Diffusive and Stochastic Processes Programming assignment 2023

Odysseas Lazaridis

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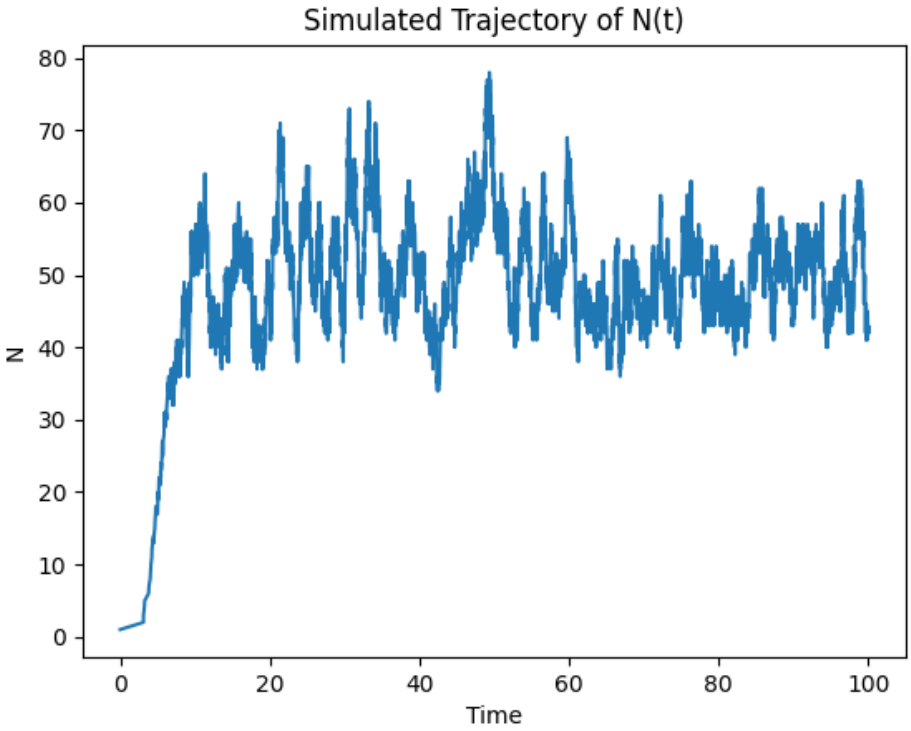
1a(i) 1a(2)

In the following plot, we can see the evolution of the population of the Bacteria



.
The mean in steady-state: 49.252
The variance in steady-state: 49.201829333333336

1 b(i)

