Towers of Hanoi

Cost: 4 | Solved: 62

Memory limit: 256 MBs

Time limit: 1 s

Input: input.txt

Output: output.txt

Task:

In the great temple of Benares, beneath the dome that marks the centre of the world, rests a brass plate in which are fixed three diamond needles, each a cubit high and as thick as the body of a bee. On one of these needles, at the creation, God placed 64 discs of pure gold, the largest resting on the brass plate, and the others getting smaller up to the top one.

This is the Tower of Brahma. Day and night unceasingly the priests transfer the discs from one diamond needle to another according to the fixed and immutable laws of Brahma, which require that the priest on duty must not move more than one disc at a time and that he must place this disc on a needle so that there is no smaller disc below it.

When the 64 discs have thus been transferred from the needle on which at the creation God placed them to one of the other needles, tower, temple, and Brahmins alike will crumble into dust and with a thunderclap the world will vanish.

Tower of Hanoi was one of the most popular quizzes in the XIX century. You have three needles and N discs on the first needle. Your task is to move all discs from the first needle to the third for the least number of moves. You are allowed to move only one disc per turn (and you can't put a bigger disc on a smaller one).

Input:

A natural N – the quantity of discs on the first needle ($1 \le N \le 16$).

Output:

You have to write the algorithm that solves the quiz for the given number N. The algorithm should represent a sequence of moves in the next format:

[Index of a disc] [Index of the needle on which a disc was] [Index of the needle on which a disc will be put]

Discs are numbered from 1 to ***N***, starting with the smallest one.

Example:

Input	Output
2	1 1 2 2 1 3 1 2 3
3	1 1 3 2 1 2 1 3 2 3 1 3 1 2 1 2 2 3 1 1 3