Practical Statistics

Assignment 3 – Sheet 6

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Question 1 :

The relationship between DBH and VOL looks linear with quite a lot of outsiders.

Question 2 :

1. 45.56+6.91x where 45.56 is the intercept and 6.91 is the slope.
2. The error variance is 6.049^2 (residual standard error squared).
3. The slope parameter is zero if the p-value for it is large but it is really small, therefore we reject the null hypothesis.
4. The intercept is zero if the p-value for it is bigger than 5% which isn't, therefore we reject the null hypothesis.
5. The total variation explained by the modell is 81.43% which is guite good therefore the model fits well. 81.43% of the data are explained by our model.

Question 3 :

We use the F-statistic to test the null hypothesis that our model is not better than a model containing intercept. Since the p-value corresponding to the F-statistic is very small, we confidently reject the null hypothesis and conclude that our model is better than the model containing only intercept.

Question 4 :

From the summary we get that 81.43% is explained by the model. Plottin the residauls shows it oscillates around zero without any pattern as expected from a good model. When we plot the residuals and the predictors there are just a few values in the extreme so we can't really say much from this.

In summart the parameters are significant, the model explains a high proportion of the response variable, the residual plots don't show obvious deviations from a good model so we can say the model is adequete.

Question 5 :

The prediction interval is for one future observation while the confidence is for the mean of future observations. The confidence is always more narrow because of the numbers of observations. This narrowness will increase as we increase the observations.

DBH is a good estimator but probably a combined model including height and diameter at 16 inches would give a better estimation for the volume.