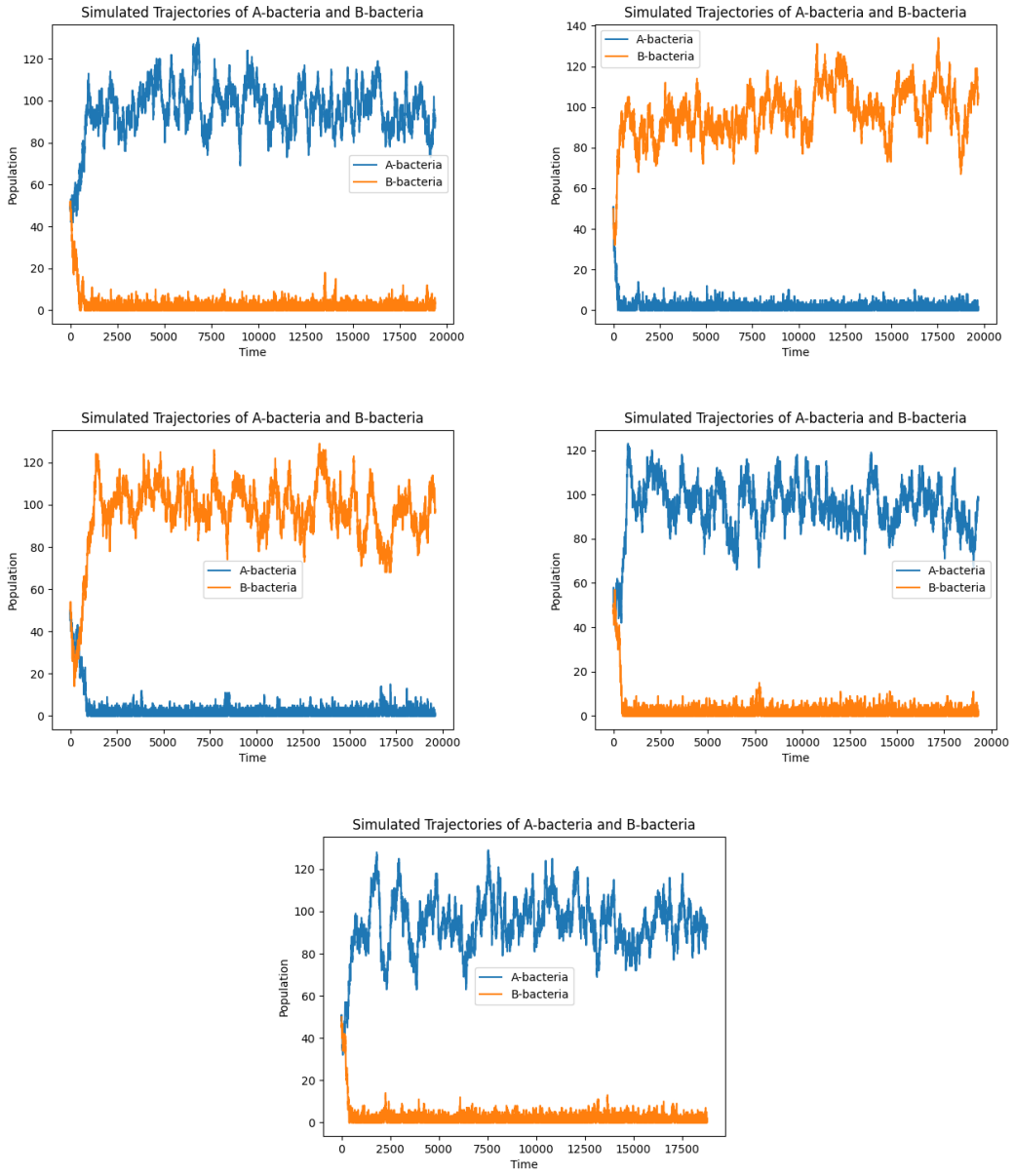
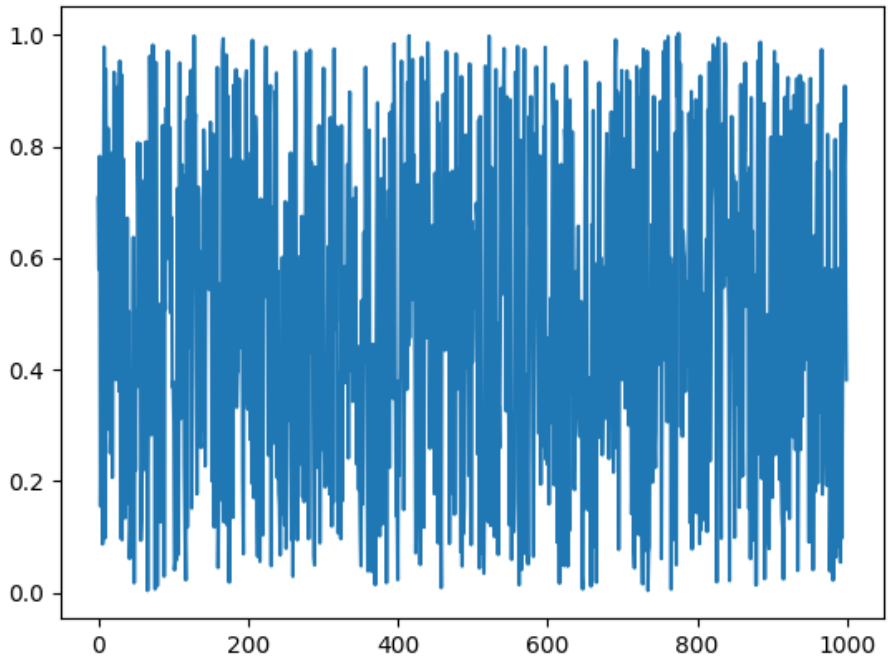
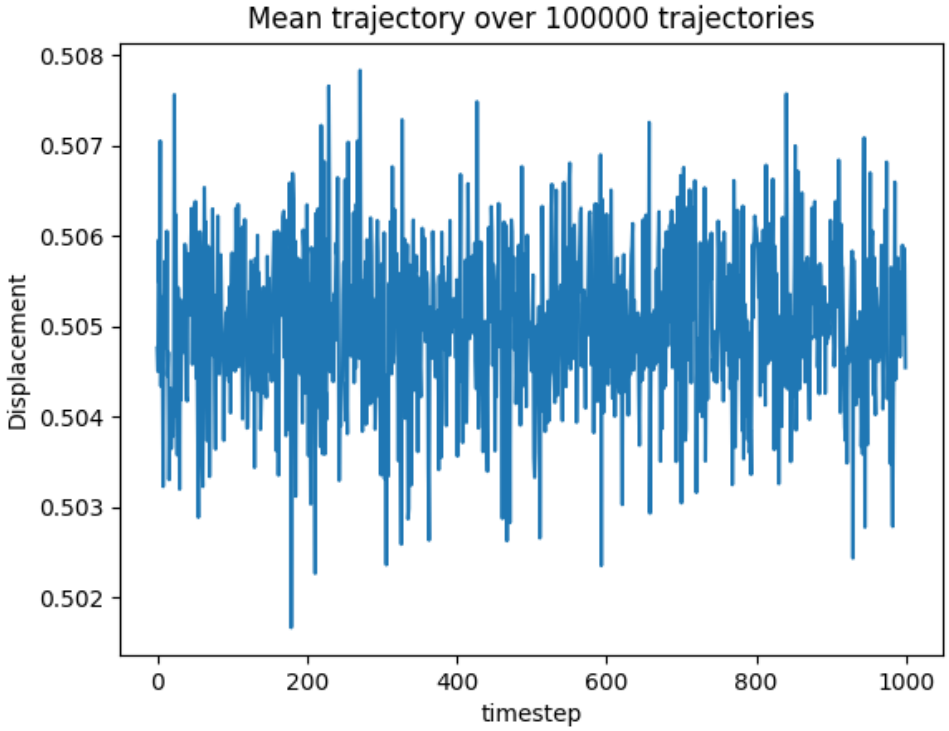


