BIOS 645 Homework

I fit a model regressing length onto the variables type and dose. I created a dummy variable “dtype” that has “VC” = 1 and “OJ” = 0. I first regressed length only onto type and dose, without an interaction term. The residuals were homoscedastic, but the qq-plot does not seem normal, because the line is not straight at the 45 degree angle.

Chart

Description automatically generated with low confidence

The parameter estimates were all significant, resulting in the following equation: y = 9.27 – 3.7ßdtype + 9.76ßdose.

Table

Description automatically generated

Next, I regressed the length onto type, dose, and the interaction between type and dose. The residuals still looked homoscedastic, and the qq-plot was noticeably more normal. The residuals plot was still a little skewed, but overall, the assumptions passed.

Chart

Description automatically generated with low confidence

The parameter estimates were significant, including for the interaction term. The type variable (β=-8.26, SE=2.24, p=0.0005), dose (β=7.81, SE=1.2, p<0.0001), and interaction term (β=3.90, SE=1.69, p=0.0246) were all significant.

Table

Description automatically generated

The simple effect for each level of dtype, 0 = “OJ” (p<0.0001) and 1=”VC” (p<0.0001), is significant for both.

