

Homework 11

Foundations of Applied Mathematics
Fall 2009

CSS-701
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Name: _____

Instructions: This homework must be submitted electronically before 8:00 AM (central time) Monday November 23, 2009. You are expected to show *all* your work. You must provide all codes and programs specifying the computer language you have used for your work. Nice graphics when appropriated and a comprehensive analysis is expected.

1. Vectorize the formula (13.3.12), then write an algorithm and a code (in your favorite language) and use formula 13.3.15 to replicate the graphs in Figure 13.8.

2. The size-classified matrix model for the desert tortoise is said to have “Low fertility” if $F_6 = 0.0420$, $F_7 = 0.0690$ and $F_8 = 0.0690$.

Perform a perturbation analysis of the desert tortoise model with low-fertility, including sensitivity and elasticity analysis for the eigenvalue and corresponding eigenvectors, and lower-level parameters. Include graphs and tables when appropriated following the above instructions. Your work should finish with comments on observations that are noteworthy, if any.