

Exercises for Statistical analysis of network data-Sheet 10

1. A directed network makes a distinction between the edge ij and the edge ji . If the directed network is Erdős-Renyi with the probability of an edge is ρ and you symmetrize the directed network to an undirected network, what is the distribution of $A_{ij} = \mathcal{I}(ij \text{ or } ji \text{ is present})$?
2. For a directed network, set the graphon as $f(x, y) = 2x \cdot 1$. Write down the "in" and "out" graphon. Determine the mean and variance of the in and out degrees, assume the A_{ij} 's are pairwise independent and that the graphon is in the format of the directed degree-based configuration model.