and it is time to make good on your campaign promises. One of these promises was to finally rid the island of its severe piracy problem by building police stations at strategic locations.

However, this is complicated by the fact that some roads in the dense jungle on the island do not actually work both ways (those of you who actually played the game might remember this). Additionally, building police stations is not free, and for every location there is an associated cost for building a police station there.

Thus your goal is the following: choose locations at which to build police stations such that (1) every location is reachable from some police station by following the roads and (2) the total cost of building the police stations is minimized.

Input The first line of the input contains the number of test cases $t \leq 20$. Every test case starts with a line containing the number of locations $n \leq 1000$ and the number of roads $m \leq 1000$, separated by spaces. This is followed by m lines, each containing two numbers $1 \leq i, j \leq n$, representing a (directed) road from the i-th to the j-th location. Finally, there is a line containing the costs $c_1, \ldots, c_n$ of building a station in the respective locations, where for every i, you may assume $0 \leq c_i \leq 100$.

Output For every test case you should output the minimum cost needed to build police stations such that every location is reachable (via roads) from some police station.

Sample Input
```
2
3 3
1 2
2 3
3 1
1 2 3
3 2
1 2
3 2
1 1 1
```

Sample Output
```
1
2
```