Project 5: 1D traffic flow

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1   Project

In this report, the sites of cars are yellow, while the sites of vacant place are blue. The total number of sites is 20.

I set initial traffic randomly for a density from 0.1 to 1, where density = site of cars/number of all sites. A random initial configuration will quickly stabilise into a pattern. I show these evolution of density from 0.1 to 1 in fig 1 to fig 10

We calculate average velocity per car over the time period for densities between 0.1 to 1. We plot average velocity versus density in fig 11. We see that the average velocity decrease with increasing density of cars, which is consistent with our intuition.
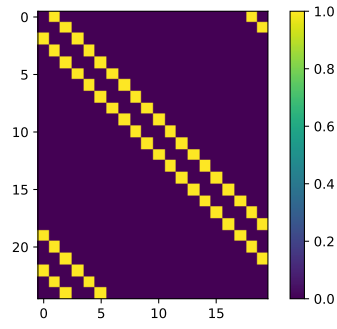
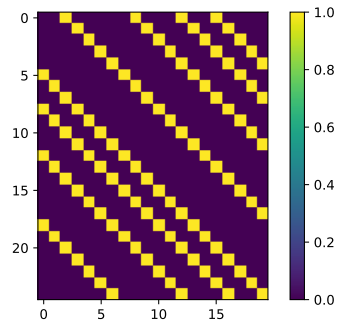Figure 1: Traffic pattern for density of 0.1

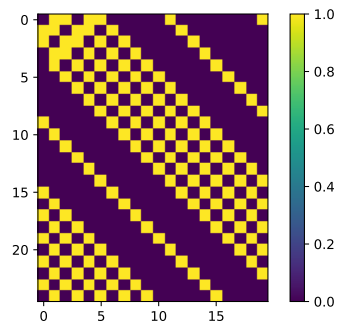Figure 2: Traffic pattern for density of 0.2

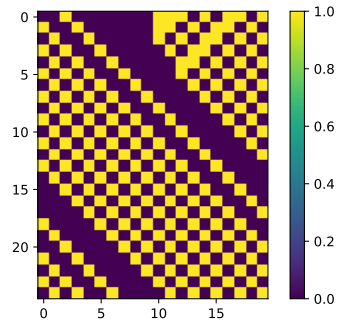Figure 3: Traffic pattern for density of 0.3

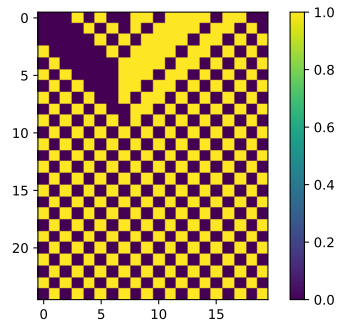Figure 4: Traffic pattern for density of 0.4

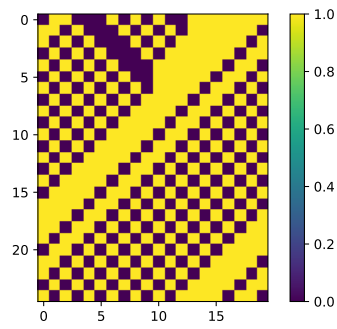Figure 5: Traffic pattern for density of 0.5

Figure 6: Traffic pattern for density of 0.6
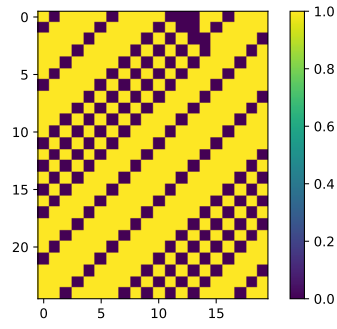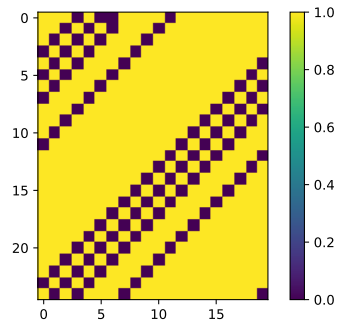
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Figure 7: Traffic pattern for density of 0.7

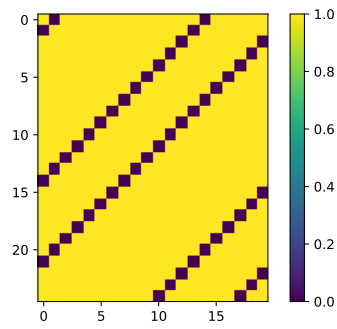Figure 8: Traffic pattern for density of 0.8

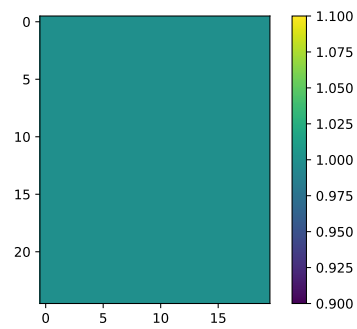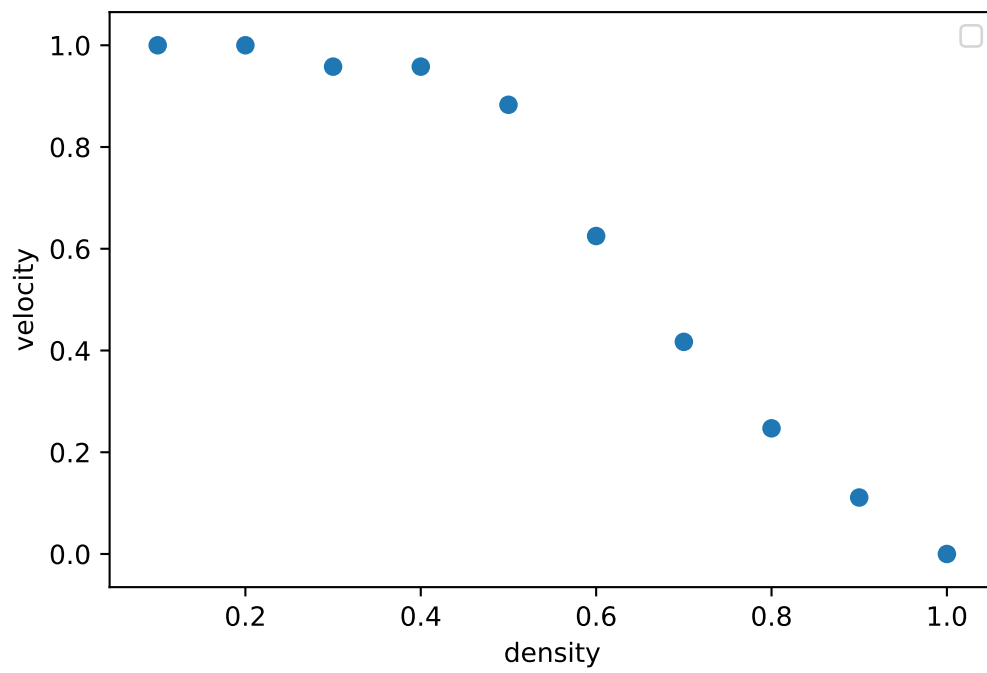Figure 9: Traffic pattern for density of 0.9

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Figure 10: Traffic pattern for density of 1

Figure 11: average velocity versus density