FIFA Player Assessment Model and Analytics

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Loading Data

```
fifa16 <- fread("~/Desktop/Northeastern-University/SML/FIFA-Player-Assessment-Model-and-Analytics/Datas
fifa16 <- as_tibble(fifa16)

fifa17 <- fread("~/Desktop/Northeastern-University/SML/FIFA-Player-Assessment-Model-and-Analytics/Datas
fifa1 <- as_tibble(fifa17)

fifa18 <- fread("~/Desktop/Northeastern-University/SML/FIFA-Player-Assessment-Model-and-Analytics/Datas
fifa18 <- as_tibble(fifa18)

fifa19 <- fread("~/Desktop/Northeastern-University/SML/FIFA-Player-Assessment-Model-and-Analytics/Datas
fifa19 <- as_tibble(fifa19)

fifa20 <- fread("~/Desktop/Northeastern-University/SML/FIFA-Player-Assessment-Model-and-Analytics/Datas
fifa20 <- as_tibble(fifa20)

fifa_datasets_list = list(fifa16, fifa17, fifa18, fifa19, fifa20)
years = list("2016", "2017", "2018", "2019", "2020")
```

Exploratory Data Analysis

Abstract Hypothesis EDA

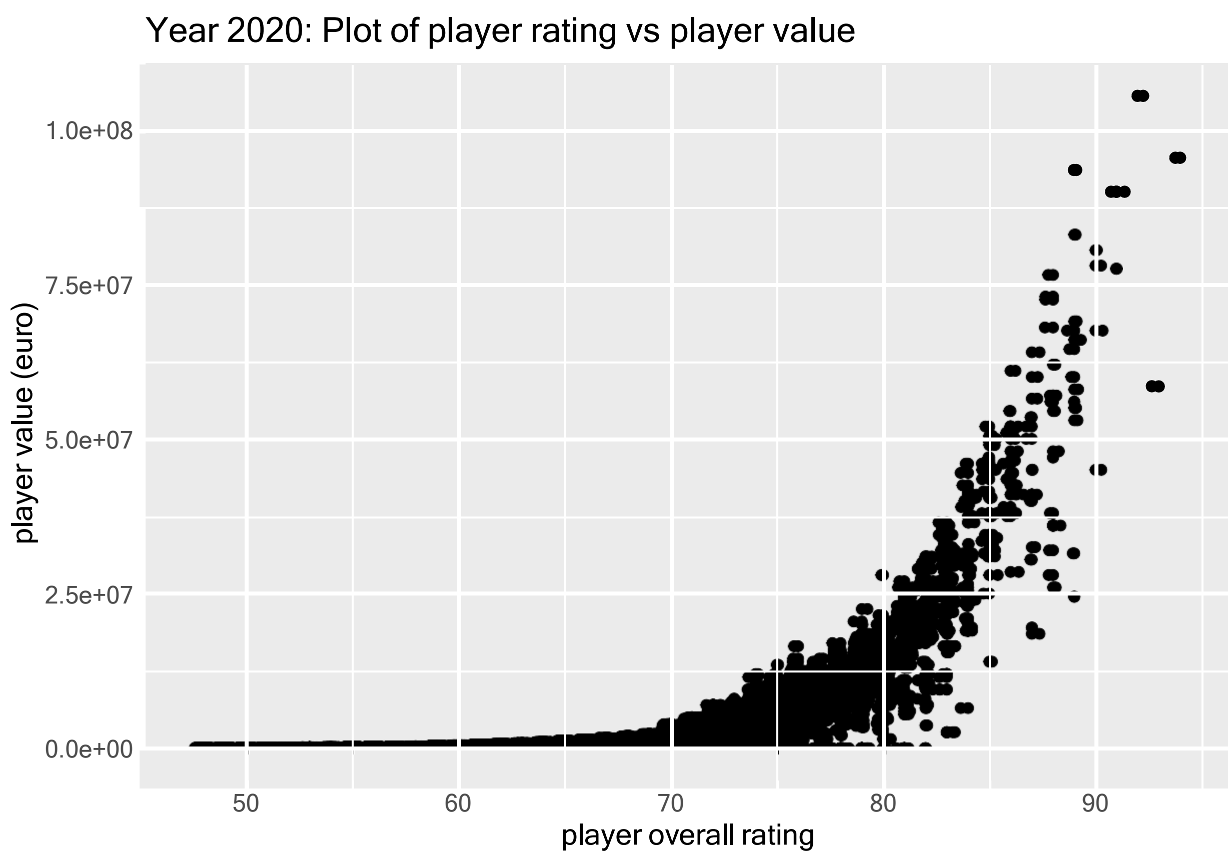
1. There exists a positive correlation between player rating and value

```
# Correlation between player overall and value in euros
for (i in seq_along(fifa_datasets_list)) {
  ovr_val_wag <- fifa_datasets_list[[i]] %>% select(overall, value_eur, wage_eur)
  cor_ovr_val_wag <- cor(ovr_val_wag)
  print(paste("Year", years[[i]], ":"))
  print(round(cor_ovr_val_wag, 2))
}
```

```
## [1] "Year 2016 :"
##           overall value_eur wage_eur
## overall      1.00      0.60     0.73
## value_eur    0.60      1.00     0.91
```

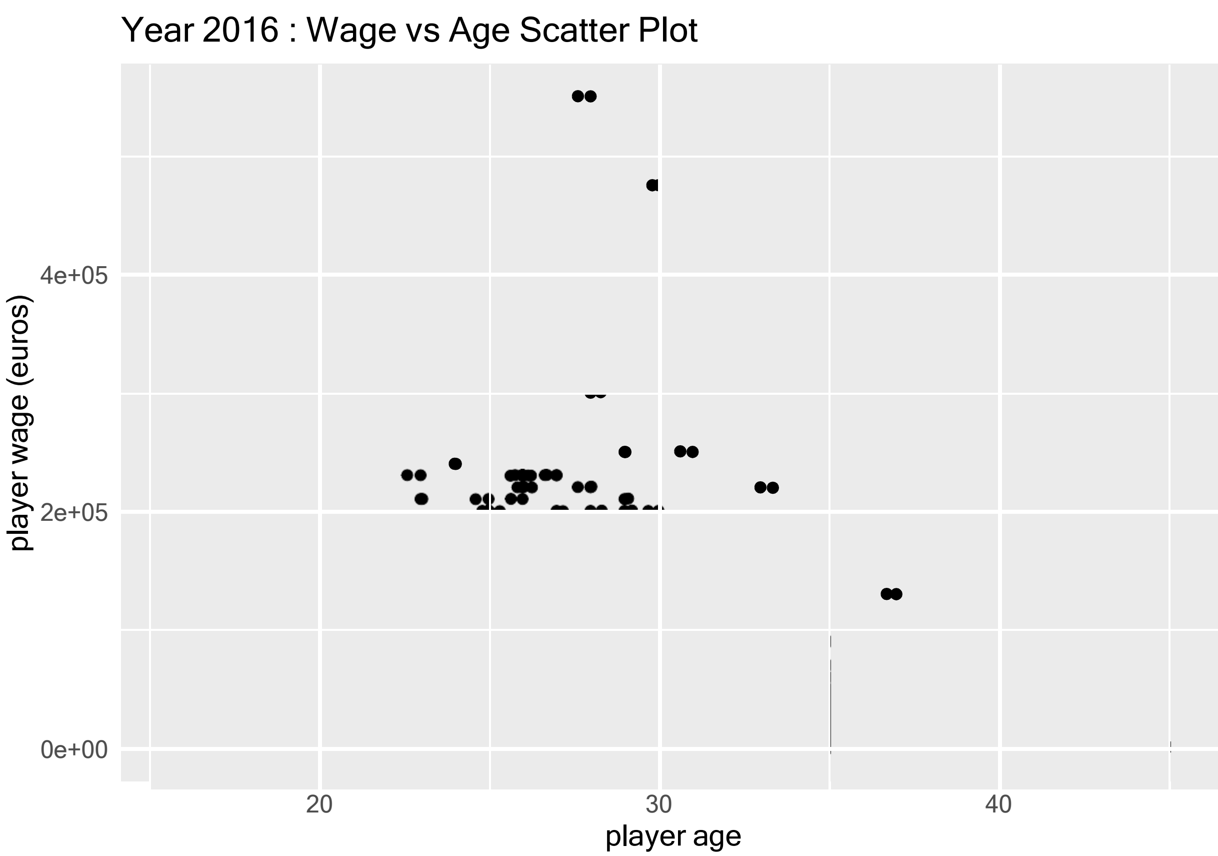
```
## wage_eur      0.73       0.91       1.00
## [1] "Year 2017 :"
##             overall  value_eur  wage_eur
## overall        1.00       0.60       0.62
## value_eur      0.60       1.00       0.88
## wage_eur       0.62       0.88       1.00
## [1] "Year 2018 :"
##             overall  value_eur  wage_eur
## overall        1.00       0.63       0.60
## value_eur      0.63       1.00       0.85
## wage_eur       0.60       0.85       1.00
## [1] "Year 2019 :"
##             overall  value_eur  wage_eur
## overall        1.00       0.63       0.57
## value_eur      0.63       1.00       0.86
## wage_eur       0.57       0.86       1.00
## [1] "Year 2020 :"
##             overall  value_eur  wage_eur
## overall        1.00       0.64       0.57
## value_eur      0.64       1.00       0.86
## wage_eur       0.57       0.86       1.00
```

```r
fifa20 %>% ggplot(aes(x=overall,y=value_eur)) + geom_point() + geom_jitter() +
  labs(x = "player overall rating", y = "player value (euro)",
       title = "Year 2020: Plot of player rating vs player value")
```

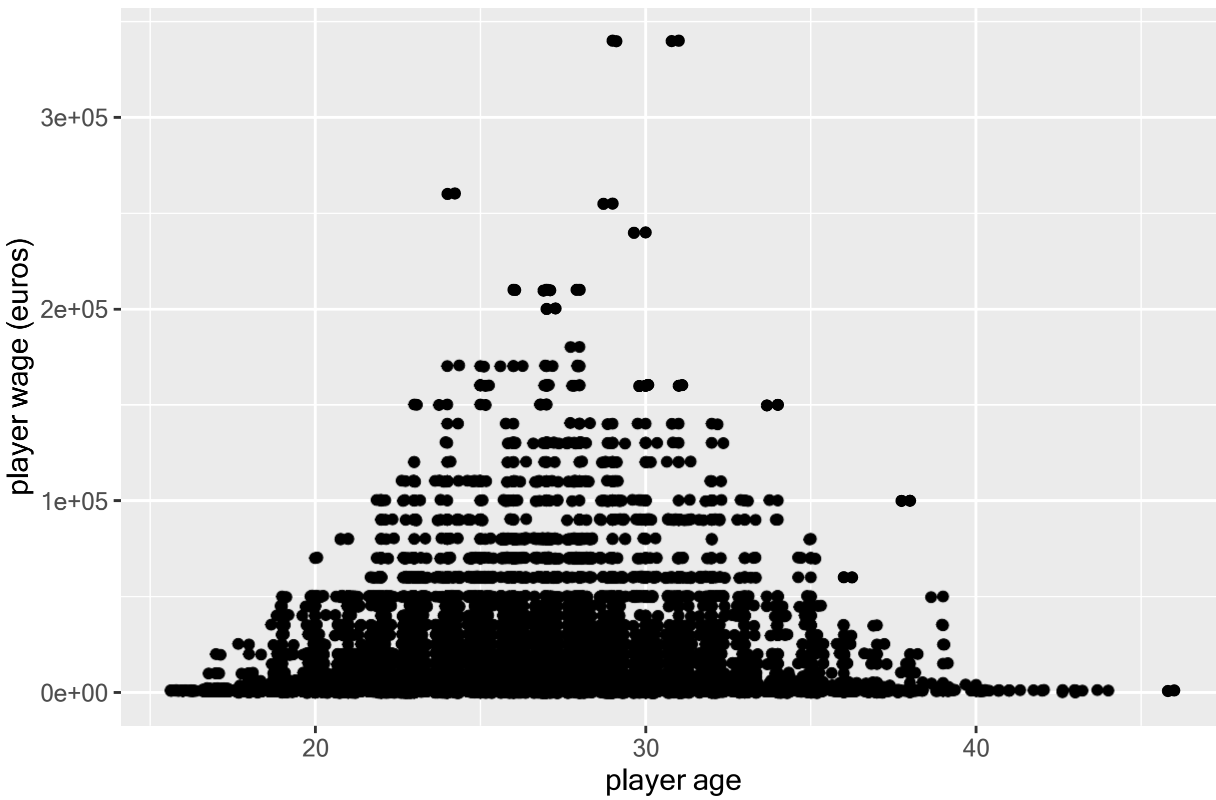


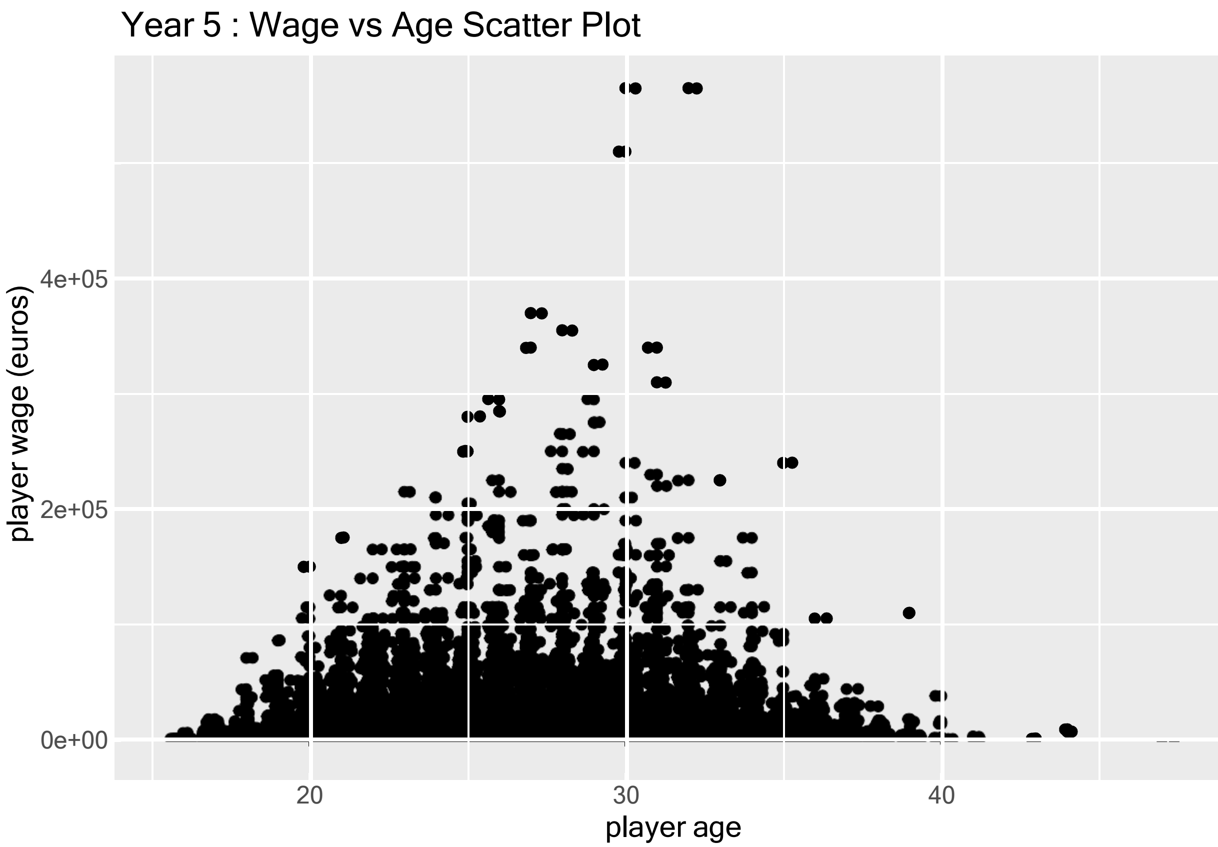
2. Player wage and age are positively correlated upto the age of 31 and negatively correlated after that

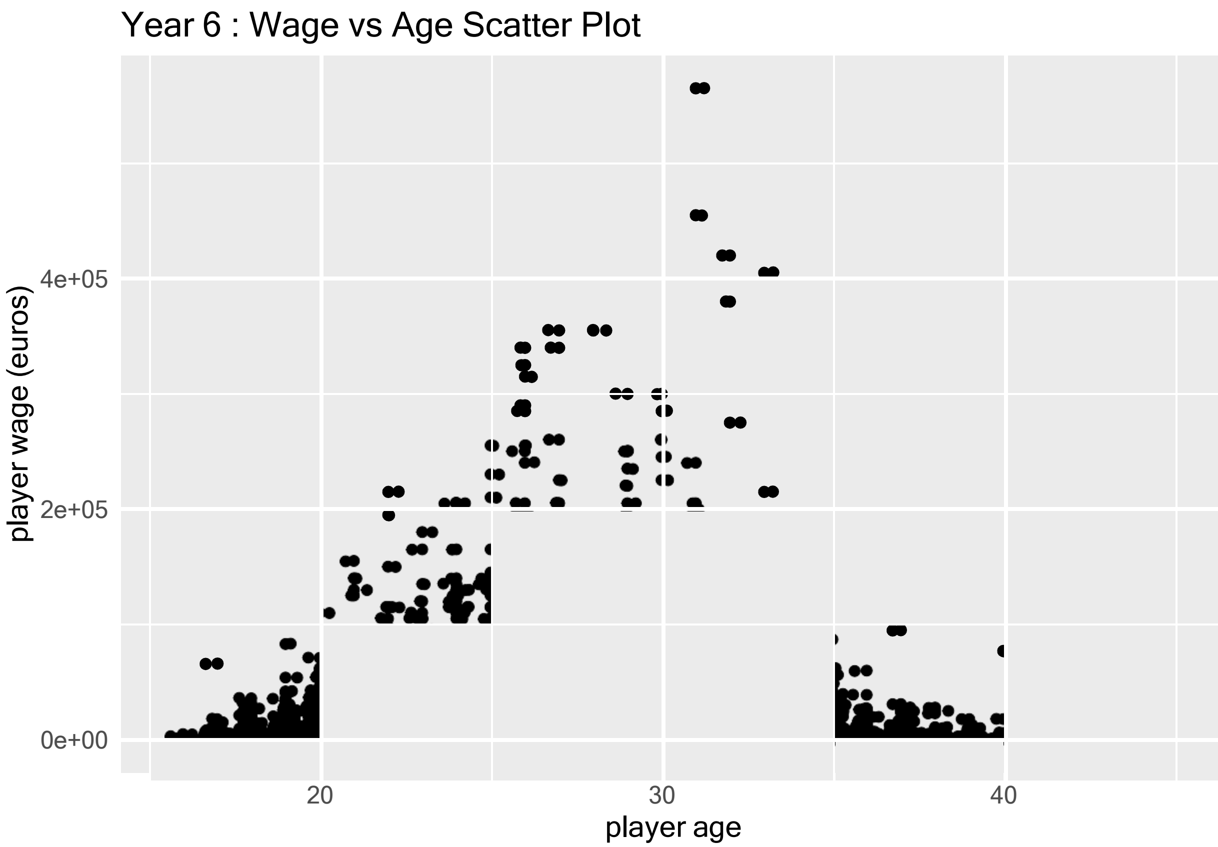
```r
# WAGE AND AGE CORRELATION: scatter plot of wage and age
for (i in seq_along(fifa_datasets_list)) {
  wage_age_plt <- fifa_datasets_list[[i]] %>% ggplot(aes(age, wage_eur)) +
    geom_point() + geom_jitter() +
    labs(x="player age", y="player wage (euros)",
         title=paste("Year", years[[i]], ":", "Wage vs Age Scatter Plot"))
  print(wage_age_plt)
}
```

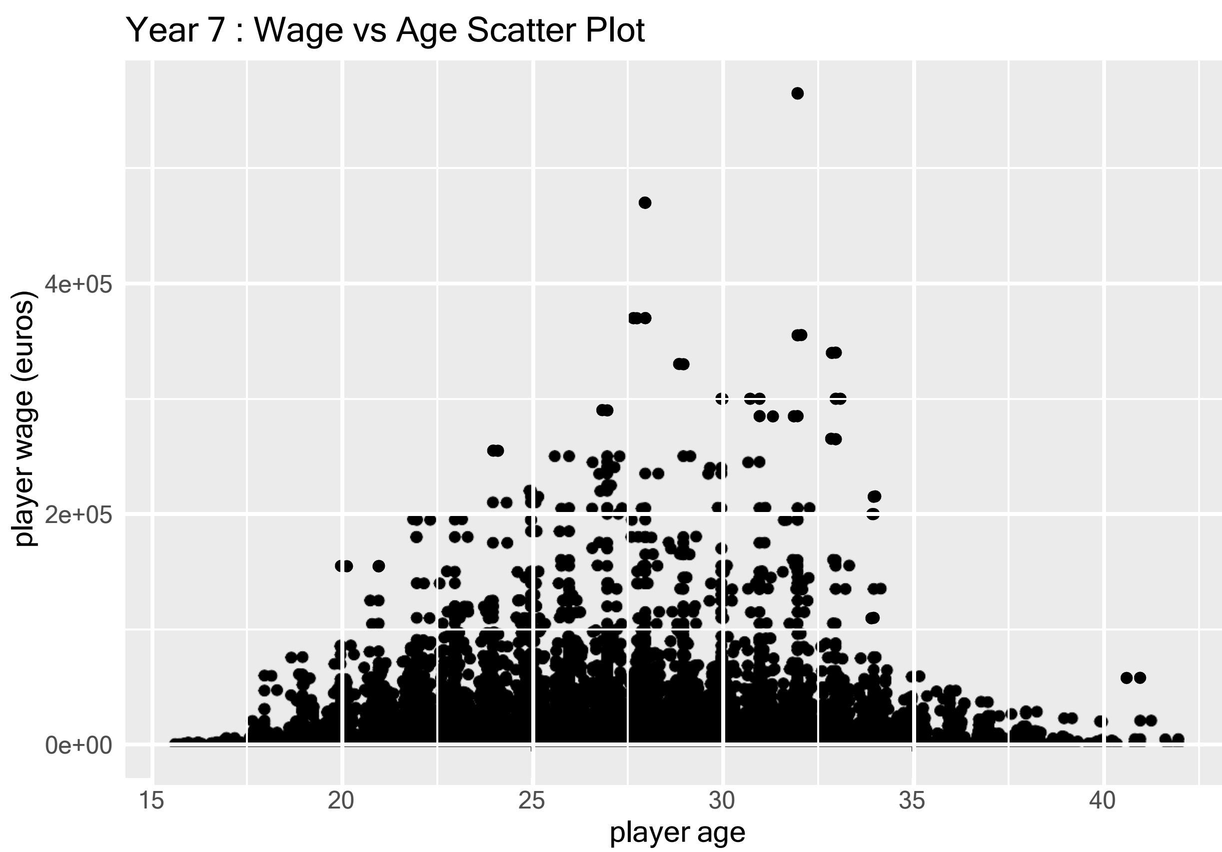


Year 4 : Wage vs Age Scatter Plot




Year 5 : Wage vs Age Scatter Plot
player wage (euros)
4e+05
2e+05
0e+00
20
30
40
player age


Year 6 : Wage vs Age Scatter Plot
player wage (euros)
4e+05
2e+05
0e+00
20
30
40
player age




```
for (i in seq_along(fifa_datasets_list)) {

  players31_andless <- fifa_datasets_list[[i]] %>%
    filter(age <= 31)%>% select(age, wage_eur, value_eur)
  players_over31  <-  fifa_datasets_list[[i]]  %>%
    filter(age > 31)%>% select(age, wage_eur, value_eur)

  cor_31andless_cor <- cor(players31_andless)
  print(paste("Year", years[[i]], ":", "Players  <=  31"))
  print(round(cor_31andless_cor, 2))
  #age and wage  are  +vely  correlated  but  the  correlation  is  not  very  high.

  players_over31_cor <- cor(players_over31)
  print(paste("Year", years[[i]], ":", "Players  >  31"))
  print(round(players_over31_cor, 2))
  #age and wage  are  -vely  correlated  but  the  correlation  is  not  very  high.
}
```

```
## [1] "Year  2016  : Players  <=  31"
##                age wage_eur value_eur
## age           1.00      0.27      0.15
## wage_eur      0.27      1.00      0.91
## value_eur     0.15      0.91      1.00
## [1] "Year 2016 : Players > 31"
##                 age  wage_eur  value_eur
## age            1.00     -0.08      -0.15
```

```
## wage_eur  -0.08      1.00        0.87
## value_eur -0.15      0.87        1.00
## [1] "Year 2017 : Players <= 31"
##                age  wage_eur value_eur
## age          1.00       0.23        0.15
## wage_eur     0.23       1.00        0.89
## value_eur    0.15       0.89        1.00
## [1] "Year 2017 : Players > 31"
##                age  wage_eur  value_eur
## age           1.00     -0.12      -0.17
## wage_eur     -0.12      1.00       0.81
## value_eur    -0.17      0.81       1.00
## [1] "Year 2018 : Players <= 31"
##                age  wage_eur value_eur
## age          1.00       0.20        0.16
## wage_eur     0.20       1.00        0.86
## value_eur    0.16       0.86        1.00
## [1] "Year 2018 : Players > 31"
##                age  wage_eur  value_eur
## age           1.00     -0.11      -0.17
## wage_eur     -0.11      1.00       0.86
## value_eur    -0.17      0.86       1.00
## [1] "Year 2019 : Players <= 31"
##                age  wage_eur value_eur
## age          1.00       0.19        0.16
## wage_eur     0.19       1.00        0.87
## value_eur    0.16       0.87        1.00
## [1] "Year 2019 : Players > 31"
##                age  wage_eur  value_eur
## age           1.00     -0.12      -0.18
## wage_eur     -0.12      1.00       0.88
## value_eur    -0.18      0.88       1.00
## [1] "Year 2020 : Players <= 31"
##                age  wage_eur value_eur
## age          1.00       0.19        0.15
## wage_eur     0.19       1.00        0.87
## value_eur    0.15       0.87        1.00
## [1] "Year 2020 : Players > 31"
##                age  wage_eur  value_eur
## age           1.00     -0.12      -0.18
## wage_eur     -0.12      1.00       0.92
## value_eur    -0.18      0.92       1.00
```

3. Left footed players have a higher overall rating compared to right footed players

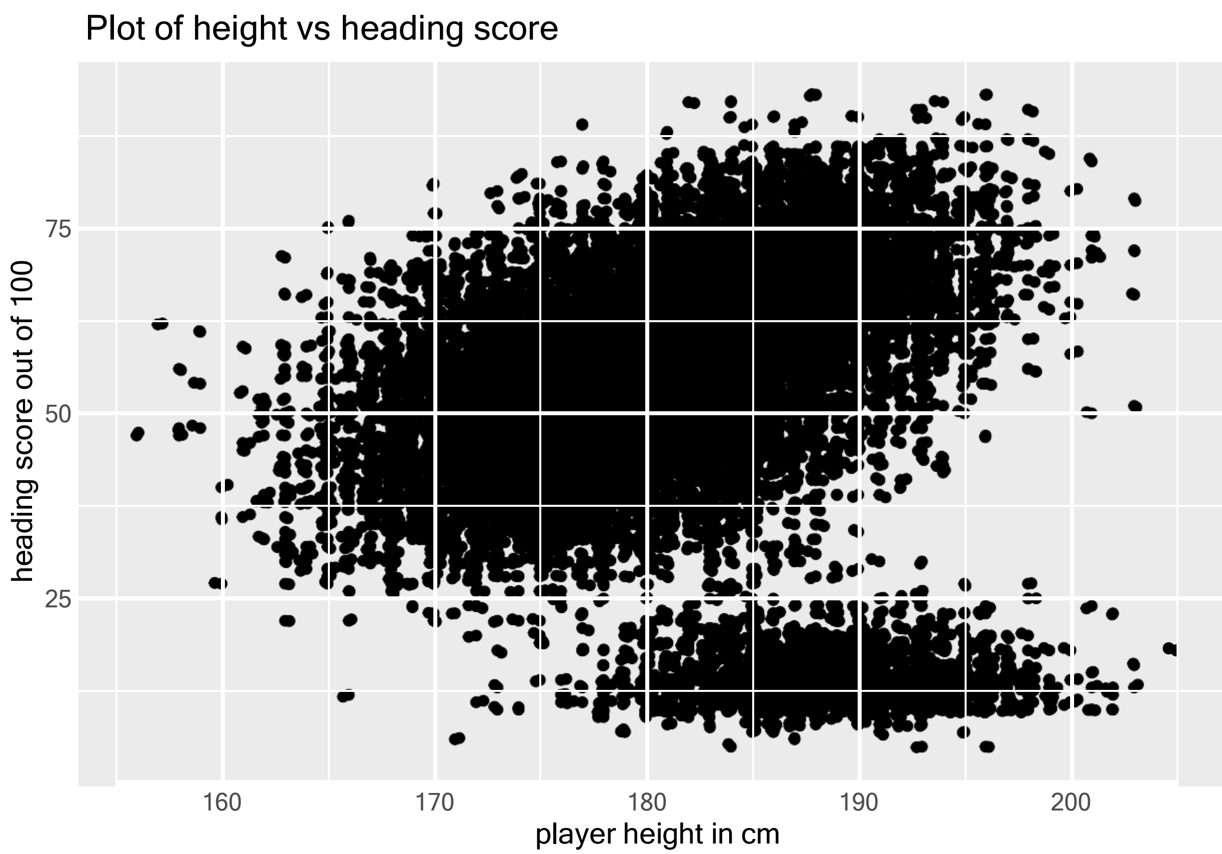
```r
# Left footed players have a higher overall rating compared to right footed players
for (i in seq_along(fifa_datasets_list)) {
  left_foot <- fifa_datasets_list[[i]] %>% filter(preferred_foot=="Left") %>%
    summarise(avg_player_overall_left = mean(overall)) %>% mutate(year = years[[i]])
```

```r
  right_foot <- fifa_datasets_list[[i]] %>% filter(preferred_foot=="Right")%>%
    summarise(avg_player_overall_right = mean(overall)) %>% mutate(year = years[[i]])

  foot_rating_year <- left_foot %>% left_join(right_foot)
  print(foot_rating_year)
}
```

```
## Joining, by = "year"

## # A tibble: 1 x 3
##   avg_player_overall_left year  avg_player_overall_right
##                     <dbl> <chr>                    <dbl>
## 1                    66.2 2016                      65.5

## Joining, by = "year"

##   avg_player_overall_left year avg_player_overall_right
## 1                66.73062 2017                 66.06775

## Joining, by = "year"

## # A tibble: 1 x 3
##   avg_player_overall_left year  avg_player_overall_right
##                     <dbl> <chr>                    <dbl>
## 1                    66.7 2018                      66.2

## Joining, by = "year"

## # A tibble: 1 x 3
##   avg_player_overall_left year  avg_player_overall_right
##                     <dbl> <chr>                    <dbl>
## 1                    66.8 2019                      66.1

## Joining, by = "year"

## # A tibble: 1 x 3
##   avg_player_overall_left year  avg_player_overall_right
##                     <dbl> <chr>                    <dbl>
## 1                    66.7 2020                      66.1
```

