Assignment 6

Moran Process for competition between TFT and ALLD : Obtain the fixation probability of TFT for **w=1** for varying population sizes when evolution occurs according to the Moran process. Assume, the two types of individuals making up the population are TFT and ALLD. Take a population of size **N** in which there is just ***one*** TFT and ***(N-1)*** ALLD **initially**. **Neither type can mutate to the other.**
Use a=3,b=0,c=5,d=1 for the payoffs in the PD game between C & D. Use m (#rounds of the game)=10

Note: Payoff to a TFT when it interacts with another TFT is $F_{TFT,TFT} = ma$

Payoff to a TFT when it interacts with an ALLD is $F_{TFT,ALLD} = b + (m-1)d$

Payoff to an ALLD interacting with another ALLD is $G_{ALLD,ALLD} = md$

Payoff to an ALLD interacting with a TFT is $G_{ALLD,TFT} = c + (m-1)d$

Write a program in which evolution of the population structure occurs according to the Moran Process i.e. in every generation only **one** individual is picked at random for death and **another** individual is picked for reproduction with a probability proportional to its fitness. **Run the simulation for as long as it takes for any one of the two types to get fixed in the population.**
Repeat the above simulation for **Nt=1000** trials and find out how many times TFT gets fixed ? (Note that the value of Nt is given as a guideline. In some cases, if necessary, you may have to choose Nt>1000. Use your judgement to choose an appropriate value for Nt if Nt=1000 is not sufficient!)

Combine all of your results to plot the N*ρ_TFT vs N plot.
Use N=100, 150, 200, 250, 300, 350, 400, 600, 800, 1600

Verify that your plot looks like Fig.7.9(a) in Nowak's book.

Submission Deadline: April 9, 2018.