

EAS6939 Homework #5

1. Minimize $f(\mathbf{x}) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ by means of Newton method. Use the initial estimate $\mathbf{x}^0 = [0, 0]$.
2. Apply two steps of the steepest descent method to the minimization of $f(\mathbf{x}) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$. Use the initial estimate $\mathbf{x}^0 = [0, 0]$.
3. Apply the conjugate gradient method to the minimization of $f(\mathbf{x}) = (2x_1 - x_2)^2 + (x_2 + 1)^2$ with $\mathbf{x}^0 = [\frac{5}{2}, 2]$.
4. Determine the first updated matrix \mathbf{A}_1 when applying DFP method to the minimization of $f(\mathbf{x}) = 3x_1^2 - 2x_1x_2 + x_2^2 + x_1$ with $\mathbf{x}^0 = [1, 1]$.