4. Tall, short and strong players are statistically good at heading, dribbling and tackling respectively

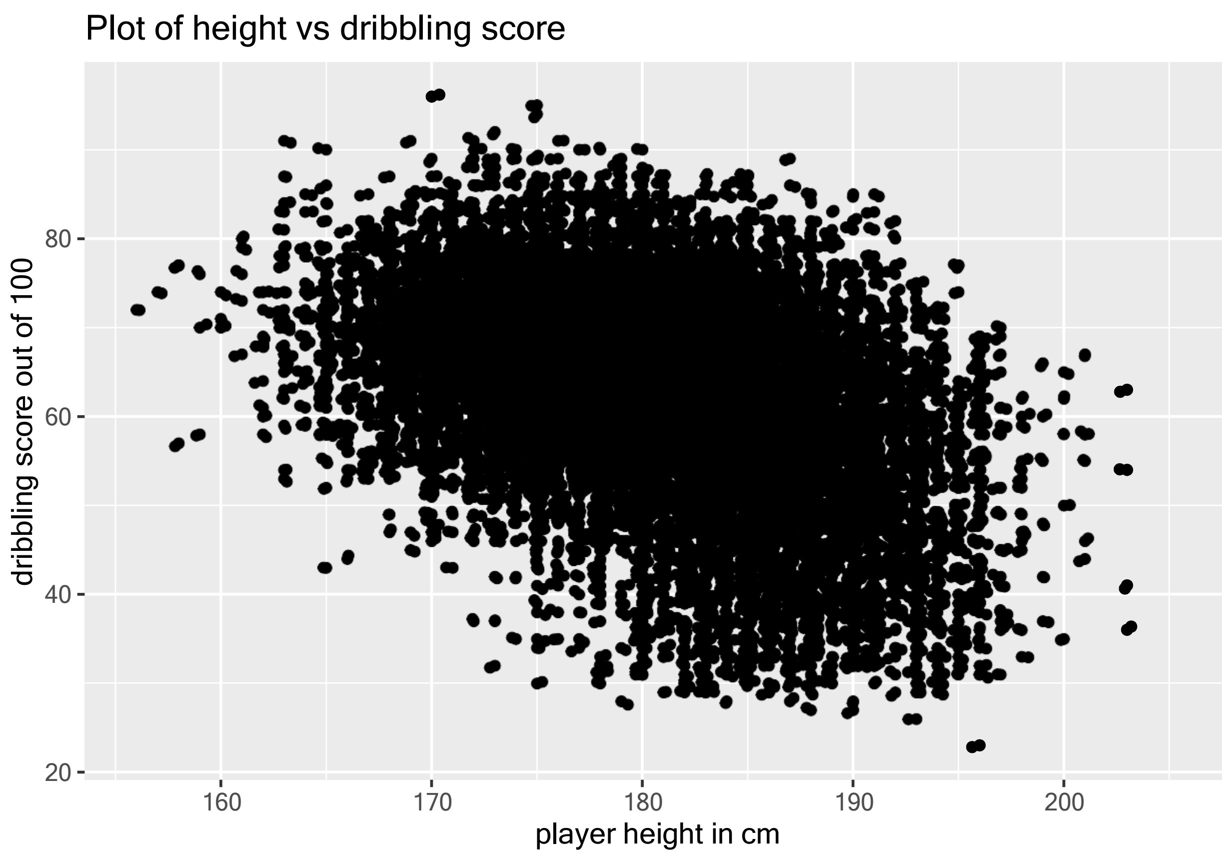
```r
# Tall players and heading: scatter plot of height vs heading
fifa20 %>% ggplot(aes(height_cm, attacking_heading_accuracy)) +
  geom_point() + geom_jitter() +
  labs(x="player height in cm", y="heading score out of 100",
       title = "Plot of height vs heading score")
```




```r
# THIS IS A VERY INTERESTING FIND. WHY?
cor(fifa20$height_cm, fifa20$attacking_heading_accuracy,
    method = "spearman", use = "complete.obs")
```

```
## [1] 0.2054838
```

```r
# There exists a weak positive correlation between height and heading.

# Short players and dribbling: scatter plot of height vs dribbling
fifa20 %>% ggplot(aes(height_cm, dribbling))+geom_point()+
  geom_jitter()+labs(x="player height in cm", y="dribbling score out of 100",
                     title = "Plot of height vs dribbling score")
```




```r
cor(fifa20$height_cm, fifa20$dribbling,
    method = "spearman", use = "complete.obs")
```

```
## [1] -0.3946403
```

```r
# There is a weak negative correlation b/w height and dribbling ie short players are good  at dribbling.

#Dribbling and movement attributes:
cor(fifa20$dribbling, fifa20$movement_agility,
    method = "pearson", use = "complete.obs")
```

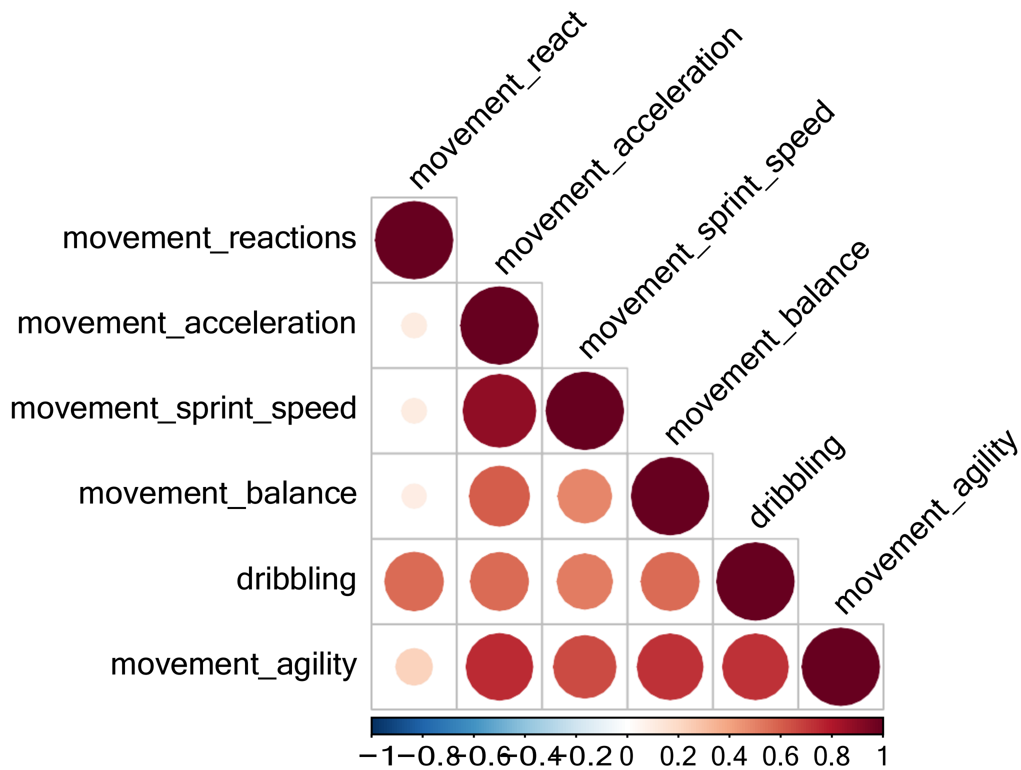
```
## [1] 0.7241454
```

```r
#Dribbling and movement_agility are highly +vely correlated

cor(fifa20$dribbling, fifa20$movement_balance,
    method = "pearson", use = "complete.obs")
```

```
## [1] 0.5581589
```

```r
#Dribbling and movement_balance are moderately +vely correlated

# Correlation matrix for dribbling and movement attributes:
```

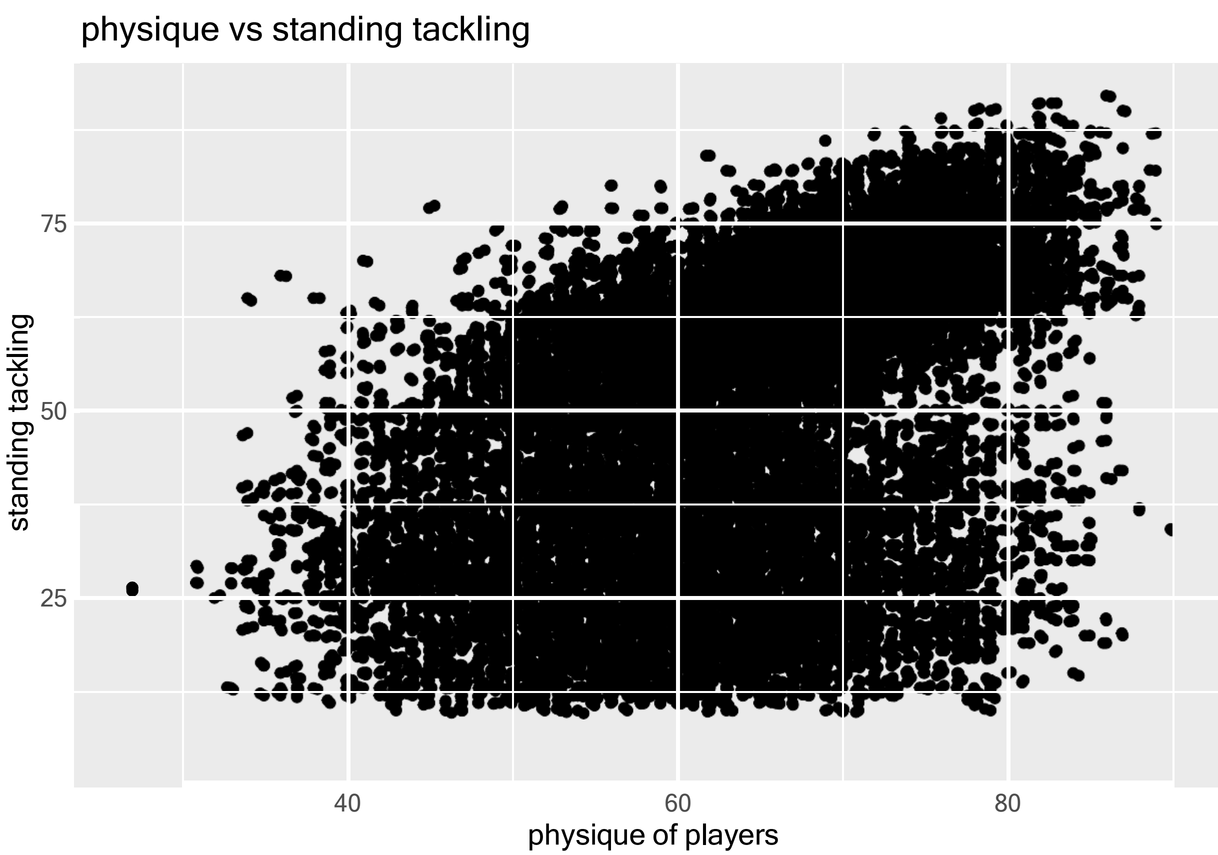
```r
drib_move <- fifa20 %>% select(dribbling,movement_acceleration,
                               movement_sprint_speed, movement_agility,
                               movement_reactions, movement_balance)
source("http://www.sthda.com/upload/rquery_cormat.r")
require("corrplot")
rquery.cormat(drib_move)
```




```
## $r
##                       movement_reactions movement_acceleration
## movement_reactions                     1
## movement_acceleration                0.1                     1
## movement_sprint_speed                0.1                  0.88
## movement_balance                   0.096                   0.6
## dribbling                           0.57                  0.56
## movement_agility                    0.22                  0.74
##                       movement_sprint_speed movement_balance dribbling
## movement_reactions
## movement_acceleration
## movement_sprint_speed                     1
## movement_balance                       0.48                1
## dribbling                              0.51             0.56         1
## movement_agility                       0.65             0.72      0.72
##                       movement_agility
## movement_reactions
## movement_acceleration
```

```
## movement_sprint_speed
## movement_balance
## dribbling
## movement_agility                1
##
## $p
##                        movement_reactions movement_acceleration
## movement_reactions                     0
## movement_acceleration          2.8e-151                     0
## movement_sprint_speed          1.7e-155                     0
## movement_balance                3.1e-97                     0
## dribbling                             0                     0
## movement_agility     5.89999999999934e-312                  0
##                      movement_sprint_speed movement_balance dribbling
## movement_reactions
## movement_acceleration
## movement_sprint_speed                 0
## movement_balance                      0                0
## dribbling                             0                0         0
## movement_agility                      0                0         0
##                      movement_agility
## movement_reactions
## movement_acceleration
## movement_sprint_speed
## movement_balance
## dribbling
## movement_agility                0
##
## $sym
##                      movement_reactions movement_acceleration
## movement_reactions    1
## movement_acceleration                   1
## movement_sprint_speed                   +
## movement_balance                        .
## dribbling             .                 .
## movement_agility                        ,
##                      movement_sprint_speed movement_balance dribbling
## movement_reactions
## movement_acceleration
## movement_sprint_speed 1
## movement_balance      .                1
## dribbling             .                .                1
## movement_agility      ,                ,                ,
##                      movement_agility
## movement_reactions
## movement_acceleration
## movement_sprint_speed
## movement_balance
## dribbling
## movement_agility      1
## attr(,"legend")
## [1] 0 ' ' 0.3 '.' 0.6 ',' 0.8 '+' 0.9 '*' 0.95 'B' 1
```

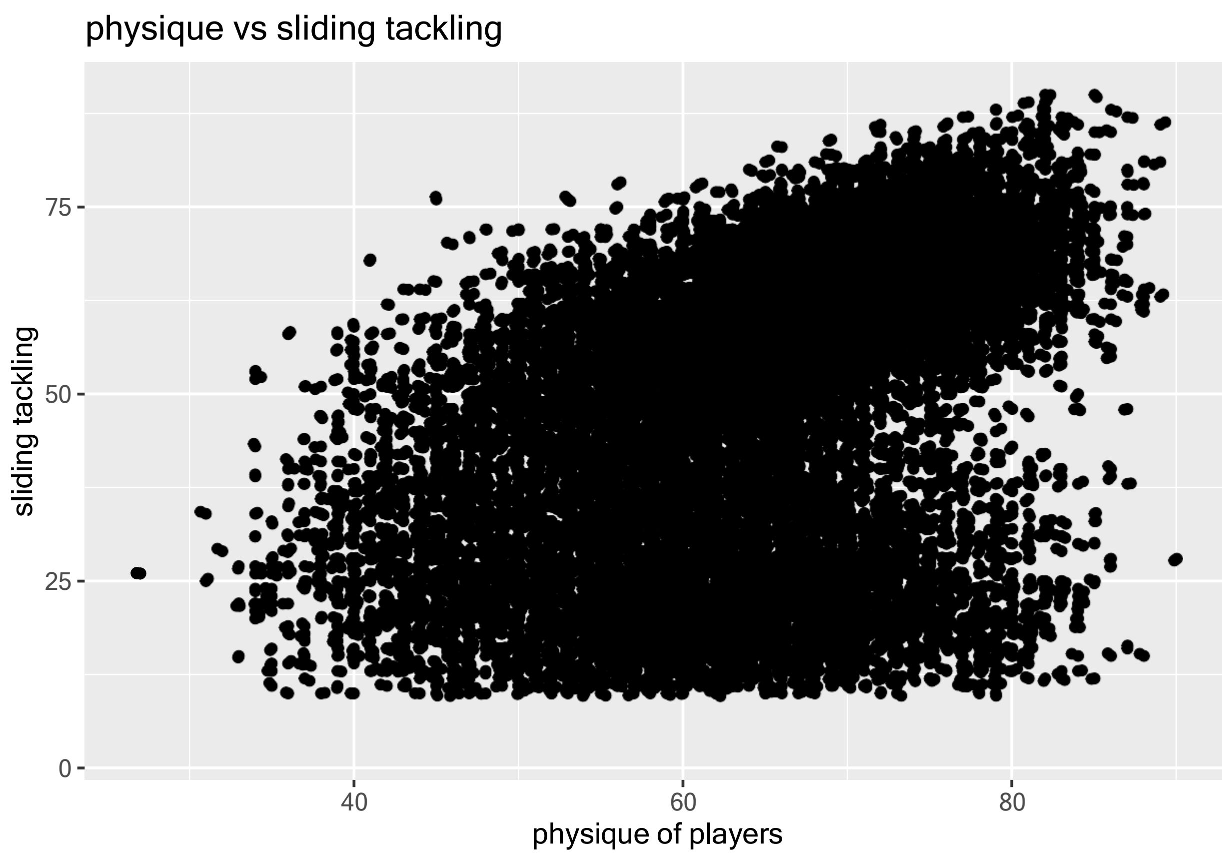
```r
# We can see from the corrplot that dribbling is highly
# +vely correlated with the movement attributes.

# Strong players and tackling(both standing and sliding)
# scatter plot of physique vs standing tackling
fifa20 %>% ggplot(aes(physic, defending_standing_tackle))+geom_point()+
  geom_jitter()+labs(x="physique of players", y="standing tackling",
                     title = "physique vs standing tackling")
```




```r
cor(fifa20$physic, fifa20$defending_standing_tackle,
    method = "pearson", use = "complete.obs")
```

```
## [1] 0.4896467
```

```r
# Moderate +ve correlation

# Scatter plot of physique vs sliding tackling
fifa20 %>% ggplot(aes(physic, defending_sliding_tackle))+geom_point()+
  geom_jitter()+labs(x="physique of players", y="sliding tackling",
                     title = "physique vs sliding tackling")
```




```r
cor(fifa20$physic, fifa20$defending_sliding_tackle,
    method = "pearson", use = "complete.obs")
```

```
## [1] 0.4515019
```

```r
# Moderate +ve correlation
```

```r
team_of_the_year <- function(year_data) {

  team_11 <- vector(mode = "list", length = 11)

  # STRIKER - positions to be considered: ST, CF, LS, RS, LF, RF
  striker <- year_data %>% filter(team_position %in% c("ST","CF","LS","RS","LF","RF")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[1]] = data.frame(striker)

  # Wingers: 2 wingers to be picked, one on the left and one on the right.
  # positions to be considered: RW, LW
  lw <- year_data %>% filter(team_position %in% c("LW")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[2]] = data.frame(lw)

  rw <- year_data %>% filter(team_position %in% c("RW")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[3]] = data.frame(rw)
```

```
  # 1 AM, positions: CAM, LAM, RAM
  am <- year_data %>% filter(team_position %in% c("CAM","LAM","RAM")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[4]] = data.frame(am)

  # 2 midfielders, one on the right and one on the left:
  # right midfielder: RCM, CDM, RDM, CM
  rm <- year_data %>% filter(team_position %in% c("RCM","CDM","RDM","CM")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[5]] = data.frame(rm)

  # left midfielder: LCM, CDM, LDM, CM
  lm <- year_data %>% filter(team_position %in% c("LCM","CDM","LDM","CM")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[6]] = data.frame(lm)

  # 2 wing backs, one on the right and one on the left:
  # left back, positions to be considered: LB, LWB
  lb <- year_data %>% filter(team_position %in% c("LWB","LB")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[7]] = data.frame(lb)

  # right back, positions to be considered: RB, RWB
  rb <- year_data %>% filter(team_position %in% c("RWB","RB")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[8]] = data.frame(rb)

  # 2 centre backs:
  # positions to be considered: LCB, RCB
  lcb <- year_data %>% filter(team_position %in% c("LCB")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[9]] = data.frame(lcb)

  rcb <- year_data %>% filter(team_position %in% c("RCB")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[10]] = data.frame(rcb)

  gk <- year_data %>% filter(team_position %in% c("GK")) %>%
    arrange(desc(overall)) %>% select(short_name, team_position, overall) %>% top_n(1)
  team_11[[11]] = data.frame(gk)

  best11 <- do.call("rbind", team_11)
  print(best11)
}
```

5. The starting eleven with the highest overall rating for a given year wins the champions league that year

```r
# FIFA World 11

unique(fifa20$team_position)
```

```
##  [1] "RW"   "LW"   "CAM"  "GK"   "RCM"  "LCB"  "ST"   "CDM"  "LDM"  "RM"   "RCB"
## [12] "LCM"  "LM"   "CF"   "SUB"  "LB"   "LS"   "RB"   "RDM"  "RES"  "RAM"  "RS"
## [23] "RF"   "CM"   "CB"   "LF"   "LAM"  ""     "RWB"  "LWB"
```

```r
# Assuming a 4231 formation, we come up with the best team for each year.

for (i in seq_along(fifa_datasets_list)) {
  print(paste("Year", years[[i]], ":"))
  team_of_the_year(fifa_datasets_list[[i]])
}
```

```
## [1] "Year 2016 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##        short_name team_position overall
## 1        L. Suárez            ST      90
## 2           Neymar            LW      88
## 3         L. Messi            RW      94
## 4     J. Rodríguez           CAM      87
## 5          M. Özil           CAM      87
## 6         T. Kroos           RDM      87
## 7   Cesc Fàbregas           RDM      87
## 8        L. Modrić           LDM      87
## 9       Jordi Alba            LB      84
## 10      Dani Alves            RB      84
## 11    G. Chiellini           LCB      87
## 12    Sergio Ramos           LCB      87
## 13    Thiago Silva           RCB      88
## 14        M. Neuer            GK      90
## [1] "Year 2017 :"
```

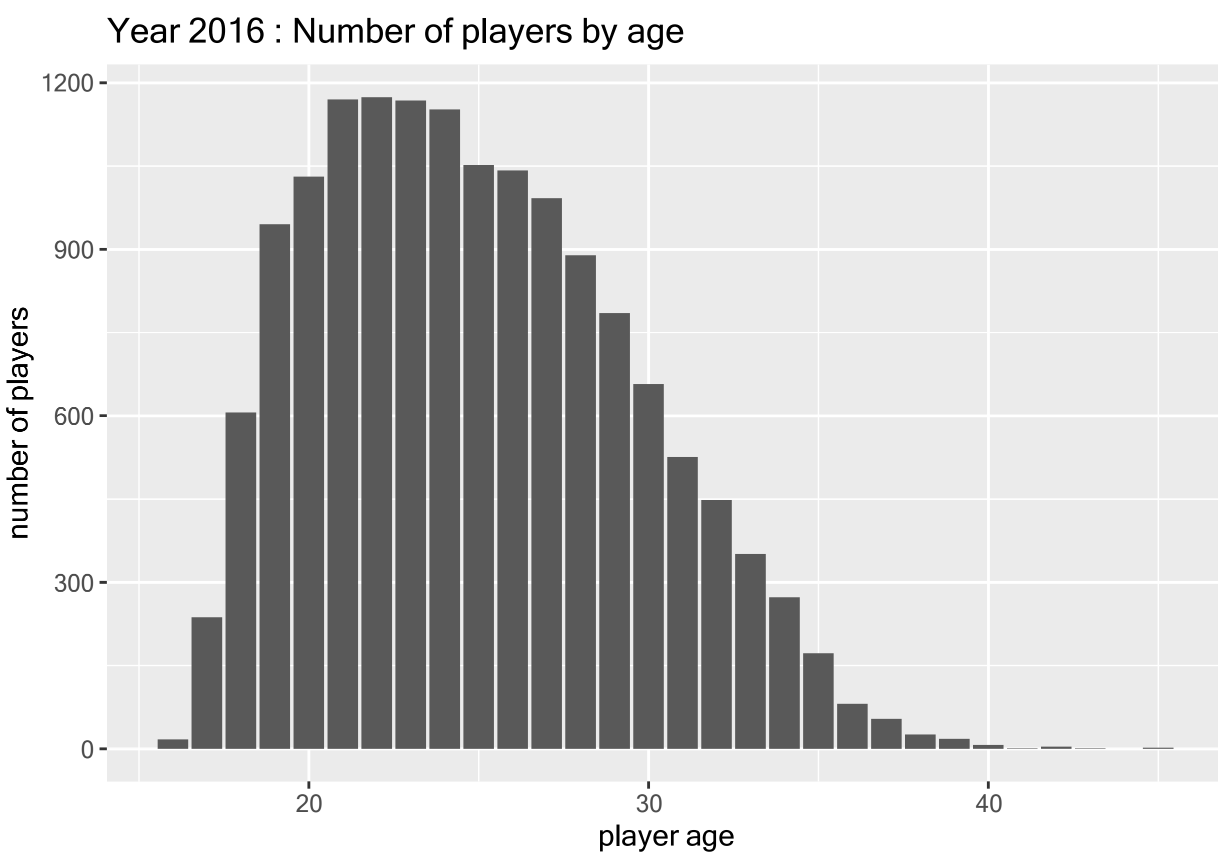
```
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##            short_name team_position overall
## 1           L. Suárez            ST      92
## 2   Cristiano Ronaldo            LW      94
## 3            L. Messi            RW      93
## 4             M. Özil           CAM      89
## 5           L. Modrić           RCM      89
## 6            P. Pogba           LDM      88
## 7            T. Kroos           LCM      88
## 8            D. Alaba            LB      87
## 9             P. Lahm            RB      88
## 10       Sergio Ramos           LCB      89
## 11       Thiago Silva           LCB      89
## 12         J. Boateng           RCB      90
## 13           M. Neuer            GK      92
## [1] "Year 2018 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##            short_name team_position overall
## 1           L. Suárez            ST      92
## 2   Cristiano Ronaldo            LW      94
## 3            L. Messi            RW      93
## 4           P. Dybala           CAM      88
## 5        K. De Bruyne           RCM      89
## 6           L. Modrić           RCM      89
## 7            T. Kroos           LCM      90
## 8             Marcelo            LB      87
## 9            Carvajal            RB      84
## 10         Dani Alves            RB      84
## 11       Sergio Ramos           LCB      90
## 12         J. Boateng           RCB      88
```

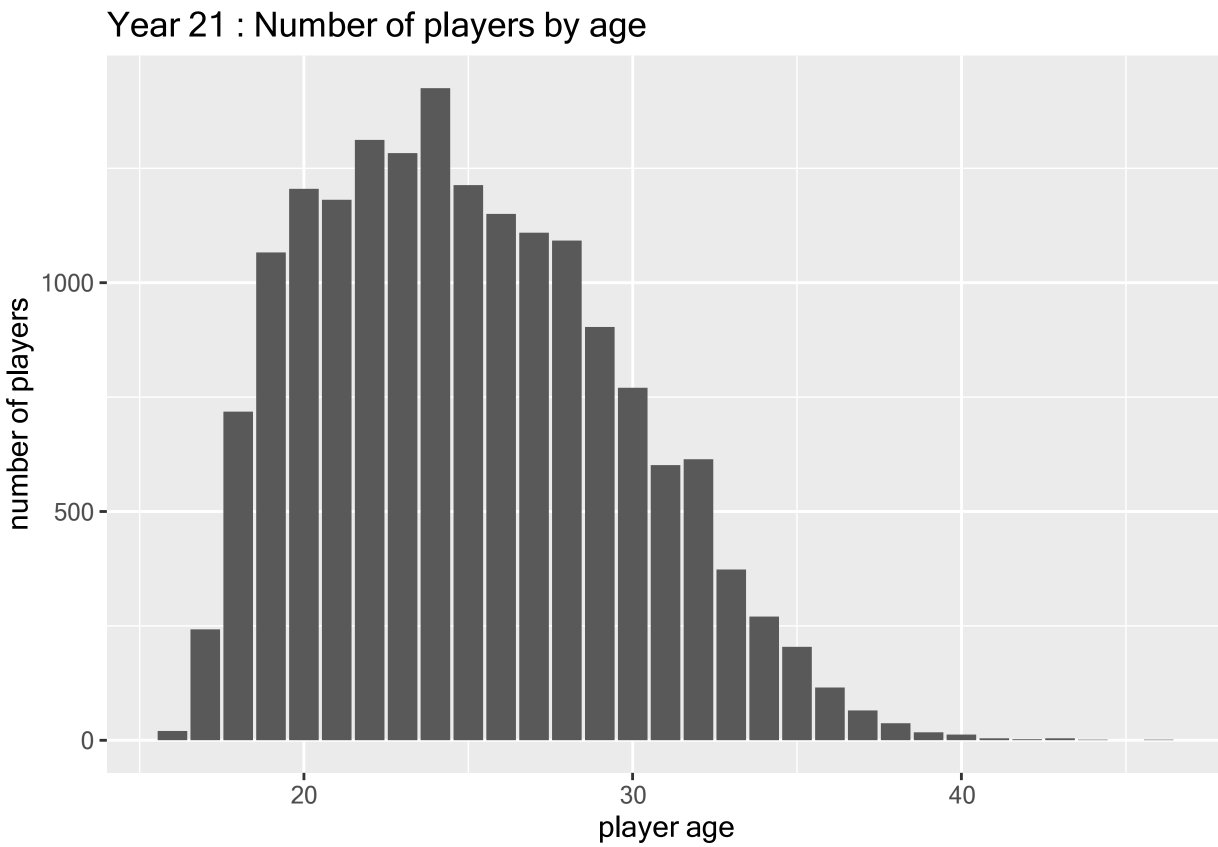
```
## 13         L. Bonucci           RCB      88
## 14           M. Neuer            GK      92
## [1] "Year 2019 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##            short_name team_position overall
## 1            L. Suárez            ST      91
## 2   Cristiano Ronaldo            LW      94
## 3             L. Messi            RW      94
## 4            Neymar Jr           CAM      92
## 5         K. De Bruyne           RCM      91
## 6            L. Modrić           RCM      91
## 7             T. Kroos           LCM      90
## 8              Marcelo            LB      88
## 9          Azpilicueta            RB      86
## 10        Sergio Ramos           LCB      91
## 11               Piqué           RCB      87
## 12              De Gea            GK      91
## [1] "Year 2020 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##            short_name team_position overall
## 1              H. Kane            ST      89
## 2            S. Agüero            ST      89
## 3            L. Suárez            ST      89
## 4       R. Lewandowski            ST      89
## 5   Cristiano Ronaldo            LW      93
## 6             L. Messi            RW      94
## 7            Neymar Jr           CAM      92
## 8         K. De Bruyne           RCM      91
## 9      Sergio Busquets           CDM      89
```

