Evolution of Cooperation in Spatial Games

The purpose of this lab is to allow you to build a model from the ground up based on what you have learned. I would like you to create a model to show how cooperative behavior can evolve when populations are not well mixed. Here are the design parameters

1. Create a population of turtles – one on each patch in the Netlogo environment, with a random mixtures of cooperators (blue) and defectors (red) . I suggest you have a slider for the proportion of cooperaters ranging from 0 to 1.
2. At each timestep let each turtle play a single game of prisoners dilema with each of its 8 neigbours, keeping track of its total fitness from playing the games. With cost -1 and benefit b being a slider variable the matrix is.

	C	D
C	b-1	-1
D	b	0

3. After all the turtles have played their games let each turtle find out who is the fitest turtle in its neighbourhood and if it is less fit than this adopt that strategy as its new strategy (and color) for the next round. (Cautionary note: You need to do this in two steps. First have all the turtles record the strategy of the fitest neighbour. Then once all turtles have done this have the turtle change its strategy if required. All turtle should reset their fitness to zero at this stage in prepartion for the next round.
4. Experiment with your model and determine the different types of behavior it exibits. For which value of b is cooperative behavior dominant, for which values is defective behavior dominant. When is there an equilibrium?