Case Study – Palmer Penguins

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R Case Study

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents.

About the case study - • R library has Palmer Penguins dataset which has three species of penguins with different parameters like flipper length, height, weight, etc. • The data set has 344 datapoints.

#Data sets in package 'palmerpenguins': penguins Size measurements for adult foraging penguins near Palmer Station, Antarctica penguins_raw (penguins) Penguin size, clutch, and blood isotope data for foraging adults near Palmer Station, Antarctica

• The aim of this project is to find the relation between flipper length and body mass. A guess would be larger the flipper length more the body mass. • The same prediction was analyzed using R scattered plot to find the correlation.

Step 1

The Penguins Dataset in R Studio can be installed using install.packages('palmerpenguins') and then using it by library('palmerpenguins')

```
install.packages('palmerpenguins')
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

Step 2

To use the dataset use the code below.

```
library(palmerpenguins)
data(package = 'palmerpenguins')
```

Step 3

Install additional packages for data analysis – tidyvers which contains ggplot2, dplyr, facets, etc.

```
install.packages('tidyverse')
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

```
library('tidyverse')
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.2     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.0
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.2     v tidyr     1.3.0
## v purrr     1.0.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

Step 4

Know your data set – Head gives 6 rows and 8 columns, str shows the internal structure of the dataframe.

```
head(penguins)
```

```
## # A tibble: 6 x 8
##   species island    bill_length_mm bill_depth_mm flipper_length_mm body_mass_g
##   <fct>   <fct>              <dbl>         <dbl>             <int>       <int>
## 1 Adelie  Torgersen           39.1          18.7               181        3750
## 2 Adelie  Torgersen           39.5          17.4               186        3800
## 3 Adelie  Torgersen           40.3          18                 195        3250
## 4 Adelie  Torgersen           NA            NA                  NA          NA
## 5 Adelie  Torgersen           36.7          19.3               193        3450
## 6 Adelie  Torgersen           39.3          20.6               190        3650
## # i 2 more variables: sex <fct>, year <int>
```

```
str(penguins)
```

```
## tibble [344 x 8] (S3: tbl_df/tbl/data.frame)
##  $ species          : Factor w/ 3 levels "Adelie","Chinstrap",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ island           : Factor w/ 3 levels "Biscoe","Dream",..: 3 3 3 3 3 3 3 3 3 3 ...
##  $ bill_length_mm   : num [1:344] 39.1 39.5 40.3 NA 36.7 39.3 38.9 39.2 34.1 42 ...
##  $ bill_depth_mm    : num [1:344] 18.7 17.4 18 NA 19.3 20.6 17.8 19.6 18.1 20.2 ...
##  $ flipper_length_mm: int [1:344] 181 186 195 NA 193 190 181 195 193 190 ...
##  $ body_mass_g      : int [1:344] 3750 3800 3250 NA 3450 3650 3625 4675 3475 4250 ...
##  $ sex              : Factor w/ 2 levels "female","male": 2 1 1 NA 1 2 1 2 NA NA ...
##  $ year             : int [1:344] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 ...
```

Step 5

Installed ggplot2 package