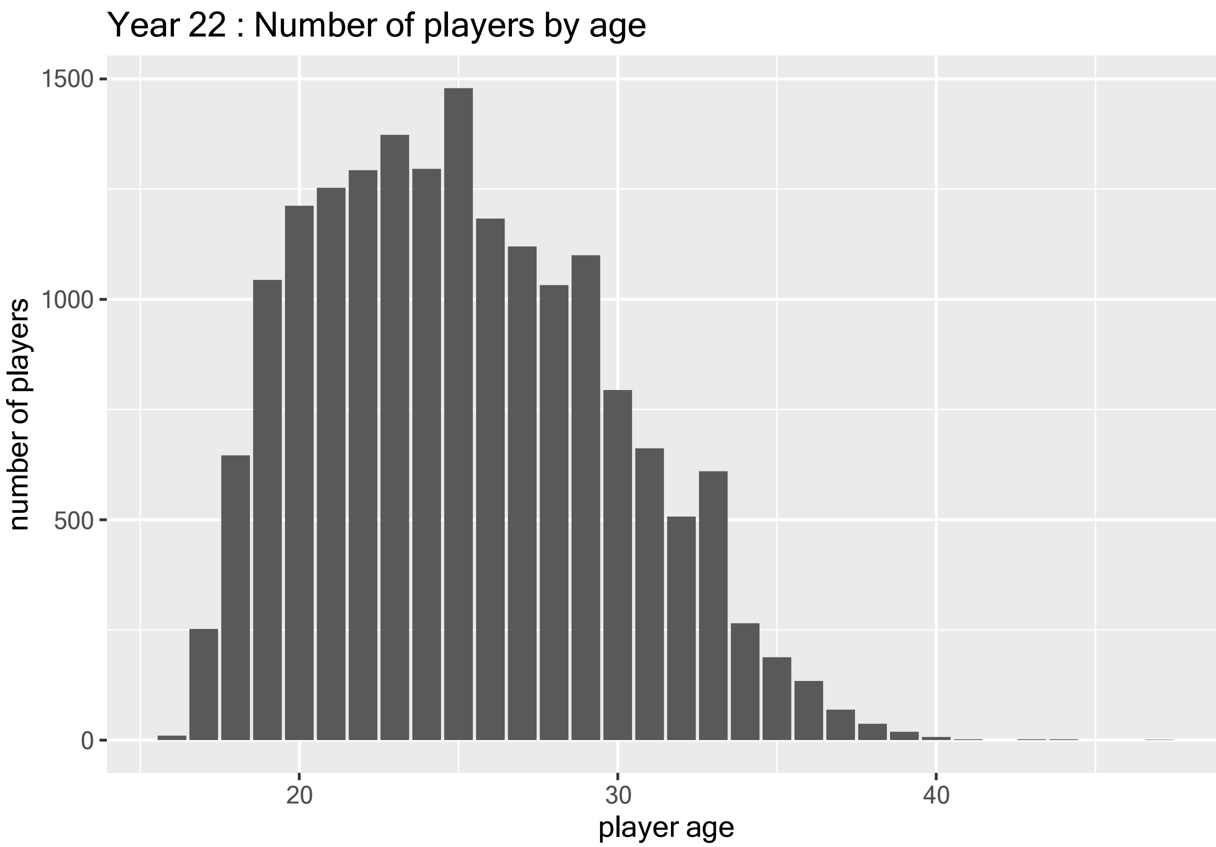
```
## 10          Jordi Alba              LB        87
## 11          J. Kimmich              RB        86
## 12         V. van Dijk             LCB        90
## 13               Piqué             RCB        88
## 14           D. Godín              RCB        88
## 15           J. Oblak               GK        91
```

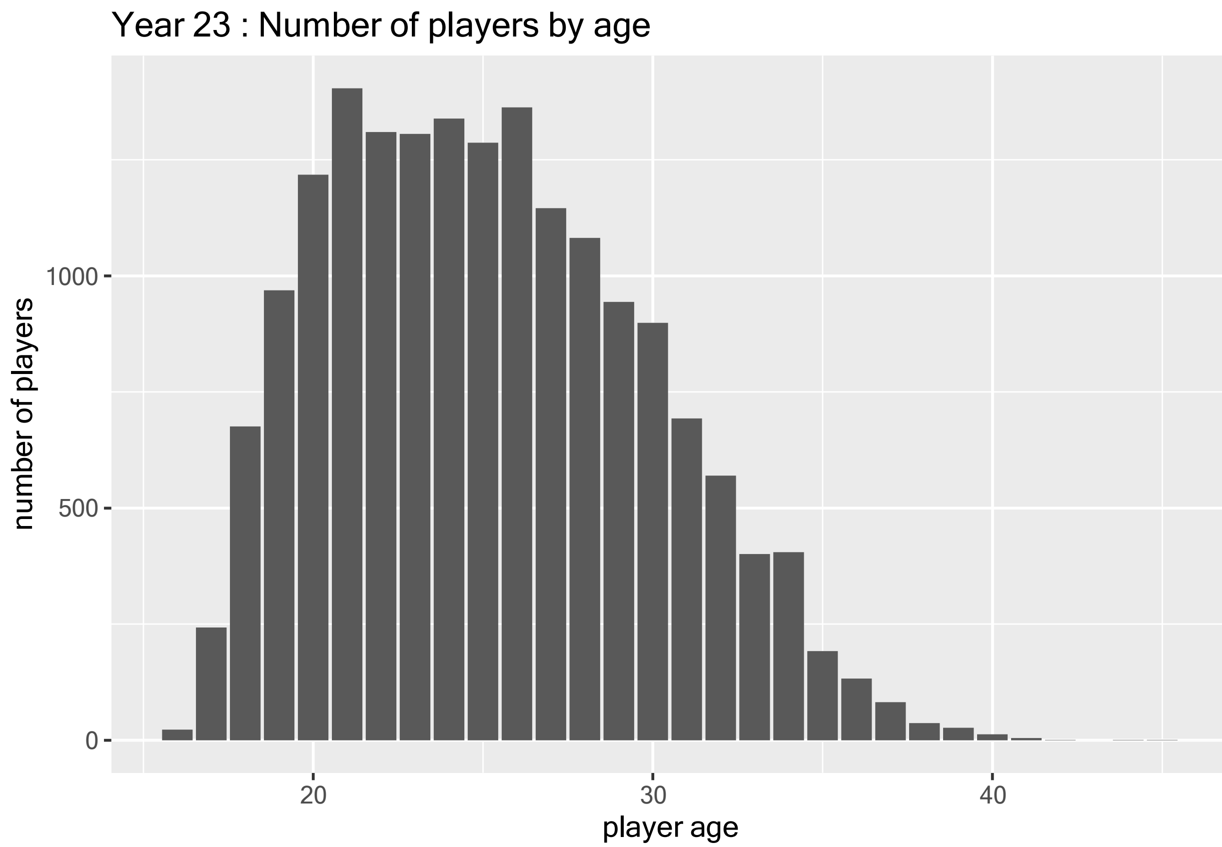
Other Supplementary EDA

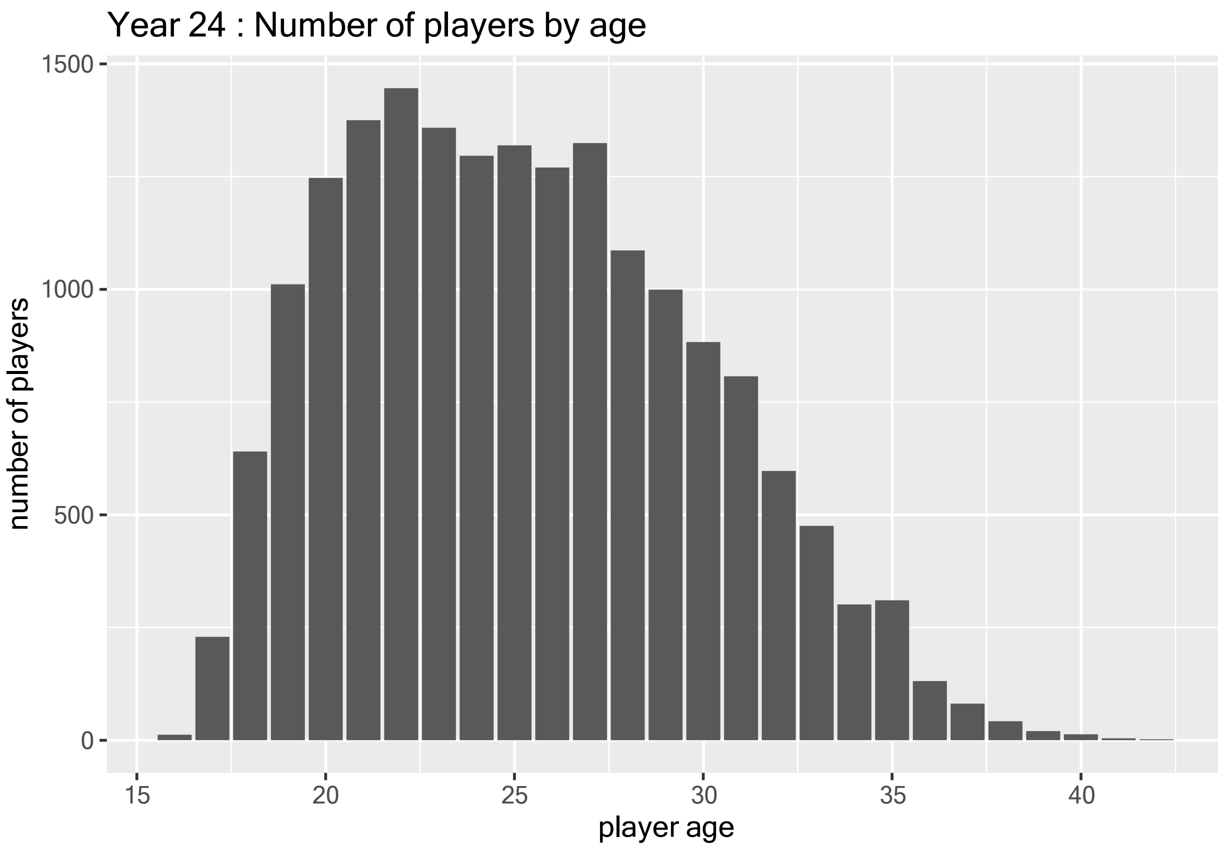
```
# Histogram of player age by year
for (i in seq_along(fifa_datasets_list)) {
  player_age_by_year <- fifa_datasets_list[[i]] %>% ggplot(aes(age)) +
    geom_bar() +
    labs(x="player age", y="number of players",
         title=paste("Year", years[[i]], ":", "Number of players by age"))
  print(player_age_by_year)
}
```



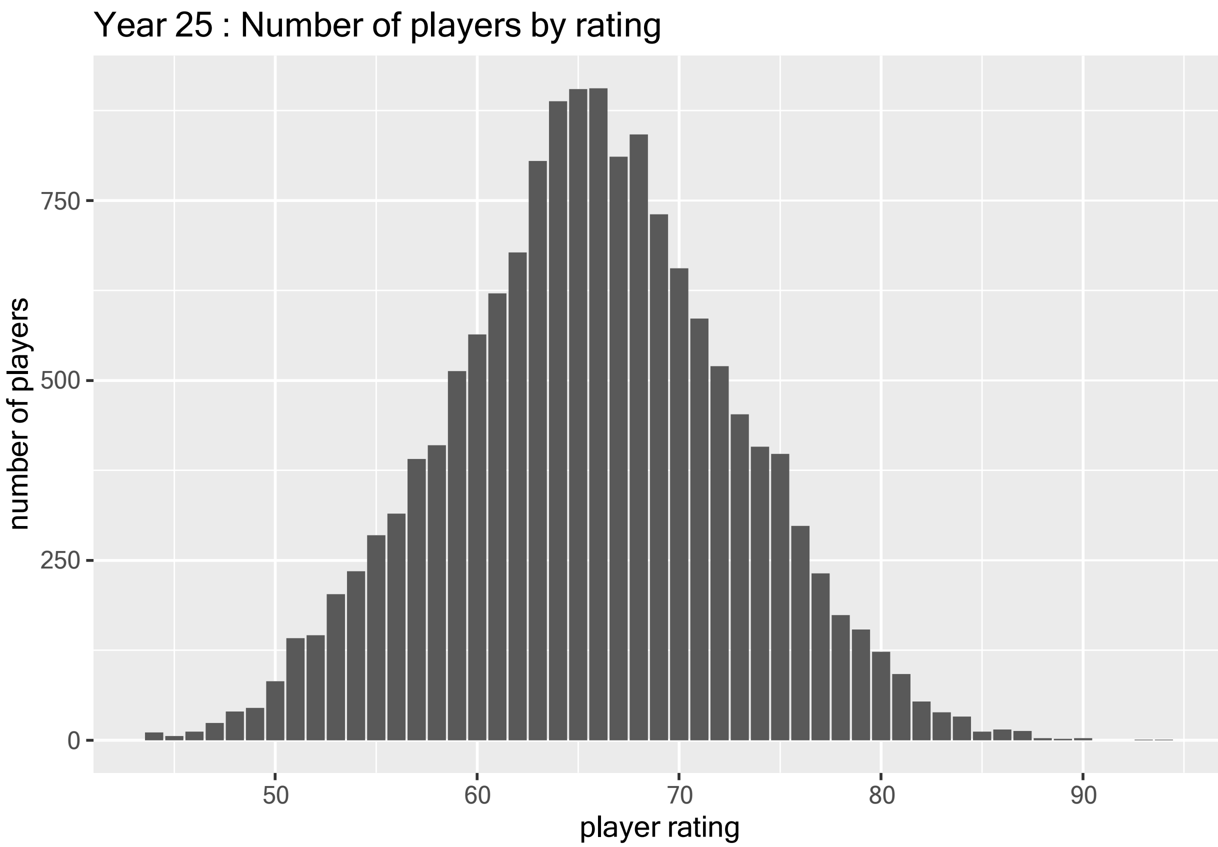

Year 21 : Number of players by age
number of players
1000
500
0
20
30
40
player age

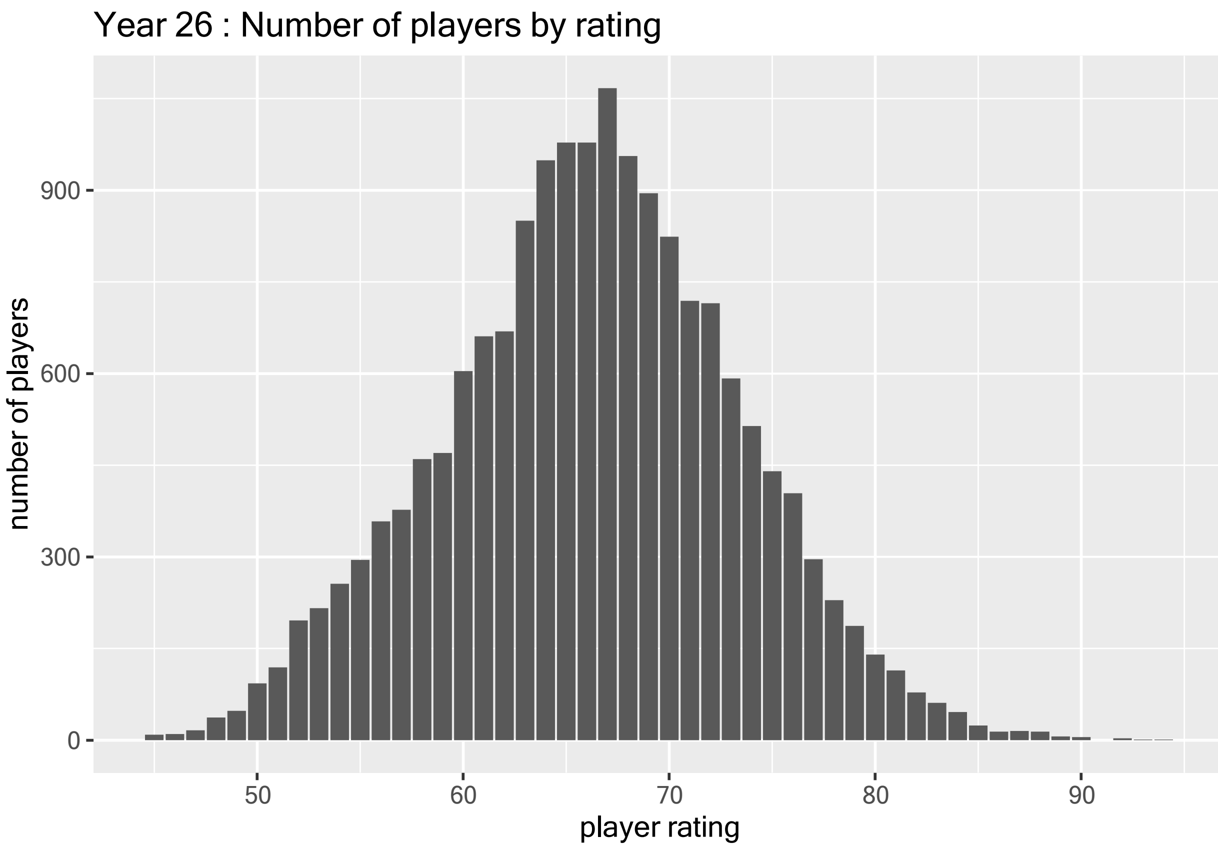

Year 22 : Number of players by age
1500
1000
500
0
number of players
20
30
40
player age

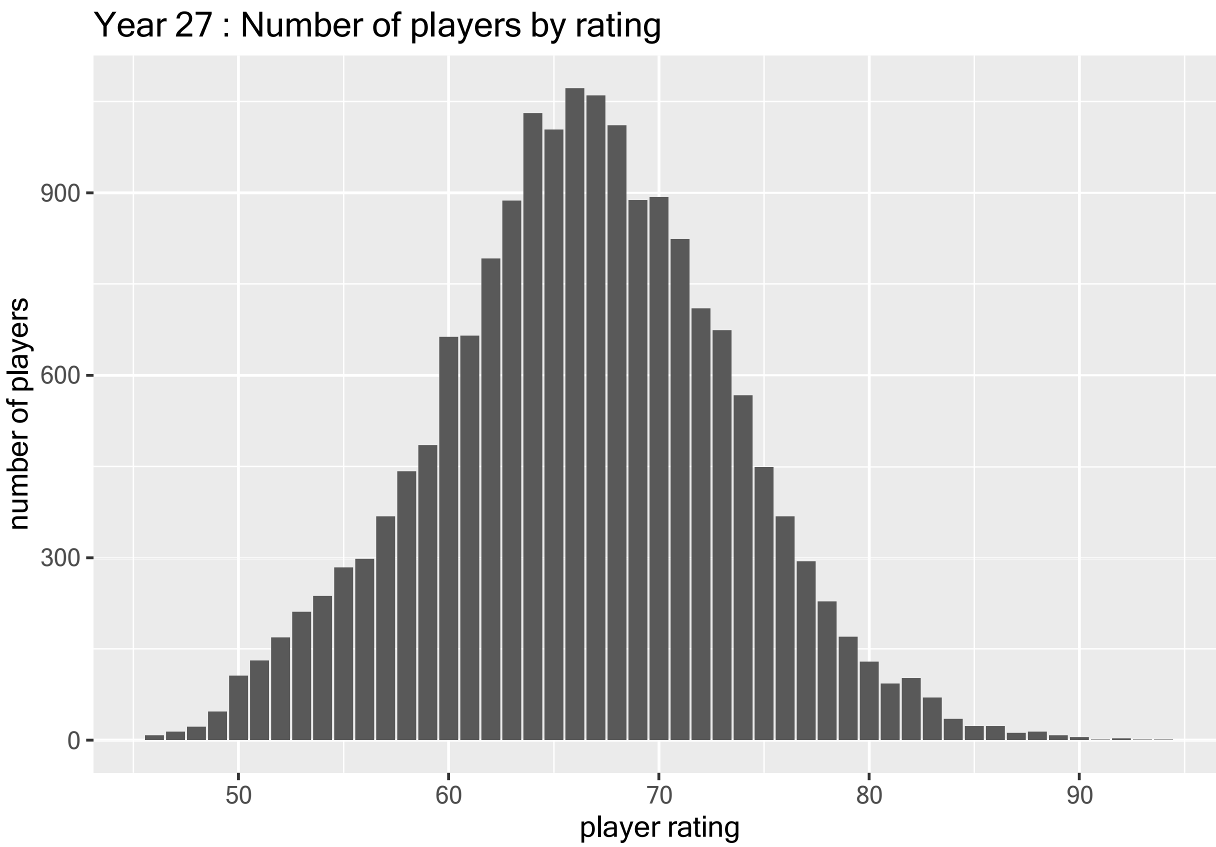

Year 23 : Number of players by age
number of players
1000
500
0
20
30
40
player age

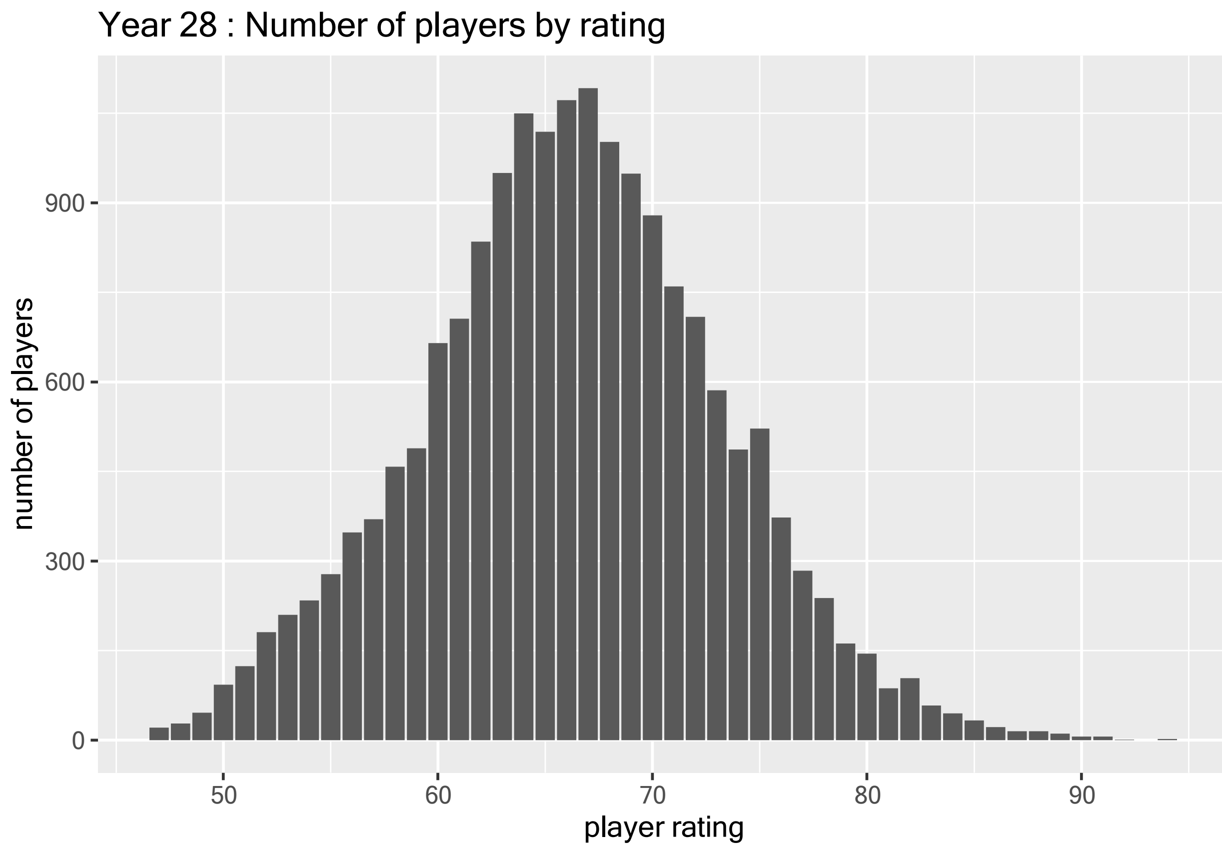


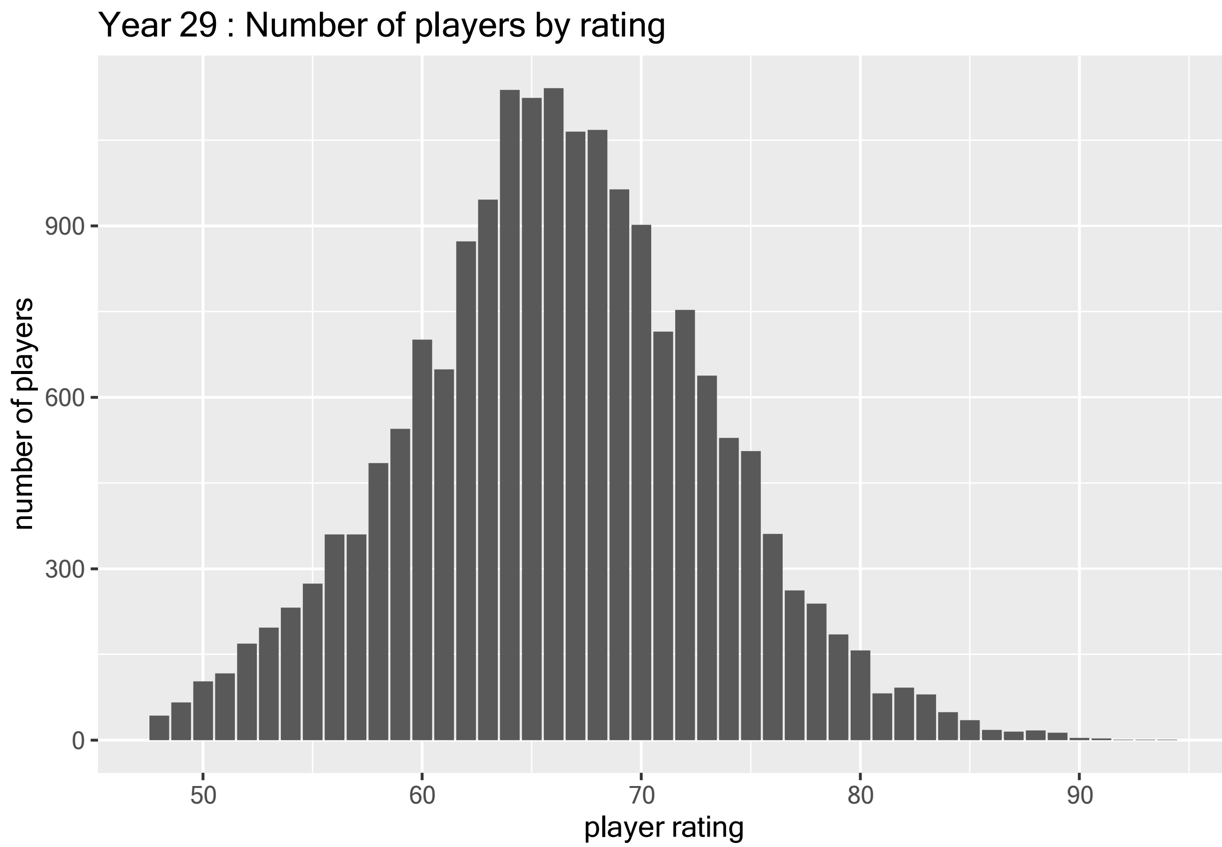

```
# Histogram of player rating by year
for (i in seq_along(fifa_datasets_list)) {
  player_rating_by_year <- fifa_datasets_list[[i]] %>% ggplot(aes(overall)) +
    geom_bar() +
    labs(x="player rating", y="number of players",
         title=paste("Year", years[[i]], ":", "Number of players by rating"))
  print(player_rating_by_year)
}
```


Year 25 : Number of players by rating
number of players
750
500
250
0
50
60
70
80
90
player rating


Year 26 : Number of players by rating
number of players
900
600
300
0
50
60
70
80
90
player rating

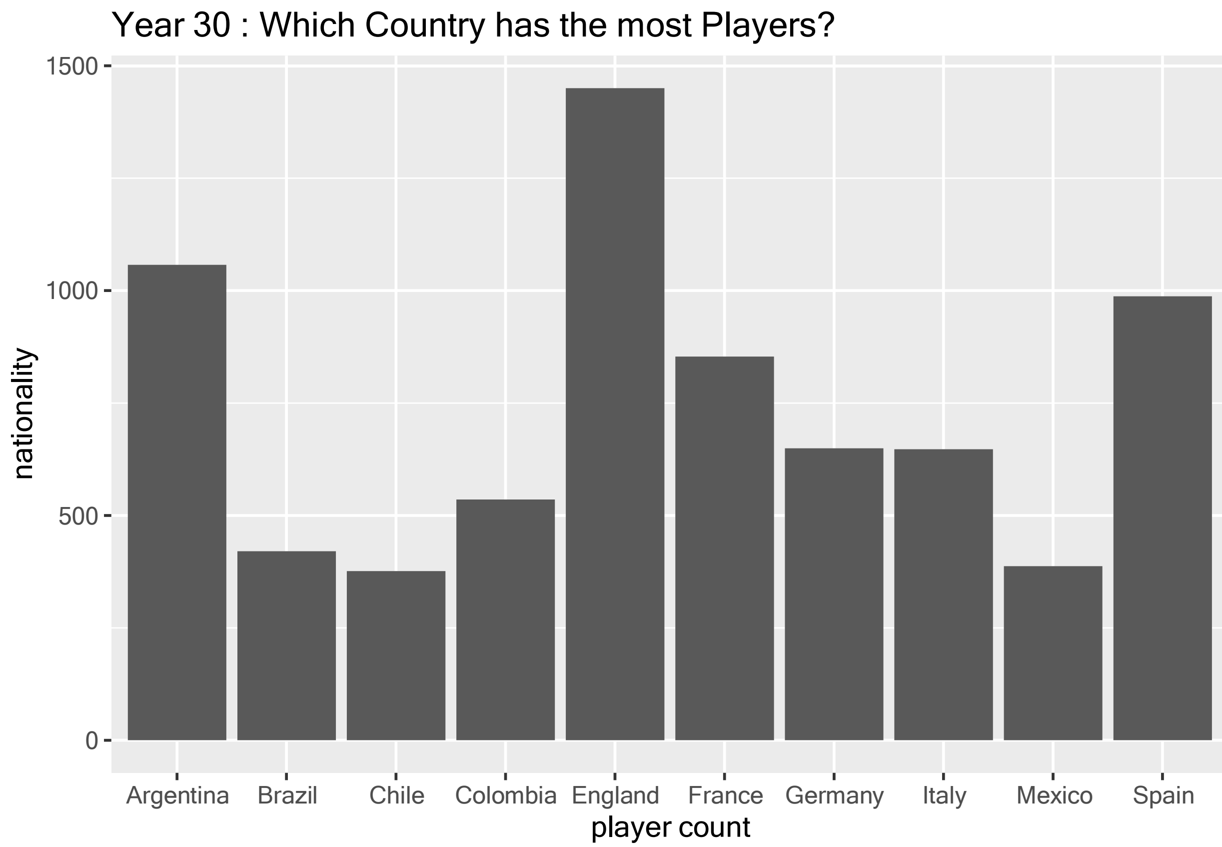

Year 27 : Number of players by rating
number of players
900
600
300
0
50
60
70
80
90
player rating


Year 28 : Number of players by rating
number of players
900
600
300
0
50
60
70
80
90
player rating

