

## Homework Assignment for Week 05

1. Section 10.1: Problems 3(a,b), 4(a,b).
2. As in the scalar case, where knowing the approximate value of  $f'(x_*)$  would help to design a fixed point iteration for solving the equation  $f(x) = 0$  by finding a suitable equivalent form  $x = g(x)$  by introducing a free parameter  $\alpha$ . Try apply this technique to the following system of equations

$$\begin{aligned}1x_1 + 2x_2 + 0.03 * \sin(x_1 + x_2) &= 4 \\5x_1 + 6x_2 + 0.07 * \cos(x_1 - x_2) &= 8\end{aligned}$$

and find a convergent fixed point iteration. If the equivalent form is not obvious to you, to use the trick as in the scalar case, but take  $\alpha$  to be a  $2 \times 2$  matrix.

3. Section 10.2: Problems 7(a,b), 14.