Preparation guide for Midterm 01

The exam problems will be closely related to your homework problems. Make sure you understand all of them.

1. Review study guide for quiz 01 and quiz 02.

2. Section 2.4: Review relevant estimates for fixed point iteration and Newton's method. Also how to accelerate convergence of Newton's method in case of multiple roots. Study problem 13 thoroughly, understand why it gives 3rd order convergence (cubic convergence).

3. Section 2.5: Study Aitken's Δ^2 method and Steffenson's Method and corresponding estimates in the textbook and homework.

   Study how to obtain rate of convergence numerically by means of scaled plot and/or finding relevant constants as in homework 02.

4. Section 10.1-10.2: Study Newton's Method for systems of nonlinear equations. Practice the implementation.

   Study how to transform $f(x) = 0$ into $x = g(x)$ in the case of systems of equations and solve it with fixed point iteration. Study how to accelerate convergence by a proper choice of the parameter matrix α. Practice the implementation.