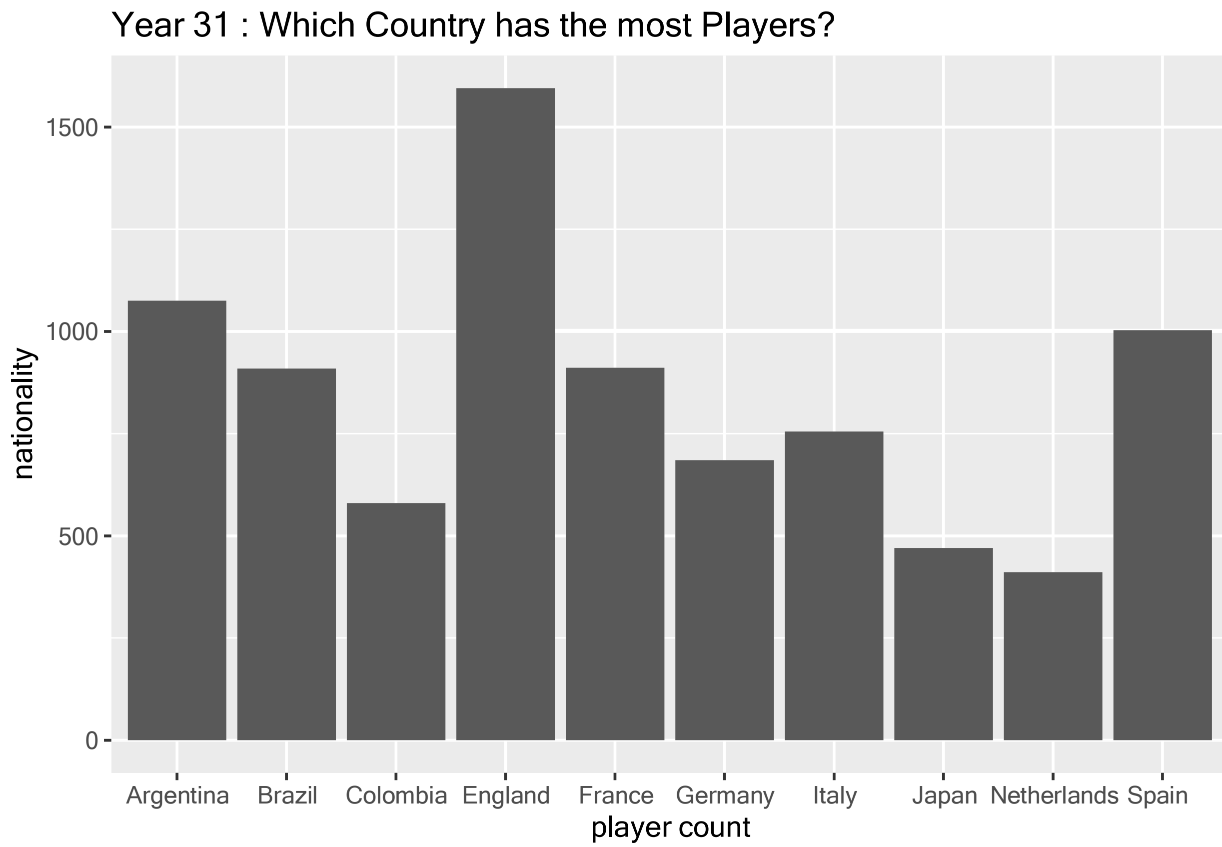



```
# Which country has the most players by year
for (i in seq_along(fifa_datasets_list)) {
  country_by_players_count <- fifa_datasets_list[[i]] %>% group_by(nationality) %>%
    summarise(count=n()) %>% arrange(desc(count)) %>% top_n(10) %>%
    ggplot(aes(x=nationality,y=count)) + geom_bar(stat = "identity") +
    labs(x="player count", y="nationality",
         title=paste("Year", years[[i]], ":", "Which Country has the most Players?"))
  print(country_by_players_count)
}
```

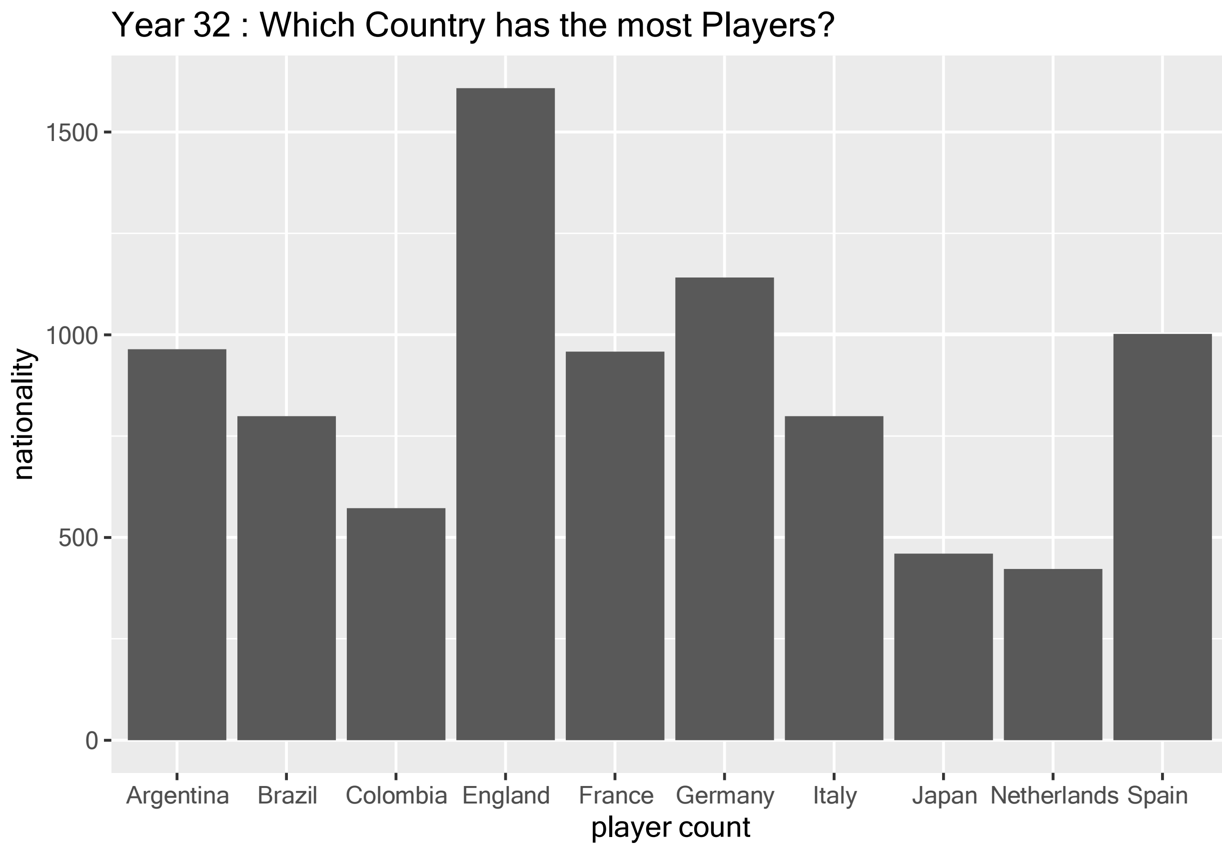
```
## Selecting by count
## Selecting by count
```



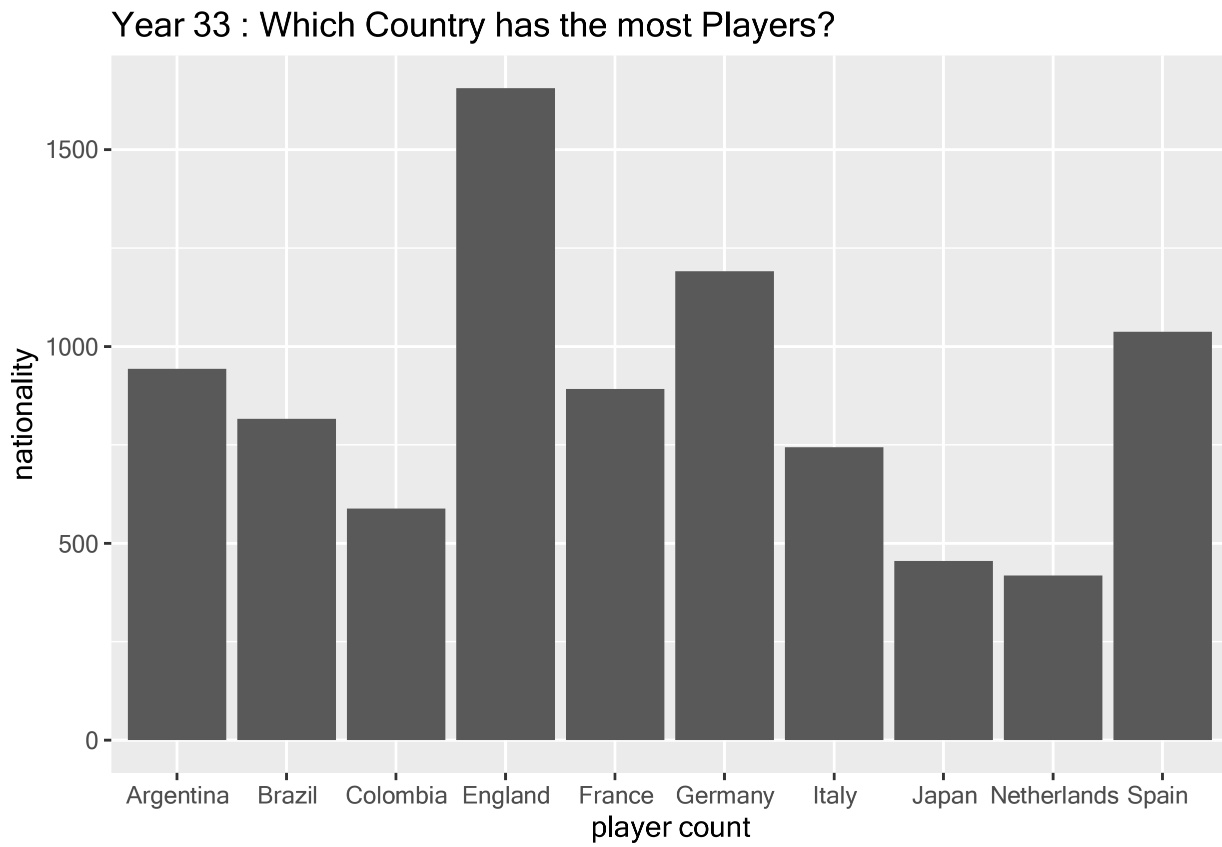

```
## Selecting by count
```

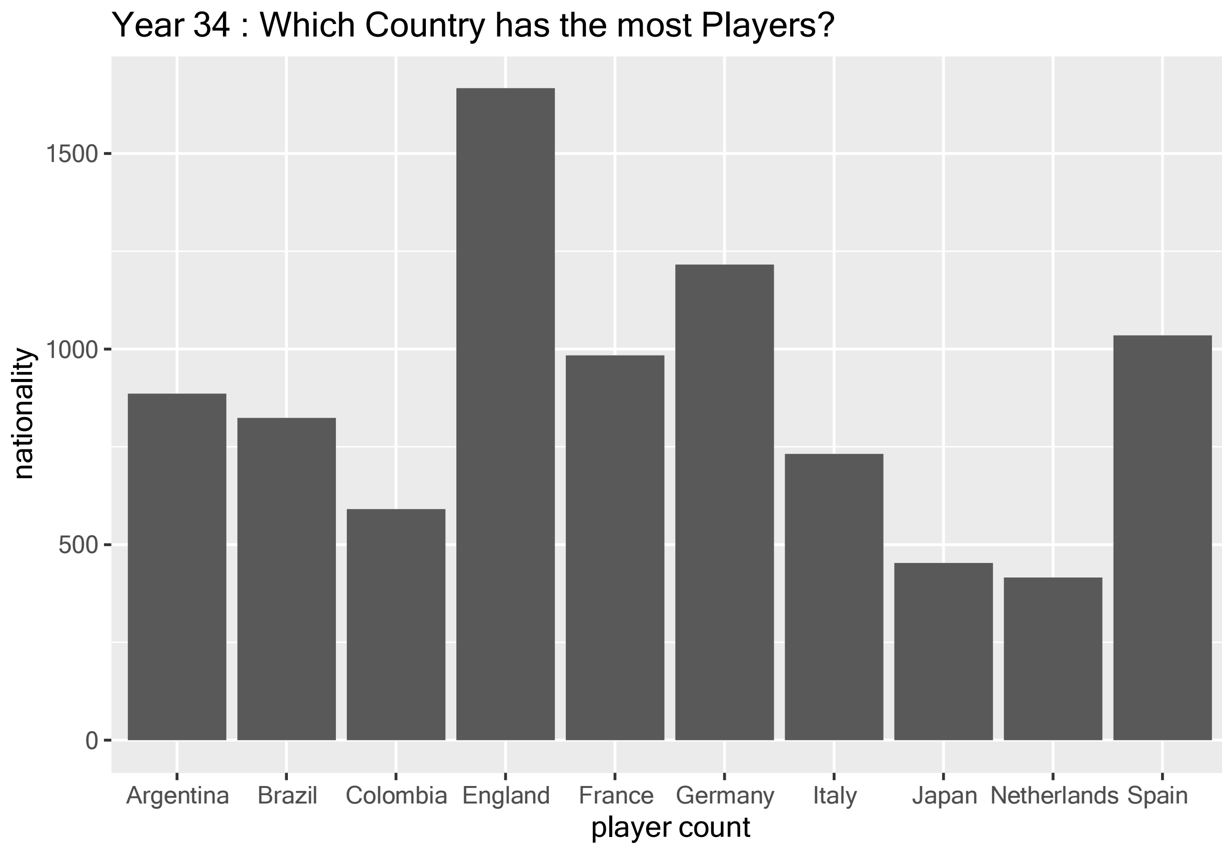



```
## Selecting by count
```

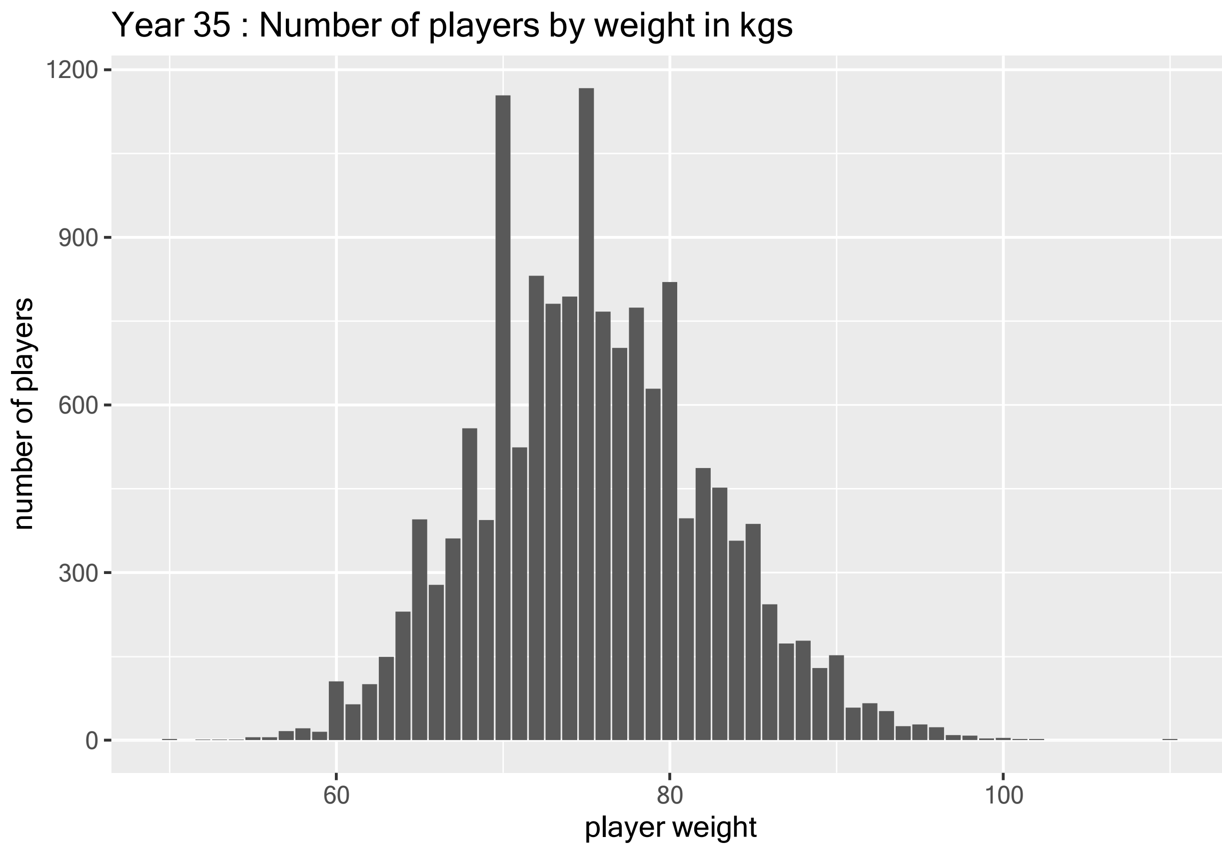


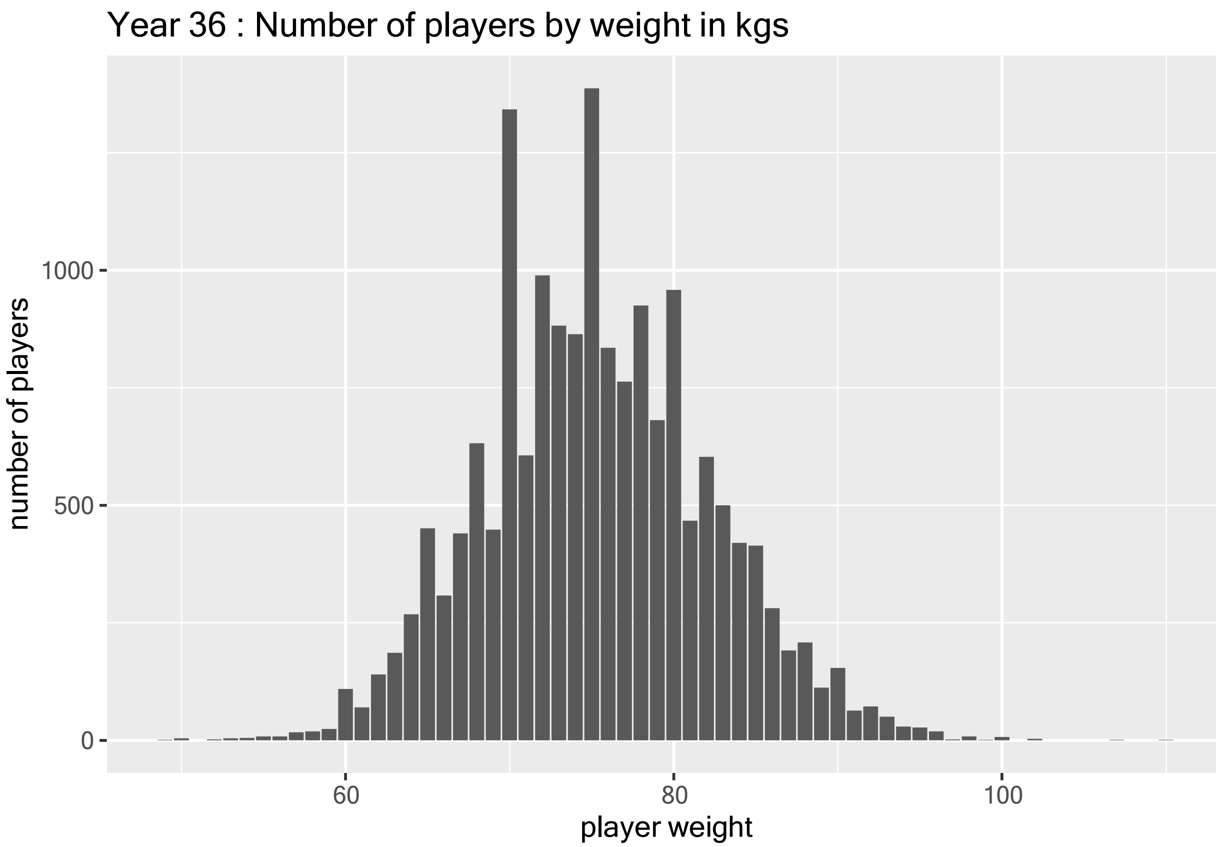

```
## Selecting by count
```

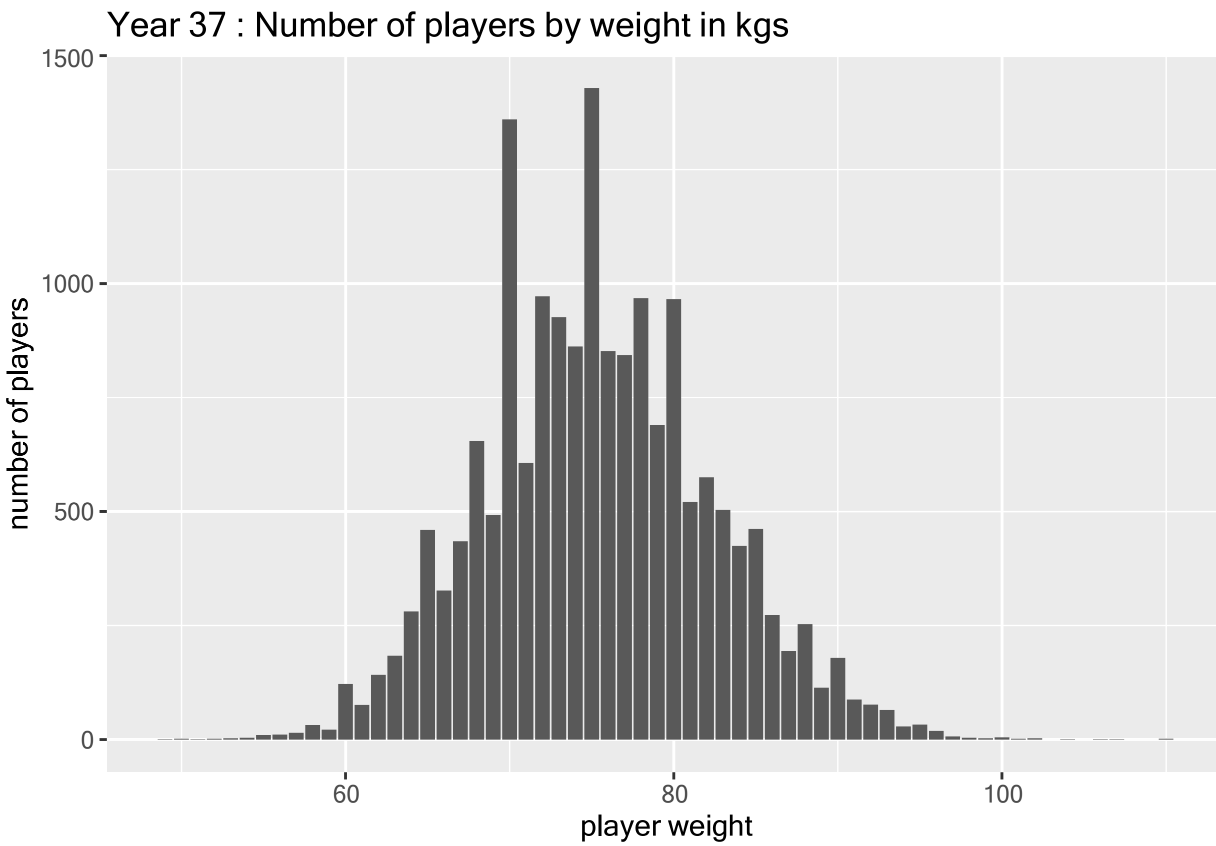

Year 33 : Which Country has the most Players?
1500
1000
500
0
nationality
Argentina
Brazil
Colombia
England
France
Germany
Italy
Japan
Netherlands
Spain
player count

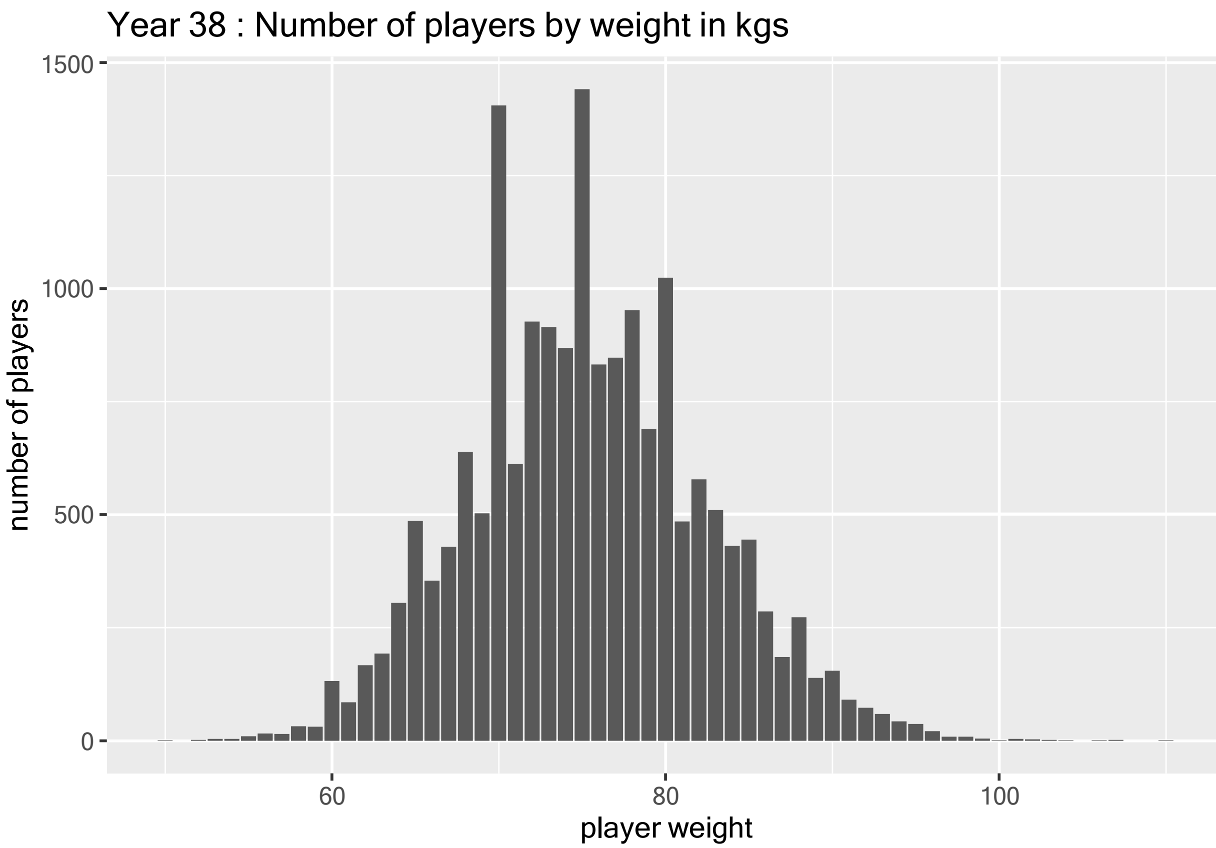


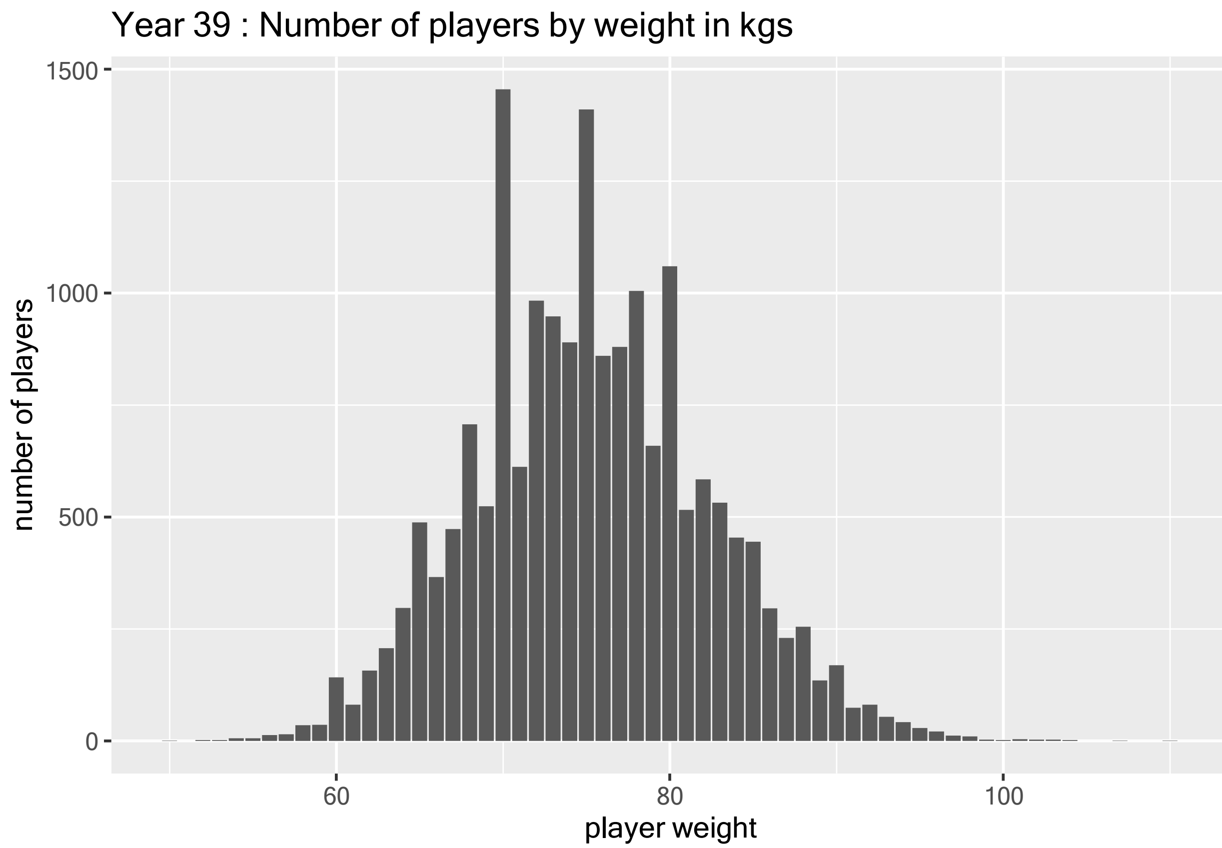

```r
# Histogram of weight in kgs by year
for (i in seq_along(fifa_datasets_list)) {
  player_weight_by_year <- fifa_datasets_list[[i]] %>%
    ggplot(aes(weight_kg)) +
    geom_bar() +
    labs(x="player weight", y="number of players",
         title=paste("Year", years[[i]], ":", "Number of players by weight in kgs" ))
  print(player_weight_by_year)
}
```


Year 35 : Number of players by weight in kgs
number of players
1200
900
600
300
0
60
80
100
player weight

