

Behaviour Dynamics in Social Networks - Assignment 4

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Abstract

Learn to use parameter tuning tools to find the best values for a set of missing parameter values in a model.

1 Part 1

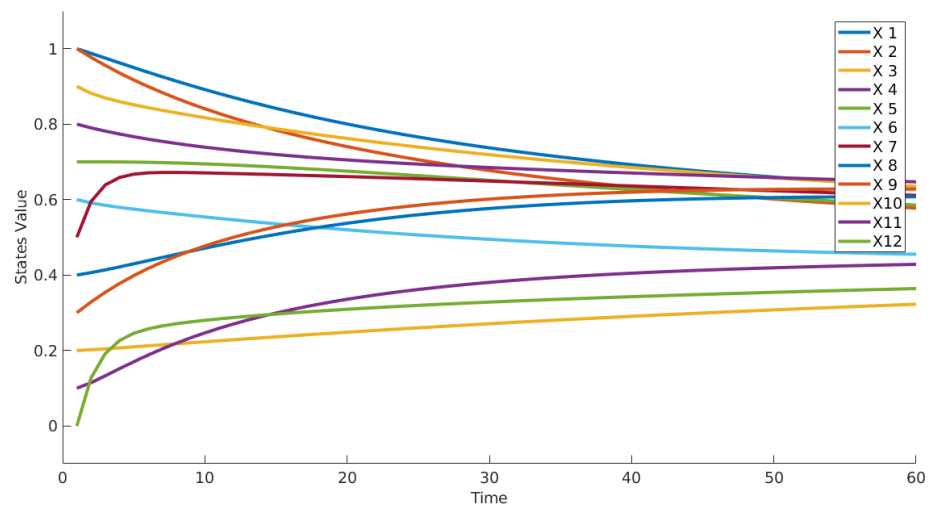


Figure 1: Results from the simulation

η_L	K(t = 2)	L(t = 2)	 K-L(t = 2) 	K(t = 13)	L(t = 13)	 K-L(t = 13) 	Sum of differences
0	0.1146	0	0.1146	0.2221	0	0.2221	0.3367
0.05	0.1146	0.0127	0.1019	0.2395	0.1232	0.1162	0.2181
0.10	0.1146	0.0255	0.0892	0.2517	0.1949	0.0568	0.1460
0.15	0.1146	0.0382	0.0765	0.2603	0.2359	0.0243	0.1008
0.20	0.1146	0.0509	0.0637	0.2664	0.2592	0.0072	0.0709
0.25	0.1146	0.0636	0.0510	0.2708	0.2724	0.0016	0.0526
0.30	0.1146	0.0764	0.0383	0.2739	0.2799	0.0060	0.0443
0.35	0.1146	0.0891	0.0256	0.2763	0.2844	0.0081	0.0337
0.40	0.1146	0.1018	0.0128	0.2781	0.2873	0.0092	0.0220
0.45	0.1146	0.1145	0.0001	0.2795	0.2892	0.0097	0.0098
0.50	0.1146	0.1273	0.0126	0.2806	0.2906	0.0100	0.0226

Table 1: Exhaustive search for different values of η_L

2 Part 2

3 Part 3

η_L	SSR	Error
0	0.9593	0.0816
0.05	0.0222	0.0124
0.1	0.0463	0.0179
0.15	0.1618	0.0335
0.2	0.2621	0.0427
0.25	0.3402	0.0486
0.3	0.4010	0.0528
0.35	0.4491	0.0558
0.4	0.4881	0.0582
0.45	0.5202	0.0601
0.5	0.5472	0.0616

Table 2: Exhaustive search for different values of η_L

The best value for η_L is $\eta_L=0.05$.

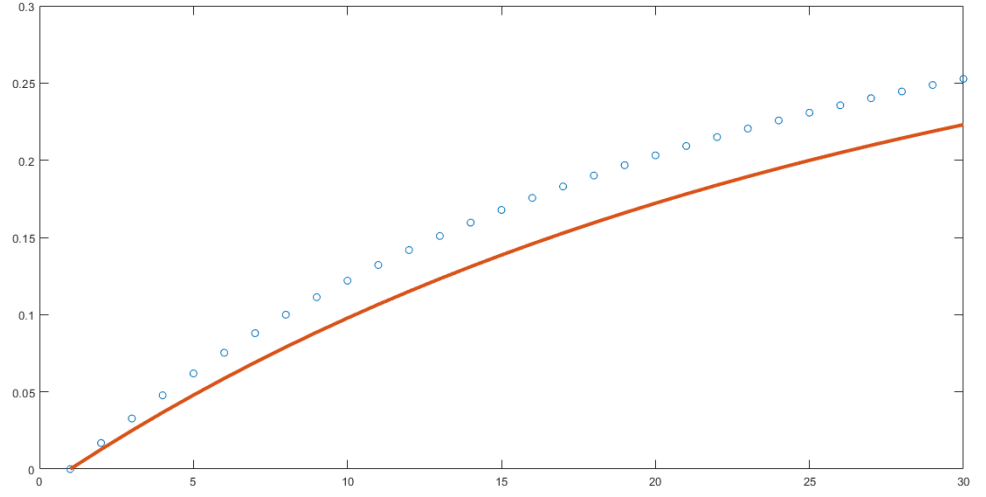


Figure 2: Simulated values for $\eta_L=0.05$ (line) vs empirical values (dots)

4 Part 4

η_i	value
η_1	0.21
η_2	0.11
η_3	0.06
η_4	0.12
η_5	0.1
η_6	0.04
η_7	0.15
η_8	0.21
η_9	0.14
η_{10}	0.03
η_{11}	0.2
η_{12}	0.162

Table 3: Exhaustive search for different values of η

If we want to use exhaustive search with grain size of 0.01, we should check 10^{12} sets of values.