It is given a chess board with N*N squares. On the board there is a dice with the dimensions equal with one square on the board and occupies perfectly the surface of a square. On each side of the dice there is an integer value between 1 and 100.

The dice can move by rotating itself with 90º around one of it`s edge on the board. With this move it can go in the upper, lower, left and right square. With more moves, the dice can go to each square on the board. The cost of a path is equal to the sum of the values on the side on the board, including the first and the last position.

Giving you the dimension of the board N, the six values on the sides of the cube, the starting position and the final position, find a minimum path from the starting position to the finish one. You must save in a file the length of the minimum path and the path itself.

Input data: file cube.in
N // board dimension
face back left right up down // the 6 values on the sides of the dice
x1 y1 x2 y2 // the positions of the start and finish squares, with 1 to N numbering

Output data: file cube.out
C // the cost of the minimum path
L // the length of the path, as number of moves of the dice
x1 y1
x2 y2
.....
xL yL // the positions of the squares in the path

Observations: At the start, the cube is positioned with the "face" side in the positive direction of Oy axis, the "right" side on the positive direction of Ox and the "top" on the positive direction of Oz.

All the coordinates start from 1.

Limits:
    1<=N<=100

Example:

cube.in	cube.out:
8 2 1 1 8 1 1 3 2 4 2	6 6 3 2 3 1 2 1 2 2 3 2 4 2

Other details:
You must put your solution in an archive named *ADC_H<number>_<name>_<group>.zip* and send it to ssteflea@gmail.com

The archive must contain:
        your solution
        a Readme file with the description of the algorithm and it`s complexity. You can put in it the OS and the compiler you used.
        The languages accepted are Java/C/C++/C#/Pascal/Matlab.
        The deadline for this assignment is 17 January 2009 23:59. At this assignment there can be no delays, so the solutions received after 17 January won`t be graded.
        Don`t forget to read the rules about assignments: http://adcfils.wordpress.com/assignements/