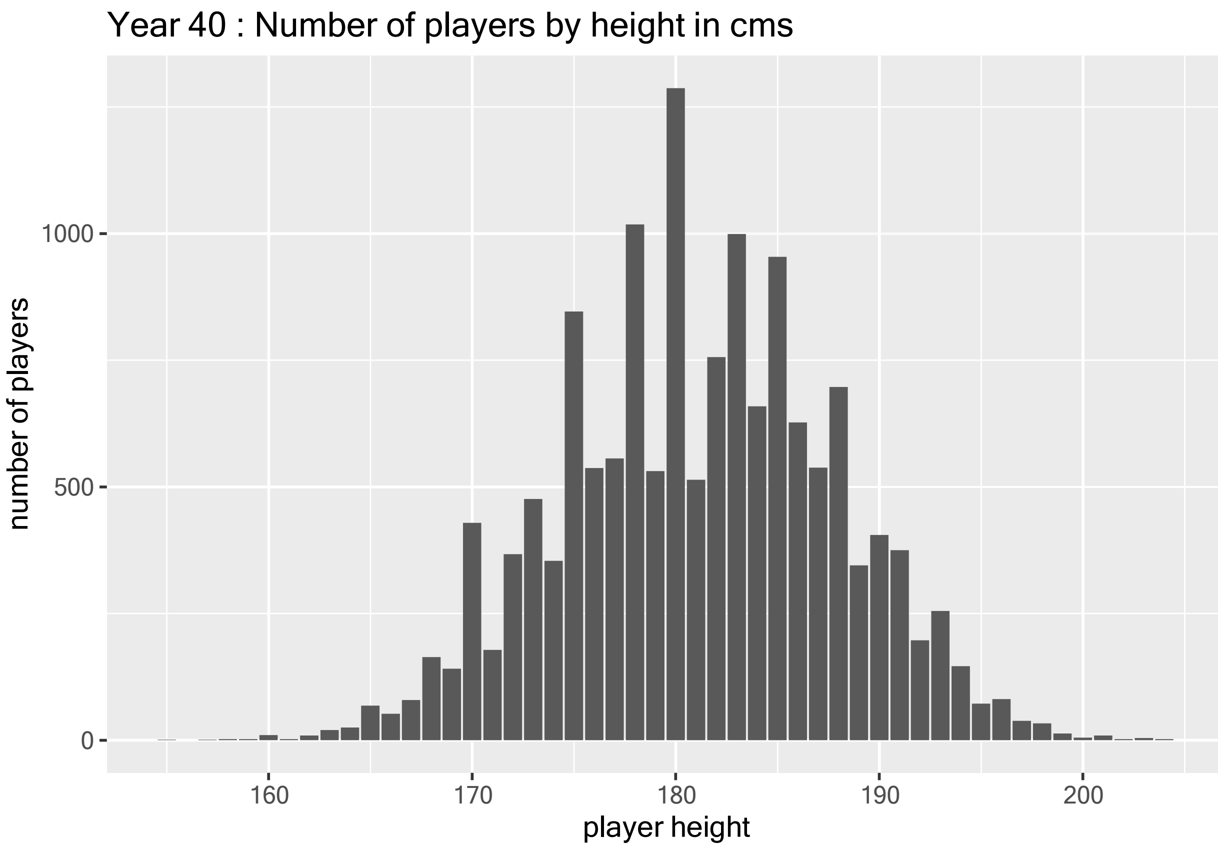

Year 36 : Number of players by weight in kgs
number of players
1000
500
0
60
80
100
player weight

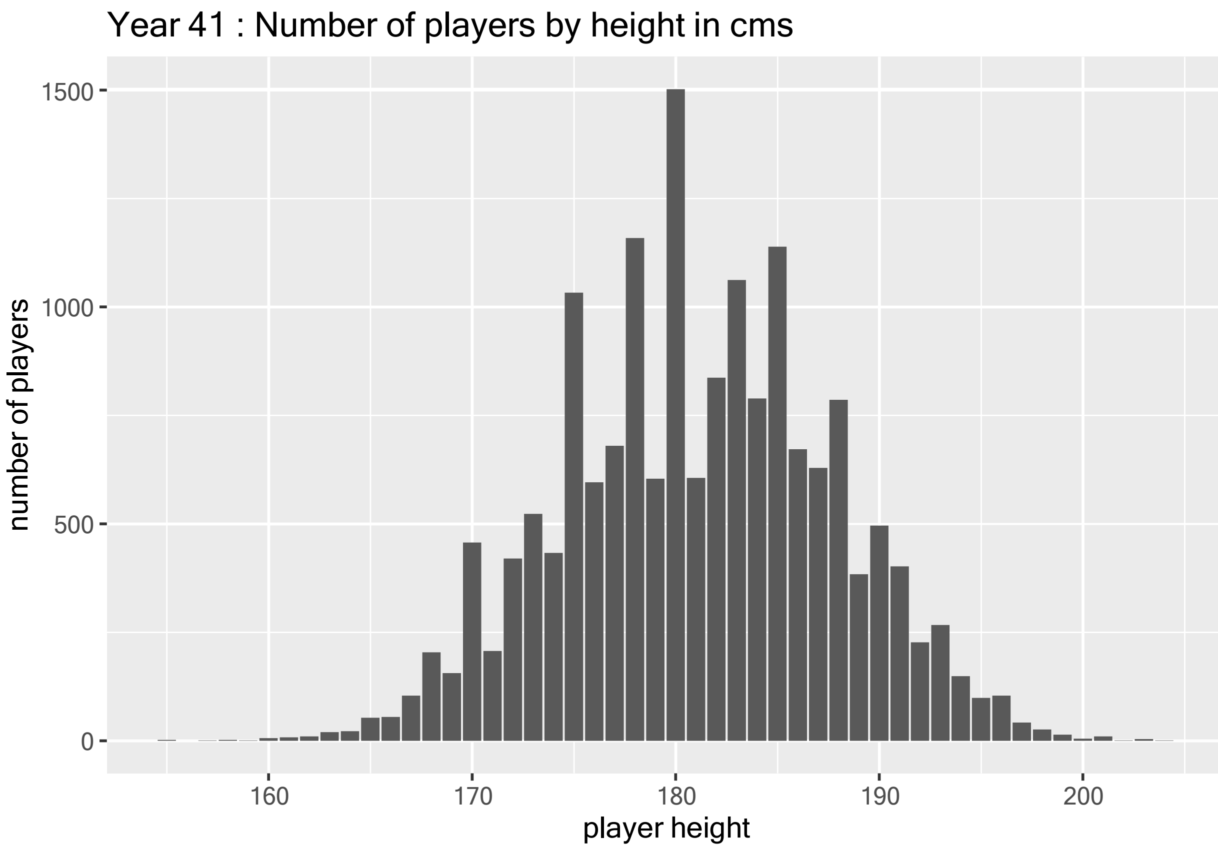

Year 37 : Number of players by weight in kgs
1500
1000
500
0
number of players
60
80
100
player weight

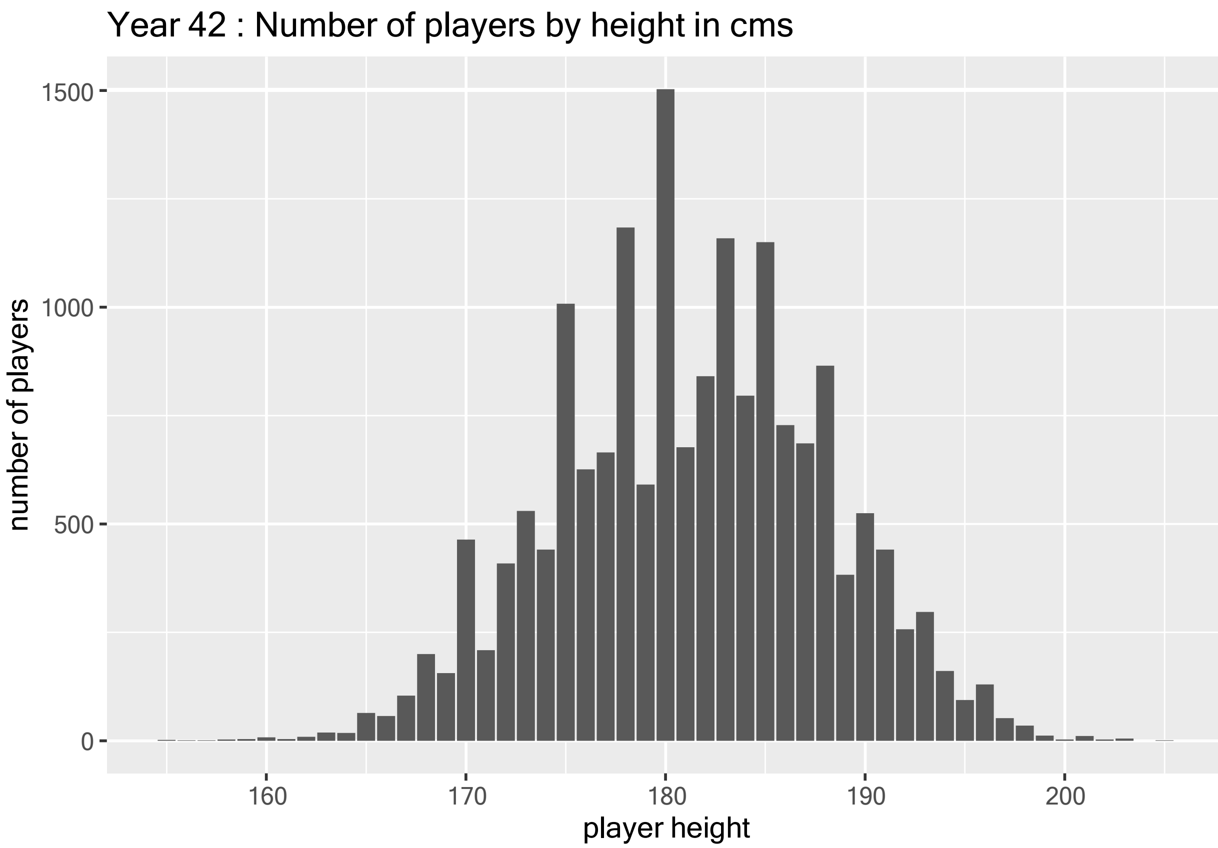

Year 38 : Number of players by weight in kgs
1500
1000
500
0
number of players
60
80
100
player weight

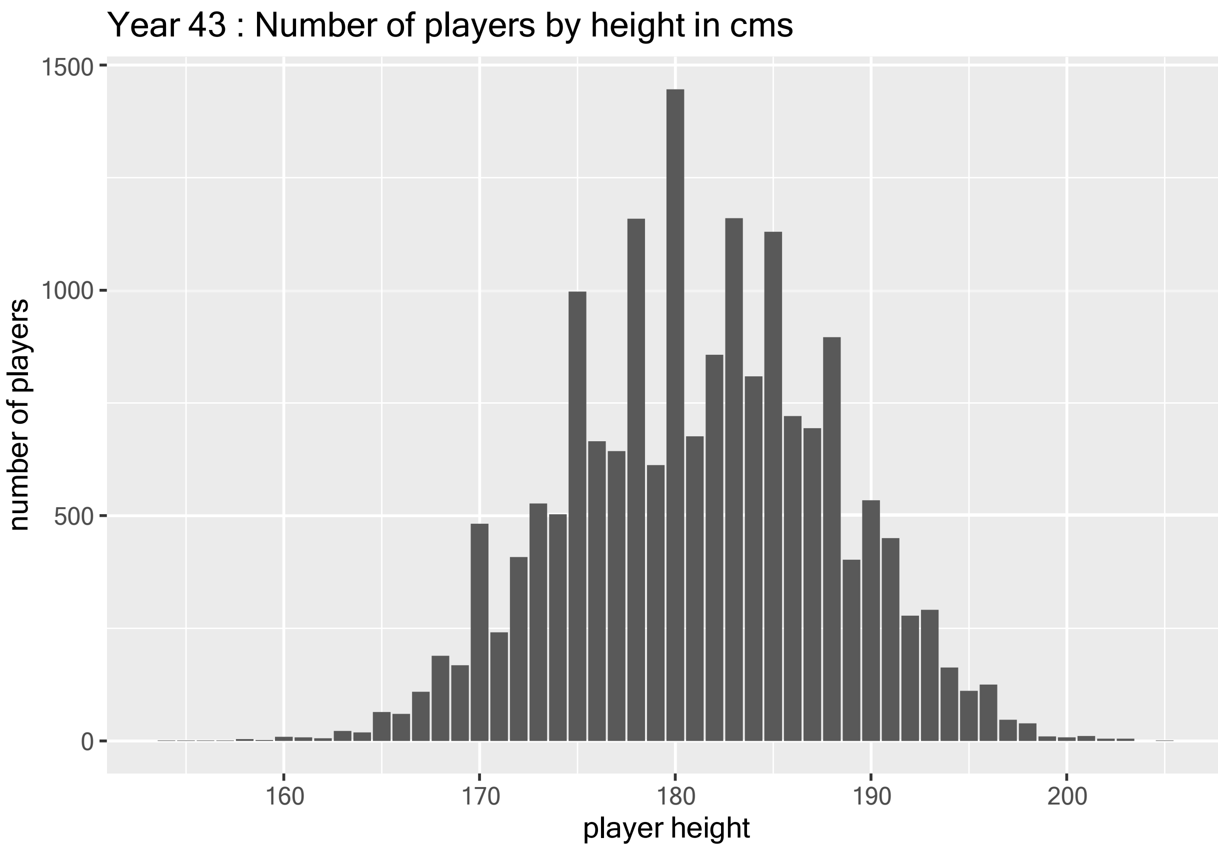


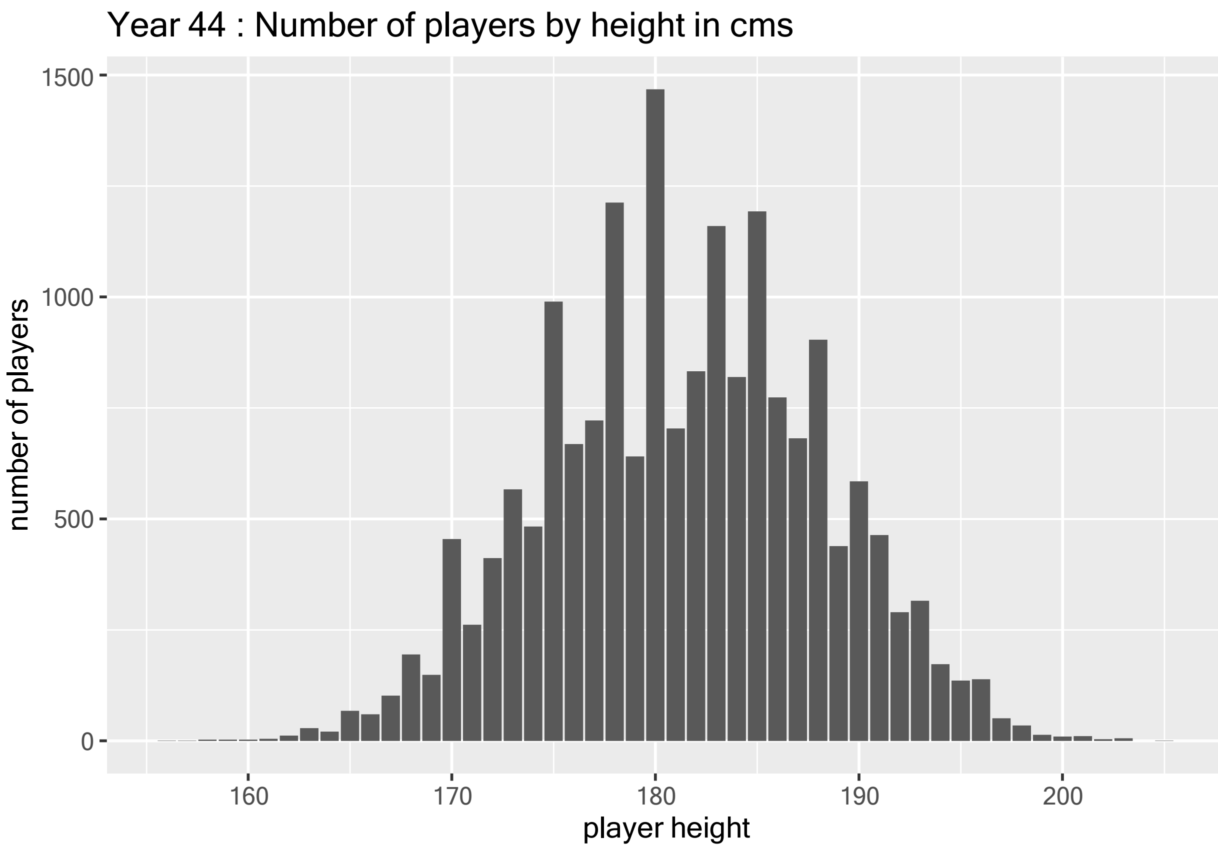

```r
# Histogram of height in cms by year
for (i in seq_along(fifa_datasets_list)) {
  player_height_by_year <- fifa_datasets_list[[i]] %>%
    ggplot(aes(height_cm)) +
    geom_bar() +
    labs(x="player height", y="number of players",
         title=paste("Year", years[[i]], ":", "Number of players by height in cms" ))
  print(player_height_by_year)
}
```


Year 40 : Number of players by height in cms
number of players
1000
500
0
160
170
180
190
200
player height


Year 41 : Number of players by height in cms
number of players
1500
1000
500
0
160
170
180
190
200
player height

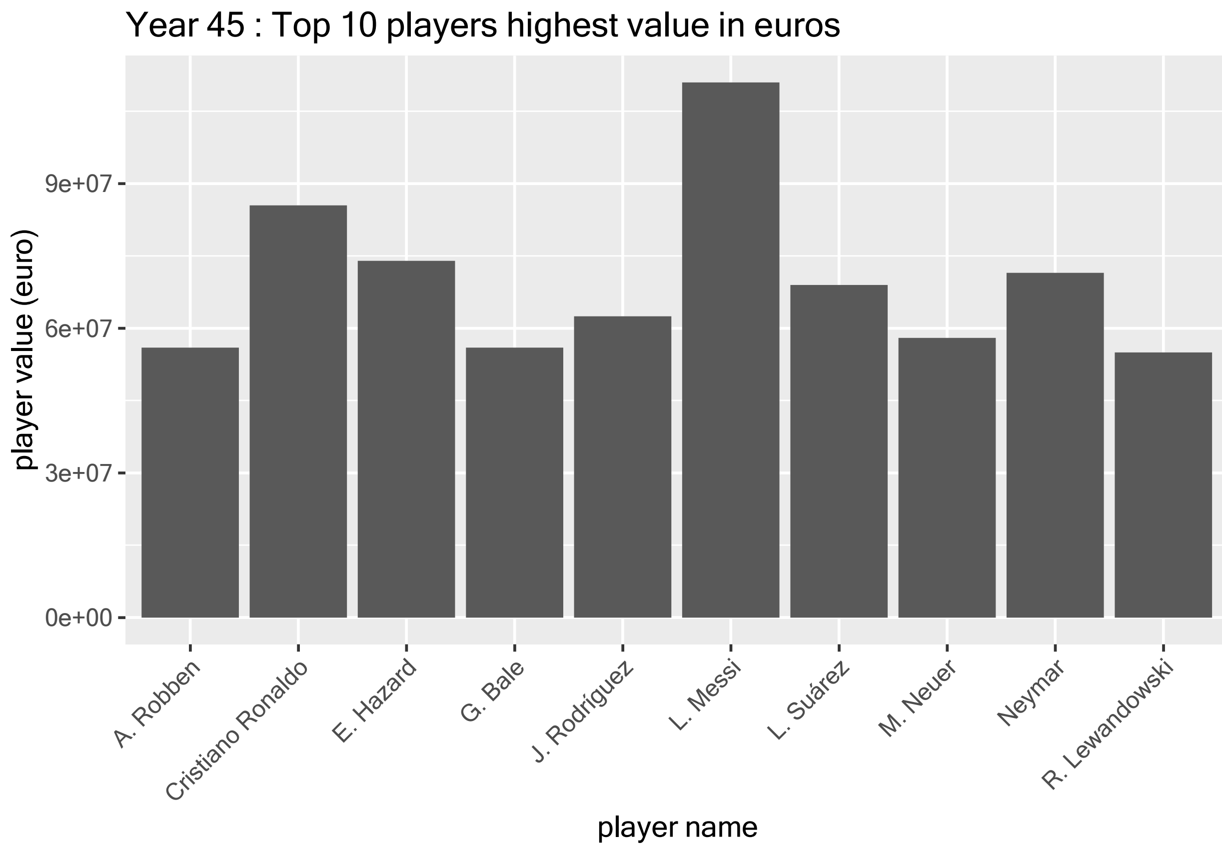

Year 42 : Number of players by height in cms
number of players
1500
1000
500
0
160
170
180
190
200
player height


Year 43 : Number of players by height in cms
1500
1000
500
0
number of players
160
170
180
190
200
player height

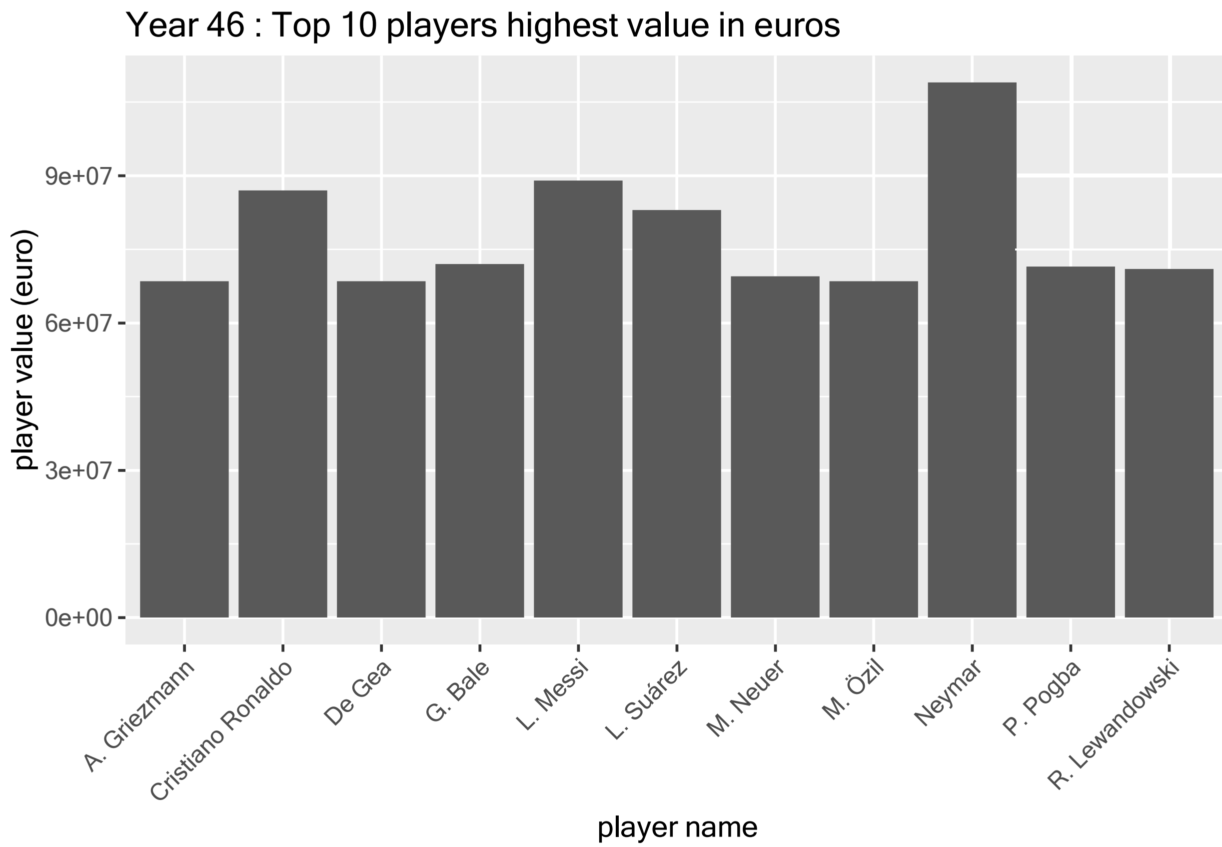



```
# Top 10 players with highest value in euros
for (i in seq_along(fifa_datasets_list)) {
  top10_value_players <- fifa_datasets_list[[i]] %>% arrange(desc(value_eur)) %>%
    select(short_name, club, nationality, overall, value_eur) %>% top_n(10) %>%
    ggplot(aes(x=short_name, y=value_eur)) + geom_bar(stat = "identity") +
    labs(x="player name", y="player value (euro)",
         title=paste("Year", years[[i]], ":", "Top 10 players highest value in euros" )) +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
  print(top10_value_players)
}
```

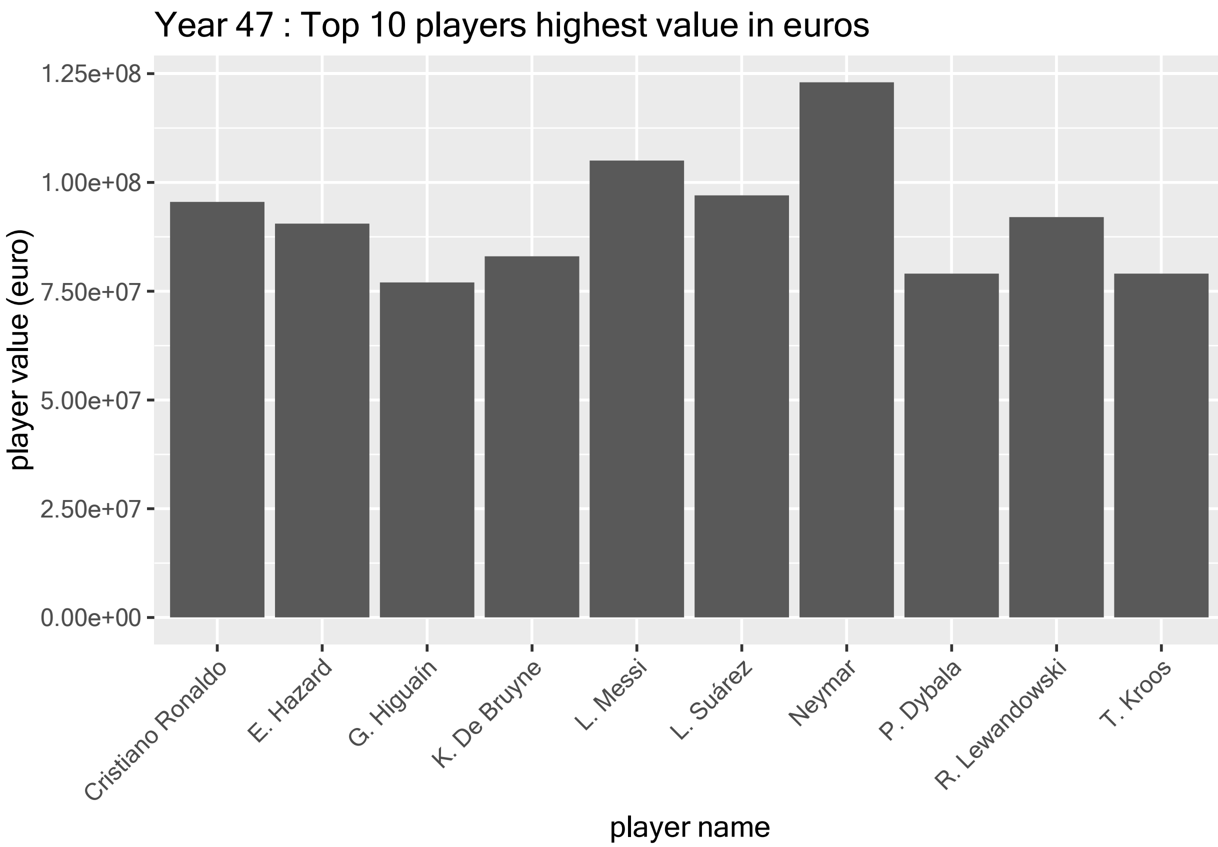
```
## Selecting by value_eur
## Selecting by value_eur
```



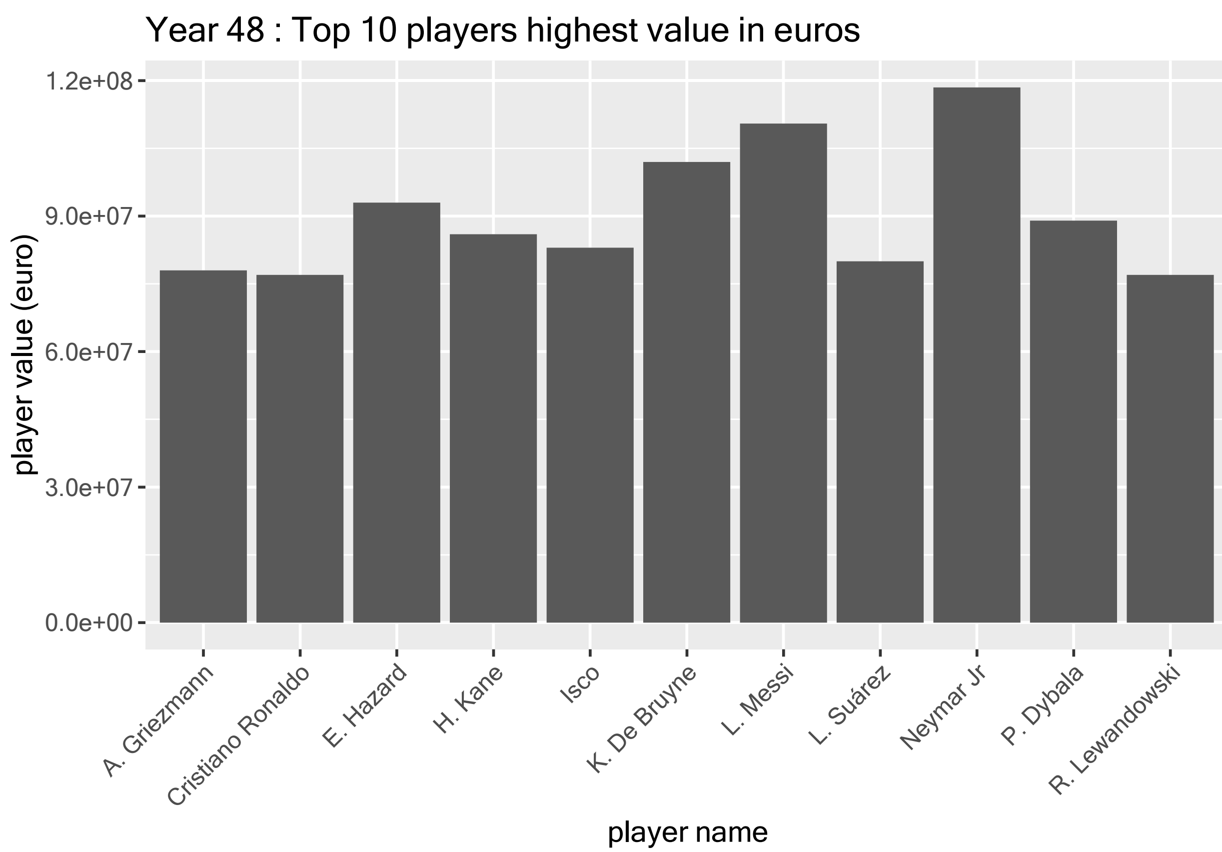

```
## Selecting by value_eur
```



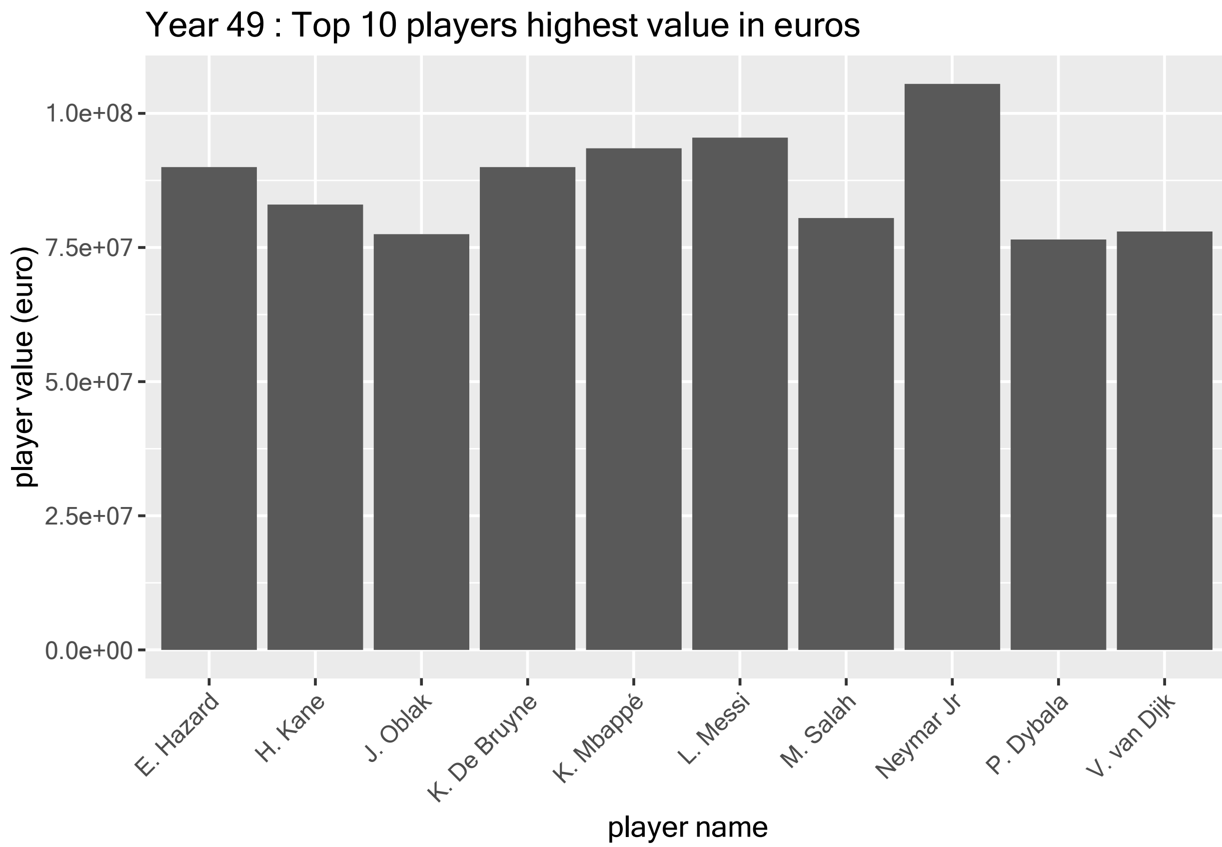

```
## Selecting by value_eur
```




```
## Selecting by value_eur
```

