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Lab 9 Modeling 2 Report
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Q1: Chi-square test **null** hypothesis: There would be no relationship between Brown Creeper presence/absence in edge and interior habitats.

Q2: **Results**: Based on the results of the chi-square test (**1.386e-06**), it appears that Brown Creepers prefer interior habitats as opposed to exterior habitats. This can also be observed in the contingency table, as the number of sightings was significantly higher in interior habitats.

Q3: **Code** for a model fit of penguin body mass as predicted by penguin species:

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

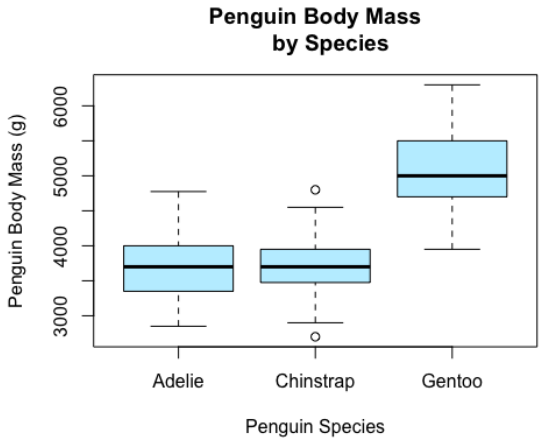
Q4: **Code** for a model fit of penguin body mass as predicted by sex:

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

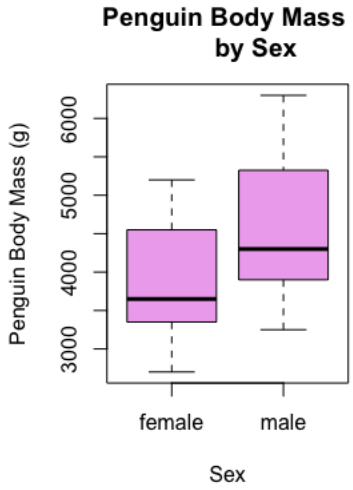
Q5: **Code** for model fit of penguin body mass as predicted by species & sex:

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

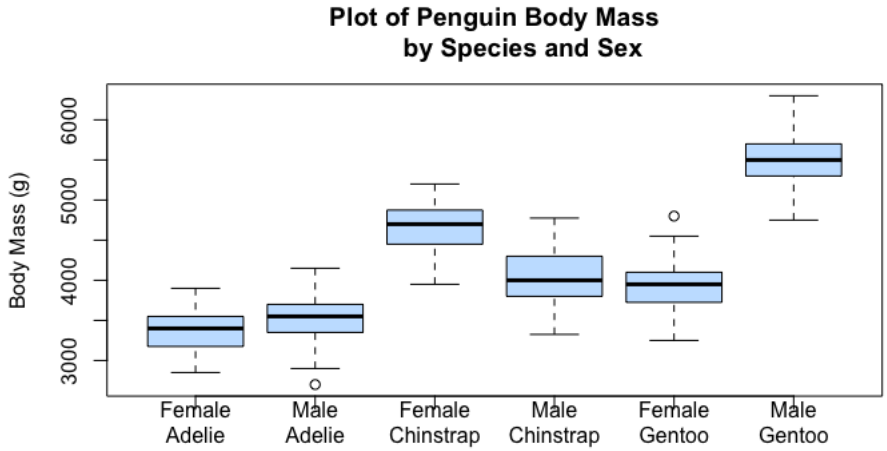
Q6: Conditional **boxplot** of fit_species model:



Q7: Conditional **boxplot** of fit_sex model:



Q8: Conditional **boxplot** of fit_both model:



Q9: Based on the shapes of the boxes, the model I think may have problems fulfilling the homogeneity assumption would be the fit**_both** model because you are comparing variances with models using different numbers of variables. You are comparing three species while only comparing two types of sexes, which may lead to some issues with fulfilling the assumption as they are heterogenous and not homogenous.

Q10: Bartlett test **null** hypothesis: There will be no differences in variance between the two groups.

Q11: P-value when grouped by species: **0.05005**

Q12: P-value when grouped by sex: **0.03194**

Q13: P-value when grouped by both factors: **0.1741**

Q14: Based on the results of the Bartlett tests, I anticipate there to be issues in homogeneity for the fit_both model. This is because both the models were grouped by sex OR species, the p-value fell below 0.05, indicating a rejection of the null hypothesis or a rejection in there being no differences in variance. However, when grouped by sex AND species, the p-value was above 0.05, indicating a failure to reject the hypothesis and thereby failing to reject a difference in variance between the two groups.