```
require(pacman)
```

```
## Loading required package: pacman
```

```
pacman::p_load(pacman, dplyr, GGally, ggplot2, ggthemes,
               ggvis, httr, lubridate, plotly, rio, rmarkdown, shiny,
               stringr, tidyr)
```

```
SW <- data.frame(starwars)
```

```
str(SW)
```

```
## 'data.frame':    87 obs. of  14 variables:
##  $ name      : chr  "Luke Skywalker" "C-3PO" "R2-D2" "Darth Vader" ...
##  $ height    : int  172 167 96 202 150 178 165 97 183 182 ...
##  $ mass      : num  77 75 32 136 49 120 75 32 84 77 ...
##  $ hair_color: chr  "blond" NA NA "none" ...
##  $ skin_color: chr  "fair" "gold" "white, blue" "white" ...
##  $ eye_color : chr  "blue" "yellow" "red" "yellow" ...
##  $ birth_year: num  19 112 33 41.9 19 52 47 NA 24 57 ...
##  $ sex       : chr  "male" "none" "none" "male" ...
##  $ gender    : chr  "masculine" "masculine" "masculine" "masculine" ...
##  $ homeworld : chr  "Tatooine" "Tatooine" "Naboo" "Tatooine" ...
##  $ species   : chr  "Human" "Droid" "Droid" "Human" ...
##  $ films     :List of 87
##   ..$ : chr  "The Empire Strikes Back" "Revenge of the Sith" "Return of the Jedi" "A New Hope" ...
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "The Phantom Menace" "Revenge of the Si
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "The Phantom Menace" "Revenge of the Si
##   ..$ : chr  "The Empire Strikes Back" "Revenge of the Sith" "Return of the Jedi" "A New Hope"
##   ..$ : chr  "The Empire Strikes Back" "Revenge of the Sith" "Return of the Jedi" "A New Hope" ...
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith" "A New Hope"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith" "A New Hope"
##   ..$ : chr "A New Hope"
##   ..$ : chr "A New Hope"
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "The Phantom Menace" "Revenge of the Si
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "Revenge of the Sith" "A New Hope"
##   ..$ : chr  "The Empire Strikes Back" "Revenge of the Sith" "Return of the Jedi" "A New Hope" ...
##   ..$ : chr  "The Empire Strikes Back" "Return of the Jedi" "A New Hope" "The Force Awakens"
##   ..$ : chr "A New Hope"
##   ..$ : chr  "The Phantom Menace" "Return of the Jedi" "A New Hope"
##   ..$ : chr  "The Empire Strikes Back" "Return of the Jedi" "A New Hope"
##   ..$ : chr "A New Hope"
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "The Phantom Menace" "Revenge of the Si
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "The Phantom Menace" "Revenge of the Si
##   ..$ : chr  "The Empire Strikes Back" "Attack of the Clones" "Return of the Jedi"
##   ..$ : chr "The Empire Strikes Back"
##   ..$ : chr "The Empire Strikes Back"
##   ..$ : chr  "The Empire Strikes Back" "Return of the Jedi"
##   ..$ : chr "The Empire Strikes Back"
##   ..$ : chr  "Return of the Jedi" "The Force Awakens"
##   ..$ : chr "Return of the Jedi"
```

```
##   ..$ : chr "Return of the Jedi"
##   ..$ : chr "Return of the Jedi"
##   ..$ : chr "Return of the Jedi"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "Return of the Jedi"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr "Attack of the Clones"
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##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "The Phantom Menace"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr "Attack of the Clones"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr "Revenge of the Sith"
##   ..$ : chr "Revenge of the Sith"
##   ..$ : chr  "Revenge of the Sith" "A New Hope"
##   ..$ : chr  "Attack of the Clones" "Revenge of the Sith"
##   ..$ : chr "Revenge of the Sith"
```

```
##   ..$ : chr "The Force Awakens"
##   ..$ : chr "The Force Awakens"
##   ..$ : chr "The Force Awakens"
##   ..$ : chr "The Force Awakens"
##   ..$ : chr "The Force Awakens"
##   ..$ : chr  "Attack of the Clones" "The Phantom Menace" "Revenge of the Sith"
## $ vehicles  :List of 87
##   ..$ : chr  "Snowspeeder" "Imperial Speeder Bike"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Imperial Speeder Bike"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Tribubble bongo"
##   ..$ : chr  "Zephyr-G swoop bike" "XJ-6 airspeeder"
##   ..$ : chr
##   ..$ : chr "AT-ST"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Snowspeeder"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Tribubble bongo"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Sith speeder"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
```

```
##   ..$ : chr
##   ..$ : chr
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##   ..$ : chr
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##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Flitknot speeder"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Koro-2 Exodrive airspeeder"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Tsmeu-6 personal wheel bike"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##  $ starships :List of 87
##   ..$ : chr  "X-wing" "Imperial shuttle"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "TIE Advanced x1"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "X-wing"
##   ..$ : chr  "Jedi starfighter" "Trade Federation cruiser" "Naboo star skiff" "Jedi Interceptor" ...
##   ..$ : chr  "Trade Federation cruiser" "Jedi Interceptor" "Naboo fighter"
##   ..$ : chr
##   ..$ : chr  "Millennium Falcon" "Imperial shuttle"
```

