Exercise in NN & PP

1. Derive the expressions for w which minimizes the linearize expression for the object function:

$$\sum_{i=1}^{n} g'\left(w_{\text{old}}^T x_i\right)^2 \left(\frac{y_i - g\left(w_{\text{old}}^T x_i\right)}{g'\left(w_{\text{old}}^T x_i\right)} + w_{\text{old}}^T x_i - w^T x_i\right)^2$$

Hint introduce the quantities below, and look up weighted regression

– $a_i = g'\left(w_{\text{old}}^T x_i\right)^2$ with $a = [a_1, \dots, a_N]^T$

– $b_i = \frac{y_i - g\left(w_{\text{old}}^T x_i\right)}{g'\left(w_{\text{old}}^T x_i\right)} + w_{\text{old}}^T x_i$ with $b = [b_1, \dots, b_N]^T$

Exercise continue.

2. #11.3

3. #NN: Recreate figure 11.17 (left) using the `neuralnet` function in library «neuralnet» in R.

    1. Use the function `calculate` to get the prediction for the test data

4. #PP: Use the `ppr` function in library «stats» in R to create a similar plot for projection pursuit.

    1. Use the function `predict` to get the prediction for the test data

5. Extra:

    1. Repeat 3 & 4 for the function in exercise 11.5