University of Konstanz
Algorithmics Group
V. Amati / J. Lerner/ M. Nasim / B. Nick

Network Modeling
Winter Term 2012/2013

Assignments $\mathcal{N}^{\underline{o}}$ 6 - part ii

released: 30.01.2013 **due:** 05.02.2013, 10am

Task 1: Assumptions of SAOM — 3 points

At the beginning of the course we considered a friendship dataset from Facebook. Discuss which assumption(s) of SAOM is/are not reliable for analysing the Facebook dataset.

Task 2: Interpreting Parameter Estimates in SAOMs — 7 points

Given the paramater estimates in the table (on next page) from the study —"Teenage Friends and Lifestyle Study"(i.e. alcohol consumption[1]), consider the following statements:

a) drinking is a social event. You do as your friends do

b) there is a drinking segregation of friendship networks

c) girls want to be among themselves and so are boys

d) the distribution of drinking behavior is pushed to the extreme value

e) changes in friendship are less frequent than changes in behavior effects

[1] drinking behavior was coded as follows 1: non, 2: once or twice a year, 3: once a month, 4: once a week, 5: more than once a week

	estimates	s.e.	t-score
Network Dynamics			
constant friendship rate (period 1)	14.67	(1.52)	
constant friendship rate (period 2)	12.42	(1.04)	
outdegree (density)	-1.57	(0.06)	-26.17
reciprocity	2.41	(0.10)	24.1
transitive triplets	0.35	(0.07)	5.00
sex ego	0.15	(0.08)	1.875
sex alter	-0.15	(0.10)	1.50
sex similarity	0.66	(0.08)	8.25
drink ego	0.09	(0.07)	1.29
drink alter	-0.01	(0.09)	0.11
drink similarity	0.14	(0.06)	2.33
Behavior Dynamics			
rate drinkbeh (period 1)	1.60	(0.32)	
rate drinkbeh (period 2)	2.50	(0.42)	
behavior drinkbeh linear shape	0.44	(0.17)	2.59
behavior drinkbeh quadratic shape	-0.64	(0.22)	2.91
behavior drinkbeh indegree	0.12	(0.18)	0.67
behavior drinkbeh outdegree	0.01	(0.15)	0.07
behavior drinkbeh average similarity	1.34	(0.61)	2.20

1. Rephrase these statements according to the effects of the SAOM for the co-evolution of network and drinking behavior.

2. According to the estimated model, establish the truth of the statements.

3. Assuming that the overall mean of the drinking variable $\bar{z} = 2.1$ and the $sim_z = 0.63$, compute the contribution to the behavioral objective function for a pupil who drinks once or twice a year and has only friends who drink more than once a week.