4

```
##    ..$ : chr  "Millennium Falcon" "Imperial shuttle"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "X-wing"
##    ..$ : chr "X-wing"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "Slave 1"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "Millennium Falcon"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "A-wing"
##    ..$ : chr
##    ..$ : chr "Millennium Falcon"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "Naboo Royal Starship"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "Scimitar"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr "Jedi starfighter"
##    ..$ : chr
##    ..$ : chr "Naboo fighter"
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
##    ..$ : chr
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##    ..$ : chr
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```

5

```
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "Belbullab-22 starfighter"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr "T-70 X-wing fighter"
##   ..$ : chr
##   ..$ : chr
##   ..$ : chr  "H-type Nubian yacht" "Naboo star skiff" "Naboo fighter"
```

names(SW)

```
##  [1] "name"       "height"     "mass"       "hair_color" "skin_color"
##  [6] "eye_color"  "birth_year" "sex"        "gender"     "homeworld"
## [11] "species"    "films"      "vehicles"   "starships"
```

head(SW, n = 15)

```
##                 name height mass   hair_color  skin_color eye_color
## 1    Luke Skywalker    172   77        blond        fair      blue
## 2            C-3PO     167   75         <NA>        gold    yellow
## 3            R2-D2      96   32         <NA> white, blue       red
## 4        Darth Vader    202  136         none       white    yellow
## 5        Leia Organa    150   49        brown       light     brown
## 6          Owen Lars    178  120  brown, grey       light      blue
## 7  Beru Whitesun lars    165   75        brown       light      blue
## 8            R5-D4      97   32         <NA>  white, red       red
## 9  Biggs Darklighter    183   84        black       light     brown
## 10    Obi-Wan Kenobi    182   77 auburn, white        fair blue-gray
## 11  Anakin Skywalker    188   84        blond        fair      blue
## 12   Wilhuff Tarkin    180   NA  auburn, grey        fair      blue
## 13        Chewbacca    228  112        brown     unknown      blue
## 14        Han Solo    180   80        brown        fair     brown
## 15          Greedo    173   74         <NA>       green     black
##    birth_year    sex    gender homeworld species
## 1        19.0   male masculine  Tatooine   Human
## 2       112.0   none masculine  Tatooine   Droid
## 3        33.0   none masculine     Naboo   Droid
## 4        41.9   male masculine  Tatooine   Human
## 5        19.0 female  feminine  Alderaan   Human
## 6        52.0   male masculine  Tatooine   Human
## 7        47.0 female  feminine  Tatooine   Human
```

