On February 5th, we talked about 4 situations in the simulation:

- L matrix (binary-valued) + Network Guided Thresholding (already done)
- C matrix (continuous) + NG Banding (already done)
- L matrix + NG Banding
- C matrix + NG Thresholding

Q1

I think the 3rd situation "L + NG Banding" is unfeasible, because we cannot know any ordering from a binary-valued information matrix.

Q2

The 4th situation "C + NG Thresholding". We must convert $\hat{C}(\eta)$ into $\hat{L}(l, p, q)$, where η is

> **Assumption 4.** *Represent the proxy correlation matrix as columns.* $C = (c_1, \ldots, c_N)$ *and* $\hat{C} = (\hat{c}_1, \ldots, \hat{c}_N)$. *Then*
>
> $$\exists \eta \in (0, 1], \forall i, \forall k, \lim_{T \to \infty} \Pr\{S_{\eta k}^{c_i} \subseteq S_k^{\hat{c}_i}\} = 1.$$

and l, p, q are

Parameter	Description
ρ	Determines how strong the correlation is and the sparsity of the covariance matrix Σ
l	Observation level, determines how we classify a pair (i, j) as important, i.e., $L_{ij} = 1$.
p	Conditional on $L_{ij} = 1$, the probability of actually observing $G_{ij} = 1$.
q	Conditional on $L_{ij} = 0$, the probability of observing $G_{ij} = 1$
τ	The Threshold level when we apply generalized thresholding operator on σ_{ij} where $G_{ij} = 0$.

Table 1: Description of varying parameters.

(G matrix in the old version notation is $\hat{L}$ in the new version notation.)

Q2.1

But there isn't an one-to-one match between $\hat{C}$ and $\hat{L}$.

Q2.2

You may think we can just pretend $\hat{L}_{fake} := I(i \in S_k^{\hat{c}_j} \wedge j \in S_k^{\hat{c}_i})$, where $\hat{c}_i$ is the i-th column of $\hat{C}$ and k is determined by the CV of NG Banding, then apply NG Thresholding.

But then, the only difference between the two methods is whether we apply thresholding on $\hat{\sigma}_{ij}$ where $\hat{L}_{fake} = 0$.