Behaviour Dynamics in Social Networks - Assignment 1

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November 7, 2017

1 Simulating the Dynamics of Opinions in a Small Social Network in Excel

1.1 Results of simulation

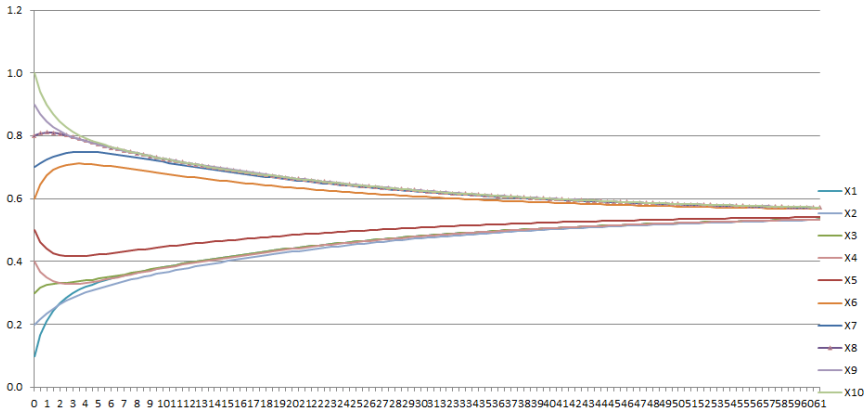

Figure 1: Simulation results

2 Communities and Bridge Connections

3 Simulating in Matlab

3.1 Initial Simulation

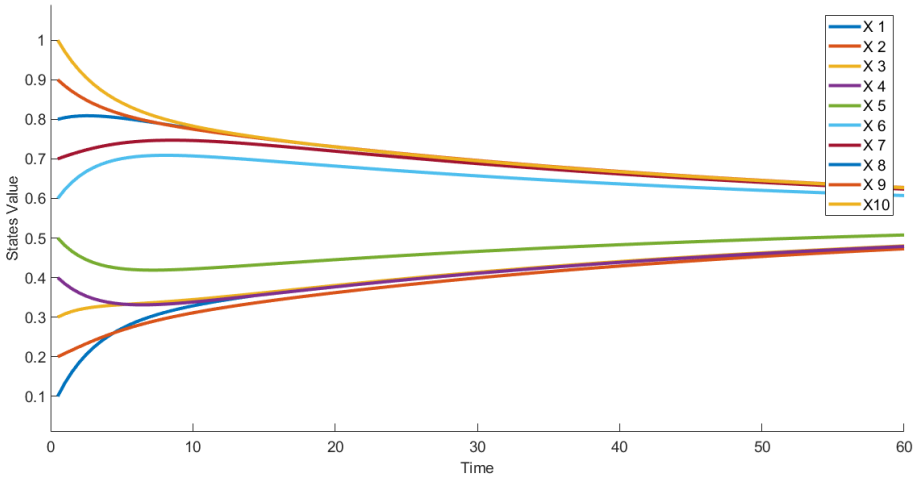

Figure 2: Initial Matlab simulation results

3.2 Δ t Change

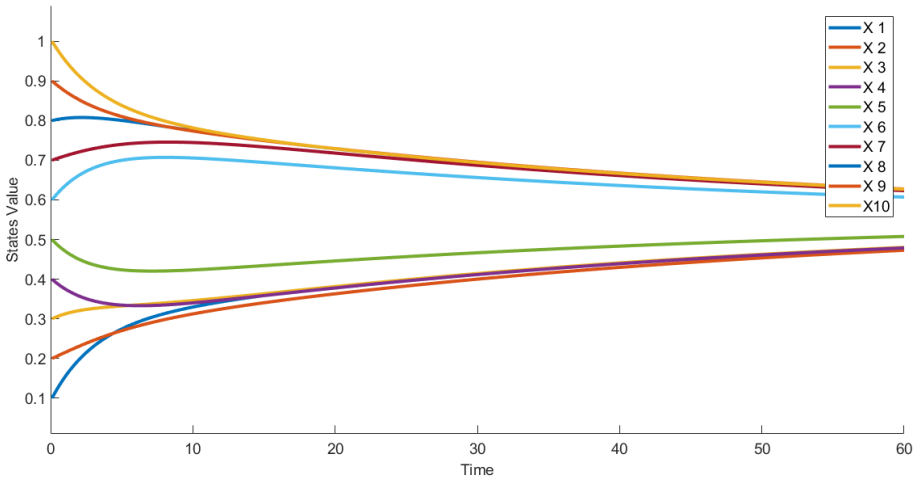

Figure 3: Resulting plot for Δ t=0.1

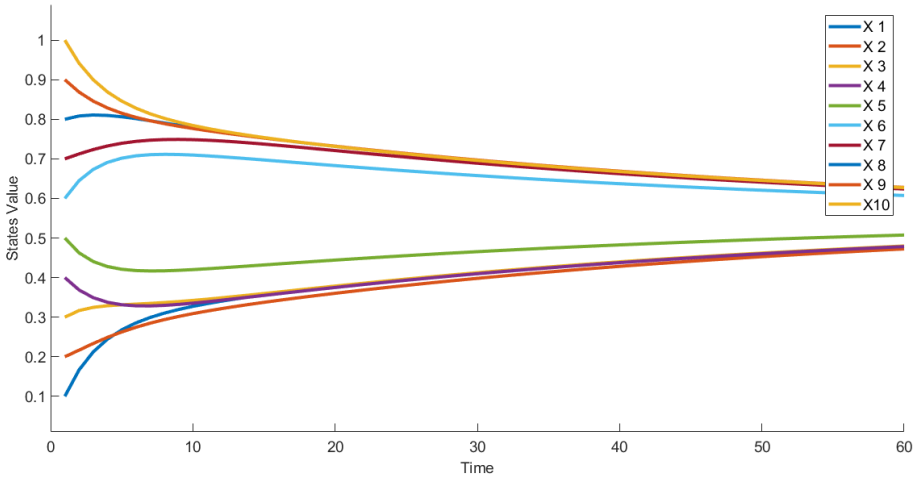

Figure 4: Resulting plot for Δ t=1

3.3 Speed Change

By changing the speed of the first state to 0, this state will no longer change its' value, no matter how many inputs it receives and how strong they are. This is because everything will be multiplied by 0, thus resulting 0. This can also be observed in Figure 4, where the plot for X1 is just a flat line. This change will also affect the other states because they are all interconnected somehow, making their values converge to a much lower value than before.

