

Homework: 7

Due November 17.

1. Compute the smallest eigenvalue of the 100-by-100 Hilbert matrix $H=1/(i+j-1)$. (Hint: The Hilbert matrix is also Cauchy. The determinant of a Cauchy matrix $C(i,j)=1/(x_i+y_j)$ is $\det C = [\prod_{i<j}(x_j-x_i)(y_j-y_i)] / [\prod_{i,j}(x_i+y_j)]$. Any submatrix of a Cauchy matrix is also Cauchy. You can use Cramer's rule in order to compute accurate formulas for H^{-1} and then compute its largest eigenvalue.
2. Trefethen 30.2