HOMEWORK 7 There are no points for this homework and you are not supposed to turn this homework in. It is only meant to help you prepare for test 5.

In the following problems assume that the game is that of infinitely repeated Prisoner's Dilemma with one-shot payoffs of 0, 1, 3 and 5 and "w=1".

Problem 1.
Consider an evolutionary Prisoner's Dilemma game played in an ecology where proportion p of the players plays strategy i and proportion 1-p plays strategy j. Assume, that i and j are different strategies. Let u(i) denote the payoff to strategy i in this ecology, i.e., $u(i) = p\,u(i,i) + (1-p)\,u(i,j)$.

Can you construct an ecology where i=TFT and u(i)>u(j) for all values of p, $0<p<1$?
Can you construct an ecology where i=TFT and u(i)<u(j)? Would u(i)<u(j) hold if p is sufficiently close to 1?
Can you construct an ecology where i=TFT and u(i)=u(j)? Would u(i)=u(j) hold if p is sufficiently close to 1?

Problem 2.
Consider now an evolutionary Prisoner's Dilemma game played in an ecology where proportion p_i of the players plays strategy i, proportion p_j plays strategy j and proportion p_k plays strategy k.

Now ask the same questions as in Problem 1. Are you answers different?