p8105_hw1_jm5509

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Problem 1

This a short description of the penguins dataset. The function of str() and summary() illustrate the names and values of important variables.

```
data('penguins',package='palmerpenguins')
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 ...
```

```
# Shows the length of the tibble, numeric variables and int varibles;
# and the levels of the factor variables(including species,island and sex)
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
```

```
# Shows the number of the factor variables, and basic statistical
# values of numeric variables

nrow(penguins)
```

```
## [1] 344
```

```
ncol(penguins)
```

```
## [1] 8
```

```
mean(penguins$flipper_length_mm)
```

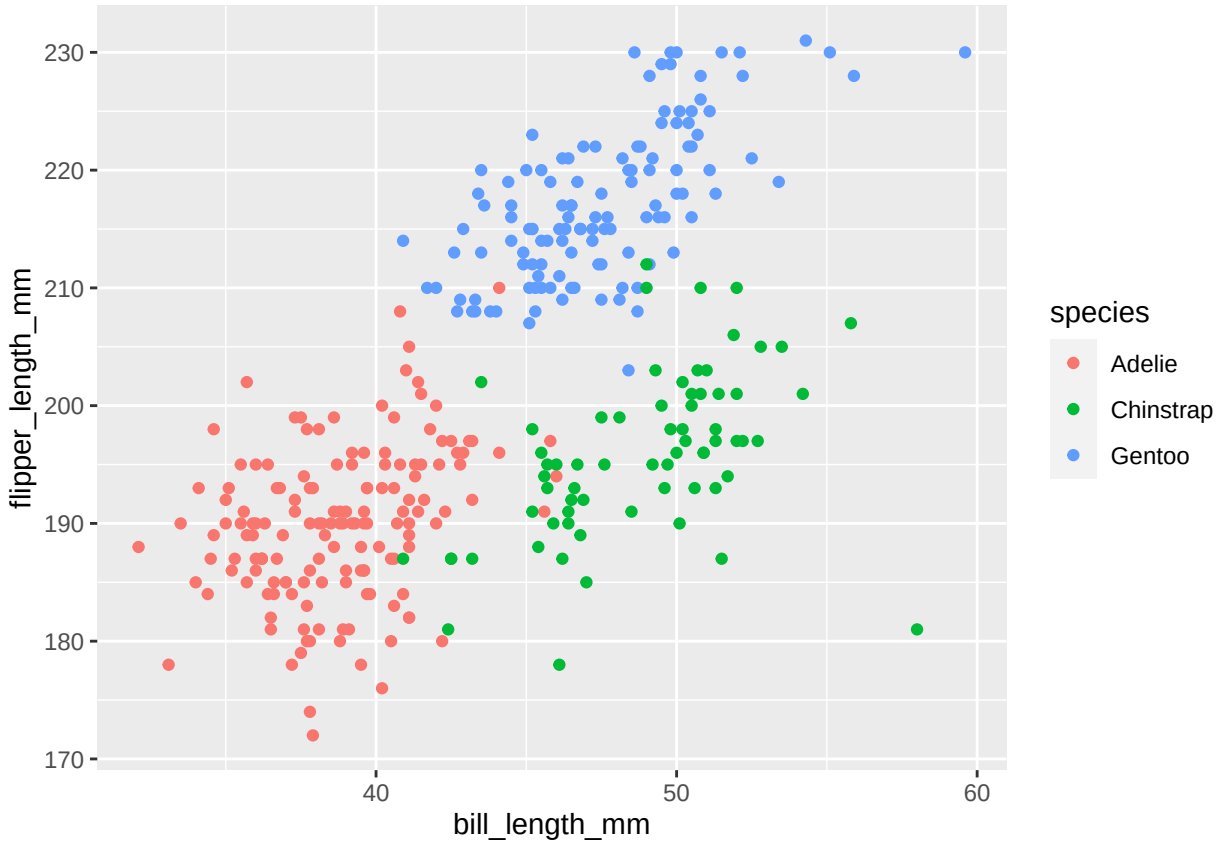
```
## [1] NA
```

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.2 --
## v ggplot2 3.3.6      v purrr   0.3.4
## v tibble  3.1.8      v dplyr   1.0.10
## v tidyr   1.2.0      v stringr 1.4.1
## v readr   2.1.2      v forcats 0.5.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
ggplot(penguins,aes(x=bill_length_mm,y=flipper_length_mm, color=species))+geom_point()
```

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




```
ggsave('penguins.pdf')
```

```
## Saving 6.5 x 4.5 in image
```

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

Problem 2

This solution is displayed as follows. In this case, we create a data frame comprised of 4 variables with different data types. Among them, only the numeric and the logical value could be taken the mean value.

```
library(tidyverse)
df =
tibble(
norm=rnorm(n=10),
logical=norm>0,
character=c('a','b','c','d','e','f','g','h','i','j'),
factor=as.factor(c(rep('paper',3),rep('scissors',4),rep('rock',3)))
)

mean(df %>% pull(1))
```

```
## [1] -0.3432521
```

```
mean(df %>% pull(2))
```

```
## [1] 0.5
```

```
mean(df %>% pull(3))
```

```
## Warning in mean.default(df %>% pull(3)): argument is not numeric or logical:
## returning NA
```

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

```
mean(df %>% pull(4))
```

```
## Warning in mean.default(df %>% pull(4)): argument is not numeric or logical:
## returning NA
```

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

We further convert three other variables to numeric ones. It turns out that only logical and factor vectors could be converted. Logical values could be converted from TRUE/FALSE to 1/0. That could explain why it can be taken the mean value. Factor values could be converted to its corresponding order when being converted. Character values are converted to "NA"s. However, if the character values is converted from numeric values, then it could be converted back to numeric values.

```
as.numeric(df %>% pull(2)) # logical
as.numeric(df %>% pull(3)) # character
as.numeric(df %>% pull(4)) # factor
```