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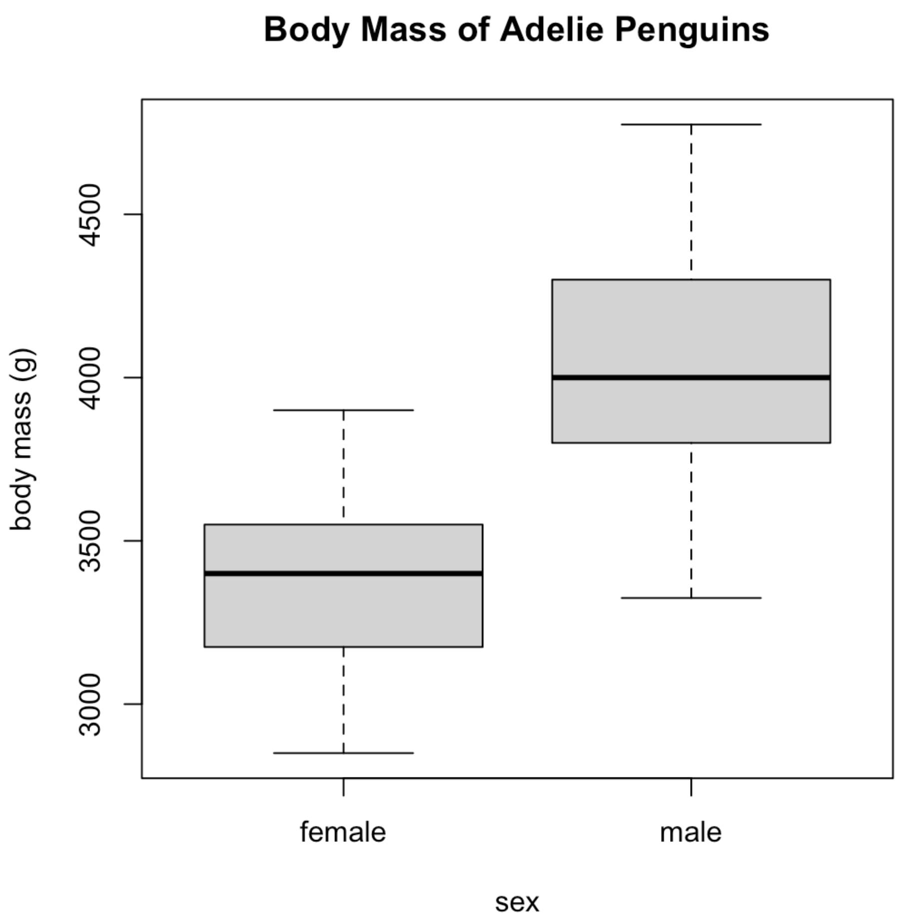
In-class t-tests

1. boxplot(dat_ade$body_mass_g ~ dat_ade$sex, main = "Body Mass of Adelie Penguins", xlab = "sex", ylab = "body mass (g)")



2. sex_f = droplevels(subset(dat_ade, sex == "female"))
   sex_m = droplevels(subset(dat_ade, sex == "male"))
   t.test(sex_f$body_mass_g, mu = 0)
   This is a two-tailed test, because we only care if it is different from 0, not if it is higher or lower.
3. The p value is < 2.2 e^-16, very small, meaning that we can accept the alternative hypothesis that female Adelie penguins have a mean body mass different from zero
4. t.test(sex_m$body_mass_g, alternative = "greater", mu = 4000)
   This is a one tailed test, because we are only interested if the mass is greater than 4000 g

5. The p value is .1438, which is equivalent to an alpha value of about 14%, which is about an 86% confidence interval.
6. t.test(sex_f$body_mass_g, sex_m$body_mass_g)
7. The p value is < 2.2 e^-16, very small, meaning that we can accept the hypothesis that the mean body mass is significantly different between male and female adelie penguins.
8. t.test(sex_m$body_mass_g, alternative = "greater", sex_f$body_mass_g)
   P = 2.2e^-16
9. t.test(sex_m$body_mass_g, alternative = "less", sex_f$body_mass_g)
   p=1
10. The p values are drastically different--essentially inverses-- because the two t-tests are measuring opposite hypotheses which are basically mutually exclusive.