

# Homework 3

Prof. Welling

cs171

due: Th, May 3

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1. Use the min-conflict (local search) method to solve the 4-Queen problem. Start with the queens on the main diagonal. Break ties randomly.
2. Exercise 5.2 (page 158)
3. Exercise 5.3 (page 158)
4. Exercise 5.5 (page 159)
5. Compute the following gradients:

- a)

$$f(x, y, z, t) = (x - 1) * (2 - y) * z + z * (t^3 - 1) * x * y$$

- b)

$$g(x, y) = \frac{1}{1 + e^{-(ax+by+c)}}$$

where  $a$ ,  $b$  and  $c$  are some constants

- c)

$$h(x, y, z) = (x - 1)^2 e^x + (y - 2)^3 z^3$$

- d)

$$c(x, y, z) = (x - z - 2y^{-2})^b$$

where  $b$  is some constant

6. Implement a gradient descent algorithm to minimize the cost-function:

$$C(x, y) = 2(x - 1)^2 + 2(y - 2)^2 - 2(x - 1)(y - 2)$$

What is the solution? What step-size did you choose?