Simulation data set

Social score
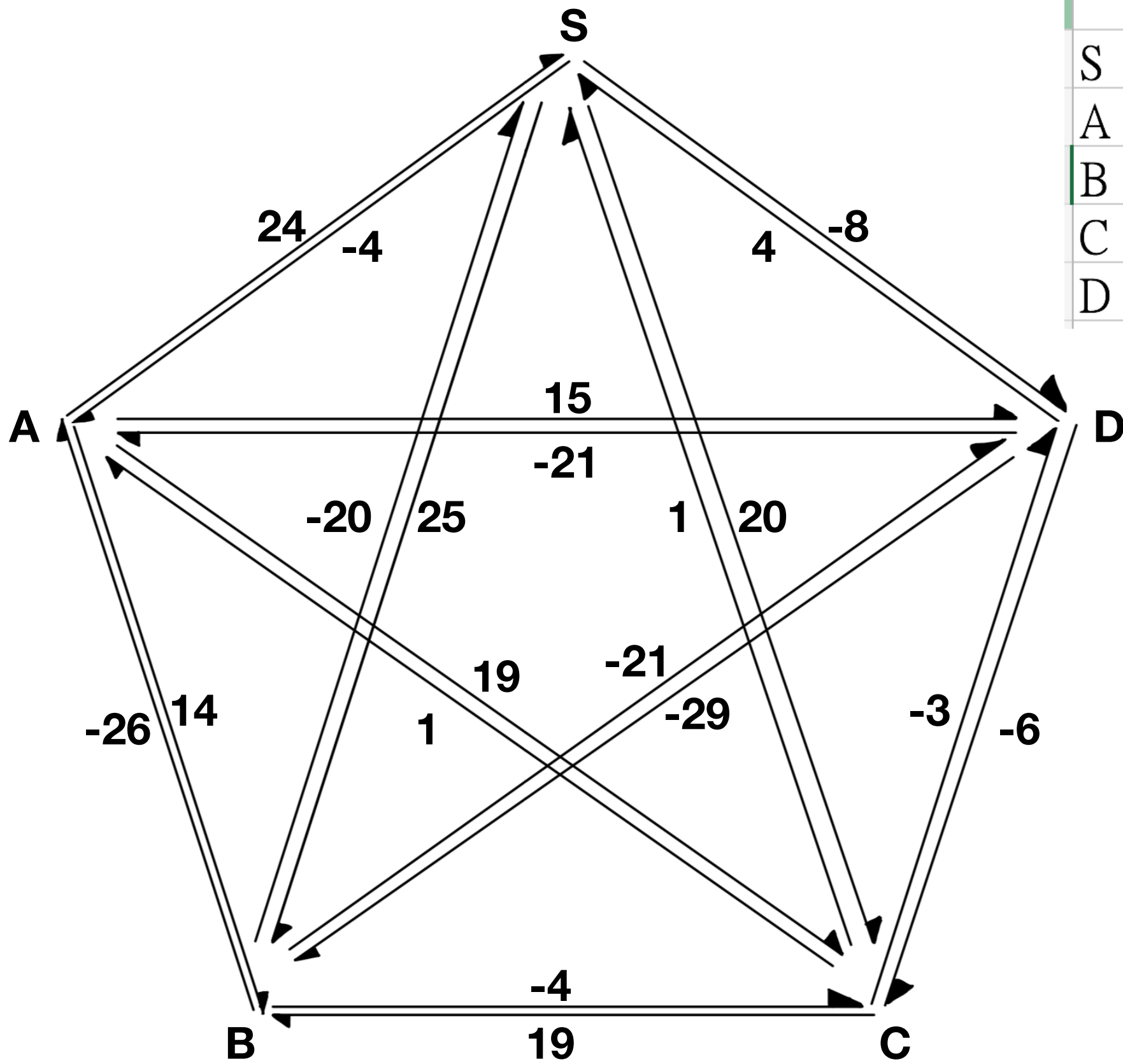
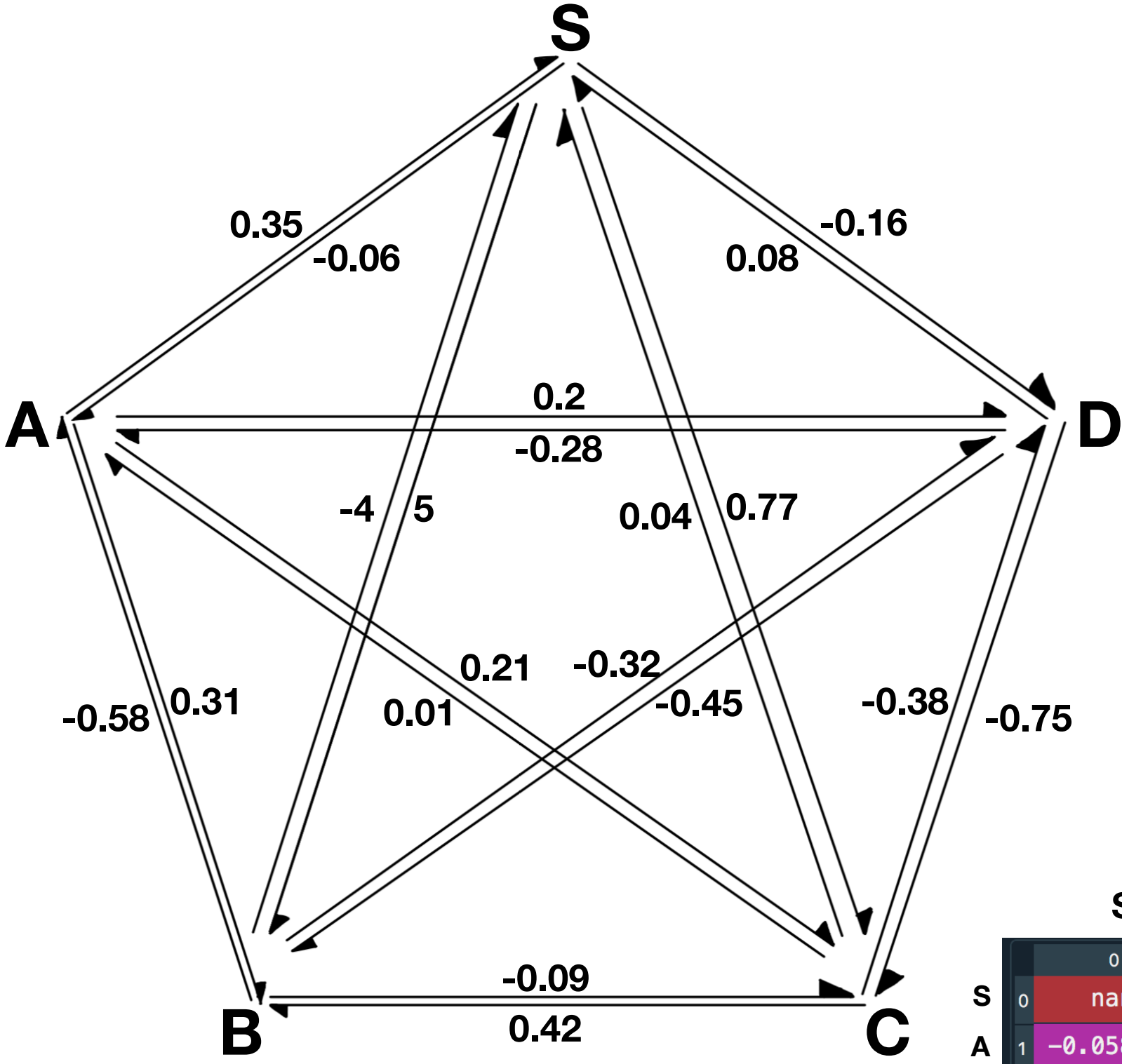|	S	A	B	C	D
S	0	24	-20	1	4
A	-4	0	-26	1	-21
B	25	14	0	19	-29
C	20	19	-4	0	-6
D	-8	15	-21	-3	0

