

## Review Week Eight Answers

1. Chapter 8, question 2.

The final boosted function looks like this,  $\widehat{f^B}(x) = \sum_{b=1}^B \lambda \hat{f}^b(x)$ . Thus, this equation will be linear if  $\hat{f}^b(x)$  is linear. With only depth-1 trees we have  $\hat{f}^b(x^b) =$

$\begin{cases} \hat{y}_{R_1^b} & \text{if } x^b \in R_1^b \\ \hat{y}_{R_2^b} & \text{if } x^b \in R_2^b \end{cases}$ . Where,  $x^b$  is the feature that minimized the RSS at step  $b$  of boosting

and  $\hat{y}_{R_i^b}$  is the mean response of all observation that fall into region- $i$  at the  $b$ th step of boosting. So, these functions are linear.

2. Chapter 8, do the lab exercise in section 8.3.4

This question is sufficiently similar to the example I reviewed in class that I am not going to document it here (plus I'm running out of time this week).