

3572 Triangular N-Queens Problem

A “queen” piece on a triangular array of cells, N cells on a side, can attack any cell on a file parallel to one of the sides containing the queen’s cell. For example, in the array in Figure 1, a queen on the black cell, attacks all of the shaded cells. The Triangular N-Queens Problem of size N , is to find a maximal set of queen positions in a triangular array with N cells on a side so that no queen is attacking any other queen. For example, the black cells in Figure 2 give a maximal set of queen positions in a size 6 array. It turns out that a size N array always has $\lfloor (2 * N + 1)/3 \rfloor$ as the maximal number of non-attacking queen positions.

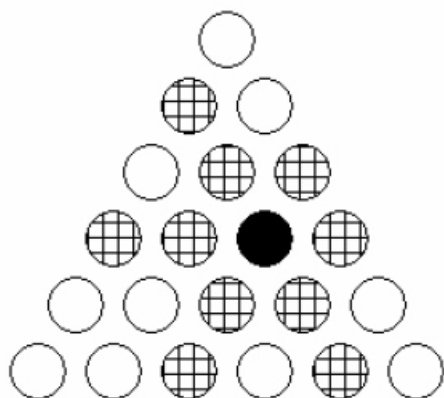


Figure 1

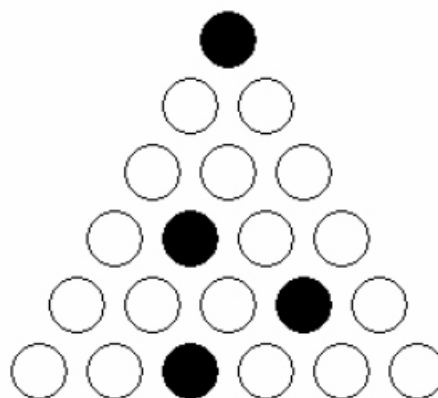


Figure 2

Write a program, which, given the size, N , of the triangular array, finds a maximal set of non-attacking queen positions on the array ($\lfloor (2 * N + 1)/3 \rfloor$ of them).

Input

The input begins with a line containing an integer value specifying the number of datasets that follow, C , ($1 \leq C \leq 1000$).

Each dataset consists of a single line containing a single integer N , ($1 \leq N \leq 1000$), which is the size of the triangular array.

Output

The first output line for each problem gives the problem number starting at 1, a single space, the input size, a single space and the number of queen positions. Following the first line will be the queen positions, 8 positions per line except perhaps for the last line of positions.

Each position has the format open bracket ('['), row number starting with 1, a comma, the position from the left within the row starting at 1 and a close bracket (']'). Positions within a line are separated by a single space. For example, the queen positions in Figure 2 are [1,1] [4,2] [5,4] [6,3].

The lines of position values are followed by a single blank line.

Notes

1. There may be many different correct answers to a particular problem, so your answers need not be the same as those in the **Sample Output** below.

2. Some solution methods for this problem may cause the time limit to be exceeded. Be sure to try the larger values before submitting your solution.

Sample Input

```
6
3
6
9
10
14
18
```

Sample Output

```
1 3 2
[1,1] [3,2]

2 6 4
[3,1] [4,3] [5,5] [6,2]

3 9 6
[4,1] [5,3] [6,5] [7,7] [8,2] [9,4]

4 10 7
[4,1] [5,3] [6,5] [7,7] [8,2] [9,4] [10,6]

5 14 9
[6,1] [7,3] [8,5] [9,7] [10,9] [11,11] [12,2] [13,4]
[14,6]

6 18 12
[7,1] [8,3] [9,5] [10,7] [11,9] [12,11] [13,13] [14,2]
[15,4] [16,6] [17,8] [18,10]
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