Exercise set # 1 for the course
"Networked Dynamical Systems"

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1. This is a computational exercise about the PageRank algorithm. In the file `PageRank.mat` you will find an adjacency matrix representing hyperlinks of a section of the WWW.

   - Compute the PageRank order of the nodes implementing the power iteration method mentioned in class, and verify that indeed it represents the P.F. eigenvector.

   - How many interactions of the power method do you need to get to an error tollerance of 10^{-4} to the "true P.F. eigenvector" (the one computed using `eig( )` function of Matlab)?

   - Is the order of PageRank nodes invariant to changes of m? In particular what happens when $m = 0$?

   - in the paper

     H. Ishii, R. Tempo. "The PageRank problem, multiagent consensus and web aggregation", IEEE Control Systems Magazine, June 2014.

   at page 39-40, a distributed randomized method for PageRank computation is described. You should implement this method and compare its accuracy and speed of convergence to the (non-distributed) power method above.