```
## 8           NA    none masculine  Tatooine   Droid
## 9         24.0    male masculine  Tatooine   Human
## 10        57.0    male masculine   Stewjon   Human
## 11        41.9    male masculine  Tatooine   Human
## 12        64.0    male masculine    Eriadu   Human
## 13       200.0    male masculine  Kashyyyk Wookiee
## 14        29.0    male masculine  Corellia   Human
## 15        44.0    male masculine     Rodia  Rodian
##
## 1                                                         The Empire Strikes Back, Revenge of the Sith, Return of
## 2                       The Empire Strikes Back, Attack of the Clones, The Phantom Menace, Revenge of
## 3   The Empire Strikes Back, Attack of the Clones, The Phantom Menace, Revenge of the Sith, Return of
## 4                                                         The Empire Strikes Back, Revenge of
## 5                                                         The Empire Strikes Back, Revenge of the Sith, Return of
## 6                                                                           Attack of the
## 7                                                                           Attack of the
## 8
## 9
## 10                 The Empire Strikes Back, Attack of the Clones, The Phantom Menace, Revenge of
## 11                                                                 Attack of the Clones,
## 12
## 13                                   The Empire Strikes Back, Revenge of the Sith, Return of
## 14                                             The Empire Strikes Back, Return of
## 15
##                                      vehicles
## 1     Snowspeeder, Imperial Speeder Bike
## 2
## 3
## 4
## 5                      Imperial Speeder Bike
## 6
## 7
## 8
## 9
## 10                     Tribubble bongo
## 11 Zephyr-G swoop bike, XJ-6 airspeeder
## 12
## 13                                AT-ST
## 14
## 15
##                                                                                            sta
## 1                                                                     X-wing, Imperial s
## 2
## 3
## 4                                                                               TIE Advan
## 5
## 6
## 7
## 8
## 9
## 10 Jedi starfighter, Trade Federation cruiser, Naboo star skiff, Jedi Interceptor, Belbullab-22 star
## 11                                           Trade Federation cruiser, Jedi Interceptor, Naboo
## 12
## 13                                                             Millennium Falcon, Imperial s
```

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```
## 14                                                                    Millennium Falcon, Imperial
## 15
```

```
View(SW)

#User defined Function
Get_hairskineyecolour <- function (name, data) {
  name_index <- which(data$name == name)
  if (length(name_index) == 0) {
    return("Not Found")
  } else {
    return(c(eye_Color = data$eye_color[name_index],
             skin_Color = data$skin_color[name_index],
             hair_Color = data$hair_color[name_index]
             ))
  }
}

Get_hairskineyecolour("Luke Skywalker", SW)
```

```
##  eye_Color skin_Color hair_Color
##     "blue"     "fair"    "blond"
```

```
Get_hairskineyecolour("Thomas", SW)
```

```