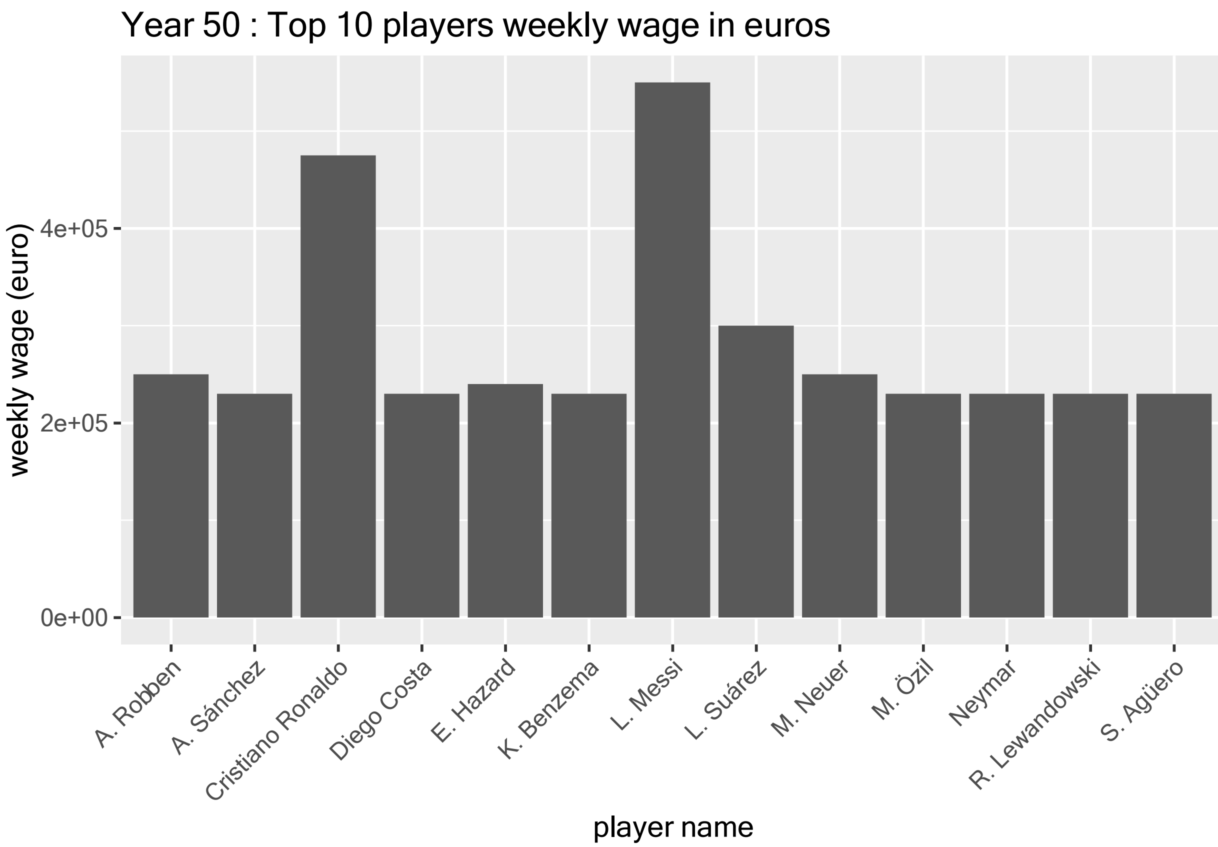


Year 48 : Top 10 players highest value in euros
player value (euro)
1.2e+08
9.0e+07
6.0e+07
3.0e+07
0.0e+00
A. Griezmann
Cristiano Ronaldo
E. Hazard
H. Kane
Isco
K. De Bruyne
L. Messi
L. Suárez
Neymar Jr
P. Dybala
R. Lewandowski
player name

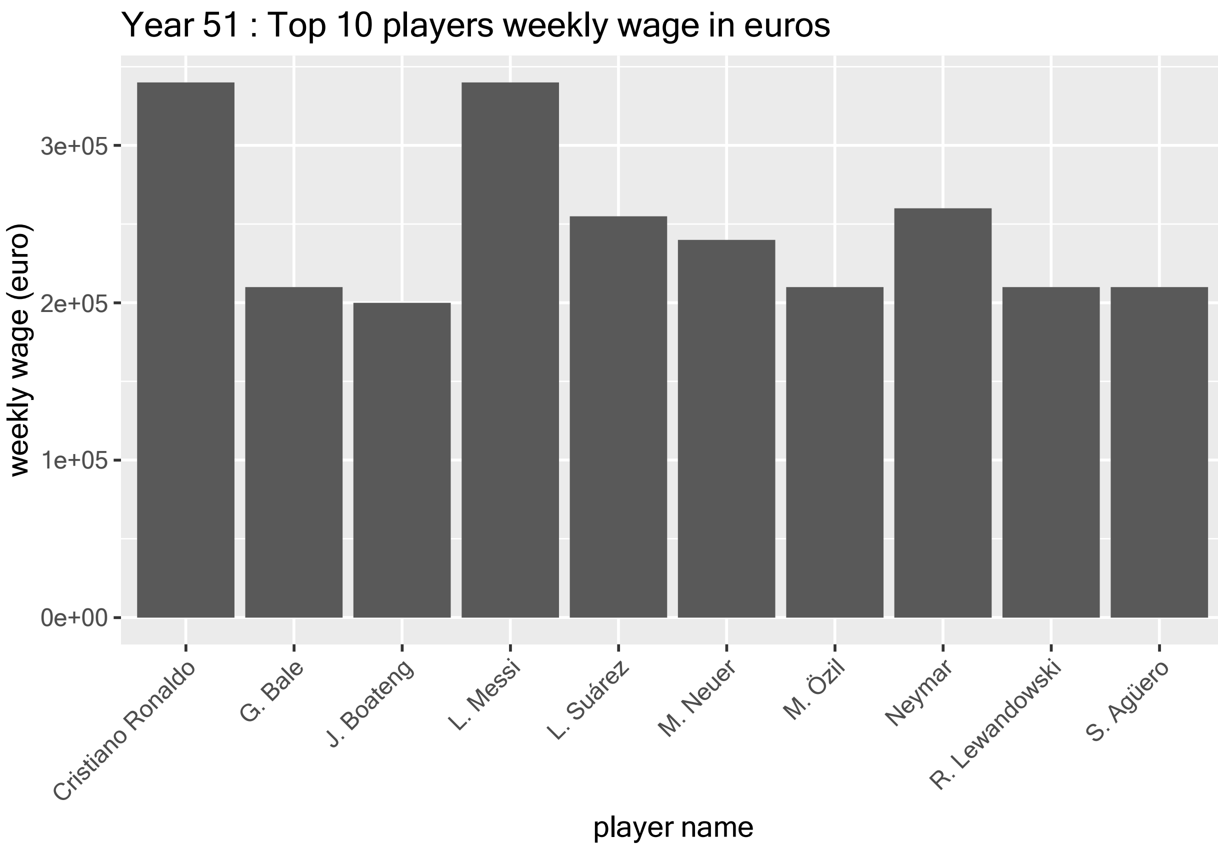



```r
# Top 10 players with highest weekly wage in euros
for (i in seq_along(fifa_datasets_list)) {
  top10_weekly_wage_players <- fifa_datasets_list[[i]] %>% arrange(desc(wage_eur)) %>%
    select(short_name, club, nationality, overall, wage_eur) %>% top_n(10) %>%
    ggplot(aes(x=short_name, y=wage_eur)) + geom_bar(stat = "identity") +
    labs(x="player name", y="weekly wage (euro)",
         title=paste("Year", years[[i]], ":", "Top 10 players weekly wage in euros" )) +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
  print(top10_weekly_wage_players)
}
```

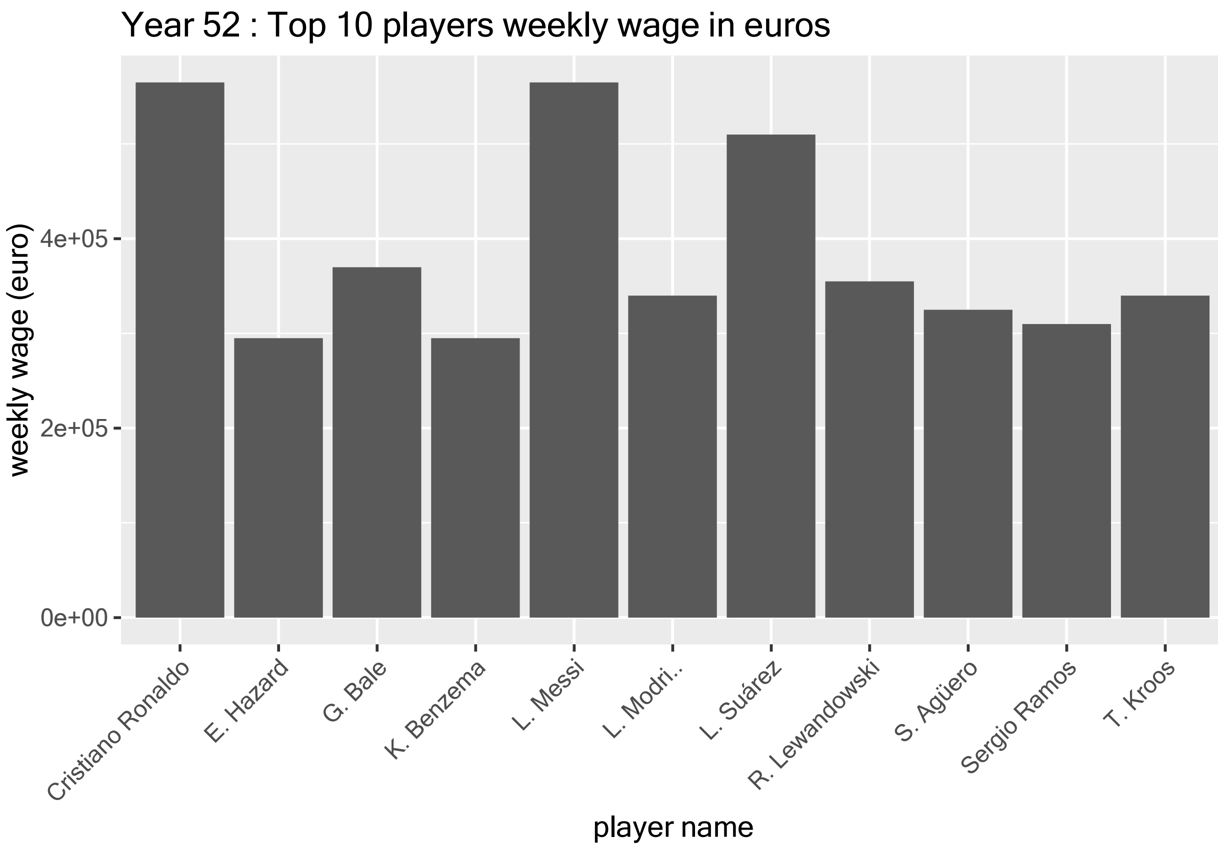
```
## Selecting by wage_eur
## Selecting by wage_eur
```



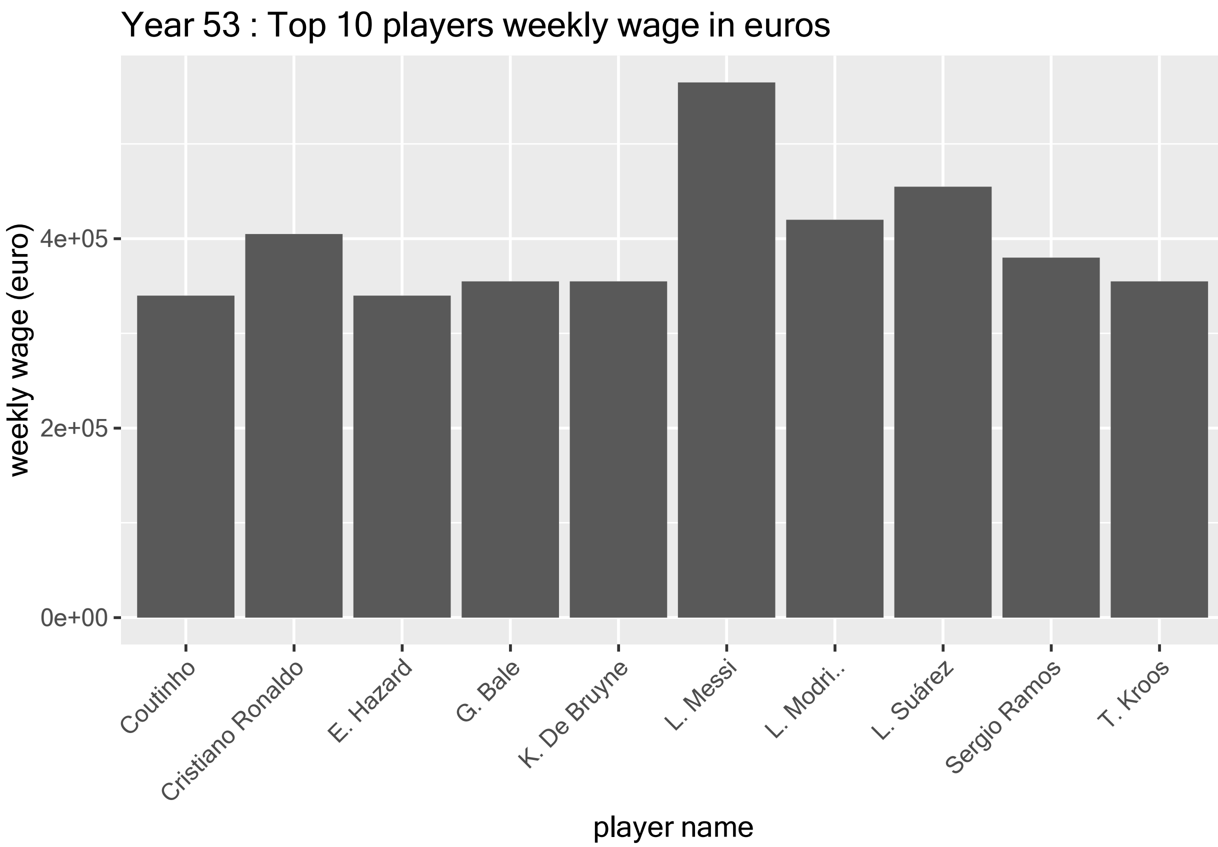

```
## Selecting by wage_eur
```

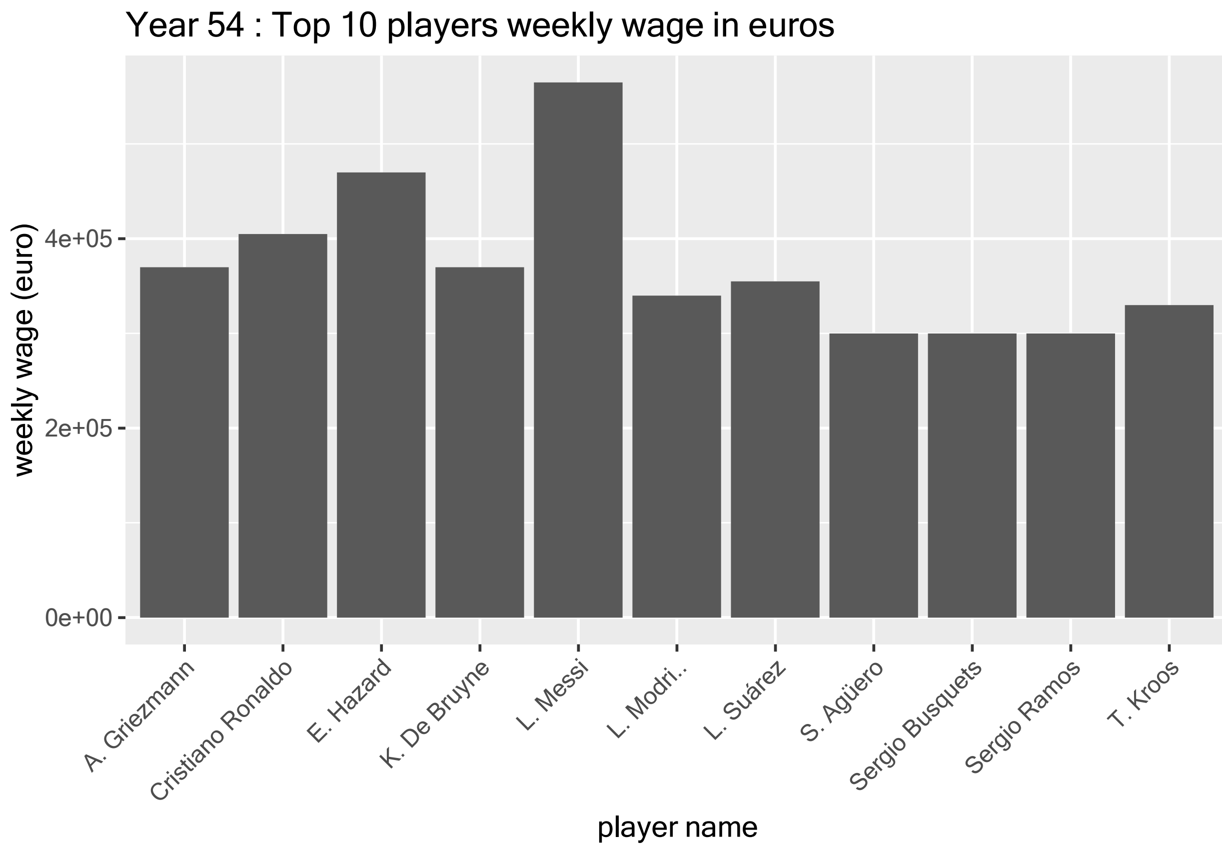



```
## Selecting by wage_eur
```



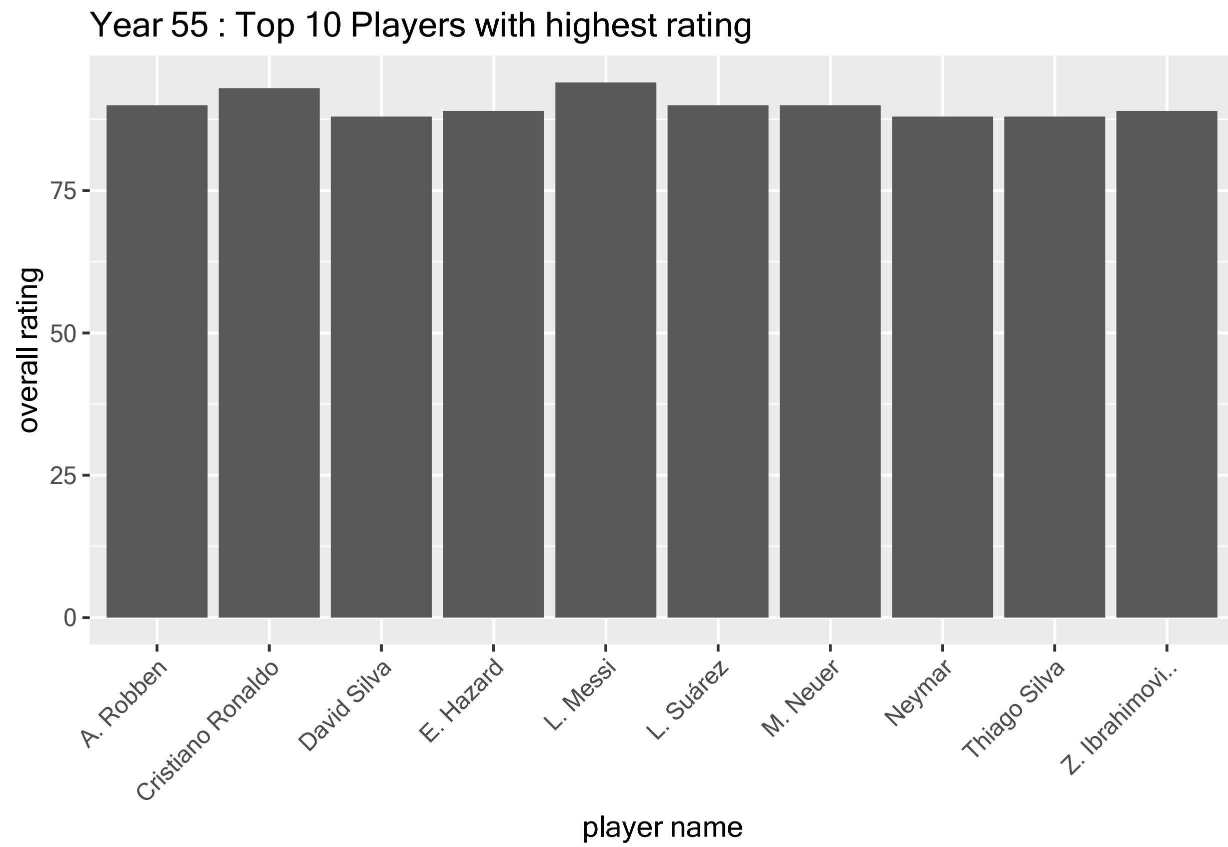

```
## Selecting by wage_eur
```


Year 53 : Top 10 players weekly wage in euros
weekly wage (euro)
4e+05
2e+05
0e+00
Coutinho
Cristiano Ronaldo
E. Hazard
G. Bale
K. De Bruyne
L. Messi
L. Modri..
L. Suárez
Sergio Ramos
T. Kroos
player name

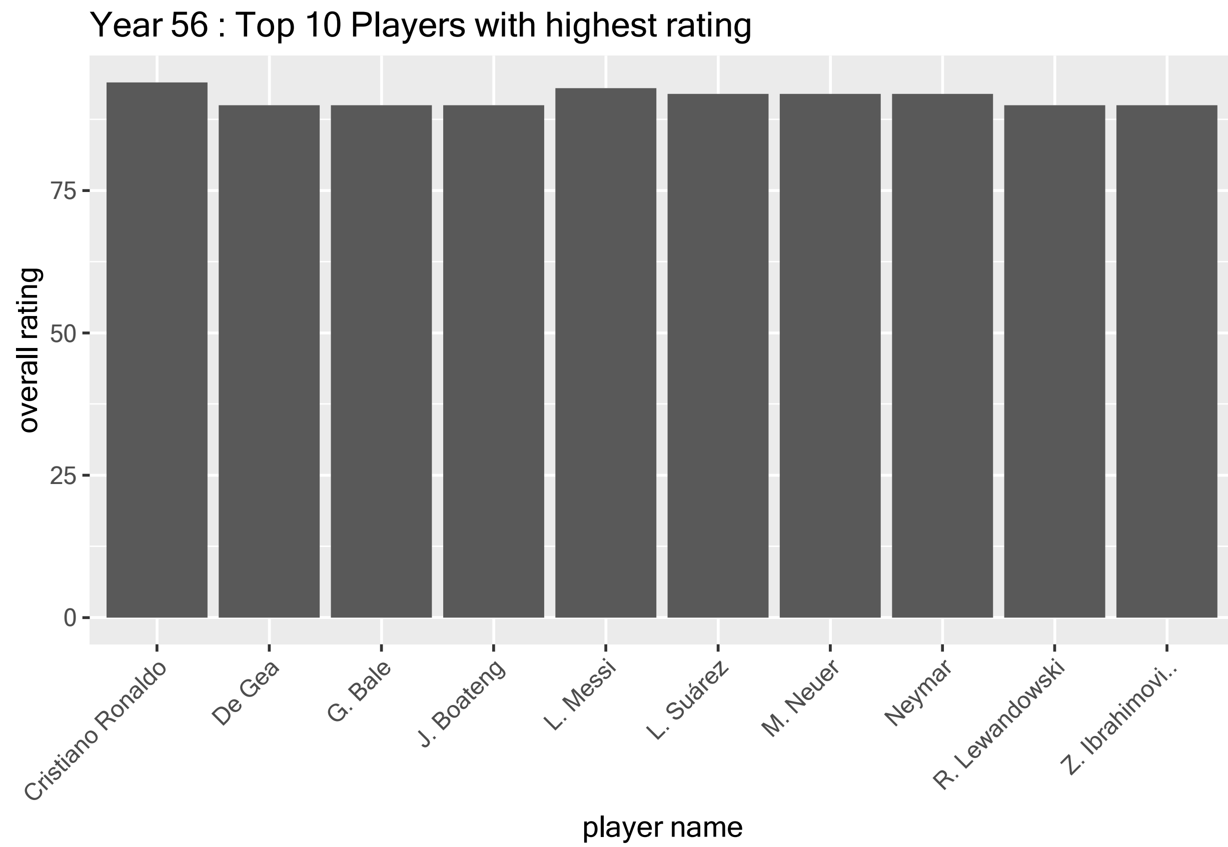



```r
# TTop 10 players with best rating
for (i in seq_along(fifa_datasets_list)) {
  top10_players <- fifa_datasets_list[[i]] %>% arrange(desc(overall)) %>%
    select(short_name, club, nationality, overall, overall) %>% top_n(10) %>%
    ggplot(aes(x=short_name, y=overall)) + geom_bar(stat = "identity") +
    labs(x="player name", y="overall rating",
         title=paste("Year", years[[i]], ":", "Top 10 Players with highest rating" )) +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
  print(top10_players)
}
```

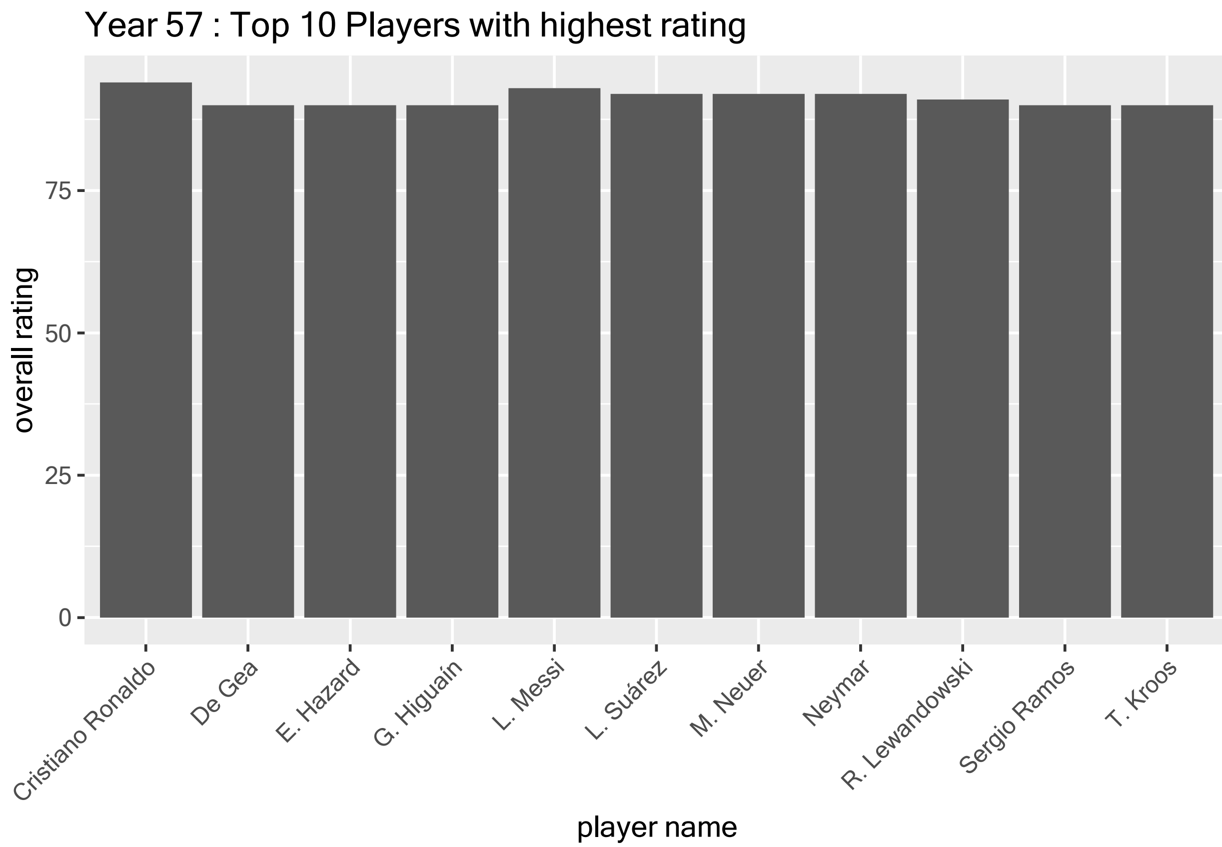
```
## Selecting by overall
## Selecting by overall
```



