

Homework 05

Due: February 26, 2021

Exercise 1. In class we proved a version of the Perron-Frobenius Theorem for symmetric matrices \mathbf{A} with non-negative entries and for which the graph $G(\mathbf{A})$ is connected. However, there are more general versions of this theory that apply to non-symmetric matrices with positive/non-negative entries. As such, the Perron-Frobenius theory has a wide range of applications. Your homework this week is to read about the more general version of the Perron-Frobenius theory, and some of its applications, in [1] (written by MSU's own Charles MacCluer!). There is nothing to turn in, but use the time you would have used working on homework this week to read the article. As a final note, there is one notable application missing from [1], which is Google's PageRank algorithm. You can search for this on the web, if you like; we might also cover it later on in the course.

References

- [1] Charles R. MacCluer. The many proofs and applications of perron's theorem. *SIAM Review*, 42(3):487–498, 2000.