# Homework Assignment 4
## Due on Friday 10/26

**Programming Problems:**

1. Use Matlab help to learn what the commends "tic", "toc" and "fsolve" are and how to use them. Solve $\cos(x) = \sin(x)$ by the bisection method, Newton's method and fsolve. Set the error tolerance for the bisection method and Newton's method to be $10^{-11}$. The initial interval for bisection method is $[0.2, 0.8]$. The initial value for Newton's method and fsolve is $p_0 = 0.2$. List the absolute errors obtained in three method and running time you need. You can use $\pi/4 = 0.785398163397448\cdots$ as the exact answer to compute the absolute errors. Which method is faster? You do not need to submit the code for this problem.

2. Implement the backward substitution and Gaussian elimination for general matrices. Save your code as function M-file and submit them to num_ana@math.nthu.edu.tw

**Writing Problems:**

Do the following exercise problems in the text book by Bradie,

Sec 3.1: 3*. 6*, 7, 9(a)*, 11, 13

Sec 3.2: 1(a, e), 3*, 8*, 10*

Do 3 in Sec 3.1 and 8, 10 in Sec. 3.2 by hand, and calculator if you need, but without using codes. You can use your codes to solve 11 and 13 in Sec. 3.1.

We only discuss * problems in discussion section.