

A two player game: There are four boxes in a 2×2 grid like this:

The first player puts numbers in two of the boxes. The second player (afterwards) puts numbers in the other two boxes. People choose their own numbers, and the first player gets to choose which boxes (obviously the second player just gets the leftover boxes).

The second player wins if they manage to make the row sums equal (add up the first row, you should get the same as if you add up the second row), and the column sums equal. Otherwise the first player wins.

2nd P Win:

25	25
25	25

 or

50	0
0	50

1st P Win:

25	25
10	40

 or

20	10
20	10

The rules don't require the row sums to be equal to the column sums for 2nd P to win. Notice that in the first 1st P win, the row sums are both 50, but the column sums are 35 and 65, hence 2nd P loses. In the other 1st P win, column sums are 40 and 20, hence 2nd P loses.

Who has the advantage in this game? How do you win?

How much harder is the game if we require that the row sums are equal to each other AND to the column sums?