Nonlinear programming: Homework 6

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1   Unconstrained optimization

- Read and understand the code for unconstrained optimization provided on the web page (steepest descent, Newton's method, quasi-Newton's method, conjugate gradient)

- For each of the following functions, compare the different methods in terms of number of iterations until convergence and trajectories:

$$f_1(x, y) = \frac{1}{2} \left(x^2 + 10y^2 \right) \tag{1}$$

$$f_2(x, y) = 100(y - x^2)^2 + (1 - x)^2 \tag{2}$$

$$f_3(x, y) = e^{x+3y-0.1} + e^{x-3y-0.1} + e^{-x-0.1} \tag{3}$$

Test different starting points, and different parameters for Armijo's rules.

2   Constrained optimization (preparation)

- install the `CVX` package.

- browse through the `CVX` user guide.