Homework Local Search

1) Exercise 4.1

2) Use the min-conflict (local search) method to solve the 4-Queen problem. Start with the queens on the main diagonal. Break ties randomly.

3) Compute the following gradients:

\[ f(x, y, z, t) = (x - 1)(2 - y)z + (t^3 - 1)xyz \]
\[ g(x, y) = \frac{1}{1 + \exp(-(ax + by + c))} \]
\[ h(x, y, z) = (x - 1)^2 \exp(x) + (y - 2)^3 z^3 \]
\[ c(x, y, z) = (x - z - 2y^{-2})^b \]
\[ g(x, y) = 2(x - 1)^2 + 2(y - 2)^2 - 2(x - 1)(y - 2) \]

Where \( a, b, c \) are some arbitrary constants.

Provide pseudo-code for a gradient descent algorithm that minimizes \( g(x, y) \).