Exercise – *Surveillance Photographs*

Sherlock Holmes is solving a case with the aid of his homeless intelligence network. His secret agents located at various intersections in London have taken ℓ surveillance photographs of members of Professor Moriarty's gang. These photographs will be used as crucial evidence during an upcoming trial. The problem is how to safely transport the photographs to a secure place: a safe in a police station.

Inspector Lestrade has k police stations at his disposal, which are scattered around London. In every station there is one policeman and one safe. Every policeman can collect at most one photograph. He can do so by driving from his police station to the photograph location and then back to some police station—not necessarily the one he started from. There the photograph is locked into the safe. Each safe can store at most one photograph.

To move between locations, the policemen use London's network of one-way streets. The streets must be used in the "correct" direction only. In order to avoid the risk of losing multiple photographs in case of an assault, every street can be used by at most one policeman who carries a photograph. In contrast, a street may be used by any number of policemen who do not carry a photograph (are on their way to collect one).

Given the map of the relevant part of London and the locations of police stations and photographs, help Dr. Watson to figure out how many photographs can be collected while preserving the security precautions. Hopefully it will be enough to convince the jury...

Input The first line of the input contains the number $t \leqslant 60$ of test cases. Each of the t test cases is described as follows.

- It starts with a line that contains four integers `n m k l`, separated by a space and such that $1 \leqslant n \leqslant 500$, $0 \leqslant m \leqslant 10^4$, and $1 \leqslant k, \ell \leqslant 500$. Here n denotes the number of intersections, m the number of streets, k the number of police stations and ℓ the number of photographs.
- The following line defines the locations of the police stations. Each of the k locations is described by an integer $x \in \{0, \ldots, n-1\}$, denoting the intersection at which the station is situated.
- In the same way, the following line defines the ℓ locations of the photographs.
- Each of the following m lines contains two integers `x y`, separated by a space and such that $x, y \in \{0, \ldots, n-1\}$ and $x \neq y$. It indicates that there is a (one-way) street that leads from intersection x to intersection y.

Note that there may be multiple police stations and photographs at a single intersection. Furthermore, there may be multiple parallel streets connecting the same pair of intersections.

Output For each test case output the maximum number of photographs that can be collected subject to the constraints in the description.

Points There are two groups of test sets, each worth 50 points. Overall, you can achieve 100 points.

1. For the first group of test sets you may assume that the map is symmetric, that is, for any pair of intersections x and y the number of streets from x to y is equal to the number of streets from y to x.

2. For the second group of test sets, there are no additional assumptions.

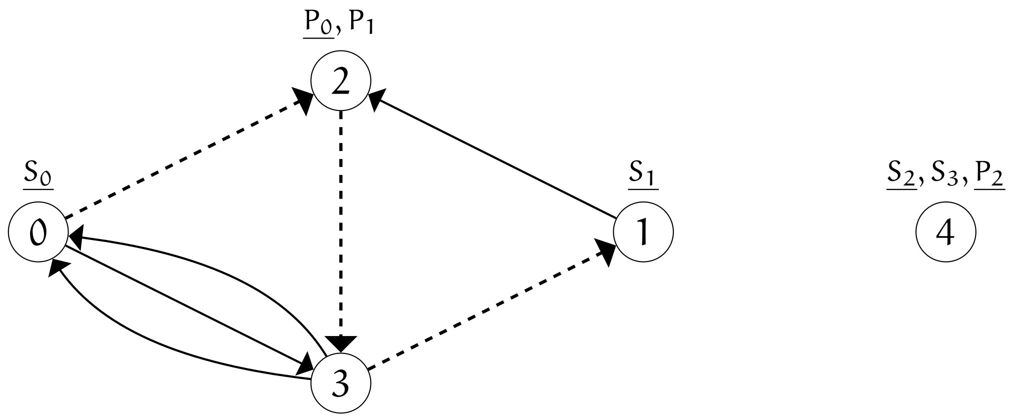
Corresponding sample test sets are contained in `testi.in/out`, for $i \in \{1, 2\}$.

Sample Input

```
1
5 7 4 3
0 1 4 4
2 2 4
0 2
1 2
2 3
3 0
3 0
0 3
3 1
```

Sample Output

```
2
```



Sample Explanation The figure presents one of the possible ways to collect two photographs. The police stations are denoted S_0 to S_3, the photographs P_0 to P_2.

One policeman leaves S_0, collects P_0 and deposits it in the safe in S_1 (he could go back to S_0 as well). A policeman from S_1 can collect P_1, but he cannot go with the photograph to S_0 since the street $(2, 3)$ was already used.

Another policeman from S_2 collects P_2 and deposits it in S_2 without using any streets (he could deposit it in S_3 as well).