Feedback — HW 6 processes on networks

You submitted this homework on **Fri 16 Nov 2012 8:37 AM PST**. You got a score of **10.00** out of **10.00**.

Question 1

Using the NetLogo simulation of a diffusion process on a small world topology, answer the following. If the infection rate is 0.25, and the recovery rate is 0.30, what is true of the diffusion processes in the regular lattice vs. rewired case:

Your Answer		Score	Explanation
◉ shortcuts prolong the amount of time an established infection can stay in the network	✓	2.00	you should be able to see the infection persisting pretty much indefinitely in the network
Total		2.00 / 2.00	

Question Explanation

Look for the number of infected individuals in the long run. You may need to reinfect the network a few times to start to see the difference in behavior.

Question 2

Using the NetLogo model of graph coloring on a network grown randomly or preferentially, answer the following (setting m = 1). What is true about a time it takes for the network to find a solution:

Your Answer	Score	Explanation

preferential attachment generates a topology that is solved more slowly than one generated with random attachment.	✓	2.00
Total		2.00 / 2.00

Question Explanation

If you're not sure about the answer here (though VARY-BA-TOPOLOGY should allow you to answer this), check Kearns et al. paper (listed in the syllabus) where they used human subjects to run this experiment and generally get similar results.

Question 3

Use the NetLogo cascade model with the 19_4 network (setup19_4 button, a = 3, b = 2, bilingual = off) and allocate opinion at random (or you can manually set the nodes' opinions using the select-blue and select-red buttons and clicking on individual nodes). Then allow the nodes to update their opinions until everyone is settled into their opinions. With these payoffs, how many distinct communities do you observe that can have a separate opinion from neighboring communities?

Your Answer		Score	Explanation
3	✓	2.00	there are 3 distinct communities, as show here
Total		2.00 / 2.00	

Question Explanation

With these payoffs you should be able to observe different opinions persisting in different parts of the network. Try setting individual nodes or re-randomizing to see a range of behaviors depending on the initial allocation of choices.

Question 4

Using the same NetLogo cascade model with the 19_4 network (setup19_4 button, b = 2, bilingual = off), how high does *a*, the payoff for choosing blue at the same time as a friend, need to be such that the whole network will adopt blue every time if at least one node adopts blue?

Your Answer		Score	Explanation
◉ 6	✓	2.00	
Total		2.00 / 2.00	

Question Explanation

There was an error in this question. The answer key says '6', but it would actually need to be 7 in order for the network to always converge to blue. Please answer this with '6' to get credit for the question. Previous explanation: To figure this one out, you may want to alloc-opinion with init-prob-blue 0. That way the whole network will have initially chosen red. Then use select-blue to set just a single node's opinion to blue.

Question 5

Use the NetLogo model of innovation on a network to answer the following. Relative to the average maximum solution achieved on a randomly grown topology, a network grown with preferential attachment will

Your Answer		Score	Explanation
◉ have roughly the same time to solution and max fitness	✓	2.00	if you run the model several times you should see similar convergence times (maybe the preferential attachment model is ever slightly faster, but not by 50%) and similar max-fitness achieved.
Total		2.00 / 2.00	

Question Explanation

Run the model repeatedly at the two extremes (prob-pref = 0 and prob-pref = 1)

and note how quickly the model converges and what is shown under agent-max.