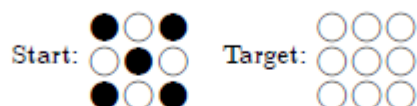
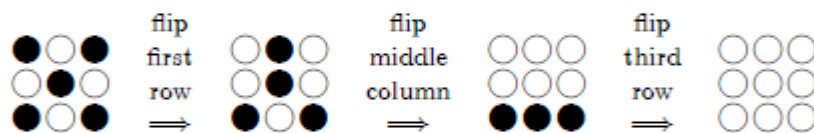


The game of *Ozflip* is for one player and involves circular counters, which are white on one side and black on the other, placed in a grid. During a game, the counters are flipped over (changing between black and white side uppermost) following certain rules.

Given a particular size of grid and a set starting pattern of whites and blacks, the aim of the game is to reach a certain target pattern. Each “move” of the game is to flip over either a whole row or a whole column of counters (so one whole row or column has all its blacks swapped to whites and vice versa). For example, in a game played in a three-by-three square grid, if you are given the starting and target patterns



a sequences of three moves to achieve the target is:



There are many other sequences of moves which also have the same result.

(i) Consider the two-by-two version of the game with starting pattern



Draw, in the blank patterns below, the eight different target patterns (including the starting pattern) that it is possible to obtain.



What are the possible numbers of white counters that may be present in these target patterns?