Assignement 5

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Theory

Answer 1]

The payoff matrix between Cooperator and defector is given to be a=3, b=0, c=5, d=1.
The number of rounds in the game is 4. Then the payoff matrix of a game between TFT and ALLD (in this order) will be:
a'=4*a, b=b+(m-1)*d, c=c+(m-1)d, d=4*d. Since we are taking the fitness to be the same as payoff, thus the equilibrium frequency will be :

$$x^* = \frac{b-d}{b-d-a+c} \tag{1}$$

Putting the values we get,

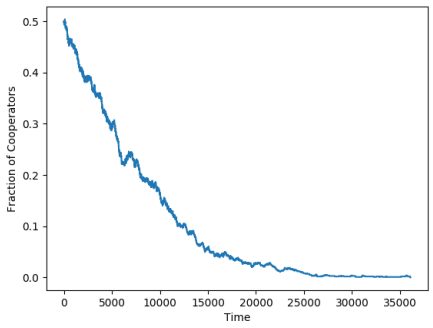
$$x^* = \frac{b-d}{b-d-ma+c+(m-1)d} \tag{2}$$

Putting the values we find the **equilibrium frequency = 0.2**

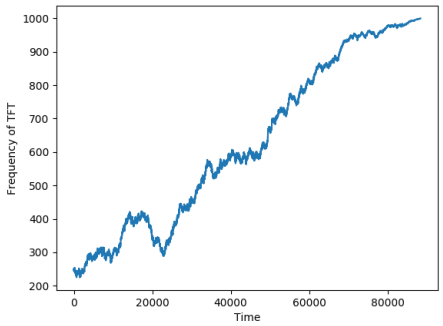
Simulation

Answer 1]

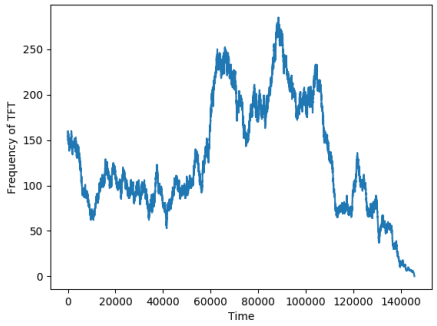
1] 2 i] 2 ii]



(a) Cooperator(500) VS Defector(500)



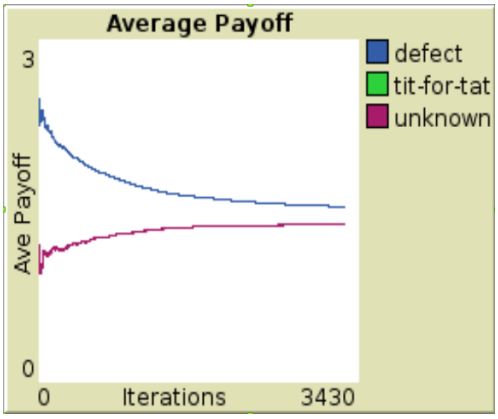
(a) TFT(250) VS ALLD(750)



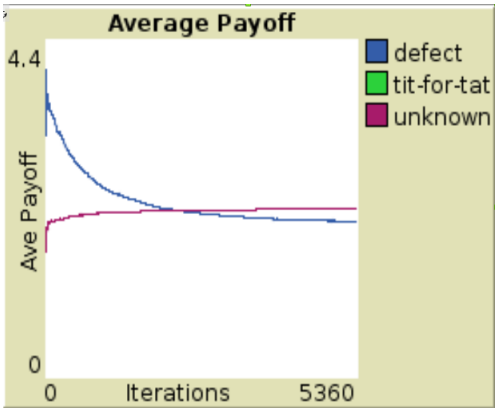
(a) TFT(150) VS ALLD(850)

Answer 2]

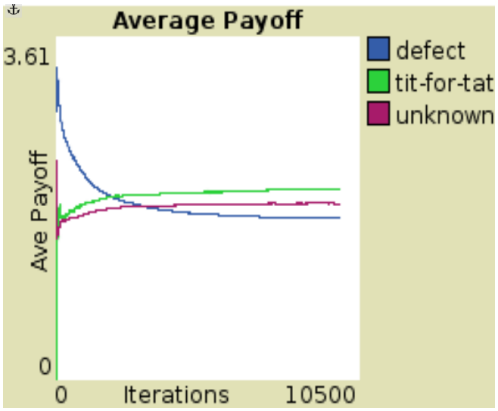
1 i] ii]
2i] 2ii]
2iii]



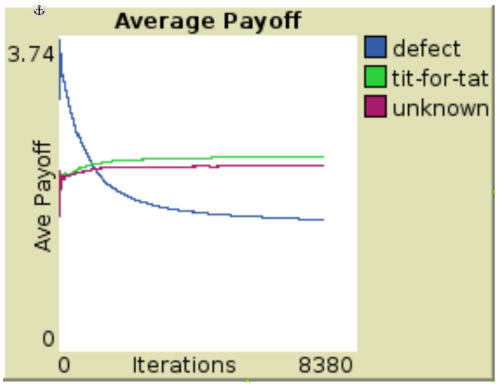
(a) GTFT(1/3) VS ALLD(2/3)



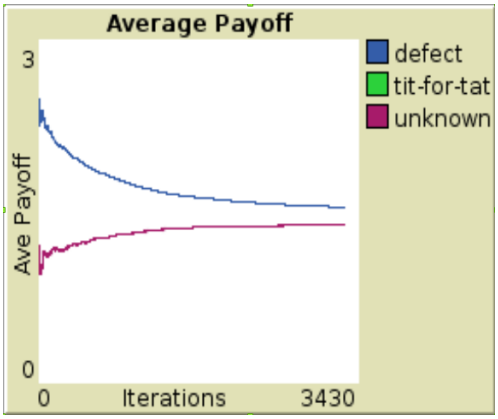
(a) GTFT(2/3) VS ALLD(1/3)



(a) TFT(ϵ) VS GTFT(1/2) VS ALLD(1/2)



(a) TFT VS GTFT VS ALLD



(a) GTFT VS ALLD(ϵ) VS TFT(ϵ)