**ALM REVIEW: FILL IN THE BLANKS!**

Use the R output provided to fill in the missing information in the results for the three different model types. The R output is similar to what you will see for your final. However, you will be asked to write the full interpretation for 1 or 2 model types (not all 3) rather than fill in blanks. The interpretations shown here are good examples of a thorough interpretation for each model type.

**LOGISTIC REGRESSION**

A logistic regression model including \_age\_, \_\_sex, and \_\_race-ethnicity\_ as predictors of ever having 3 or more ear infections was statistically significantly better than the baseline at explaining ear infections (chi-squared(\_\_7\_\_) = \_\_24.63\_\_\_; p = \_\_\_.001\_\_). The model correctly predicted \_\_630\_\_\_\_ out of \_\_\_1000\_\_\_\_ observations including 69.8\_% of those with ear infections and \_\_56.2\_\_\_\_\_% of those without ear infections. Age and race-ethnicity were statistically significantly related to ear infections. For every one year increase in age, the odds of having ear infections decrease by \_\_\_.003\_\_\_ or \_\_.3\_\_\_\_\_% (OR = \_\_\_.997\_\_\_\_; 95% CI: \_.996\_\_\_\_ - \_\_\_.999\_\_\_). Compared to Non-Hispanic Black participants, Mexican American participants have \_\_1.21\_\_\_\_\_\_ times the odds of ear infection (OR = \_1.21\_\_\_\_\_; 95% CI: \_\_\_1.08\_\_\_ – \_\_\_1.35\_\_\_\_), Other Hispanic participants have \_\_\_\_1.17\_\_\_ times the odds of ear infection (OR = \_1.17\_\_\_\_; 95% CI: \_\_1.04\_\_\_\_-\_\_1.31\_\_\_\_), Non-Hispanic White have \_\_\_1.35\_\_\_\_ times the odds of ear infections (OR = \_\_1.35\_\_\_\_; 95% CI: \_1.25\_\_\_\_ – \_\_1.46\_\_\_\_), and Other Race Including Multi-Racial have \_\_1.66\_\_\_\_\_ times the odds of ear infections (OR = \_\_1.66\_\_\_\_; 95% CI: \_\_\_\_1.38\_\_ – \_\_\_1.98\_\_\_). Ear infections were not statistically significantly associated with \_\_\_\_sex\_\_\_ and Non-Hispanic Asian participants did not have significantly different odds of ear infection compared to \_\_\_\_\_non-Hisp Black\_\_\_\_\_\_\_participants.

The assumptions of \_indep obs , \_\_no multicollinearity\_\_\_\_\_\_, and \_\_\_\_linearity\_\_\_\_\_\_ were met; with all assumptions met, the model is considered unbiased and can be generalized to the population. There were \_\_5\_\_\_\_ observations identified as outlier or influential values; all were Other Race, none had ear infections, and four were Male, suggesting the model had a difficult time discerning Other Race Males without ear infections. The outliers do not appear to be data entry errors and so would be left in. Interventions related to ear health might be targeted toward younger people who are Non-Hispanic White, Mexican American, Other Hispanic, or Other Race.

**ANOVA**

A two-way ANOVA was used to compare the mean systolic blood pressure in a sample by sex, race-ethnicity, and the interaction of sex and race-ethnicity. The main effects of sex [F(\_1\_,\_\_742\_\_\_) = \_\_\_7.02\_\_\_\_; p = \_\_\_.008\_\_\_] was statistically significant, however, there was no statistically significant main effect of race-ethnicity, and no significant interaction between the two. The effect size of the sex main effect was \_\_\_weak\_\_\_\_ (ω2= \_\_.008\_\_). Males had significantly higher mean systolic blood pressure (m = \_\_121\_\_\_; sd = \_\_19.2\_\_\_) than females (m = \_\_117\_\_\_; sd = \_\_18.0\_\_\_\_). The residuals were a little \_\_right\_\_\_\_\_\_ skewed, but close to normally distributed. The homogeneity of variances assumption was not met with a significant \_\_\_\_levene’s test\_\_\_\_\_\_\_\_. The NHANES study is a large national survey with independent observations. The race-ethnicity and sex groups were independent and the systolic blood pressure measure was continuous. Not all assumptions were met so the results are \_\_\_\_not generalizable\_\_\_\_\_\_\_\_.

**LINEAR REGRESSION**

A linear regression model using age, sex, and race-ethnicity to predict systolic blood pressure was statistically significantly better than the mean of the outcome at explaining the outcome [F(\_7\_\_, \_\_\_706\_\_\_) = \_\_\_\_54.6\_\_; p \_\_\_<.05\_\_\_]. The model explained \_\_34.5\_\_\_\_% of the variation in systolic blood pressure (adjusted R2 = \_.345\_\_\_\_\_). The age, sex, and race-ethnicity predictors were all statistically significantly associated with systolic blood pressure. For every additional year older, blood pressure increased by \_\_.48\_\_\_ (b = \_\_.48\_\_; t = \_\_18.84\_\_\_; p < .05). Systolic blood pressure was \_\_3.78\_\_\_\_ mmHg higher for males than for females (b = \_3.78\_\_\_\_; t = \_\_\_3.48\_\_\_; p = .0005). Systolic blood pressure was \_\_\_5.19\_\_ mmHg higher for Non-Hispanic Black than for Non-Hispanic White (b = \_5.19\_\_\_\_; t = \_\_\_\_3.56\_; p = .0004).

The 95% confidence interval indicated that, in the population that was sampled, systolic blood pressure likely increased between \_.43\_\_\_ and \_\_.53\_\_ mmHg for each one-year increase in age. Likewise, the 95% confidence interval suggests that males in the population have systolic blood pressure \_\_1.65\_\_\_ to \_5.91\_\_\_\_ higher than females. Finally, people who identify as Non-Hispanic Black in the population are likely to have \_\_2.32\_\_\_ to \_\_8.06\_\_\_ higher systolic blood pressure than Non-Hispanic Whites in the population.

The model clearly met the independence of observations, continuous outcome, no multicollinearity, and independent residuals. The linearity plot was a little suspicious, as was the plot of residuals, which seemed right skewed. The assumption of \_\_\_\_\_\_homoscedas\_\_\_\_\_\_\_\_\_\_\_ (i.e., constant variance) was not met. There were \_\_\_48\_ values that were outliers or influential, most of which had high or low values for the outcome and a higher age. There were no obvious data entry or other errors, so all the observations would be retained in the model.