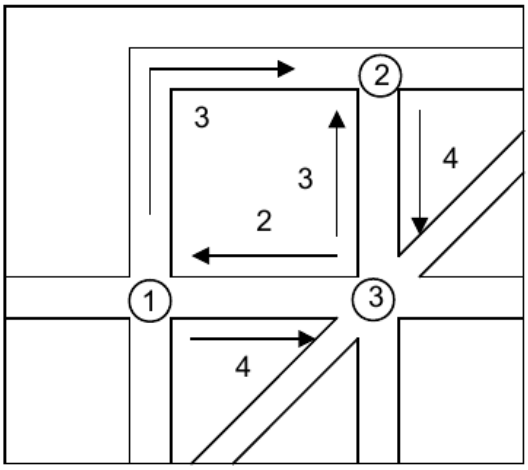
2879 Emergency Services

As result of the intense rain, many cities in the country as well as their habitants are suffering flooding. Most of the time emergency services were not able to respond promptly to the habitants requests for help. As a contingency plan city authorities have decided to assign Emergency Anti Flooding Teams (EAFT) to strategic points in the city to assist the habitants help calls during the flooding. The EAFT task is to go from their base point to the place where there is a problem, As soon as possible and release the drainage lid open, so the water level decrease faster.

When it starts to rain and some person see that the water level is raising in his street, he/she must call the EAFT center, where the responsible of the center should send the nearest team.



Example of a City map

Your task is to develop a program that finds the routes that the teams should follow to assist to the habitants calls for help. So that the water level in their streets reminds as low as possible.

You should consider the following assumptions:

- The drainage lids are located in street intersections.
- The EAFT are located in street intersections.
- If you can go directly from intersection A to intersection B, that does not imply that you could go directly from intersection B to intersection A. (The street may be ONE way only).
- The time elapsed to go from one intersection to another is known.
- Even though not all intersection can be reach directly, there will always be a possible route between two points.

Input

The input to your program has the following information.

There may be one or more sets of data. The first line is a number that defines how many sets are in the file.

With in each set of data:

- the first line is the number of intersections in the map, its value is n.
- From the second line up to the line $n+1$ you find the values of a square matrix of size $n \times n$, that represents the time required to go from intersection i (rows) to intersection j (columns). When $i = j$ (since the start and the destination are the same) the time is cero. The time is '`-1`' when the intersections do not connect directly between them.
- The line $n + 2$ has the following values: a number p that represent the place where there is a problem. Then there may be one or more numbers representing the locations of the EAFT.

Output

For each dataset, the output should have one line with the set number, as follows:

```
Set Number #
```

where '#' should be replaced for 1, 2, etc.

Then, there should be one or more lines, (at least) one for each EAFT representing the shortest path from the starting point of the EAFT to the point of problem p.

The format of each line should be: the number of the starting point of the EAFT, the number of the intersection with a problem of flooding, the time elapsed to get there and the path followed (the path is a set of intersections form the start to the destination).

All the values of these line must be separated by a blank space. The lines must be ordered from the least to the greatest time.

Sample Input

```
1
6
0    3    4    -1   -1   -1
-1   0    4    5    -1   -1
2    3    0    -1   -1   2
8    9    5    0    1    -1
7    2    1    -1   0    -1
5    -1   4    5    4    0
2    4    5    6
```

Sample Output

```
Set Number 1
5 2 2 5 2
4 2 3 4 5 2
6 2 6 6 5 2
```