Distance
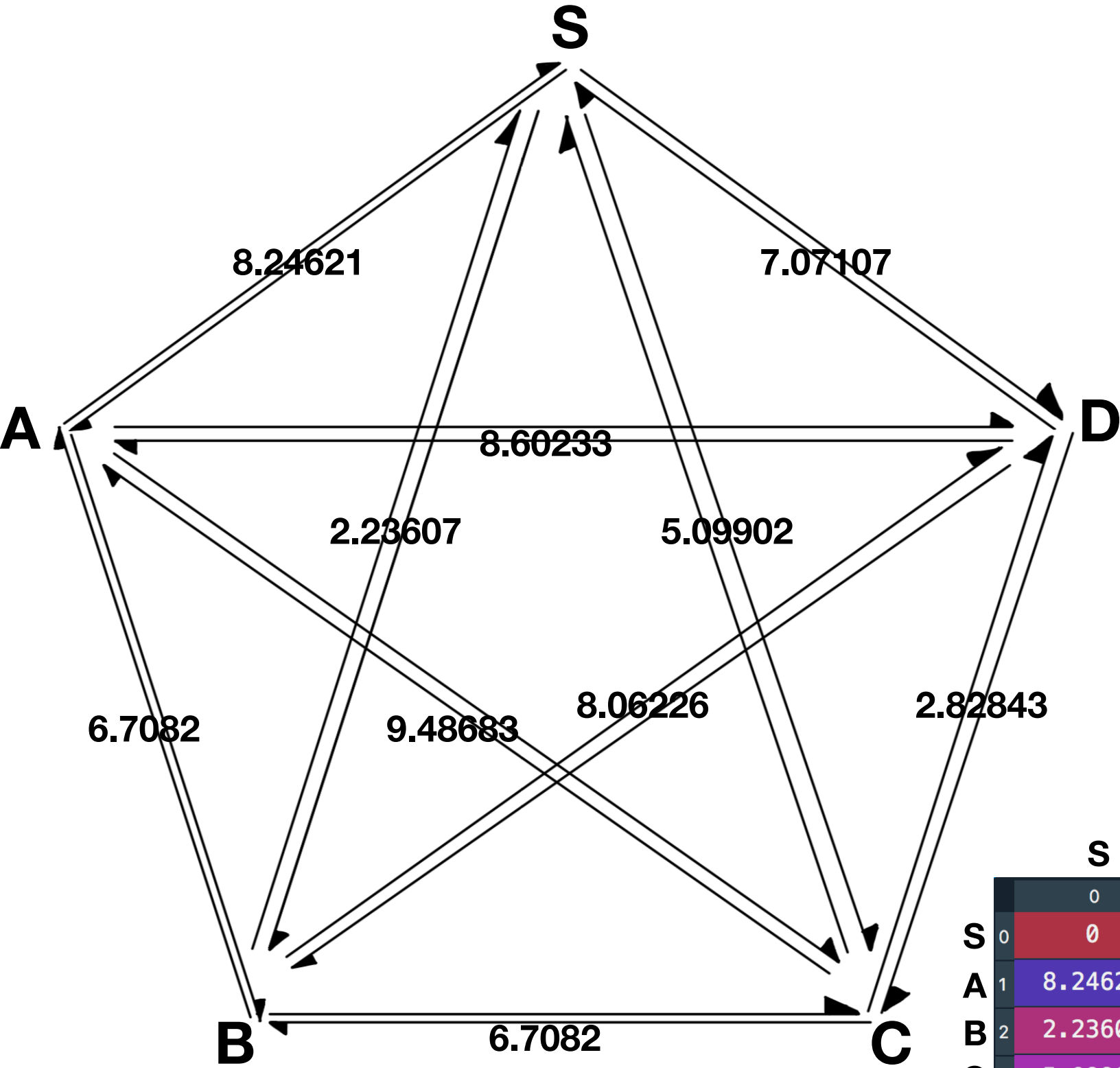
	S	A	B	C	D
	0	1	2	3	4
S 0	0	8.24621	2.23607	5.09902	7.07107
A 1	8.24621	0	6.7082	9.48683	8.60233
B 2	2.23607	6.7082	0	6.7082	8.06226
C 3	5.09902	9.48683	6.7082	0	2.82843
D 4	7.07107	8.60233	8.06226	2.82843	0