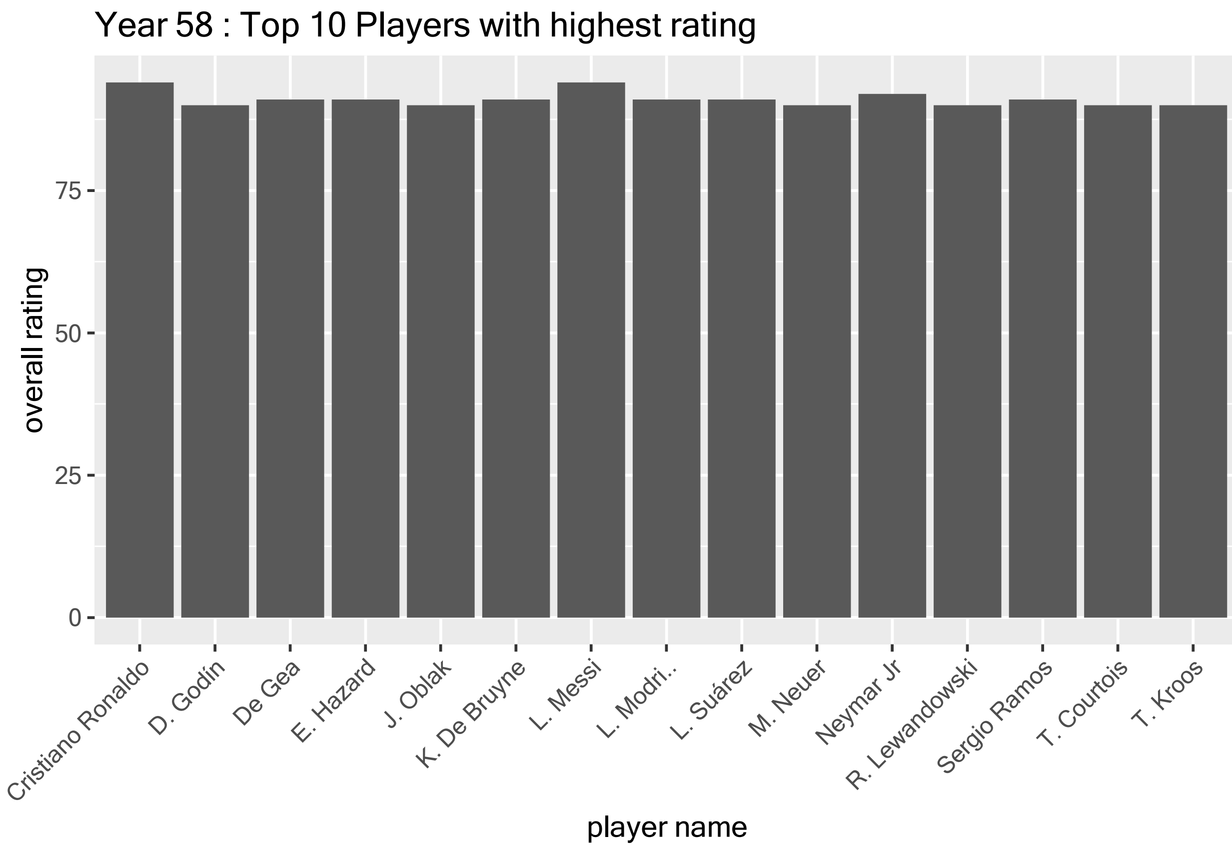

```
## Selecting by overall
```

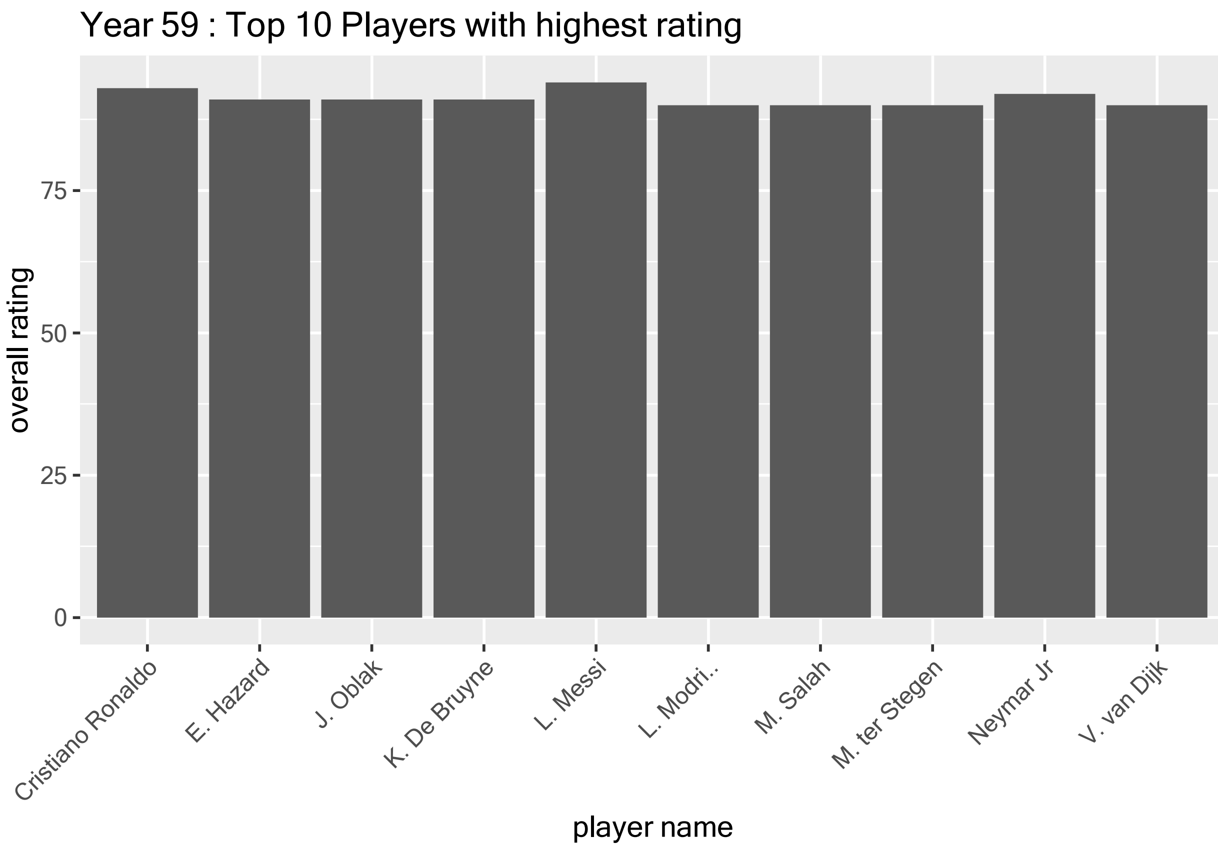



```
## Selecting by overall
```




```
## Selecting by overall
```


Year 58 : Top 10 Players with highest rating
overall rating
0
25
50
75
Cristiano Ronaldo
D. Godín
De Gea
E. Hazard
J. Oblak
K. De Bruyne
L. Messi
L. Modri..
L. Suárez
M. Neuer
Neymar Jr
R. Lewandowski
Sergio Ramos
T. Courtois
T. Kroos
player name




```
# Top 10 players with the best potential overall
for (i in seq_along(fifa_datasets_list)) {
  top10_best_potential <- fifa_datasets_list[[i]] %>% arrange(desc(potential)) %>%
    select(short_name, club, nationality, overall, potential) %>% top_n(10)
  print(top10_best_potential)
}
```

```
## Selecting by potential

## # A tibble: 14 x 5
##    short_name        club                   nationality overall potential
##    <chr>             <chr>                  <chr>         <int>     <int>
##  1 L. Messi          FC Barcelona           Argentina        94        95
##  2 Cristiano Ronaldo Real Madrid            Portugal         93        93
##  3 Neymar            FC Barcelona           Brazil           88        93
##  4 J. Rodríguez      Real Madrid            Colombia         87        93
##  5 P. Pogba          Juventus               France           86        92
##  6 E. Hazard         Chelsea                Belgium          89        91
##  7 G. Bale           Real Madrid            Wales            87        91
##  8 A. Robben         FC Bayern München      Netherlands      90        90
##  9 M. Neuer          FC Bayern München      Germany          90        90
## 10 L. Suárez         FC Barcelona           Uruguay          90        90
## 11 T. Kroos          Real Madrid            Germany          87        90
## 12 T. Courtois       Chelsea                Belgium          86        90
## 13 A. Halilović      Real Sporting de Gijón Croatia          76        90
## 14 Y. Tielemans      RSC Anderlecht         Belgium          76        90
```

```
## Selecting by potential

##           short_name              club  nationality  overall  potential
## 1              Neymar       FC Barcelona       Brazil       92         95
## 2   Cristiano Ronaldo        Real Madrid     Portugal       94         94
## 3            P. Pogba Manchester United       France       88         94
## 4            L. Messi       FC Barcelona    Argentina       93         93
## 5         T. Courtois            Chelsea      Belgium       89         93
## 6            M. Neuer FC Bayern München      Germany       92         92
## 7           L. Suárez       FC Barcelona      Uruguay       92         92
## 8              De Gea Manchester United        Spain       90         92
## 9        A. Griezmann    Atlético Madrid       France       88         92
## 10       J. Rodríguez        Real Madrid     Colombia       87         92
## 11          P. Dybala           Juventus    Argentina       85         92

## Selecting by potential

## # A tibble: 17 x 5
##    short_name        club                nationality overall potential
##    <chr>             <chr>               <chr>         <int>     <int>
##  1 Cristiano Ronaldo Real Madrid         Portugal         94        94
##  2 Neymar            Paris Saint-Germain Brazil           92        94
##  3 K. Mbappé         Paris Saint-Germain France           83        94
##  4 G. Donnarumma     Milan               Italy            82        94
##  5 L. Messi          FC Barcelona        Argentina        93        93
##  6 J. Oblak          Atlético Madrid     Slovenia         88        93
##  7 P. Dybala         Juventus            Argentina        88        93
##  8 M. Neuer          FC Bayern München   Germany          92        92
##  9 L. Suárez         FC Barcelona        Uruguay          92        92
## 10 De Gea            Manchester United   Spain            90        92
## 11 T. Courtois       Chelsea             Belgium          89        92
## 12 K. De Bruyne      Manchester City     Belgium          89        92
## 13 P. Pogba          Manchester United   France           87        92
## 14 R. Varane         Real Madrid         France           85        92
## 15 Marco Asensio     Real Madrid         Spain            84        92
## 16 O. Dembélé        FC Barcelona        France           83        92
## 17 Gabriel Jesus     Manchester City     Brazil           81        92

## Selecting by potential

## # A tibble: 10 x 5
##    short_name        club                nationality overall potential
##    <chr>             <chr>               <chr>         <int>     <int>
##  1 K. Mbappé         Paris Saint-Germain France           87        95
##  2 Cristiano Ronaldo Juventus            Portugal         94        94
##  3 L. Messi          FC Barcelona        Argentina        94        94
##  4 P. Dybala         Juventus            Argentina        89        94
##  5 Neymar Jr         Paris Saint-Germain Brazil           92        93
##  6 De Gea            Manchester United   Spain            91        93
##  7 J. Oblak          Atlético Madrid     Slovenia         90        93
##  8 L. Sané           Manchester City     Germany          86        93
##  9 Marco Asensio     Real Madrid         Spain            85        93
## 10 G. Donnarumma     Milan               Italy            82        93
```

```
## Selecting by potential

## # A tibble: 14    x 5
##    short_name        club                 nationality overall potential
##    <chr>             <chr>                <chr>         <int>     <int>
##  1 K. Mbappé         Paris Saint-Germain  France           89        95
##  2 L. Messi          FC Barcelona         Argentina        94        94
##  3 Cristiano Ronaldo Juventus             Portugal         93        93
##  4 J. Oblak          Atlético Madrid      Slovenia         91        93
##  5 M. ter Stegen     FC Barcelona         Germany          90        93
##  6 M. de Ligt        Juventus             Netherlands      85        93
##  7 João Félix        Atlético Madrid      Portugal         80        93
##  8 Neymar Jr         Paris Saint-Germain  Brazil           92        92
##  9 P. Dybala         Juventus             Argentina        88        92
## 10 L. Sané           Manchester City      Germany          86        92
## 11 G. Donnarumma     Milan                Italy            85        92
## 12 J. Sancho         Borussia Dortmund    England          84        92
## 13 K. Havertz        Bayer 04 Leverkusen  Germany          84        92
## 14 Vinícius Jr.      Real Madrid          Brazil           79        92
```

```
# Players aged 25 or less with best potential:
for (i in seq_along(fifa_datasets_list)) {
  top_potential_below_25 <- fifa_datasets_list[[i]] %>% filter(age <= 25) %>%
    arrange(desc(potential)) %>% top_n(50) %>%
    select(short_name, club, nationality, overall, potential)
  print(top_potential_below_25)
}
```

```
## Selecting by rb

## # A tibble: 57    x 5
##    short_name        club                nationality overall potential
##    <chr>             <chr>               <chr>         <int>     <int>
##  1 P. Pogba          Juventus            France           86        92
##  2 M. Verratti       Paris Saint-Germain Italy            84        89
##  3 L. Shaw           Manchester United   England          78        89
##  4 D. Alaba          FC Bayern München   Austria          85        88
##  5 William Carvalho  Sporting CP         Portugal         81        88
##  6 L. Kurzawa        Paris Saint-Germain France           80        88
##  7 R. Rodriguez      VfL Wolfsburg       Switzerland      83        87
##  8 M. Musacchio      Villarreal CF       Argentina        81        87
##  9 Marquinhos        Paris Saint-Germain Brazil           81        87
## 10 Gayà              Valencia CF         Spain            80        87
## # ... with 47 more rows

## Selecting by rb

##       short_name                club nationality overall
## 1       P. Pogba   Manchester United      France      88
## 2      R. Varane         Real Madrid      France      84
## 3       D. Alaba   FC Bayern München     Austria      87
## 4    M. Verratti Paris Saint-Germain       Italy      85
```

##	5	E. Bailly	Manchester United	Ivory Coast	82
##	6	L. Shaw	Manchester United	England	81
##	7	A. Laporte	Athletic Club de Bilbao	France	84
##	8	S. Mustafi	Arsenal	Germany	83
##	9	S. Aurier	Paris Saint-Germain	Ivory Coast	83
##	10	Marquinhos	Paris Saint-Germain	Brazil	82
##	11	L. Kurzawa	Paris Saint-Germain	France	81
##	12	Saúl	Atlético Madrid	Spain	80
##	13	J. Stones	Manchester City	England	78
##	14	Alex Sandro	Juventus	Brazil	84
##	15	M. Musacchio	Villarreal CF	Argentina	83
##	16	Danilo Pereira	FC Porto	Portugal	82
##	17	S. Umtiti	FC Barcelona	France	82
##	18	Héctor Bellerín	Arsenal	Spain	79
##	19	Fabinho	AS Monaco	Brazil	79
##	20	João Cancelo	Valencia CF	Portugal	79
##	21	V. Koziello	OGC Nice	France	79
##	22	J. Kimmich	FC Bayern München	Germany	78
##	23	R. Rodríguez	VfL Wolfsburg	Switzerland	83
##	24	Carvajal	Real Madrid	Spain	83
##	25	T. Kolodziejczak	Sevilla FC	France	80
##	26	E. Can	Liverpool	Germany	80
##	27	J. Willems	PSV	Netherlands	79
##	28	L. Goretzka	FC Schalke 04	Germany	79
##	29	Danilo	SL Benfica	Brazil	79
##	30	A. Florenzi	Roma	Italy	82
##	31	N. Clyne	Liverpool	England	81
##	32	N. Kanté	Chelsea	France	81
##	33	Hugo Mallo	RC Celta	Spain	80
##	34	Gayà	Valencia CF	Spain	80
##	35	A. Baba	FC Schalke 04	Ghana	78
##	36	Ricardo Pereira	OGC Nice	Portugal	78
##	37	Wendell	Bayer 04 Leverkusen	Brazil	78
##	38	J. Matip	Liverpool	Cameroon	82
##	39	J. McCarthy	Everton	Republic of Ireland	81
##	40	F. Coquelin	Arsenal	France	81
##	41	Marc Bartra	Borussia Dortmund	Spain	81
##	42	Mario Gaspar	Villarreal CF	Spain	80
##	43	L. Digne	FC Barcelona	France	79
##	44	D. Sidibé	AS Monaco	France	79
##	45	N. Mendy	Leicester City	France	78
##	46	Allan	Napoli	Brazil	81
##	47	Mário Fernandes	PFC CSKA Moscow	Brazil	80
##	48	Danilo	Real Madrid	Brazil	80
##	49	S. Vrsaljko	Atlético Madrid	Croatia	79
##	50	Bernat	FC Bayern München	Spain	79
##	51	E. Hysaj	Napoli	Albania	79
##	52	A. Mandi	Real Betis	Algeria	78
##	53	D. Rose	Tottenham Hotspur	England	80
##	54	J. Guilavogui	VfL Wolfsburg	France	80
##	55	S. Rode	Borussia Dortmund	Germany	80
##	56	Montoya	Valencia CF	Spain	79
##	57	F. Ghoulam	Napoli	Algeria	79
##	58	Cédric	Southampton	Portugal	78

```
## 59        B. Davies     Tottenham Hotspur           Wales       78
## 60   Alberto Moreno             Liverpool           Spain       77
## 61      Alex Telles              FC Porto          Brazil       77
## 62        Mário Rui                  Roma        Portugal       78
## 63         S. Arias                   PSV        Colombia       77
## 64           Rafael     Olympique Lyonnais          Brazil       78
## 65      S. Corchia            LOSC Lille          France       77
## 66    Marcos Alonso               Chelsea           Spain       77
## 67       T. Meunier  Paris Saint-Germain         Belgium       77
##    potential
## 1         94
## 2         91
## 3         90
## 4         90
## 5         90
## 6         89
## 7         88
## 8         88
## 9         88
## 10        88
## 11        88
## 12        88
## 13        88
## 14        87
## 15        87
## 16        87
## 17        87
## 18        87
## 19        87
## 20        87
## 21        87
## 22        87
## 23        86
## 24        86
## 25        86
## 26        86
## 27        86
## 28        86
## 29        86
## 30        85
## 31        85
## 32        85
## 33        85
## 34        85
## 35        85
## 36        85
## 37        85
## 38        84
## 39        84
## 40        84
## 41        84
## 42        84
## 43        84
## 44        84
```

```
## 45          84
## 46          83
## 47          83
## 48          83
## 49          83
## 50          83
## 51          83
## 52          83
## 53          82
## 54          82
## 55          82
## 56          82
## 57          82
## 58          82
## 59          82
## 60          82
## 61          82
## 62          81
## 63          81
## 64          80
## 65          80
## 66          80
## 67          80

## Selecting by rb

## # A tibble: 64 x 5
##    short_name  club                     nationality overall potential
##    <chr>       <chr>                    <chr>         <int>     <int>
##  1 R. Varane   Real Madrid              France           85        92
##  2 M. Verratti Paris Saint-Germain      Italy            87        91
##  3 Saúl        Atlético Madrid          Spain            82        90
##  4 Casemiro    Real Madrid              Brazil           85        89
##  5 A. Laporte  Athletic Club de Bilbao  France           84        89
##  6 E. Bailly   Manchester United        Ivory Coast      84        89
##  7 Marquinhos  Paris Saint-Germain      Brazil           83        89
##  8 C. Tolisso  FC Bayern München        France           82        89
##  9 D. Alaba    FC Bayern München        Austria          86        88
## 10 S. Umtiti   FC Barcelona             France           83        88
## # ... with 54 more rows

## Selecting by rb

## # A tibble: 70 x 5
##    short_name           club                nationality overall potential
##    <chr>                <chr>               <chr>         <int>     <int>
##  1 S. Umtiti            FC Barcelona        France           87        92
##  2 R. Varane            Real Madrid         France           86        92
##  3 M. Škriniar          Inter               Slovakia         85        92
##  4 Saúl                 Atlético Madrid     Spain            85        91
##  5 S. Milinković-Savić  Lazio               Serbia           85        90
##  6 M. Verratti          Paris Saint-Germain Italy            86        89
##  7 Fabinho              Liverpool           Brazil           85        89
```

```
##   8 Marquinhos          Paris Saint-Germain  Brazil           84        89
##   9 D. Sánchez          Tottenham Hotspur    Colombia         84        89
##  10 P. Kimpembe         Paris Saint-Germain  France           83        89
## # ... with 60 more rows
```

```
## Selecting by rb
```

```
## # A tibble: 54 x 5
##    short_name   club                nationality overall potential
##    <chr>        <chr>               <chr>         <int>     <int>
##  1 F. de Jong   FC Barcelona        Netherlands      85        91
##  2 A. Laporte   Manchester City     France           87        90
##  3 Marquinhos   Paris Saint-Germain Brazil           86        90
##  4 Rodri        Manchester City     Spain            85        90
##  5 S. Umtiti    FC Barcelona        France           86        89
##  6 Saúl         Atlético Madrid     Spain            85        89
##  7 Fabinho      Liverpool           Brazil           85        89
##  8 A. Robertson Liverpool           Scotland         85        89
##  9 C. Lenglet   FC Barcelona        France           85        89
## 10 João Cancelo Manchester City     Portugal         84        89
## # ... with 44 more rows
```

```r
# Players aged 21 or less with best potential:
for (i in seq_along(fifa_datasets_list)) {
  top_potential_below_21 <- fifa_datasets_list[[i]] %>% filter(age <= 21) %>%
    arrange(desc(potential)) %>% top_n(50) %>%
    select(short_name, club, nationality, overall, potential)
  print(top_potential_below_21)
}
```

```
## Selecting by rb
```

```
## # A tibble: 71 x 5
##    short_name club                      nationality overall potential
##    <chr>      <chr>                     <chr>         <int>     <int>
##  1 L. Shaw    Manchester United         England          78        89
##  2 D. Rugani  Juventus                  Italy            78        88
##  3 R. Bazoer  Ajax                      Netherlands      75        88
##  4 A. Laporte Athletic Club de Bilbao   France           83        87
##  5 Marquinhos Paris Saint-Germain       Brazil           81        87
##  6 Gayà       Valencia CF               Spain            80        87
##  7 J. Stones  Everton                   England          77        87
##  8 K. Zouma   Chelsea                   France           77        87
##  9 J. Geis    FC Schalke 04             Germany          79        86
## 10 J. Willems PSV                       Netherlands      78        86
## # ... with 61 more rows
```

```
## Selecting by rb
```

```
##           short_name                club nationality overall
## 1     Renato Sanches   FC Bayern München    Portugal      78
## 2            L. Shaw   Manchester United     England      81
```

##	3	K. Zouma	Chelsea	France	80
##	4	J. Giménez	Atlético Madrid	Uruguay	83
##	5	Saúl	Atlético Madrid	Spain	80
##	6	M. Lemos	UD Las Palmas	Uruguay	80
##	7	J. Tah	Bayer 04 Leverkusen	Germany	79
##	8	N. Süle	TSG 1899 Hoffenheim	Germany	81
##	9	Héctor Bellerín	Arsenal	Spain	79
##	10	D. Rugani	Juventus	Italy	79
##	11	V. Koziello	OGC Nice	France	79
##	12	J. Kimmich	FC Bayern München	Germany	78
##	13	A. Christensen	Borussia Mönchengladbach	Denmark	78
##	14	T. Fosu-Mensah	Manchester United	Netherlands	71
##	15	L. Goretzka	FC Schalke 04	Germany	79
##	16	J. Weigl	Borussia Dortmund	Germany	79
##	17	Danilo	SL Benfica	Brazil	79
##	18	A. Romagnoli	Milan	Italy	78
##	19	C. Tolisso	Olympique Lyonnais	France	78
##	20	V. Nilsson Lindelöf	SL Benfica	Sweden	78
##	21	Grimaldo	SL Benfica	Spain	77
##	22	J. Riedewald	Ajax	Netherlands	76
##	23	Gayà	Valencia CF	Spain	80
##	24	A. Baba	FC Schalke 04	Ghana	78
##	25	A. Rabiot	Paris Saint-Germain	France	78
##	26	R. Bazoer	Ajax	Netherlands	77
##	27	T. Jedvaj	Bayer 04 Leverkusen	Croatia	75
##	28	G. Donsah	Bologna	Ghana	75
##	29	Rúben Neves	FC Porto	Portugal	75
##	30	M. Grujić	Liverpool	Serbia	71
##	31	M. Sanson	Montpellier HSC	France	78
##	32	C. Mbemba	Newcastle United	DR Congo	77
##	33	E. Gutiérrez	Pachuca	Mexico	76
##	34	D. Amartey	Leicester City	Ghana	75
##	35	K. Linetty	Sampdoria	Poland	74
##	36	N. Stark	Hertha BSC	Germany	74
##	37	J. Denayer	Sunderland	Belgium	74
##	38	A. Diawara	Napoli	Guinea	74
##	39	A. Cubas	Boca Juniors	Argentina	73
##	40	F. Mattiello	Juventus	Italy	72
##	41	E. Nabiullin	Rubin Kazan	Russia	72
##	42	L. Klostermann	RB Leipzig	Germany	72
##	43	A. Nagy	Bologna	Hungary	72
##	44	Rafa Soares	Rio Ave FC	Portugal	71
##	45	P. Galdames	Unión Española	Chile	71
##	46	S. Ascacibar	Estudiantes de La Plata	Argentina	71
##	47	K. Tete	Ajax	Netherlands	77
##	48	L. Dendoncker	RSC Anderlecht	Belgium	76
##	49	J. Hendrix	PSV	Netherlands	76
##	50	S. Milinković-Savić	Lazio	Serbia	76
##	51	D. Cataldi	Lazio	Italy	75
##	52	J. Lerma	Levante UD	Colombia	75
##	53	O. Tufan	Fenerbahçe SK	Turkey	75
##	54	F. Ricca	Málaga CF	Uruguay	75
##	55	J. Gbamin	1. FSV Mainz 05	France	73
##	56	Marín	CD Leganés	Spain	73

```
## 57          O. Ndidi            KRC Genk     Nigeria      72
## 58        T. Vilhena            Feyenoord Netherlands     76
## 59       R. Karsdorp            Feyenoord Netherlands     76
## 60       C. Chambers        Middlesbrough     England      72
## 61       P. Højbjerg          Southampton     Denmark      74
## 62       T. Bakayoko            AS Monaco      France      74
## 63           N. Aké           Bournemouth Netherlands     72
## 64            Varela         Real Oviedo       Spain      71
## 65          K. Diks           Fiorentina Netherlands      71
## 66         T. Foket             KAA Gent     Belgium      73
## 67          Vigaray     Deportivo Alavés       Spain      71
## 68         B. Mendy            AS Monaco      France      75
## 69        J. Lukaku                Lazio     Belgium      73
## 70        J. Toljan  TSG 1899 Hoffenheim     Germany      73
## 71       S. Moreira           FC Lorient      France      72
## 72         C. Fiore    Standard de Liège     Belgium      72
## 73     Rubén Duarte         RCD Espanyol       Spain      72
## 74       R. Gosens       Heracles Almelo     Germany      71
##    potential
## 1         90
## 2         89
## 3         89
## 4         88
## 5         88
## 6         88
## 7         88
## 8         87
## 9         87
## 10        87
## 11        87
## 12        87
## 13        87
## 14        87
## 15        86
## 16        86
## 17        86
## 18        86
## 19        86
## 20        86
## 21        86
## 22        86
## 23        85
## 24        85
## 25        85
## 26        85
## 27        85
## 28        85
## 29        85
## 30        85
## 31        84
## 32        84
## 33        84
## 34        84
## 35        84
```

```
## 36         84
## 37         84
## 38         84
## 39         84
## 40         84
## 41         84
## 42         84
## 43         84
## 44         84
## 45         84
## 46         84
## 47         83
## 48         83
## 49         83
## 50         83
## 51         83
## 52         83
## 53         83
## 54         83
## 55         83
## 56         83
## 57         83
## 58         82
## 59         82
## 60         82
## 61         81
## 62         81
## 63         81
## 64         81
## 65         81
## 66         80
## 67         80
## 68         79
## 69         79
## 70         79
## 71         79
## 72         79
## 73         79
## 74         75
```

```
## Selecting by rb
```

```
## # A tibble: 54   x 5
##    short_name     club                nationality overall potential
##    <chr>          <chr>               <chr>         <int>     <int>
##  1 T. Lemar       AS Monaco           France           83        91
##  2 D. Alli        Tottenham Hotspur   England          84        90
##  3 N. Süle        FC Bayern München   Germany          83        89
##  4 A. Christensen Chelsea             Denmark          81        89
##  5 J. Tah         Bayer 04 Leverkusen Germany          82        88
##  6 D. Sánchez     Tottenham Hotspur   Colombia         81        88
##  7 Dani Ceballos  Real Madrid         Spain            78        88
##  8 M. Sarr        OGC Nice            France           75        88
##  9 J. Weigl       Borussia Dortmund   Germany          81        87
```

```
## 10 Grimaldo        SL Benfica         Spain              80         87
## # ... with 44 more rows

## Selecting by rb

## # A tibble: 56 x 5
##    short_name          club                    nationality overall potential
##    <chr>               <chr>                   <chr>         <int>     <int>
##  1 M. de Ligt          Ajax                    Netherlands      80        91
##  2 Arthur              FC Barcelona            Brazil           82        90
##  3 T. Alexander-Arnold Liverpool               England          78        88
##  4 N. Barella          Cagliari                Italy            76        88
##  5 Rúben Neves         Wolverhampton Wandere~ Portugal         79        87
##  6 Dani Ceballos       Real Madrid             Spain            78        87
##  7 F. Kessié           Milan                   Ivory Coast      78        87
##  8 T. Ndombele         Olympique Lyonnais      France           78        87
##  9 J. Gomez            Liverpool               England          77        87
## 10 D. Calabria         Milan                   Italy            77        87
## # ... with 46 more rows

## Selecting by rb

## # A tibble: 56 x 5
##    short_name          club               nationality overall potential
##    <chr>               <chr>              <chr>         <int>     <int>
##  1 M. de Ligt          Juventus           Netherlands      85        93
##  2 T. Alexander-Arnold Liverpool          England          83        89
##  3 H. Aouar            Olympique Lyonnais France           81        89
##  4 S. Tonali           Brescia            Italy            75        89
##  5 Éder Militão        Real Madrid        Brazil           81        88
##  6 A. Wan-Bissaka      Manchester United  England          79        88
##  7 I. Konaté           RB Leipzig         France           79        88
##  8 S. Berge            KRC Genk           Norway           79        87
##  9 D. Rice             West Ham United    England          78        87
## 10 E. Palacios         River Plate        Argentina        77        87
## # ... with 46 more rows
```

```r
#Player with highest scope for increase in overall
for (i in seq_along(fifa_datasets_list)) {
  pot_inc <- fifa_datasets_list[[i]] %>%
    mutate(pot_increase = potential-overall) %>%
    arrange(desc(pot_increase)) %>%
    select(short_name, club, nationality, age, overall, potential, pot_increase)

  #we see that young players have scope for highest increase in rating.
  #so are pot_increase and age positively correlated?

  pot_inc_age_pot_inc <- pot_inc %>% select(age, pot_increase)
  cor_pot_inc_age_pot_inc <- cor(pot_inc_age_pot_inc)
  print(paste("Year", years[[i]], ":"))
  print(round(cor_pot_inc_age_pot_inc, 2))
}
```

```
## [1] "Year 2016 :"
##                  age  pot_increase
## age             1.00         -0.87
## pot_increase  -0.87          1.00
## [1] "Year 2017 :"
##                  age  pot_increase
## age             1.00         -0.86
## pot_increase  -0.86          1.00
## [1] "Year 2018 :"
##                  age  pot_increase
## age             1.00         -0.86
## pot_increase  -0.86          1.00
## [1] "Year 2019 :"
##                  age  pot_increase
## age             1.00         -0.87
## pot_increase  -0.87          1.00
## [1] "Year 2020 :"
##                  age  pot_increase
## age             1.00         -0.87
## pot_increase  -0.87          1.00
```

```
# 6 PHYSICAL ATTRIBUTES: pace, shooting, passing, dribbling, defending and physique

pace_dfs <- vector(mode = "list", length = 5)
shooting_dfs <- vector(mode = "list", length = 5)
passing_dfs <- vector(mode = "list", length = 5)
dribble_dfs <- vector(mode = "list", length = 5)
defend_dfs <- vector(mode = "list", length = 5)
physic_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # pace
  pace_ <- fifa_datasets_list[[i]] %>% arrange(desc(pace)) %>%
    select(short_name, club, nationality, overall, team_position, pace) %>% top_n(1)
  pace_ <- add_column(pace_, years[[i]], .before = "short_name")
  pace_dfs[[i]] <- data.frame(pace_)

  #  shooting
  shooting_ <- fifa_datasets_list[[i]] %>% arrange(desc(shooting)) %>%
    select(short_name, club, nationality, overall, team_position, shooting) %>% top_n(1)
  shooting_ <- add_column(shooting_, years[[i]], .before = "short_name")
  shooting_dfs[[i]] <- data.frame(shooting_)

  # passing
  passing_ <- fifa_datasets_list[[i]] %>% arrange(desc(passing)) %>%
    select(short_name, club, nationality, overall, team_position, passing) %>% top_n(1)
  passing_ <- add_column(passing_, years[[i]], .before = "short_name")
  passing_dfs[[i]] <- data.frame(passing_)

  #  dribble
  dribble_ <- fifa_datasets_list[[i]] %>% arrange(desc(dribbling)) %>%
    select(short_name, club, nationality, overall, team_position, dribbling) %>% top_n(1)
  dribble_ <- add_column(dribble_, years[[i]], .before = "short_name")
```

```
  dribble_dfs[[i]] <- data.frame(dribble_)

  # defending
  defend_  <-  fifa_datasets_list[[i]]  %>%  arrange(desc(defending))  %>%
    select(short_name, club, nationality, overall, team_position, defending) %>% top_n(1)
  defend_ <- add_column(defend_, years[[i]], .before = "short_name")
  defend_dfs[[i]] <- data.frame(defend_)

  # physic
  physic_  <-  fifa_datasets_list[[i]]  %>% arrange(desc(physic))  %>%
    select(short_name, club, nationality, overall, team_position, physic) %>% top_n(1)
  physic_ <- add_column(physic_, years[[i]], .before = "short_name")
  physic_dfs[[i]]  <-  data.frame(physic_)
}
```

```
## Selecting by pace

## Selecting by shooting##

Selecting by passing ##

Selecting by dribbling##

Selecting by defending##

Selecting by physic

## Selecting by pace

## Selecting by shooting##

Selecting by passing ##

Selecting by dribbling##

Selecting by defending##

Selecting by physic

## Selecting by pace

## Selecting by shooting##

Selecting by passing ##

Selecting by dribbling##

Selecting by defending
```