```
install.packages("ggplot2")
```

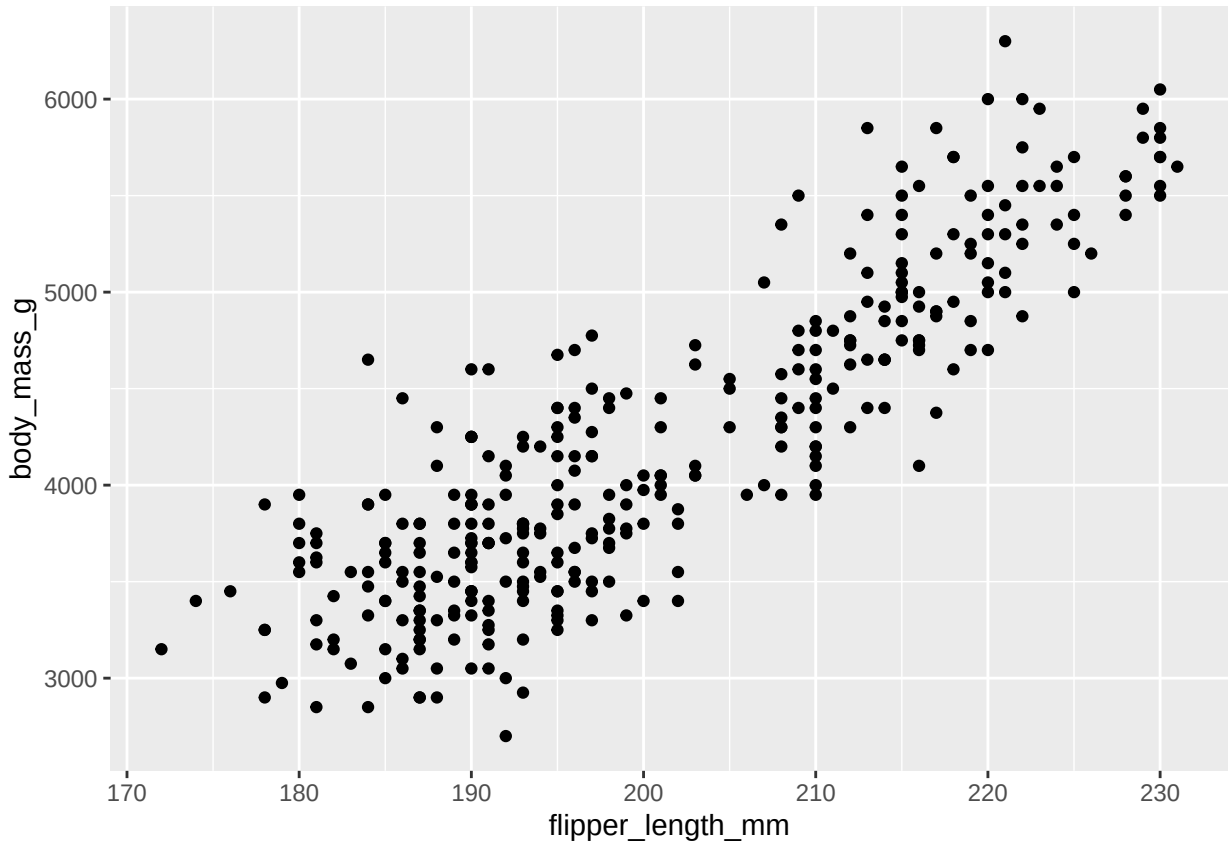
```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

Step 6

Created a scattered plot to show the relation between flipper length and body mass.

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point()
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```



Step 7

To change the color of the scattered point to red

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point(colour = "red")
```

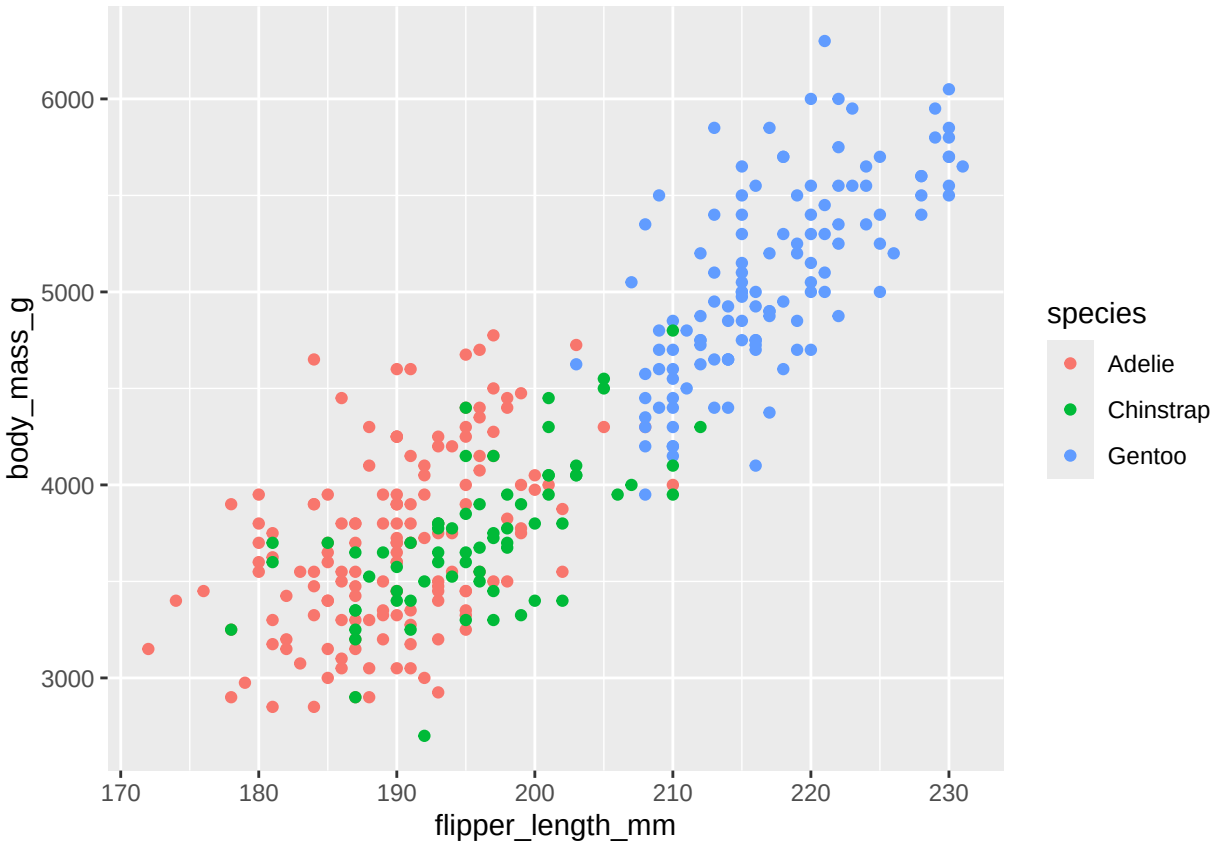
```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

