

Homework 2

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1 Question 2

Notice $P(G|\{g_i\}, \theta)$ is similar to binomial distribution with the probability of success, or the existence of an edge, as a variable. So we can write

$$P(G|\{g_i\}, \theta) = \prod_{i \neq j}^N p_{g_i, g_j}^{A_{ij}} (1 - p_{g_i, g_j}^{A_{ij}})^{(1 - A_{ij})} \quad (1)$$

and the assignment of g_i is just

$$P(\{g_i\}|\theta) = \prod_i^N n_{g_i} \quad (2)$$

With Bayes' theorem, we have

$$P(\{g_i\}|G, \theta) = \frac{P(G|\{g_i\}, \theta)P(\{g_i\}|\theta)}{\sum_{\{g_i\}} P(G|\theta)} \quad (3)$$