Figure 1: Here are five trajectories, we can see the the surviving population is not always the same. I tun the code for sufficient enough time, and in some occasions the conditions where perfect and the populations switched positions(which was fun).

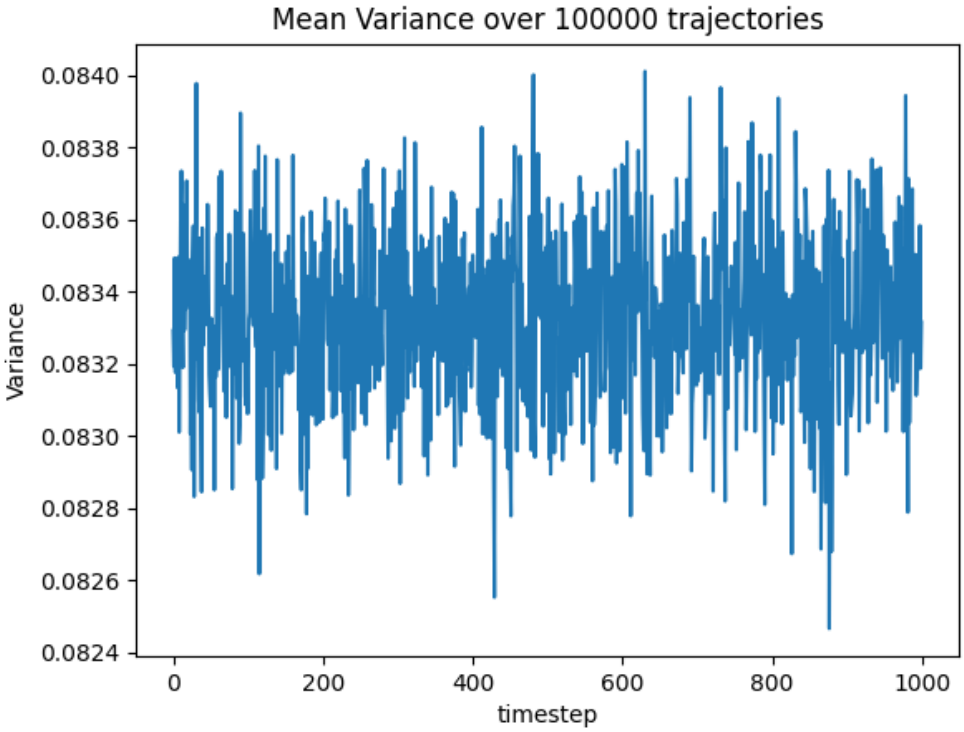
2 a(i)


1.0
0.8
0.6
0.4
0.2
0.0
0
200
400
600
800
1000

2 a(ii)


Mean trajectory over 100000 trajectories
Displacement
0.508
0.507
0.506
0.505
0.504
0.503
0.502
0
200
400
600
800
1000
timestep

2 a(iii)


Mean Variance over 100000 trajectories
Variance
timestep
0.0840
0.0838
0.0836
0.0834
0.0832
0.0830
0.0828
0.0826
0.0824
0
200
400
600
800
1000