$$\boxed{\text{Talk 11: Random regular graphs}}$$

Speakers. Nicolas Hotton & Jonathan Wächter
Date. Thursday, May 23.

Reference material

[Ell, JLR11]

Goal

The goal is to study random regular graphs (regular in the sense that every vertex has fixed degree), and to compute the limiting probability that they are simple (in the sense that they have no loops nor multiple edges) in the case of the so-called "configuration model".

Content

- Show that this limiting probability is $e^{-(d^2-1)/4}$ where d is the degree of every vertex (pages 2-7 in [Ell], it is a slightly more detailed presentation of Section 9.2 of [JLR11]). It is not necessary to present the proof of the multidimensional extension of the Poisson approximation theorem (Theorem 3 in [Ell]), but you can try to prove it during the preparation of your talks if you want.

References

[Ell]   David Ellis.   Notes available online https://snap.stanford.edu/class/cs224w-readings/ellis11expansion.pdf.

[JLR11] Svante Janson, Tomasz Luczak, and Andrzej Rucinski. *Random graphs*. John Wiley & Sons, https://faculty.sdu.edu.cn/_tsf/00/21/YvaIryj6ZvQf.pdf, 2011.