Algorithms for optimisation
Problem Set # 4
Due date: 19/02/2020

Simulated Annealing

Find the optimum of the function $f(x) = 0.2 + x_1^2 + x_2^2 - 0.1 \cos(6\pi x_1) - 0.1 \cos(6\pi x_2)$, using simulated annealing, with x0 = [0.8, -0.5].

(a) Plot the evolution of both variables with respect to the number of iterations

(b) Plot the evolution of the objective function with respect to the number of iterations

Linear Programming

Solve the optimisation problem below

$$\begin{aligned} \underset{x}{\text{minimize}} \quad & c^\top x \\ \text{subject to} \quad & Ax \leq b \\ & x \geq 0. \end{aligned}$$

with

$$c^\top = \begin{bmatrix} 2 & 1 & 3 \end{bmatrix}$$
$$A = \begin{bmatrix} 0.5 & -0.5 & 1 \\ 2 & 0.5 & -1.5 \end{bmatrix}$$
$$b^\top = \begin{bmatrix} 2.5 & -1.5 \end{bmatrix}$$

using the affine scaling method. Take the initial guess as $x_0^T = [1\ 1\ 1]$.