## [1] "Not Found"
```

```
#Filter
SW_human <- filter(SW, species == "Human")
View(SW_human)


# identify the dependent variable (height) and independent variables (mass and species)
dependent_var <- "height"
independent_vars <- c("mass", "species")

# reshape the data frame to create a new data frame with the independent variables as columns and the d
new_df <- SW %>%
  gather(key = independent_var, value = value, mass, species) %>%
  spread(key = independent_var, value) %>%
  select(height, mass, species)

# check the structure of the new data frame
str(new_df)
```

```
## 'data.frame':    87 obs. of  3 variables:
##  $ height : int  172 167 96 202 150 178 165 97 183 182 ...
##  $ mass   : chr  "77" "75" "32" "136" ...
##  $ species: chr  "Human" "Droid" "Droid" "Human" ...
```

```r
#remove missing values
SW_complete <- na.omit(SW)

#remove duplicated from complete value df
SW_complete_uni <- unique(SW_complete)

#Reorder rows
SW_complete_uni <- arrange(SW_complete_uni,
                           desc(SW_complete_uni$mass),
                           desc(SW_complete_uni$birth_year))

#Rename
SW_complete_uni <- plyr::rename( SW_complete_uni, c("homeworld" = "homeplanet",
                                    "films" = "movies"))
#Add new variable
SW_complete_uni <- mutate(SW_complete_uni, HMratio = SW_complete_uni$height /
                          SW_complete_uni$mass)

#Create a training set using random number generator engine.

# Load the data frame
df <- data.frame(SW)

# Load the caret library
require(caret)
```

```
## Loading required package: caret
```

```
## Warning in library(package, lib.loc = lib.loc, character.only = TRUE,
## logical.return = TRUE, : there is no package called 'caret'
```

```r
# Set the seed for reproducibility
set.seed(123)

# Sample 75% of the data frame to create the training set
require(dplyr)
SW_training_set <- SW_complete_uni %>%
  sample_n(round(nrow(SW_complete_uni) * 0.75))

# Summary
summary(SW_complete_uni$height)
```
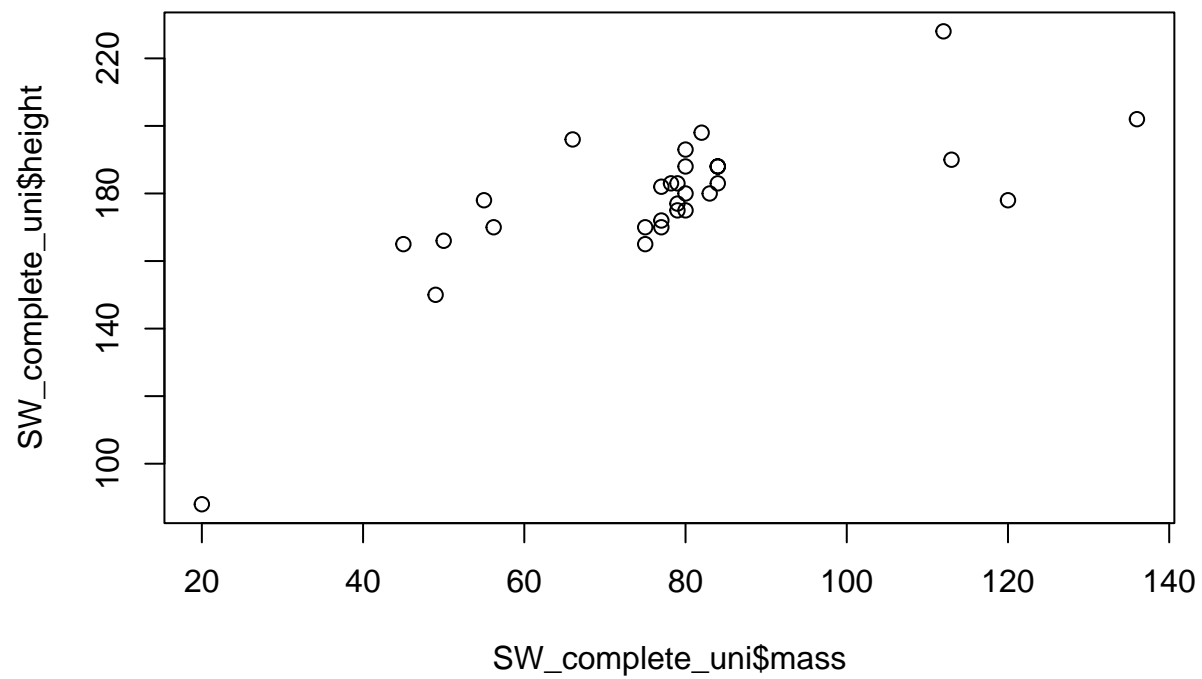
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##      88     170     180     178     188     228
```
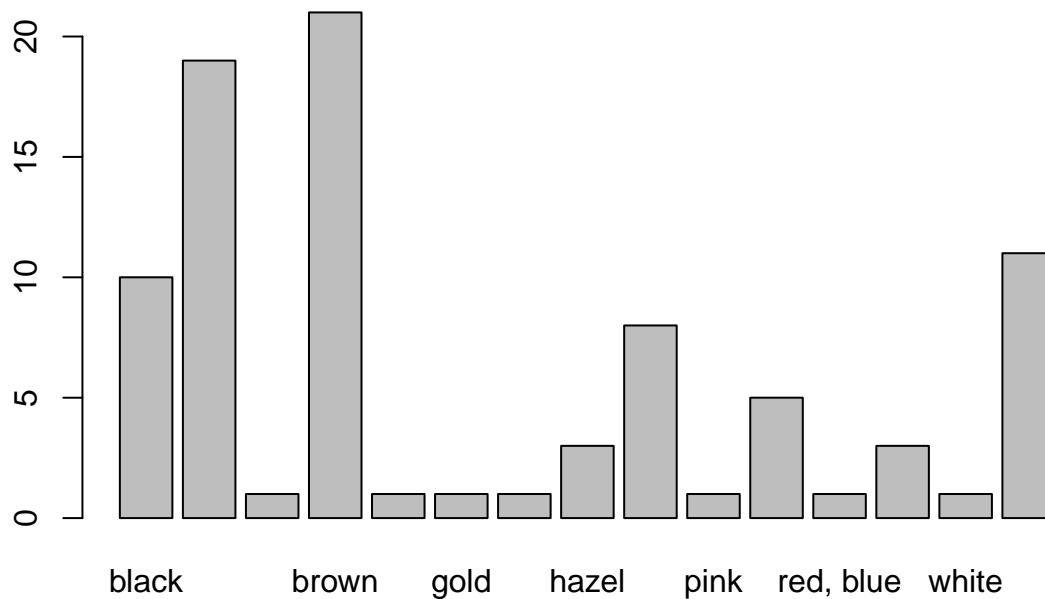
```r
range(SW_complete_uni$height)
```

```
## [1]  88 228
```

```
#Scatter plot
require(ggplot2)
plot(SW_complete_uni$mass, SW_complete_uni$height)
```



```
#barchart
SW_bar <- table(SW$eye_color)
barplot(SW_bar)
```

https://github.com/Codychu14/Assignment-1-Data-Analysis-using-R-Programming

```
#regression
#Load the data frame
df <- data.frame(SW)
#Calculate the correlation using lm()
model <- lm(SW_complete_uni$height ~ SW_complete_uni$mass)
#Print the correlation
print(summary(model))
```

```
##
## Call:
## lm(formula = SW_complete_uni$height ~ SW_complete_uni$mass)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -48.812  -5.991   0.598   7.818  26.421
##
## Coefficients:
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)          122.5647    10.3754  11.813 3.55e-12 ***
## SW_complete_uni$mass   0.7123     0.1281   5.562 6.76e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.64 on 27 degrees of freedom
## Multiple R-squared:  0.534,  Adjusted R-squared:  0.5167
## F-statistic: 30.94 on 1 and 27 DF,  p-value: 6.756e-06
```