Julia Vineyard

Worked with: Andrew Gordon

Lab 9: Modeling 2

1. The null hypothesis is that the Brown Creeper presence/absence is the same for the edge and interior habitats.
2. The Brown Creepers showed preference for the interior habitat. The strong p-value (1.386e-06) indicates that you can reject the null and the comparison of the expected and actual contingency tables shows that there are more Brown Creepers present in the interior habitat than expected.

   Expected

   ```
        TRUE    FALSE
   E  56.72945 116.2706
   I 286.27055 586.7294
   ```

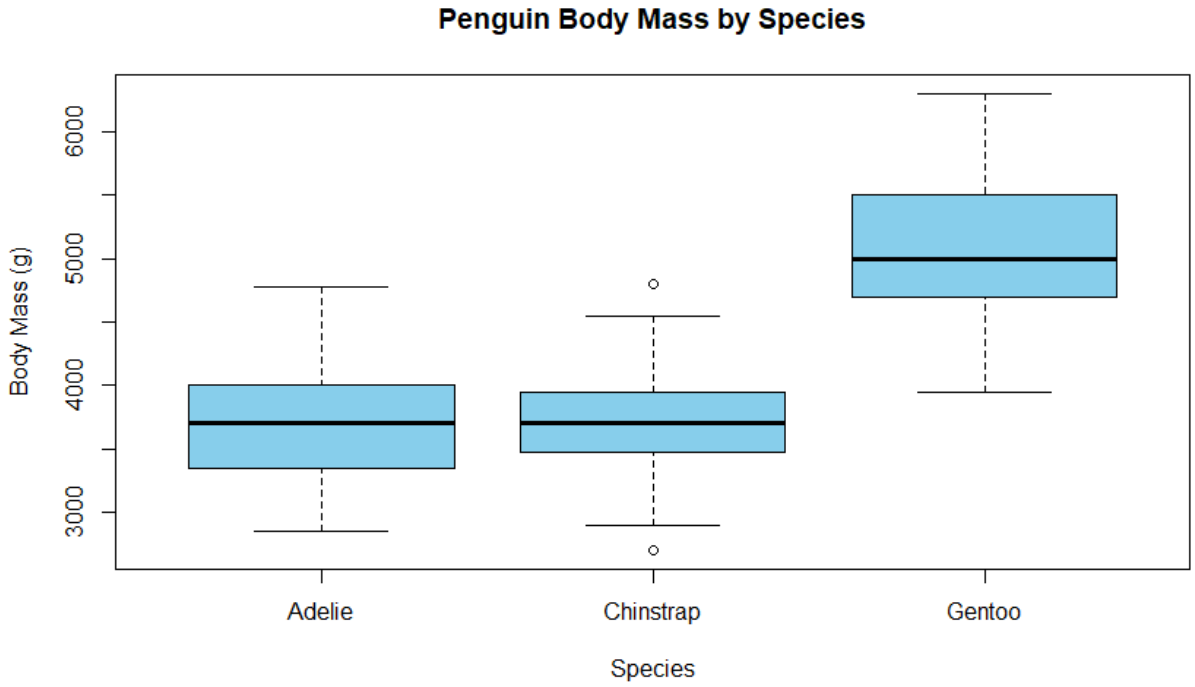
   br_creeper_table

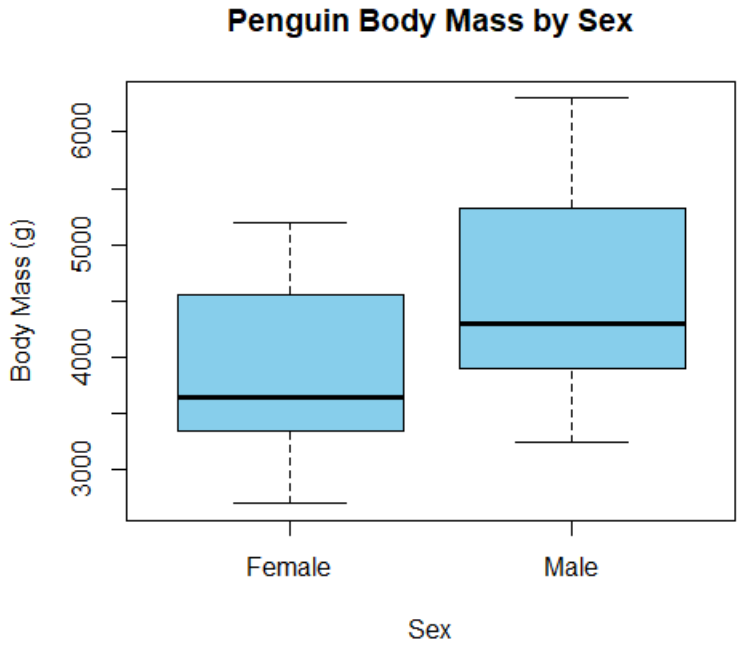
   ```
     TRUE FALSE
   E   29   144
   I  314   559
   ```

