**Zool 421 Lab Deliverable (20 pts)**

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**Introduction to R online module**

1. Attach the final output graph from **Step 5** in the R Tutorial. Add figure caption and title.

Barplot of Species Richness

Chart, bar chart

Description automatically generated

The barplot compares the species richness of 11 taxon groups: Beetle, Bird, Butterfly, Dragonfly, Plants, Fungus, Hymenopteran, Lichen, Liverwort, Mammal, Mollusc. Flowering plants had the greatest species richness; Dragon flies had the least species richness.

1. Attach the final output graph from **Step 6** in the R Tutorial. Add figure caption and title.

Barplot of Species Richness

Chart, bar chart

Description automatically generated

The barplot compares the values for the species richness of each taxon in the data set: Beetle, Bird, Butterfly, Dragonfly, Plants, Fungus, Hymenopteran, Lichen, Liverwort, Mammal, Mollusc. Flowering plants had the greatest species richness; Dragon flies had the least species richness.

1. Which of the following would be poor variable names and why?

data –this variable is vague, I would avoid it

min\_height –this is a good variable name

max.height –this would be an appropriate name

\_age –I wouldn’t use this because it has an underscore to start, but it is fine

.mass –again, I wouldn’t use this because it has an period to start, but it is fine

MaxLength –this is a good name

min-length –I wouldn’t use this because it has a hyphen, and it seems R is sensitive to weird stuff

2widths –I wouldn’t use this because it has a number in the title, could mess things up

celsius2kelv –I wouldn’t use this because it has a number in the title, could mess things up

**For Questions 4-8 download the dataset from blackboard course site 🡪 lab modules 🡪 Intro to R 🡪 Data 🡪 Dataset for Deliverable**

4) Calculate the mean of species wingspan using a function. Provide code you used and output.

sparrow <- mean(22, 24, 21) #this is how you would calculate the mean for sparrows.

Table

Description automatically generated

sparrow <- mean(22, 24, 21)

#22 output

kingfisher <- mean(26, 23, 25)

#26 output

eagle <- mean(195, 201, 185)

#195 output

hummingbird <- mean(8, 9, 9)

#9 output

5) Now something really fun – make a barplot plot of your wingspans. You’ll first need to create a vector to combine all the wingspans for each species. Attach the barplot with figure caption.

*# Chain them together in a vector*

wingspan <- c(sparrow, kingfisher, eagle, hummingbird)

*# Create a bird species vector (careful to match the order of the previous vector!)*

bird\_sp <- c("sparrow", "kingfisher", "eagle", "hummingbird")

*# Plot the bar plot & save it to file*

barplot(wings$wingspan, names.arg = wings$bird\_sp,

xlab = "Bird species",

ylab = "Average wingspan (cm)", *# adding axis titles*

ylim = c(0, 200), *# setting the limits of the y axis to fit the eagle*

col = "blue" *# changing the color because why not!*

)

