Assignment 4:

Due Oct 17, 2016, 4pm by email to dalhousieml2016@gmail.com with subject line A4. The page limit for this assignment is 2.

1. What is the goal of supervised machine learning?
2. Explain briefly what k-fold cross validation is used for.
3. What is a maximum likelihood estimate?
4. What is a hyper-parameter?
5. Why do you need nonlinearities in a deep network?
6. What is a maximum likelihood estimate and how does it relate to MAP?
7. Write down Bayes rule.
8. Given is a model of the form \( y = \sin(w^2x + b^2) \). Derive the learning rule that minimizes the MSE. Hint: The derivative of \( \sin(x) \) is \( \cos(x) \).
9. Write a python program with less than 10 lines that reads in an image and finds vertical lines. Print the original and the filtered image as well as your code.