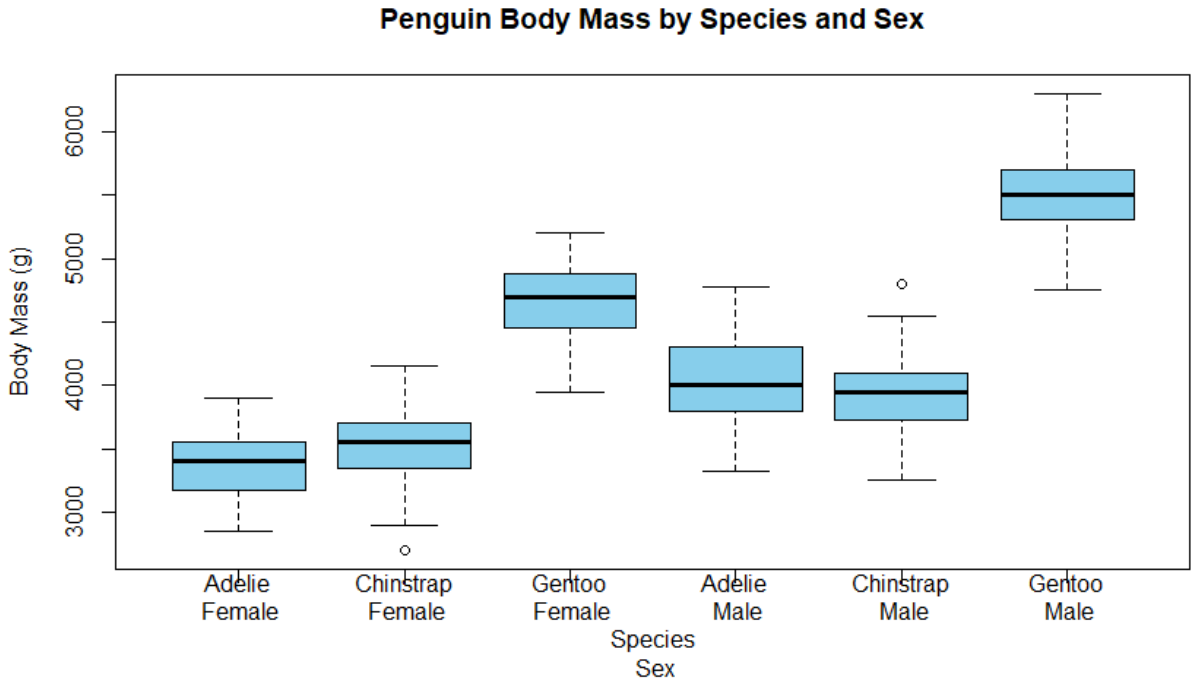
3. fit_species= lm(formula=body_mass_g ~ species, data=penguins)
   fit_species

4. fit_sex= lm(formula=body_mass_g ~ sex, data=penguins)
   fit_sex

5. fit_both= lm(formula= body_mass_g ~ species * sex, data=penguins)
   fit_both


Penguin Body Mass by Species
Body Mass (g)
3000
4000
5000
6000
Adelie
Chinstrap
Gentoo
Species


Penguin Body Mass by Sex
Body Mass (g)
3000
4000
5000
6000
Female
Male
Sex



9. fit_fl_sp (body mass by species) and fit_both (body mass by both species and sex) may both have problems fulfilling the homogeneity assumption.
10. A null Bartlett's test states that there is no differences in the variance among the data, so you have homogeneity.
11. p-value = 0.0501
12. p-value = 0.0319
13. p-value = 0.1741
14. For the model of body mass by species and the model of body mass by species and sex, we have p-values that are not less than 0.05. Since we cannot reject the null hypothesis we do not anticipate any issues with heterogeneity in these 2 models. For the model of body mass by sex we can reject the null hypothesis (p-value= 0.0319) so we do expect to have issues with heterogeneity.