Step 8

To mark different colors for different species

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point(aes(colour = species))
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```



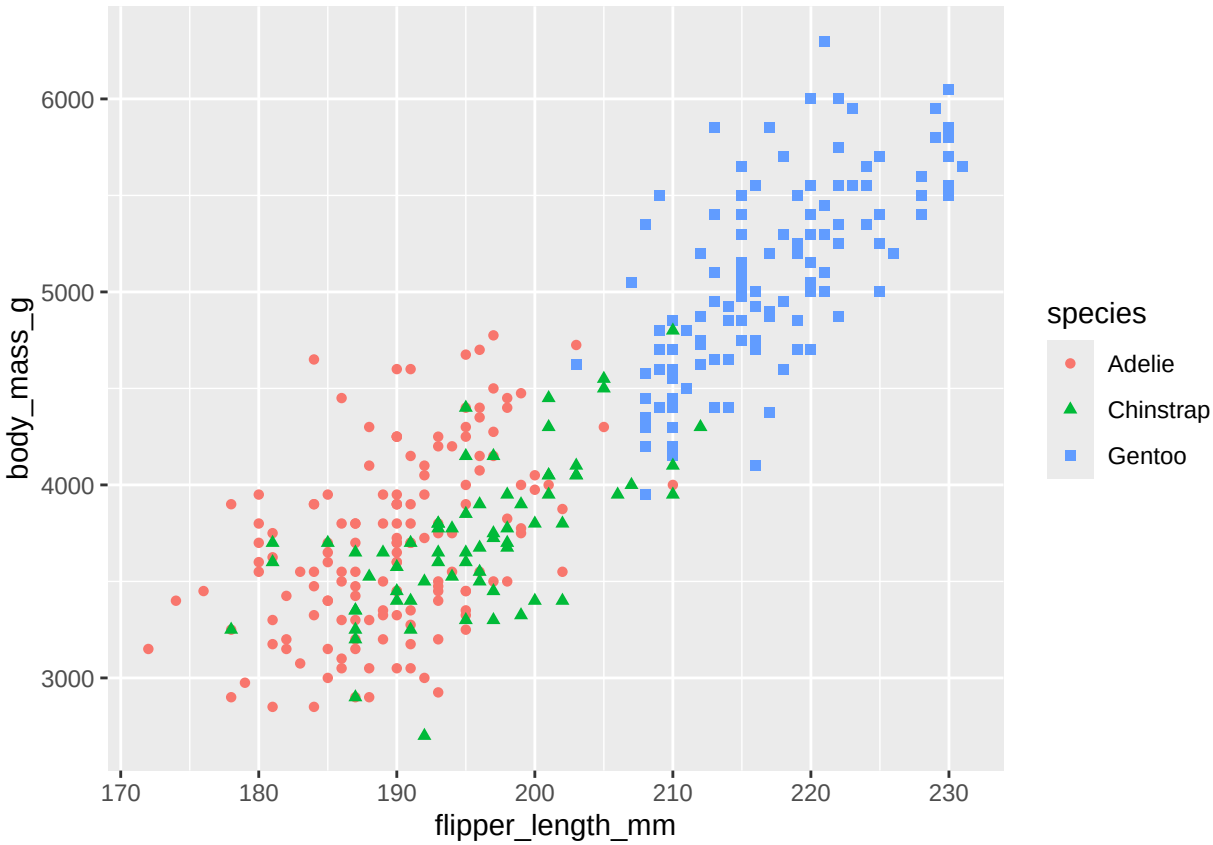
The plot shows that Gentoo penguins are the largest. R has created automatic legends for the plot to help us understand the color coding.