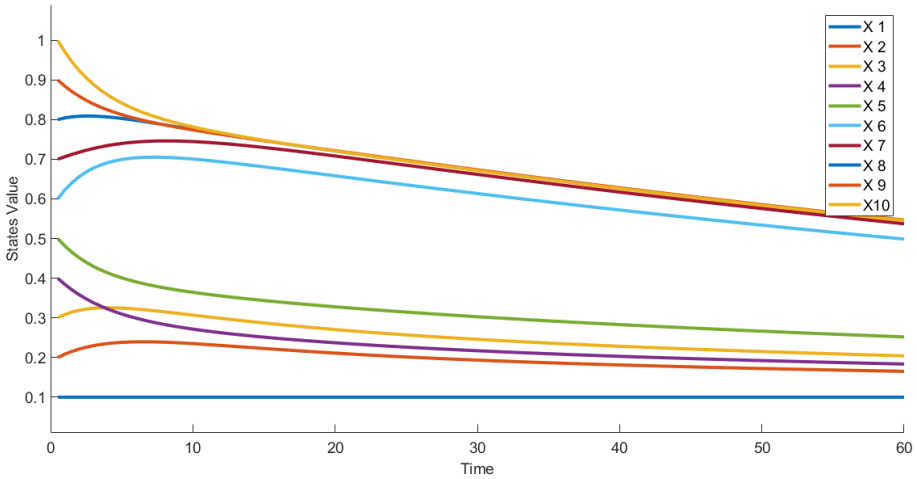

Figure 5: Resulting plot η_1=0

3.4 Communities and Bridge Connections in Matlab

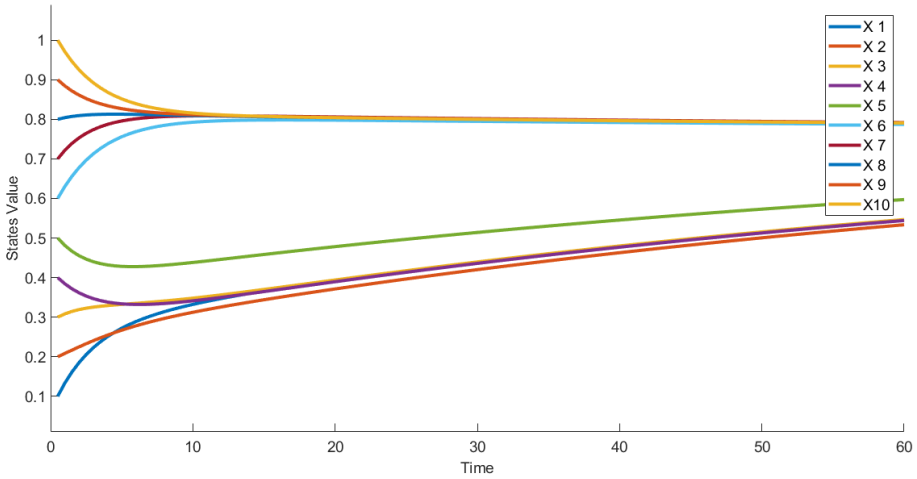

Figure 6: Resulting plot for $\omega_{5,6}$=0.1 and $\omega_{6,5}$=0.1

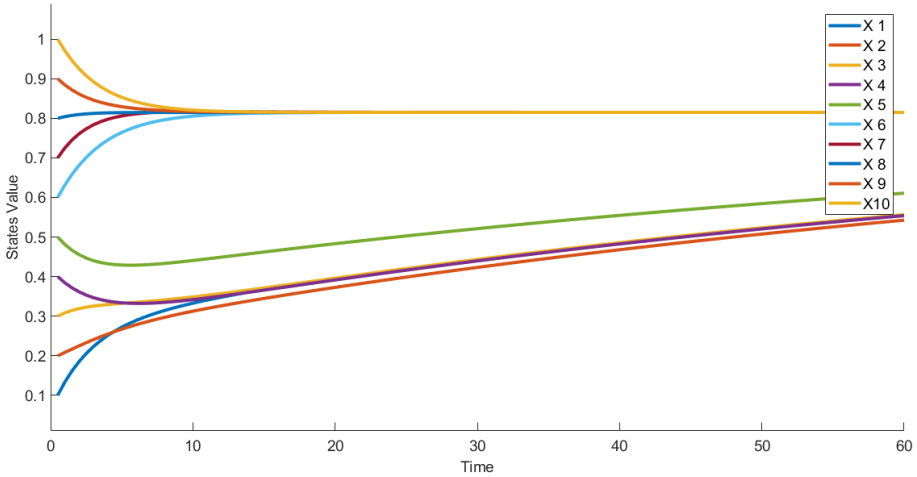