Force

$$F = \frac{g_{social}}{distance^2}$$

	S	A	B	C	D
	0	1	2	3	4
S 0	nan	0.352941	−4	0.0384615	0.08
A 1	−0.05882…	nan	−0.577778	0.0111111	−0.283784
B 2	5	0.311111	nan	0.422222	−0.446154
C 3	0.769231	0.211111	−0.08888…	nan	−0.75
D 4	−0.16	0.202703	−0.323077	−0.375	nan

Force vector

t=1
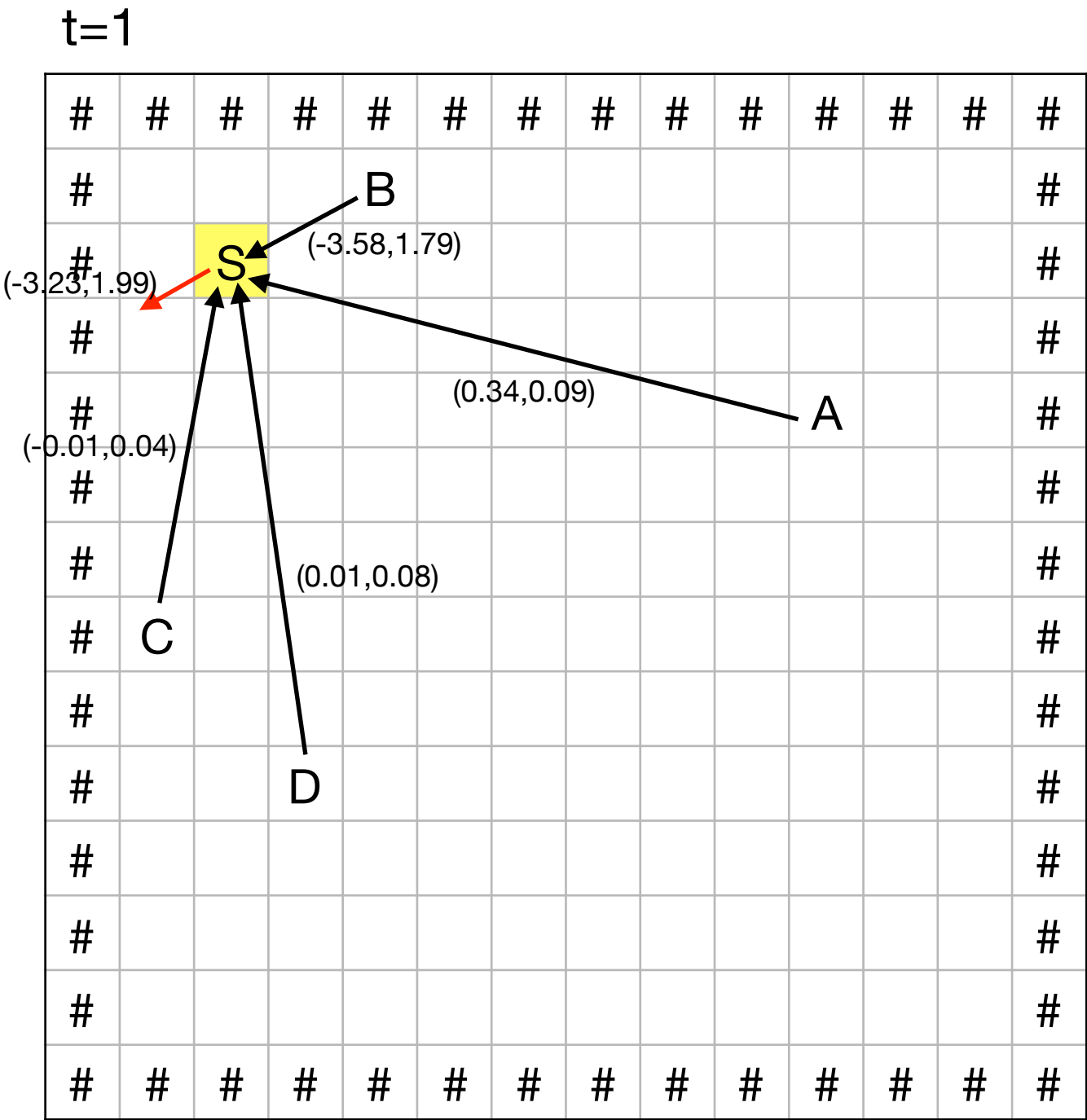
$$\overrightarrow{F}_{j\,res} = \sum_{i=S,A,B,C,D} \overrightarrow{F}_i$$

$$|F_i| = \frac{g_{social}}{distance_{ij}^2}$$

$$\theta = tan^{-1}\frac{\delta y_{ij}}{\delta x_{ij}}$$

Force vector

t=2

$$\overrightarrow{F}_{j\,res} = \sum_{i=S,A,B,C,D} \overrightarrow{F}_i$$

$$|F_i| = \frac{g_{social}}{distance_{ij}^2}$$

$$\theta = tan^{-1}\frac{\delta y_{ij}}{\delta x_{ij}}$$

	0	1
0	−0.851337	0.524619
1	0.794231	0.111225
2	−0.882165	0.47094
3	−0.169649	−0.985505
4	0.412666	0.62632