Week 9 homework problems

1. Do problem **5.14**. For 5.14.1, use the `scatterplot()` function with the groups argument to get different plotting symbols for males and females, as described in this week's lab. You will also need turn `BGSall$Sex` into a factor variable before you do 5.14.2 and 5.14.3. For 5.14.2, testing the parallel regression model consists of testing the interaction term, since the interaction allows for non-parallel slopes in `HT9`. For 5.14.3, remember that the difference between males and females is represented by a particular model coefficient; hence, you are being asked to simply find a confidence interval on a coefficient.

2. Do problem **5.17**. In 5.17.1, all you need to do is get the scatter plot between `salary` and `year`, with different plotting symbols for the levels of `sex`. In 5.17.2, use a simple two-sample t test. 5.17.3 is just like 5.14.3; use the model that includes only `year` and `sex` as predictors. Skip 5.17.4.

3. Use the `Wool` data from **5.19**. Turn the three predictors `len`, `amp`, and `load` into factors and use log(`cycles`) as the response instead of `cycles`. Do the following:

   a. Fit the model for log(`cycles`) using the three main effects and the three two-way interactions; report the type-II sum of squares ANOVA table. Which main effects and which interactions would you keep in the model, based on $\alpha = 0.05$?

   b. Produce the effects plot for the full second-order model fit in part a. (Optional: Does it appear to be consistent with the test results you found in part a?)

   c. Obtain estimates of the level means of `amp` in the model that only contains main effects using `emmeans()`.