Figure 7: Resulting plot for $\omega_{5,6}$=0 and $\omega_{6,5}$=0

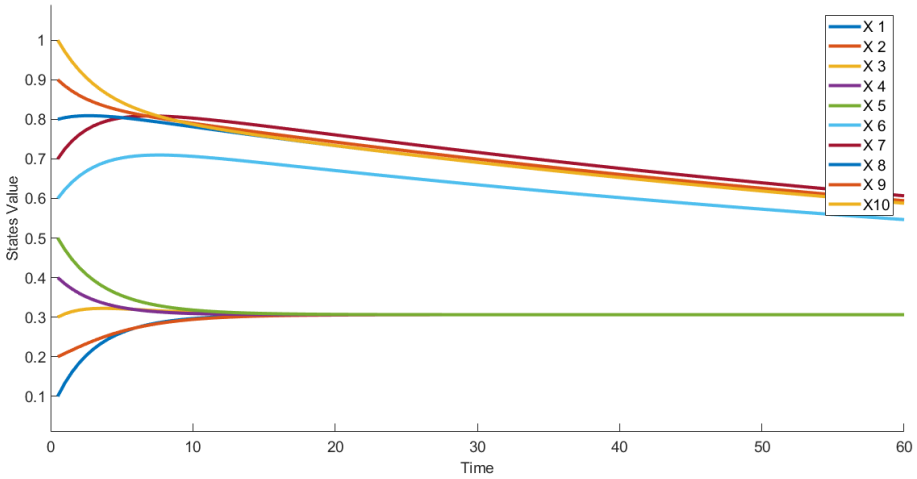

Figure 8: Resulting plot for $\omega_{5,6}$=1 and $\omega_{6,5}$=0

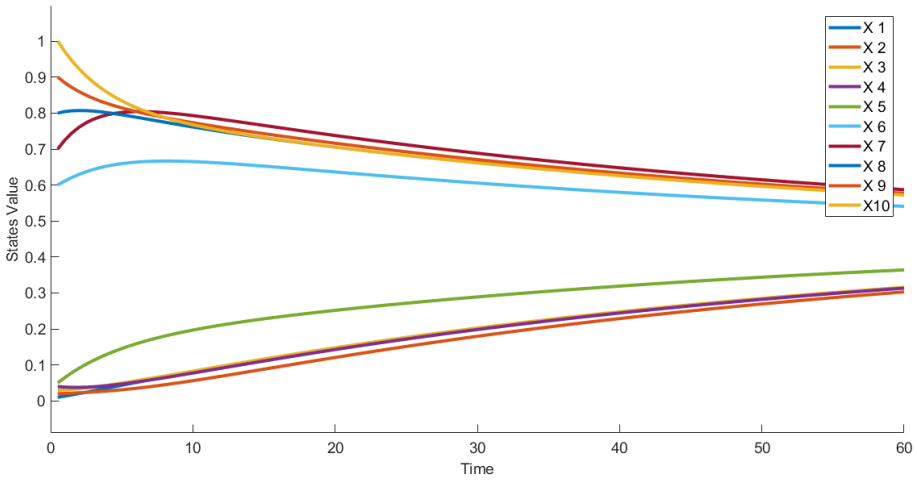

Figure 9: Resulting plot after multiplying the initial values of the members of the first community by 0.1