# R Notebook

```
# libraries
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.3     v purrr   0.3.4
## v tibble  3.1.0     v dplyr   1.0.5
## v tidyr   1.1.3     v stringr 1.4.0
## v readr   1.4.0     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(palmerpenguins)
library(ggplot2)
```

Problem 1

```
set.seed(123)
df <- tibble(
  x_1 = rnorm(10, sd = 1),
  x_2 = x_1 > 0,
  x_3 = c("a","b","c","d","e","f","g","h","i","j"),
  x_4 = factor(c("1","2","3","2","3","1","1","3","2","1"))
)
mean_num = mean(pull(df,x_1))
mean_log = mean(pull(df,x_2))
mean_char = mean(pull(df, x_3))
```

```
## Warning in mean.default(pull(df, x_3)): argument is not numeric or logical:
## returning NA
```

```
mean_fact = mean(pull(df, x_4))
```

```
## Warning in mean.default(pull(df, x_4)): argument is not numeric or logical:
## returning NA
```

The means are shown as: 0.0746256; 0.5; NA; NA.
Mean of **numeric and logical vectors** can be calculated while mean of **character vector and factor vector** cannot be calculated. And thus, we got NAs for these two columns.

```
as.numeric(df$x_2)
```

```
##  [1] 0 0 1 1 1 1 1 0 0 0
```

```
as.numeric(df$x_3)
```

```
## Warning: NAs introduced by coercion
```

```
##  [1] NA NA NA NA NA NA NA NA NA NA
```

```r
as.numeric(df$x_4)
```

```
##  [1] 1 2 3 2 3 1 1 3 2 1
```

Logical vectors can be converted to numeric form with values 0 and 1; character values cannot be converted to numeric forms and thus return NAs; factor values can be converted to numeric forms according to their levels.

Problem 2

```r
data("penguins", package = "palmerpenguins")
summary(penguins)
```

```
##       species          island    bill_length_mm  bill_depth_mm
##  Adelie   :152   Biscoe   :168   Min.   :32.10   Min.   :13.10
##  Chinstrap: 68   Dream    :124   1st Qu.:39.23   1st Qu.:15.60
##  Gentoo   :124   Torgersen: 52   Median :44.45   Median :17.30
##                                  Mean   :43.92   Mean   :17.15
##                                  3rd Qu.:48.50   3rd Qu.:18.70
##                                  Max.   :59.60   Max.   :21.50
##                                  NA's   :2       NA's   :2
##  flipper_length_mm  body_mass_g       sex           year
##  Min.   :172.0     Min.   :2700   female:165   Min.   :2007
##  1st Qu.:190.0     1st Qu.:3550   male  :168   1st Qu.:2007
##  Median :197.0     Median :4050   NA's  : 11   Median :2008
##  Mean   :200.9     Mean   :4202                Mean   :2008
##  3rd Qu.:213.0     3rd Qu.:4750                3rd Qu.:2009
##  Max.   :231.0     Max.   :6300                Max.   :2009
##  NA's   :2         NA's   :2
```

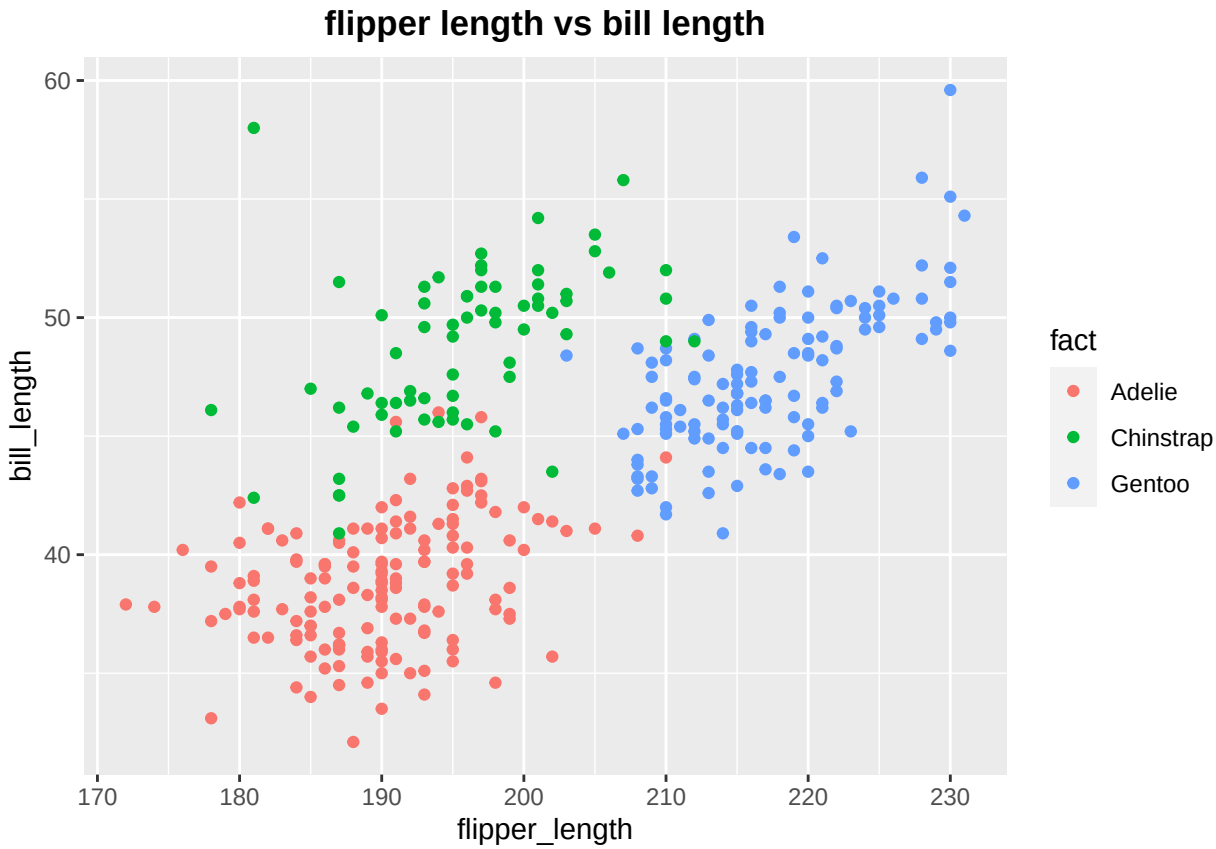
```r
n_row = nrow(penguins)
n_col = ncol(penguins)
# strip NA values before calculating mean
m_flipper = mean(penguins$flipper_length_mm, na.rm = TRUE)
```

The penguins dataset contains **344 rows and 8 columns**. The variables are: species, island, bill_length_mm, bill_depth_mm, flipper_length_mm, body_mass_g, sex, year. There are overall **3 species on 3 islands**, summary statistics are displayed in the table above.
The mean of flipper length in mm is **200.9152047**.

```r
plot_df <- tibble(
  flipper_length = penguins$flipper_length_mm,
  bill_length = penguins$bill_length_mm,
  fact = factor(penguins$species)
)
```

```r
ggplot(plot_df, aes(x = flipper_length, y = bill_length, color = fact)) + geom_point() + labs(title = "
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```




```
ggsave("hw1_scatterplot.png", width = 5, height = 5)
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```