Homework 12

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April 2012

1 Problem 1

Table 1 and Figure 1 summarize the convergence rate of the power iteration algoirhtm on the A matrix for a random initialization vector. Figure 1 plots the difference between the actual largest eigenvalue (as calculated by Matlab's `eig` command).

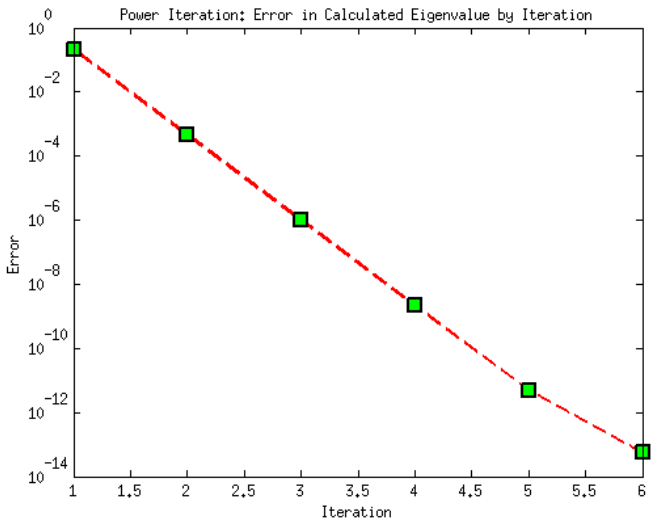

Figure 1: Power Iteration: Error in Calculated Eigenvalue by Iteration

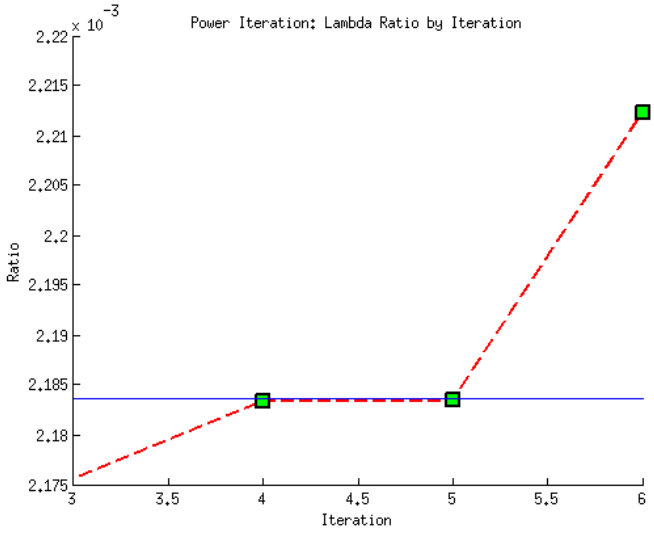

Figure 2: Power Iteration: Lambda Ratio by Iteration

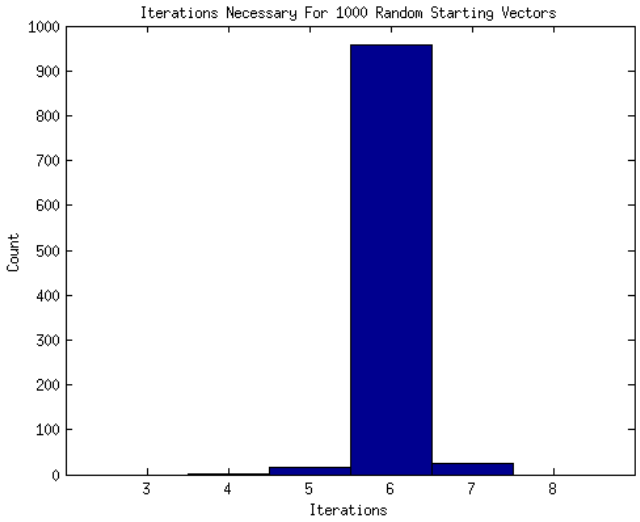

Figure 3: Power Iteration: Iterations Necessary for 1000 Random Starting Vectors

Iteration	Eigenvalue	Error
1	332.7815351291716	0.064780277883358
2	332.8461979585259	0.000117448529011
3	332.8463151514994	0.000000255555506
4	332.8463154064969	0.000000000558032
5	332.8463154070536	0.000000000001307
6	332.8463154070549	0.000000000000057

Figure 4: Power Iteration: Error in Calculated Eigenvalue by Iteration