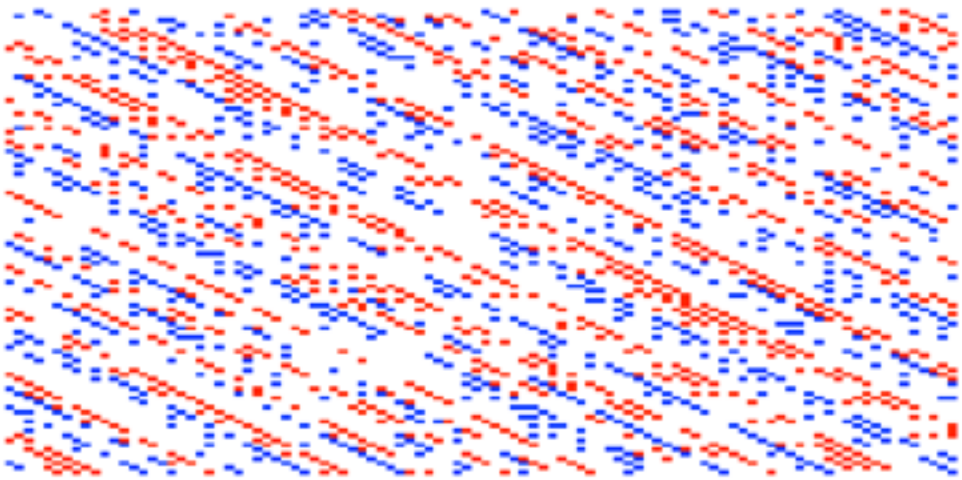
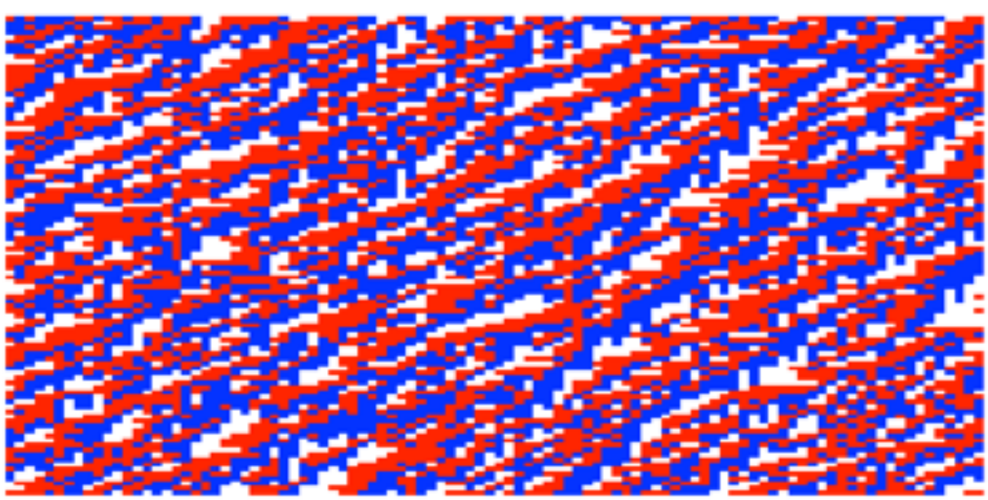
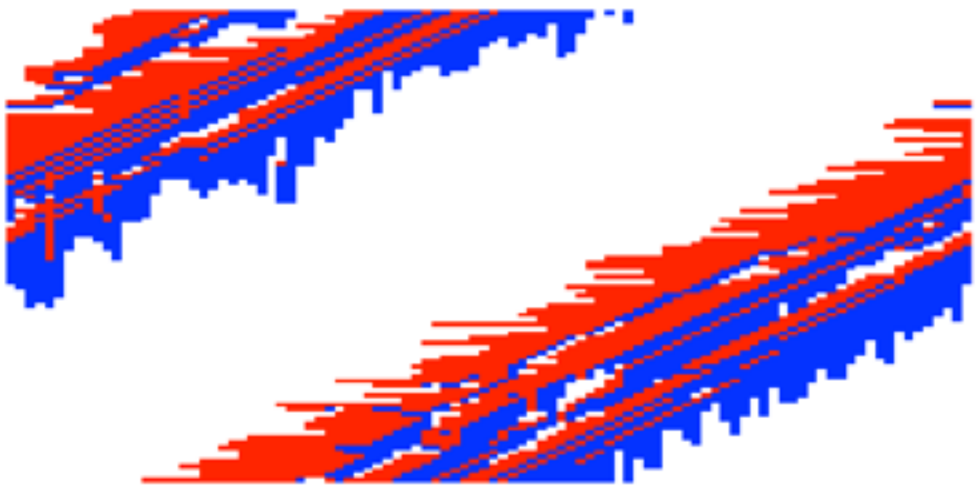
Question 1:
For p = 0.2, I find free flowing traffic after 2000 iterations on a 100*100 grid. I repeated the experiment for 5 times and each time I get a free flowing traffic. The figure shows what the traffic looks like after 2000 iterations.



For p = 0.8, traffic jam occurs after 60~70 iterations on a 100*100 grid. I repeated the experiment for 5 times and each time I get a gridlock (though at different iterations). The figure shows the gridlock that occurs after 61 iterations.



For p = 0.4, sometimes I get free flowing traffic and sometimes I find traffic jams on a 100*100 grid. I repeated the experiment for 5 times and I get a gridlock for 2 times. As shown in the figure below, traffic jam occurs after 741 iterations. At another run, traffic jam occurs after 541 iterations. However, for the other 3 runs, I get free flowing traffic after 2000 iterations. Thus, in the case of p = 0.4, it's a mixture of jams and free flowing traffic.



Question 2:
As mentioned in the question 1, the number of steps is different for different density p. As for p = 0.4, it takes 541 steps once and 741 steps once. However, for p = 0.8, it takes only 60~70 steps. As I allow more steps before determining the state, maybe I can find smaller p which can result in gridlock.

Question 3:
My critical density is at p = 0.4 on a 100*100 grid. When I run with p = 0.35, 0.38, 0.39 each for 5 times, the gridlock doesn't appear after 2000 iterations. However, if I run the experiment on an extremely small grid, the critical density will be very small. For example, I used p = 0.3 on a 1*1 grid. The gridlock appears in every run. Also, if I run the experiment on an extremely stretched grid (10000 * 1), p = 0.3 will result in gridlock every time. Thus, a stretched grid will result in smaller critical density.