Step 9

To create different colors and shapes for different species in the scattered plot shape was added in aesthetics.

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point(aes(colour = species,
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

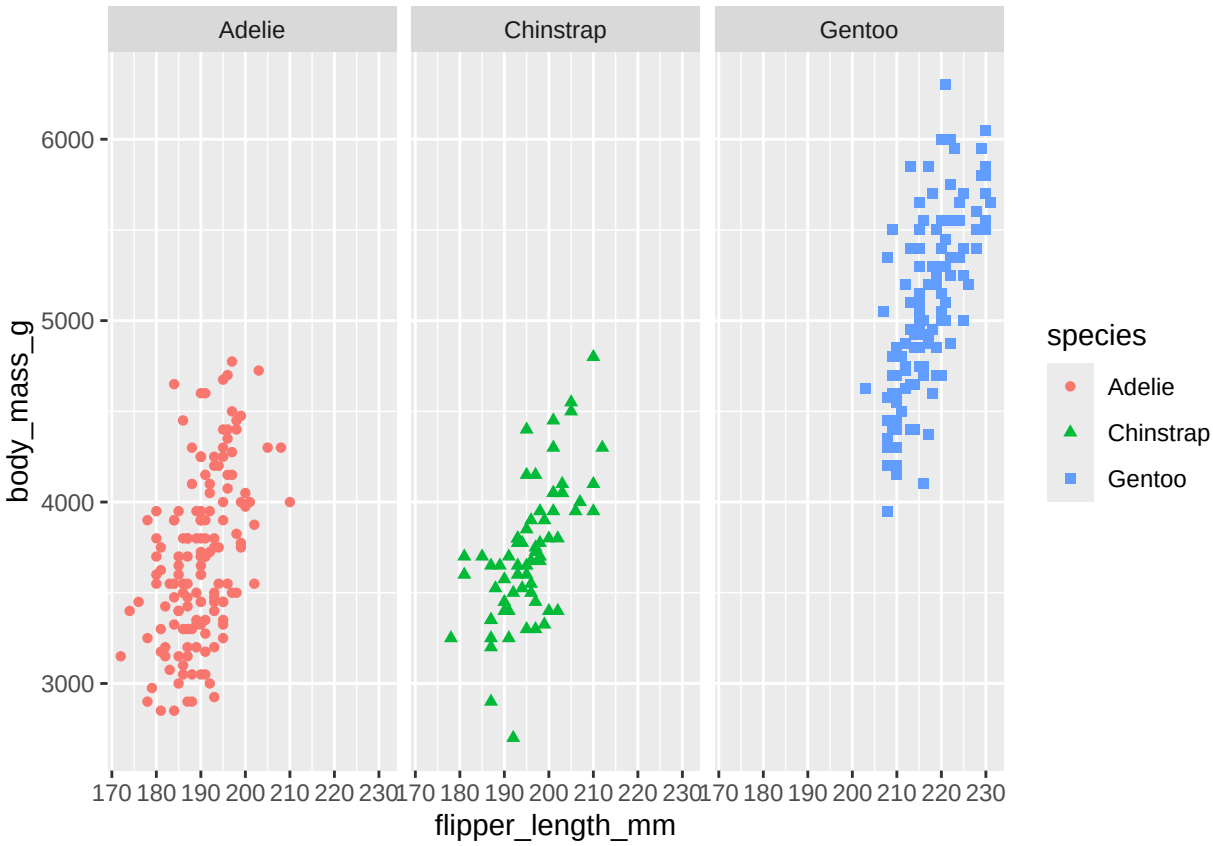


Step 10

Now the subsets of the plot were created for each species using facet wrap.

