Exercises

Introduction

These questions are not necessarily designed to be answered in order! Choose ones that interest you, or explore the Toolbox help and run some of the examples found there.

Question 1

By using NAG routine X01AB write a MATLAB function that returns the value of Euler's Constant.

Question 2

S15AB returns the value of the cumulative Normal distribution function. Use this to write a MATLAB function that returns the value of the cumulative Normal distribution at the point x.

Question 3

Write a function to solve a real symmetric positive definite system of equations with multiple right-hand sides using both F07FD and F07FE. Check that it works for the example given in the F07FE documentation.

Question 4

Using a NAG routine produce two vectors of length n both containing normally distributed numbers, with mean 0 and standard deviation 2. Plot the pairs of vectors against each other.

Now generate vectors of uniformly distributed numbers, again using a NAG routine, and plot them on the same axis.

Question 5

Use D01AH to find the area under the sine curve between 0 and pi. Using the documentation look what other information can be retrieved on output from the routine and print it out. Try other functions making sure you check the value of ifail on exit.

Question 6

Find the zeros of the cubic polynomial $x^3 - 6x^2 + 11x - 6$. Plot the function to check your result.

Question 7

Compute the positive eigenvalues (not eigenvectors) of a random symmetric matrix. Use MATLABs eig to ensure you have done so correctly. Time the two for large matrix sizes, remembering to suppress the output to the computational routines.