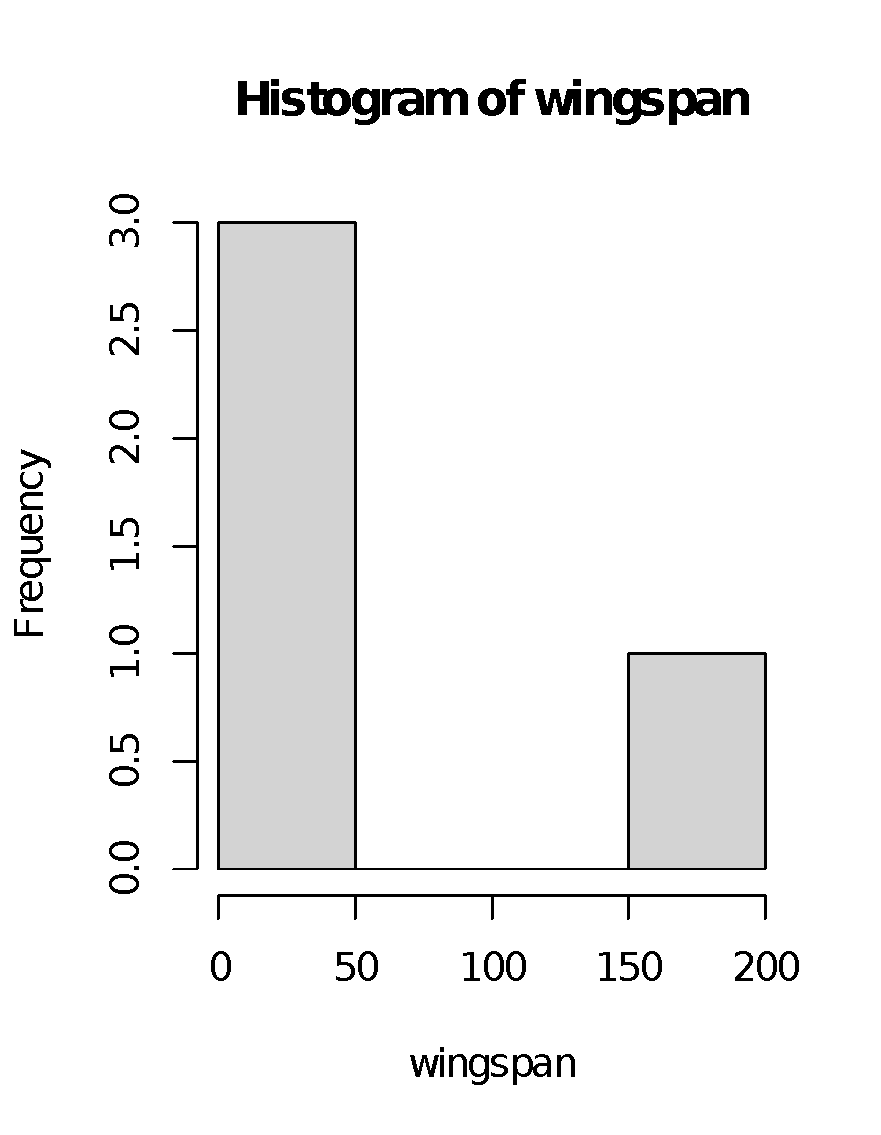
dev.off()

Barplot of Average Wingspan by SpeciesChart, bar chart, histogram

Description automatically generated

This barplot compares the average wingspan of sparrow, kingfisher, eagle and hummingbird from the sample data. Hummingbirds were the smallest, an average of 8cm; eagles were the greatest, with an average of 195cm.

6) Make a histogram – if I don’t tell you the function? How can you figure it out? Attach final output.

To figure out how to do a histogram I used google to find an open source answer. When I was unsuccessful in getting it to run I went to TA Office Hours with Olivia and it was very helpful. 

This histogram depicts the frequency of wingspans in different ranges. Three quarters of the wingspans were less than 50cm, and only one quarter of the wingspans were greater than 150cm. because the data breaks the wingspan categories into 4 groups, there isn’t much distinction between the sparrow, kingfisher, and hummingbird in the histogram, and the eagles are alone as the largest group.

7) What does the default of the summary function give you?

> summary(wingspan)

Min. 1st Qu. Median Mean 3rd Qu. Max.

8.00 18.50 24.00 62.75 68.25 195.00

This tells me the minimum, maximum and quartile breaks. This quick data summary can be helpful for analyzing the results of any study.

8) Why would you want to check the structure of your data – what does it tell you that is important?

It could be because rows or columns are being misread by R Studio, and changing things from characters to factors (or any number of other mishaps), or even smaller things like having inappropriate spaces or capitalizations that are misread by R.

**My code:**

install.packages("dplyr")

library(dplyr)

# There are quotation marks when installing a package, but not when loading it

#Import data

wingspan <- read.csv("WingspansDATA.csv")

sparrow <- mean(22, 24, 21)

#22 output

kingfisher <- mean(26, 23, 25)

#26 output

eagle <- mean(195, 201, 185)

#195 output

hummingbird <- mean(8, 9, 9)

#9 output

# Chain them together in a vector

wingspan <- c(sparrow, kingfisher, eagle, hummingbird)

# Create a bird species vector (careful to match the order of the previous vector!)

bird\_sp <- c("sparrow", "kingfisher", "eagle", "hummingbird")

# Plot the bar plot & save it to file

class(bird\_sp) # currently character

bird\_sp <- as.factor(bird\_sp) # transforming into factor

class(bird\_sp) # now a factor!

# Then, combine the two vectors in a data frame

wings <- data.frame(bird\_sp, wingspan)

barplot(wings$wingspan, names.arg = wings$bird\_sp,

xlab = "Bird species",

ylab = "Average wingspan (cm)", # adding axis titles

ylim = c(0, 200), # setting the limits of the y axis to fit the eagle

col = "blue" # changing the color because why not!

)

hist(wingspan)

summary(wingspan)