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point(aes(colour = species,
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

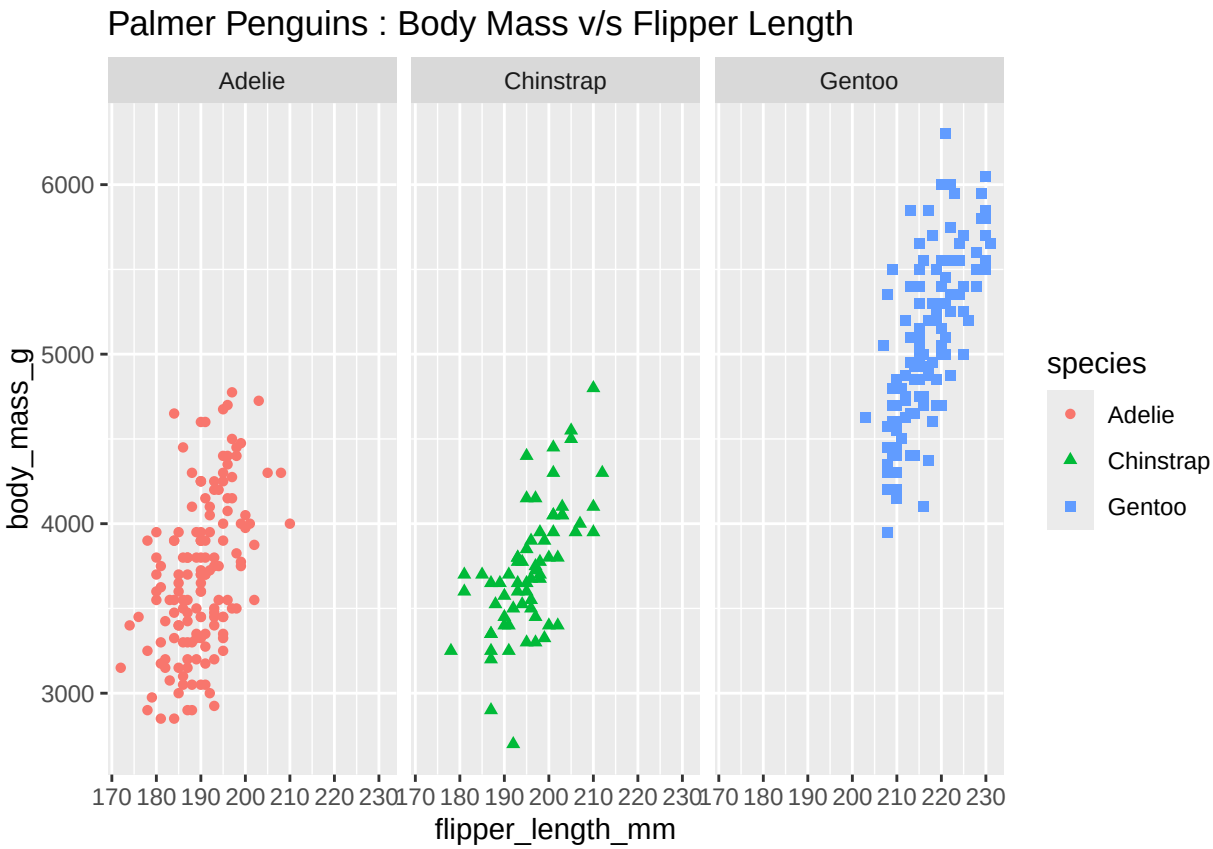


Step 11

Now a title was given to our plots

```
ggplot(data = penguins, aes(x = flipper_length_mm, y = body_mass_g)) + geom_point(aes(colour = species,
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## (`geom_point()`).
```



Step 12

The analysis was then saved using R Markdown. It is a tool to document analysis in Rstudio. First the package was installed

```
install.packages("rmarkdown")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```