Math 104 **Fall 2009**

Homework 4

Due Wednesday, October 28, 2009

1. Exercise 3.5, Chapter 3 of Trefethen-Bau.
2. Let U be an $m \times m$ arbitrary unitary matrix. Show that $\|UA\|_2 = \|A\|_2$ and that $\|UA\|_F = \|A\|_F$. Deduce from this that we also have $\|AV\|_2 = \|A\|_2$ and $\|AV\|_F = \|A\|_F$, where V is an $n \times n$ (arbitrary) unitary matrix.
3. Exercise 5.3, Chapter 5 of Trefethen-Bau.
4. Exercise 6.1, Chapter 6 of Trefethen-Bau.
5. Consider the square matrices A and $B = A + \mu I$ for some scalar $\mu \in \mathbb{C}$. How do the eigenvalues and eigenvectors of B relate to those of A?