732A51 Bioinformatics

LAB 3 Bioinformatics

Hugo Morvan
William Wiik

STIMA
Department of Computer and Information Science
Linköpings universitet

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Contents

1 Question 1

Using the script http://ape-package.ird.fr/APER/APER2/SylviaWarblers.R obtain the *Sylvia* warblers phylogeny (the script saves in in the file sylvia nj k80.tre). The geographical range data can be found in http://ape-package.ird.fr/APER/APER2/sylvia_data.txt and in the script is referenced as `DF$geo.range`. Notice that one tip is removed due to missing data

```
#
# tr <- drop.tip(tr, "Chamaea_fasciata")
# DF <- sylvia.eco[tr$tip.label, ]
```

1.1 Question 1.1

Explain all the steps in the script required to obtain the phylogeny and trait data.

Answer:

1.2 Question 1.2 *

2 Question 2

Install the `ade4` package. Included with it you will find the carnivores dataset, `data(carni70)`

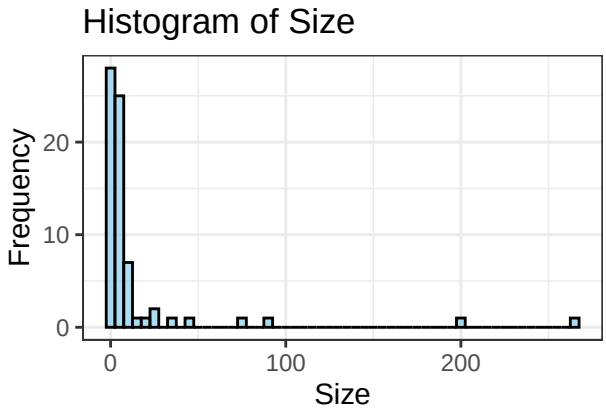
2.1 Question 2.1

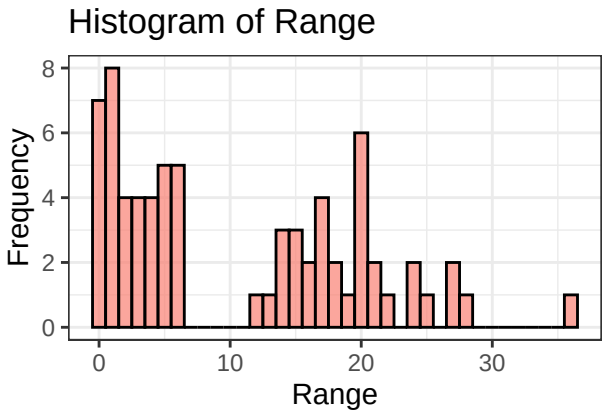
Explore the data set and report what can be found in it. Provide some plots.

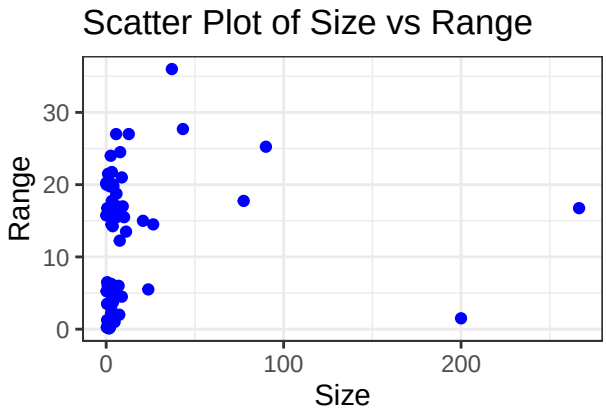
```
library(ade4)
library(ggplot2)
library(cowplot)

data(carni70)

tab_df <- as.data.frame(carni70$tab)
summary(tab_df)
```

```
##       size             range        
##  Min.   :  0.040   Min.   : 0.120  
##  1st Qu.:  1.282   1st Qu.: 2.062  
##  Median :  3.200   Median : 6.125  
##  Mean   : 14.288   Mean   :10.721  
##  3rd Qu.:  7.293   3rd Qu.:17.750  
##  Max.   :266.500   Max.   :36.000
```

```
p1 <- ggplot(tab_df, aes(x = size)) +
  geom_histogram(binwidth = 5, fill = "skyblue", color = "black", alpha = 0.7) +
  labs(title = "Histogram of Size", x = "Size", y = "Frequency") + theme_bw()

p2 <- ggplot(tab_df, aes(x = range)) +
  geom_histogram(binwidth = 1, fill = "salmon", color = "black", alpha = 0.7) +
  labs(title = "Histogram of Range", x = "Range", y = "Frequency") + theme_bw()

p3 <- ggplot(tab_df, aes(x = size, y = range)) +
  geom_point(color = "blue") +
  labs(title = "Scatter Plot of Size vs Range", x = "Size", y = "Range") + theme_bw()


cowplot::plot_grid(p1, p2, p3, ncol = 2)
```








```
## [1] "Total number of carnivores: 70"
```

```
## [1] "The carnivore with biggest size: Ursus_arctos"
```

```
## [1] "The carnivore with smallest size: Mustela_nivalis"
```

```
## [1] "The carnivore with biggest range: Puma_concolor"
```

```
## [1] "The carnivore with smallest range: Bassariscus_pauli"
```

There are 70 carnivores, with a median size of 3.2 and a median range of 6.1. Two clear outliers in size are Ursus arctos (Brown bear) and Tremarctos ornatus (Spectacled bear).

2.2 Question 2.2*