Networks and Complexity

Solution 8-5

This is an example solution from the forthcoming book Networks and Complexity.
Find more exercises at https://github.com/NC-Book/NCB

Ex 8.5: Flashback to six degrees [2]

The mean degree of the human contact network is about $z = 150$. Estimate the proportion of people that are in the giant component. (Assume that the contact network is an ER random graph.)

Solution

We start with an initial guess $s_0 = 0.5$ and iterate

$$s = 1 - \mathrm{e}^{-sz}. \tag{1}$$

In this case already the first iteration step yields

$$s = 1 - \mathrm{e}^{-75} \approx 1 \tag{2}$$

At such a high mean degree we can expect everybody to be in the giant component.