

Complex Networks

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Random graphs

The configuration model

Our ensemble

In our particular case, we define a random graph ensemble \mathcal{G} such that:

- the graph has N nodes;
- the graph is generated using the configuration model;
- the graph doesn't contain self-edges and multiple edges;
- we define a parameter π and the the graph is such that the fraction of the nodes $p_1 = 1 - \pi$ has degree 1, and the remaining fraction $p_4 = \pi$ has degree 4.

Examples of random graphs

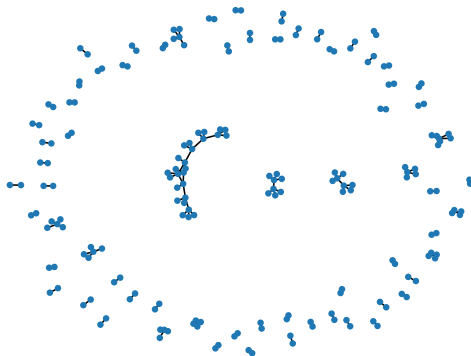


Figure: Instance of a random graph for $\pi = 0.1$

Examples of random graphs

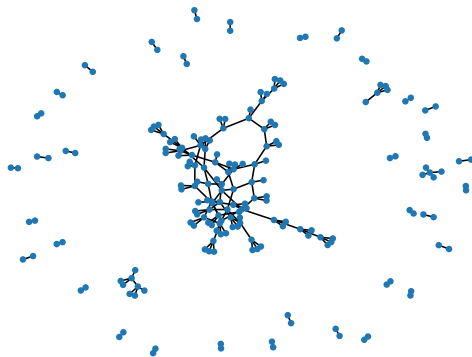


Figure: Instance of a random graph for $\pi = 0.3$

Examples of random graphs

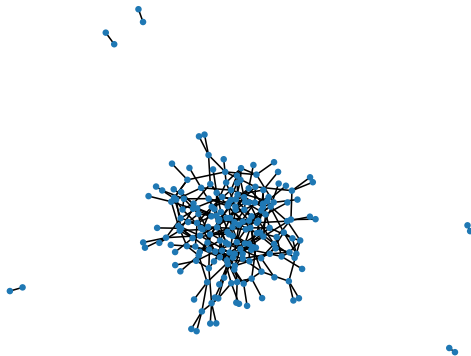


Figure: Instance of a random graph for $\pi = 0.7$

The size of the giant component

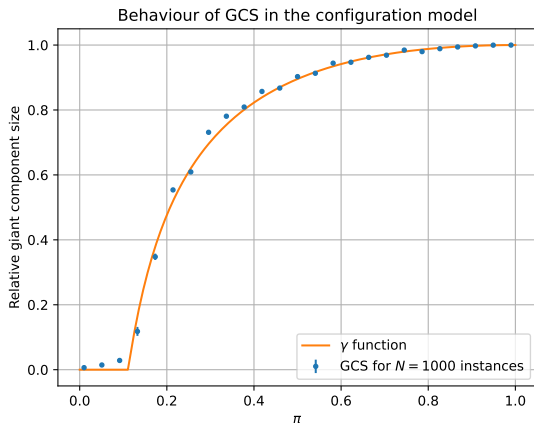


Figure: Comparison between theoretical value and measures from random instances of the size of the giant component

The size of the 3-core

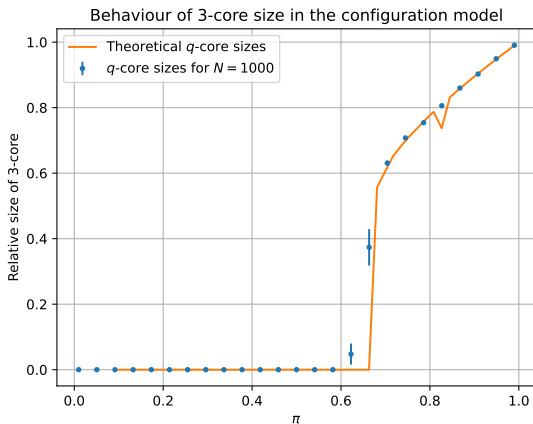


Figure: Comparison between theoretical value and measures from random instances of the size of the 3-core