Bullet Train

In the year of 2207, the country PVH has become one of the busiest countries in the world. To satisfy the rapidly increasing demand of of travelling between cities increases rapidly, and to reduce the emission caused by airplanes, the government plans to establish a bullet train system.

There are n cities in the country PVH. These cities are numbered from 1 to n, inclusively. Each city has exactly one central station, where trains depart and arrive. The current rail system in country PVH allows trains to travel directly between every pair of cities. The distance between the central stations of two cities i and j is $d_{i,j}$. Please note that $d_{i,j} = d_{j,i}$ for every pair of cities (i, j) and $d_{i,i} = 0$ for every city i.

The government plans to operate several train routes. Each route departs from some station, passing through several other stations and terminating at some station. In a route, the train must not pass through a station more than once and there should be at most k stations in a route (including the starting and ending ones). The operating cost of a route is the total distance of all pairs of consecutive stations.

Formally, a route can be represented as a sequence of integers $x_1, x_2, \ldots, x_t$ satisfying:

- $1 \le x_1, x_2, \ldots, x_t \le n$
- $2 \le t \le k$
- $x_1, x_2, \ldots, x_t$ are pairwise distinct.

The operating cost of this route is $d_{x_1,x_2} + d_{x_2,x_3} + \ldots + d_{x_{t-1},x_t}$.

There are m important pairs of cities, where millions of people travel between every year. For each important pair of cities (u, v), the government wants to have at least one route passing through both u and v. Note that the order does not matter, meaning that two important pairs (u, v) and (v, u) are considered the same.

Please help the country PVH to design train routes so as to cover all important pairs of cities, and the total operating cost of these routes is as small as possible.

Input

The first line contains a single integer – the number of test cases. Each test case is presented as follows:

- The first line contains three integers n, k and m $(2 \le k \le n \le 19, 1 \le m \le 15)$.
- In the next $n-1$ lines, the i-th one $(1 \le i \le n-1)$ contains $n-i$ integers $d_{i,i+1}, d_{i,i+2}, \ldots, d_{i,n}$ $(1 \le d_{i,j} \le 1312)$.
- In the last m lines, each contains two integers u and v $(1 \le u < v \le n)$ representing an important pair of cities.

It is guaranteed that:

- The sum of n over all test cases does not exceed 95.
- The sum of m over all test cases does not exceed 75.

Output

For each test case:

- The first line contains two integers b and c — the minimum operating cost and the total number of train routes.
- In the last c lines, each contains an integer t $(2 \leq t \leq k)$ followed by t integers $x_1, x_2, \ldots, x_t$ $(1 \leq x_i \leq n)$ demonstrating a train route.

If there are multiple optimal solutions, you can output any of them.

Sample Input 1

```
2
5 3 6
1 2 3 4
5 6 7
8 9
10
1 2
2 3
1 3
3 4
4 5
3 5
5 4 6
1 2 3 4
5 6 7
8 9
10
1 2
2 3
1 3
3 4
4 5
3 5
```

Sample Output 1

```
20 2
3 4 3 5
3 2 1 3
17 2
4 4 1 3 5
3 2 1 3
```