2720   Hrip Van Wankle's Wealth

Hrip Van Winkle is a descendent of Rip Van Winkle about whom the late Diedrich Knickerbocker, an old gentleman of New York, wrote a famous tale long ago. Like his ancestor, Hrip Van Winkle is a simple good-natured lazy man and a daydreamer. However unlike his ancestor he lives in the modern society and is a computer literate. Often he dreams getting rich miraculously.

In one of his dreams he finds himself wandering in a wonderland. He meets a kindhearted angel who likes him for his simplicity and good nature. The angel brings him near to a huge funny looking magical house. The outer boundary of the house as well as the inner boundary of the floor or the roof of every room in the house forms an equilateral triangle. The rooms are of the same size and are numbered serially, row wise. The angel can increase or decrease the number as well as the size of rooms magically. With n rows of rooms, the total number of rooms in the house is n^2, n being a positive integer. The row wise numbering of rooms is illustrated in Fig. 1 below.
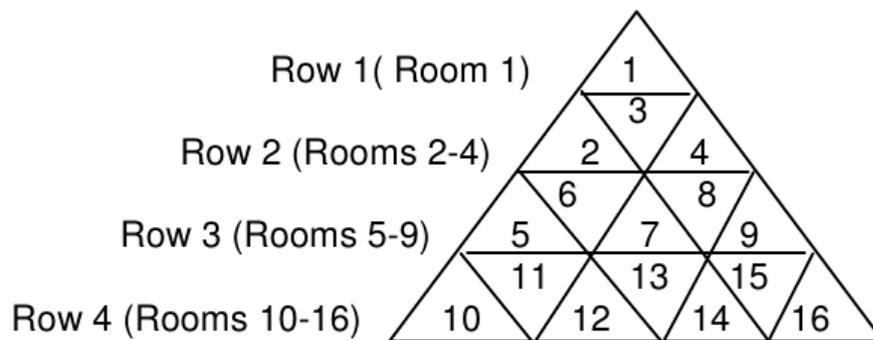

Fig. 1: Row wise numbering of rooms with 4 rows of rooms

There are four types rooms in the house:

1. *Entry room: Entry to the house is possible through Room No. 1, the only room in the first row. The room has only one adjacent room.*

2. *Exit rooms: Exit from the house is possible through the first or the last room in the last row, e.g., Room 10 or 16 in Fig. 1. Like the entry room these two rooms have one adjacent room.*

3. *Side rooms: Rooms having no adjacent room on the side facing the outer boundary of the house. These rooms have two adjacent rooms one on each of the other two sides, e.g., Rooms 2, 4, 5, 9, 12 & 14 in Fig. 1.*

4. *Inner rooms: Rooms having three adjacent rooms, one on each of the three sides e.g., Rooms 3, 6, 7,8, 11, 13, & 15 in Fig. 1.*

Each room has two or three doors. All entry/exit rooms as well as inner rooms have three doors while each side room has two doors. The doors, when present, are located at the middle of a side. In side rooms there is no door on the side facing the outer boundary of the house.
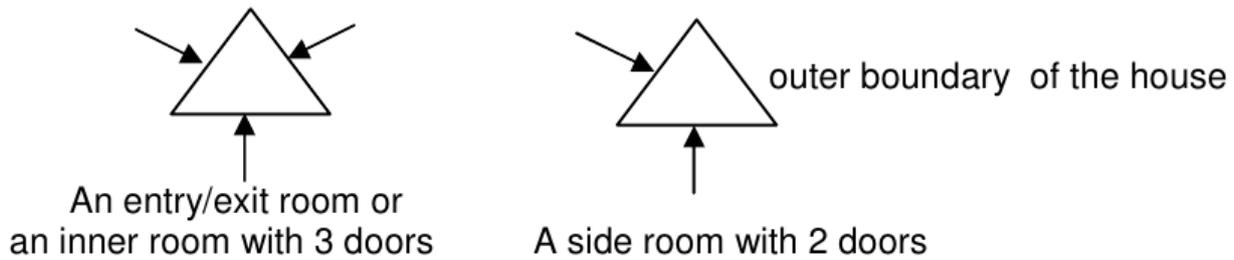
Fig. 2: Positions of doors in a room (an arrow shows the location of a door)

At the center of each room there lies an open magical box. The box contains either a certain number of gold coins or a huge magical stone. The gold coins can be taken out from the box but the magical stone cannot be removed. The magical stone, if present in the box, changes the characteristic of coins brought to the room; gold coins are converted to iron coins and iron coins are converted to gold coins.

After giving details of the content of the magical box in each room the angel tells Hrip that he is pleased with him for his simplicity and good nature. If Hrip wishes to become a wealthy man then he can help him. He will let Hrip visit the magical house and collect as many coins as he can. However Hrip should follow the following conditions:

1. *Entry/exit should be through entry/exit rooms,*

2. *A room should not be visited more than once,*

3. *All gold coins, if present, should be collected from the magical box,*

4. *All coins collected en route should be carried in person.*

Hrip feels happy. Being a computer literate but a lazy man he ponders about the offer in his own way and requests the angel to allow him to take the help of a friend and a computer. His idea is to request a friend to write a program for him so that he can run the program on a computer and find the best possible route for him to get the maximum possible number of gold coins under the given conditions.

The angel agrees to the request but says that he will magically change the number of rooms in the house as well as the contents of the box in the rooms and let him know these just before he runs the program. He imposes one additional condition, viz., the exit from the house should be through a specified exit room. Would you like to be a friend of a simple good-natured man like Hrip and write a dream program for him?

Input

The input may contain multiple test cases. For each test case the first input line gives the case number c, the total number of rows of rooms n and the room number of the exit room.

The next n lines give contents of magical boxes in rooms arranged serially. The k-th line gives contents of boxes in the k-th row of rooms. The content of a box is represented by an integer. It is zero if the box contains the magical stone; otherwise it indicates the number of gold coins in the box.

The input terminates with an input '0' for c.

Output

For each test case first print in one line, the test case number c, the number of possible routes k and the maximum number of gold coins g that can be collected.

In each of the next k lines print a route for him to collect the maximum number of gold coins from the magical house. The route consists of a sequence of room numbers of the rooms he visits starting from the entry room and ending with the specified exit room.

Sample Input

```
1 3 5
1
2 0 1
1 0 1 0 0
2 4 10
1
2 0 3
1 5 4 0 0
0 0 0 3 5 2 0
0
```

Sample Output

```
1 2 2
1 3 2 6 5
1 3 4 8 7 6 5
2 1 23
1 3 4 8 9 15 14 13 7 6 5 11 10
```