

Open lectures for PhD students in computer science
Combinatorial limits course by D. Král' and A. Grzesik
Assignment #3

1. Inspect the proof of Mantel's theorem and deduce the structure of the extremal graphs, i.e., graphs with $\mathfrak{L} = 0$ and $\mathfrak{f} = 1/2$.
2. Inspect the proof of Goodman's bound and deduce the structure of the extremal graphs, i.e., graphs with $\mathfrak{L} = \mathfrak{f}(2\mathfrak{f} - 1)$.
3. Let G_n be a graph on $\mathbb{Z}_n = \{0, 1, 2, \dots, n-1\}$ with xy being an edge if and only if $x - y \pmod n$ is equal to ± 1 , ± 2 or ± 3 . Prove that the sequence of graphs G_n is Benjamini-Schramm convergent.

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