Selecting by physic

Selecting by pace

Selecting by shooting##

Selecting by passing ##

Selecting by dribbling##

Selecting by defending##

Selecting by physic

Selecting by pace

Selecting by shooting##

Selecting by passing ##

Selecting by dribbling##

Selecting by defending##

Selecting by physic

```
pace_df <- do.call("rbind", pace_dfs)
shooting_df <- do.call("rbind", shooting_dfs)
passing_df <- do.call("rbind", passing_dfs)
dribble_df <- do.call("rbind", dribble_dfs)
defend_df <- do.call("rbind", defend_dfs)
physic_df <- do.call("rbind", physic_dfs)

print(pace_df)
```

```
##    years..i..     short_name                     club  nationality overall
## 1        2016     T. Walcott                  Arsenal      England      81
## 2        2016       M. Bolly       Fortuna Düsseldorf  Ivory Coast      67
## 3        2017  P. Aubameyang        Borussia Dortmund        Gabon      86
## 4        2017       M. Bolly      SpVgg Greuther Fürth Ivory Coast      67
## 5        2018  P. Aubameyang        Borussia Dortmund        Gabon      88
## 6        2018    J. Biabiany             Sparta Praha       France      75
## 7        2019      K. Mbappé      Paris Saint-Germain       France      87
## 8        2019          Adama  Wolverhampton Wanderers        Spain      75
## 9        2020      K. Mbappé      Paris Saint-Germain       France      89
## 10       2020   Adama Traoré  Wolverhampton Wanderers        Spain      74
##    team_position pace
## 1             ST   96
## 2            SUB   96
## 3             ST   96
```

```
## 4          SUB   96
## 5           ST   96
## 6           RM   96
## 7           RW   96
## 8          SUB   96
## 9           RW   96
## 10         SUB   96
```

```r
print(shooting_df)
```

```
##   years..i..        short_name        club nationality overall
## 1       2016 Cristiano Ronaldo Real Madrid    Portugal      93
## 2       2017 Cristiano Ronaldo Real Madrid    Portugal      94
## 3       2018 Cristiano Ronaldo Real Madrid    Portugal      94
## 4       2019 Cristiano Ronaldo    Juventus    Portugal      94
## 5       2020 Cristiano Ronaldo    Juventus    Portugal      93
##   team_position shooting
## 1            LM       93
## 2            LW       92
## 3            LW       93
## 4            LW       93
## 5            LW       93
```

```r
print(passing_df)
```

```
##   years..i..   short_name             club nationality overall
## 1       2016     A. Pirlo New York City FC       Italy      84
## 2       2017     A. Pirlo New York City FC       Italy      82
## 3       2018     T. Kroos      Real Madrid     Germany      90
## 4       2018     A. Pirlo New York City FC       Italy      79
## 5       2019 K. De Bruyne  Manchester City     Belgium      91
## 6       2020     L. Messi     FC Barcelona   Argentina      94
## 7       2020 K. De Bruyne  Manchester City     Belgium      91
##   team_position passing
## 1           CDM      93
## 2           LCM      91
## 3           LCM      89
## 4           SUB      89
## 5           RCM      92
## 6            RW      92
## 7           RCM      92
```

```r
print(dribble_df)
```

```
##   years..i.. short_name         club nationality overall team_position
## 1       2016   L. Messi FC Barcelona   Argentina      94            RW
## 2       2017   L. Messi FC Barcelona   Argentina      93            RW
## 3       2018   L. Messi FC Barcelona   Argentina      93            RW
## 4       2019   L. Messi FC Barcelona   Argentina      94            RW
## 5       2020   L. Messi FC Barcelona   Argentina      94            RW
##   dribbling
## 1 95
```

```
## 2          96
## 3          96
## 4          96
## 5          96
```

```r
print(defend_df)
```

```
##    years..i..   short_name              club nationality overall
## 1        2016 Thiago Silva Paris Saint-Germain      Brazil      88
## 2        2016  G. Chiellini           Juventus       Italy      87
## 3        2017    J. Boateng  FC Bayern München     Germany      90
## 4        2017 Thiago Silva Paris Saint-Germain      Brazil      89
## 5        2017  G. Chiellini           Juventus       Italy      88
## 6        2018  G. Chiellini           Juventus       Italy      89
## 7        2019 Sergio Ramos         Real Madrid       Spain      91
## 8        2019  G. Chiellini           Juventus       Italy      89
## 9        2020   V. van Dijk          Liverpool Netherlands      90
## 10       2020  G. Chiellini           Juventus       Italy      89
##    team_position defending
## 1            RCB        90
## 2            LCB        90
## 3            RCB        90
## 4            LCB        90
## 5            LCB        90
## 6            LCB        90
## 7            LCB        91
## 8            LCB        91
## 9            LCB        90
## 10           LCB        90
```

```r
print(physic_df)
```

```
##    years..i..   short_name              club nationality overall
## 1        2016     G. Medel              Inter       Chile      81
## 2        2016  M. Fellaini  Manchester United     Belgium      78
## 3        2016   V. Wanyama        Southampton       Kenya      77
## 4        2016 J. Van Damme  Standard de Liège     Belgium      72
## 5        2016  C. Paterson Heart of Midlothian    Scotland      65
## 6        2017  M. Fellaini  Manchester United     Belgium      78
## 7        2017     C. N'Doye          Angers SCO     Senegal      77
## 8        2017  C. Paterson Heart of Midlothian    Scotland      68
## 9        2018 J. Van Damme    Royal Antwerp FC     Belgium      77
## 10       2019     S. Nzonzi               Roma      France      82
## 11       2019   D. Hediger            FC Thun Switzerland      68
## 12       2020    M. Marega           FC Porto        Mali      80
##    team_position physic
## 1            CDM     89
## 2            SUB     89
## 3            RDM     89
## 4             LB     89
## 5             RB     89
## 6            RDM     90
## 7            RCM     90
```

```
## 8               RB      90
## 9              SUB      92
## 10             SUB      89
## 11             RDM      89
## 12              RS      90
```

```
# Goalkeeping stats
top_gks_dfs <- vector(mode = "list", length = 5)
gk_diving_dfs <- vector(mode = "list", length = 5)
gk_handling_dfs <- vector(mode = "list", length = 5)
gk_kicking_dfs <- vector(mode = "list", length = 5)
gk_reflex_dfs <- vector(mode = "list", length = 5)
gk_speed_dfs <- vector(mode = "list", length = 5)
gk_position_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # Top 5 best goalkeepers by year
  top_5_gk <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>% arrange(desc(overall)) %>%
    select(short_name, club, nationality, overall) %>% top_n(5)
  top_5_gk <- add_column(top_5_gk, years[[i]], .before = "short_name")
  top_gks_dfs[[i]] <- data.frame(top_5_gk)

  # Top 5 best divers by year
  top_5_divers <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>% arrange(desc(gk_diving))
    select(short_name, club, nationality, gk_diving) %>% top_n(5)
  top_5_divers <- add_column(top_5_divers, years[[i]], .before = "short_name")
  gk_diving_dfs[[i]] <- data.frame(top_5_divers)

  # Top 5 best handlers by year
  top_5_handlers <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>%
    arrange(desc(gk_handling)) %>% select(short_name, club, nationality, gk_handling) %>% top_n(5)
  top_5_handlers <- add_column(top_5_handlers, years[[i]], .before = "short_name")
  gk_handling_dfs[[i]] <- data.frame(top_5_handlers)

  # Top 5 best kickers by year
  top_5_kickers <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>%
    arrange(desc(gk_kicking)) %>% select(short_name, club, nationality, gk_kicking) %>% top_n(5)
  top_5_kickers <- add_column(top_5_kickers, years[[i]], .before = "short_name")
  gk_kicking_dfs[[i]] <- data.frame(top_5_kickers)

  # Top 5 best reflexes by year
  top_5_reflex <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>%
    arrange(desc(gk_reflexes)) %>% select(short_name, club, nationality, gk_reflexes) %>% top_n(5)
  top_5_reflex <- add_column(top_5_reflex, years[[i]], .before = "short_name")
  gk_reflex_dfs[[i]] <- data.frame(top_5_reflex)

  # Top 5 best speed by year
  top_5_speed <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>%
    arrange(desc(gk_speed)) %>% select(short_name, club, nationality, gk_speed) %>% top_n(5)
  top_5_speed <- add_column(top_5_speed, years[[i]], .before = "short_name")
  gk_speed_dfs[[i]] <- data.frame(top_5_speed)

  # Top 5 best position by year
```

```r
  top_5_position <- fifa_datasets_list[[i]] %>% filter(team_position=="GK") %>%
    arrange(desc(gk_positioning)) %>% select(short_name, club, nationality, gk_positioning) %>% top_n(5
  top_5_position <- add_column(top_5_position, years[[i]], .before = "short_name")
  gk_position_dfs[[i]] <- data.frame(top_5_position)
}
```

```
## Selecting by overall

## Selecting by gk_diving

## Selecting by gk_handling

## Selecting by gk_kicking

## Selecting by gk_reflexes

## Selecting by gk_speed

## Selecting by gk_positioning

## Selecting by overall

## Selecting by gk_diving

## Selecting by gk_handling

## Selecting by gk_kicking

## Selecting by gk_reflexes

## Selecting by gk_speed

## Selecting by gk_positioning

## Selecting by overall

## Selecting by gk_diving

## Selecting by gk_handling

## Selecting by gk_kicking

## Selecting by gk_reflexes

## Selecting by gk_speed

## Selecting by gk_positioning
```

```
## Selecting by overall

## Selecting by gk_diving

## Selecting by gk_handling

## Selecting by gk_kicking

## Selecting by gk_reflexes

## Selecting by gk_speed

## Selecting by gk_positioning

## Selecting by overall

## Selecting by gk_diving

## Selecting by gk_handling

## Selecting by gk_kicking

## Selecting by gk_reflexes

## Selecting by gk_speed

## Selecting by gk_positioning
```

```r
top_5_gks_yearly_df <- do.call("rbind", top_gks_dfs)
gk_diving_yearly_df <- do.call("rbind", gk_diving_dfs)
gk_handling_yearly_df <- do.call("rbind", gk_handling_dfs)
gk_kicking_yearly_df <- do.call("rbind", gk_kicking_dfs)
gk_reflexes_yearly_df <- do.call("rbind", gk_reflex_dfs)
gk_speed_yearly_df <- do.call("rbind", gk_speed_dfs)
gk_position_yearly_df <- do.call("rbind", gk_position_dfs)

print(top_5_gks_yearly_df )
```

```
##    years..i..  short_name               club    nationality  overall
## 1        2016    M. Neuer  FC Bayern München        Germany       90
## 2        2016      De Gea  Manchester United          Spain       86
## 3        2016     P. Čech            Arsenal Czech Republic       85
## 4        2016   H. Lloris  Tottenham Hotspur         France       85
## 5        2016    B. Leno Bayer 04 Leverkusen        Germany       84
## 6        2016   G. Buffon           Juventus          Italy       84
## 7        2016    Casillas           FC Porto          Spain       84
## 8        2016     J. Hart    Manchester City        England       84
## 9        2017    M. Neuer  FC Bayern München        Germany       92
## 10       2017      De Gea  Manchester United          Spain       90
## 11       2017 T. Courtois            Chelsea        Belgium       89
```

```
## 12        2017        G. Buffon           Juventus          Italy        88
## 13        2017         P. Čech             Arsenal  Czech Republic       88
## 14        2017        H. Lloris   Tottenham Hotspur         France        88
## 15        2018         M. Neuer   FC Bayern München        Germany        92
## 16        2018          De Gea    Manchester United          Spain        90
## 17        2018      T. Courtois             Chelsea        Belgium        89
## 18        2018        G. Buffon            Juventus          Italy        89
## 19        2018         J. Oblak      Atlético Madrid       Slovenia        88
## 20        2018        H. Lloris   Tottenham Hotspur         France        88
## 21        2019          De Gea    Manchester United          Spain        91
## 22        2019         J. Oblak      Atlético Madrid       Slovenia        90
## 23        2019      T. Courtois         Real Madrid        Belgium        90
## 24        2019         M. Neuer   FC Bayern München        Germany        90
## 25        2019 M. ter Stegen          FC Barcelona        Germany        89
## 26        2020         J. Oblak      Atlético Madrid       Slovenia        91
## 27        2020 M. ter Stegen          FC Barcelona        Germany        90
## 28        2020          Alisson           Liverpool         Brazil        89
## 29        2020          De Gea    Manchester United          Spain        89
## 30        2020          Ederson     Manchester City         Brazil        88
## 31        2020      T. Courtois         Real Madrid        Belgium        88
## 32        2020 S. Handanovič               Inter       Slovenia        88
## 33        2020         M. Neuer   FC Bayern München        Germany        88
## 34        2020        H. Lloris   Tottenham Hotspur         France        88
```

```
print(gk_diving_yearly_df)
```

```
##    years..i..     short_name                    club nationality gk_diving
## 1        2016         De Gea       Manchester United       Spain        88
## 2        2016      H. Lloris       Tottenham Hotspur      France        87
## 3        2016       Casillas                FC Porto       Spain        87
## 4        2016  S. Handanovič                   Inter    Slovenia        87
## 5        2016       M. Neuer       FC Bayern München     Germany        85
## 6        2016      G. Buffon                Juventus       Italy        85
## 7        2016        J. Hart         Manchester City     England        85
## 8        2016     S. Mandanda Olympique de Marseille      France        85
## 9        2016       A. Lopes      Olympique Lyonnais    Portugal        85
## 10       2017       M. Neuer       FC Bayern München     Germany        89
## 11       2017         De Gea       Manchester United       Spain        88
## 12       2017    Diego Alves             Valencia CF      Brazil        88
## 13       2017      G. Buffon                Juventus       Italy        87
## 14       2017      H. Lloris       Tottenham Hotspur      France        87
## 15       2017       K. Navas             Real Madrid  Costa Rica        87
## 16       2018       M. Neuer       FC Bayern München     Germany        91
## 17       2018         De Gea       Manchester United       Spain        90
## 18       2018      G. Buffon                Juventus       Italy        89
## 19       2018      H. Lloris       Tottenham Hotspur      France        88
## 20       2018 G. Donnarumma                    Milan       Italy        88
## 21       2019       M. Neuer       FC Bayern München     Germany        91
## 22       2019         De Gea       Manchester United       Spain        90
## 23       2019      H. Lloris       Tottenham Hotspur      France        88
## 24       2019 G. Donnarumma                    Milan       Italy        88
## 25       2019    T. Courtois             Real Madrid     Belgium        87
## 26       2019  M. ter Stegen            FC Barcelona     Germany        87
## 27       2019  S. Handanovič                   Inter    Slovenia        87
```

```
## 28       2019      Casillas              FC Porto     Spain       87
## 29       2020       De Gea      Manchester United     Spain       90
## 30       2020 G. Donnarumma                Milan     Italy       90
## 31       2020    H. Lloris      Tottenham Hotspur    France       89
## 32       2020 M. ter Stegen          FC Barcelona   Germany       88
## 33       2020 S. Handanovič                 Inter  Slovenia       88
```

```r
print(gk_handling_yearly_df)
```

```
##    years..i..    short_name                    club    nationality
## 1        2016      M. Neuer       FC Bayern München        Germany
## 2        2016       P. Čech                 Arsenal Czech Republic
## 3        2016       B. Leno     Bayer 04 Leverkusen        Germany
## 4        2016  J. Cillessen                    Ajax    Netherlands
## 5        2016      J. Oblak         Atlético Madrid       Slovenia
## 6        2017   T. Courtois                 Chelsea        Belgium
## 7        2017      M. Neuer       FC Bayern München        Germany
## 8        2017       P. Čech                 Arsenal Czech Republic
## 9        2017      J. Oblak         Atlético Madrid       Slovenia
## 10       2017 S. Handanovič                   Inter       Slovenia
## 11       2018   T. Courtois                 Chelsea        Belgium
## 12       2018      M. Neuer       FC Bayern München        Germany
## 13       2018      J. Oblak         Atlético Madrid       Slovenia
## 14       2018     G. Buffon                Juventus          Italy
## 15       2018       P. Čech                 Arsenal Czech Republic
## 16       2019      J. Oblak         Atlético Madrid       Slovenia
## 17       2019   T. Courtois             Real Madrid        Belgium
## 18       2019      M. Neuer       FC Bayern München        Germany
## 19       2019 S. Handanovič                   Inter       Slovenia
## 20       2019        De Gea       Manchester United          Spain
## 21       2019 M. ter Stegen            FC Barcelona        Germany
## 22       2020      J. Oblak         Atlético Madrid       Slovenia
## 23       2020   T. Courtois             Real Madrid        Belgium
## 24       2020      M. Neuer       FC Bayern München        Germany
## 25       2020    P. Gulácsi              RB Leipzig        Hungary
## 26       2020 M. ter Stegen            FC Barcelona        Germany
## 27       2020 S. Handanovič                   Inter       Slovenia
## 28       2020     Y. Sommer Borussia Mönchengladbach    Switzerland
##    gk_handling
## 1           87
## 2           84
## 3           84
## 4           84
## 5           84
## 6           91
## 7           90
## 8           90
## 9           90
## 10          89
## 11          91
## 12          90
## 13          90
## 14          88
## 15          87
```

```
## 16             92
## 17             91
## 18             88
## 19             86
## 20             85
## 21             85
## 22             92
## 23             89
## 24             87
## 25             86
## 26             85
## 27             85
## 28             85
```

```r
print(gk_kicking_yearly_df)
```

```
##    years..i..   short_name                   club  nationality
## 1        2016     M. Neuer      FC Bayern München      Germany
## 2        2016     C. Bravo           FC Barcelona        Chile
## 3        2016      De Gea      Manchester United        Spain
## 4        2016     I. Khune          Kaizer Chiefs South Africa
## 5        2016    Y. Sommer Borussia Mönchengladbach  Switzerland
## 6        2016 K. Schmeichel        Leicester City      Denmark
## 7        2017     M. Neuer      FC Bayern München      Germany
## 8        2017     I. Khune          Kaizer Chiefs South Africa
## 9        2017      De Gea      Manchester United        Spain
## 10       2017     C. Bravo        Manchester City        Chile
## 11       2017    Y. Sommer Borussia Mönchengladbach  Switzerland
## 12       2017 K. Schmeichel        Leicester City      Denmark
## 13       2018     M. Neuer      FC Bayern München      Germany
## 14       2018      M. Ryan Brighton & Hove Albion    Australia
## 15       2018      De Gea      Manchester United        Spain
## 16       2018 M. ter Stegen          FC Barcelona      Germany
## 17       2018   J. Pickford               Everton      England
## 18       2019     M. Neuer      FC Bayern München      Germany
## 19       2019      Ederson        Manchester City       Brazil
## 20       2019     I. Khune          Kaizer Chiefs South Africa
## 21       2019 M. ter Stegen          FC Barcelona      Germany
## 22       2019   J. Pickford               Everton      England
## 23       2020      Ederson        Manchester City       Brazil
## 24       2020     M. Neuer      FC Bayern München      Germany
## 25       2020 M. ter Stegen          FC Barcelona      Germany
## 26       2020   J. Pickford               Everton      England
## 27       2020         Kepa                Chelsea        Spain
## 28       2020     A. Onana                   Ajax     Cameroon
##    gk_kicking
## 1          91
## 2          87
## 3          86
## 4          86
## 5          85
## 6          85
## 7          95
## 8          90
```

```
## 9              87
## 10             87
## 11             85
## 12             85
## 13             95
## 14             90
## 15             87
## 16             87
## 17             85
## 18             91
## 19             90
## 20             90
## 21             88
## 22             88
## 23             93
## 24             91
## 25             88
## 26             87
## 27             86
## 28             86
```

```r
print(gk_reflexes_yearly_df)
```

```
##    years..i..    short_name              club nationality gk_reflexes
## 1        2016      M. Perin             Genoa       Italy          90
## 2        2016    V. Enyeama        LOSC Lille     Nigeria          90
## 3        2016        De Gea Manchester United       Spain          89
## 4        2016     H. Lloris Tottenham Hotspur      France          88
## 5        2016      Casillas          FC Porto       Spain          88
## 6        2017        De Gea Manchester United       Spain          90
## 7        2017     H. Lloris Tottenham Hotspur      France          90
## 8        2017    V. Enyeama        LOSC Lille     Nigeria          90
## 9        2017      M. Neuer FC Bayern München     Germany          89
## 10       2017   T. Courtois           Chelsea     Belgium          89
## 11       2018        De Gea Manchester United       Spain          90
## 12       2018     H. Lloris Tottenham Hotspur      France          90
## 13       2018      M. Perin             Genoa       Italy          90
## 14       2018      M. Neuer FC Bayern München     Germany          89
## 15       2018   T. Courtois           Chelsea     Belgium          88
## 16       2018 G. Donnarumma             Milan       Italy          88
## 17       2019        De Gea Manchester United       Spain          94
## 18       2019     H. Lloris Tottenham Hotspur      France          92
## 19       2019 M. ter Stegen      FC Barcelona     Germany          90
## 20       2019      J. Oblak   Atlético Madrid    Slovenia          89
## 21       2019 S. Handanovič             Inter    Slovenia          89
## 22       2020        De Gea Manchester United       Spain          92
## 23       2020     H. Lloris Tottenham Hotspur      France          91
## 24       2020 M. ter Stegen      FC Barcelona     Germany          90
## 25       2020 G. Donnarumma             Milan       Italy          90
## 26       2020      J. Oblak   Atlético Madrid    Slovenia          89
## 27       2020       Alisson         Liverpool      Brazil          89
## 28       2020 S. Handanovič             Inter    Slovenia          89
## 29       2020      A. Lopes Olympique Lyonnais   Portugal          89
## 30       2020      R. Bürki Borussia Dortmund Switzerland          89
```

```r
print(gk_speed_yearly_df)
```

```
##    years..i..      short_name                club     nationality gk_speed
## 1        2016       H. Lloris   Tottenham Hotspur          France       64
## 2        2016        Casillas            FC Porto           Spain       64
## 3        2016      F. Muslera       Galatasaray SK         Uruguay       62
## 4        2016        A. Lopes  Olympique Lyonnais        Portugal       62
## 5        2016       J. Orozco           Monterrey          Mexico       61
## 6        2016 J. Villalpando   Jaguares de Chiapas         Mexico       61
## 7        2017    Jairo Farnias           Joinville          Brazil       68
## 8        2017        G. Ochoa          Granada CF          Mexico       67
## 9        2017        O. Kıvrak          Trabzonspor          Turkey       65
## 10       2017       H. Lloris   Tottenham Hotspur          France       64
## 11       2017        Casillas            FC Porto           Spain       64
## 12       2017      A. Belenov FC Anzhi Makhachkala          Russia       64
## 13       2018       H. Lloris   Tottenham Hotspur          France       64
## 14       2018         Palatsí    Cultural Leonesa           Spain       64
## 15       2018         Ederson     Manchester City          Brazil       63
## 16       2018        A. Onana                Ajax        Cameroon       63
## 17       2018         Alberto      Rayo Vallecano           Spain       63
## 18       2019        A. Lopes  Olympique Lyonnais        Portugal       64
## 19       2019       H. Lloris   Tottenham Hotspur          France       63
## 20       2019         Ederson     Manchester City          Brazil       63
## 21       2019        A. Onana                Ajax        Cameroon       63
## 22       2019         Alberto      Rayo Vallecano           Spain       63
## 23       2019       Z. Zlámal  Heart of Midlothian Czech Republic       63
## 24       2020     Jordi Masip   Real Valladolid CF           Spain       65
## 25       2020        A. Lopes  Olympique Lyonnais        Portugal       64
## 26       2020         Ederson     Manchester City          Brazil       63
## 27       2020       H. Lloris   Tottenham Hotspur          France       63
## 28       2020        A. Onana                Ajax        Cameroon       63
## 29       2020         Alberto      Rayo Vallecano           Spain       63
```

```r
print(gk_position_yearly_df)
```

```
##    years..i..     short_name                    club nationality
## 1        2016       M. Neuer       FC Bayern München     Germany
## 2        2016      G. Buffon                Juventus       Italy
## 3        2016    Diego López                   Milan       Spain
## 4        2016  S. Handanovič                   Inter    Slovenia
## 5        2016        J. Hart         Manchester City     England
## 6        2016        Iraizoz  Athletic Club de Bilbao       Spain
## 7        2017       M. Neuer       FC Bayern München     Germany
## 8        2017      G. Buffon                Juventus       Italy
## 9        2017       J. Oblak         Atlético Madrid    Slovenia
## 10       2017    T. Courtois                 Chelsea     Belgium
## 11       2017  S. Handanovič                   Inter    Slovenia
## 12       2017        B. Leno     Bayer 04 Leverkusen     Germany
## 13       2018       M. Neuer       FC Bayern München     Germany
## 14       2018      G. Buffon                Juventus       Italy
## 15       2018       J. Oblak         Atlético Madrid    Slovenia
## 16       2018  S. Handanovič                   Inter    Slovenia
```

```
## 17        2018    R. Jarstein                Hertha BSC      Norway
## 18        2019 S. Handanovič                      Inter    Slovenia
## 19        2019         De Gea          Manchester United       Spain
## 20        2019       J. Oblak            Atlético Madrid    Slovenia
## 21        2019       M. Neuer          FC Bayern München     Germany
## 22        2019    T. Courtois                Real Madrid     Belgium
## 23        2020       J. Oblak            Atlético Madrid    Slovenia
## 24        2020        Alisson                  Liverpool      Brazil
## 25        2020 S. Handanovič                      Inter    Slovenia
## 26        2020 M. ter Stegen               FC Barcelona     Germany
## 27        2020        Ederson            Manchester City      Brazil
## 28        2020    W. Szczęsny                   Juventus      Poland
## 29        2020    R. Jarstein                Hertha BSC      Norway
##    gk_positioning
## 1              90
## 2              89
## 3              87
## 4              86
## 5              84
## 6              84
## 7              91
## 8              90
## 9              87
## 10             86
## 11             86
## 12             86
## 13             91
## 14             90
## 15             87
## 16             87
## 17             87
## 18             89
## 19             88
## 20             88
## 21             88
## 22             87
## 23             90
## 24             90
## 25             89
## 26             88
## 27             86
## 28             86
## 29             86
```

```
# Attacking Stats: attacking_crossing, attacking_finishing and attacking_heading_accuracy
attack_crossing_dfs <- vector(mode = "list", length = 5)
attack_finish_dfs <- vector(mode = "list", length = 5)
attack_head_acc_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # Top 5 best crossers by year
  top_attack_crossing <- fifa_datasets_list[[i]] %>% arrange(desc(attacking_crossing)) %>%
    select(short_name, club, nationality, overall, attacking_crossing) %>% top_n(5)
```

```
  top_attack_crossing <- add_column(top_attack_crossing, years[[i]], .before = "short_name")
  attack_crossing_dfs[[i]] <- data.frame(top_attack_crossing)

  # Top 5 best finishers by year
  top_attack_finish <- fifa_datasets_list[[i]] %>% arrange(desc(attacking_finishing)) %>%
    select(short_name, club, nationality, overall, attacking_finishing) %>% top_n(5)
  top_attack_finish <- add_column(top_attack_finish, years[[i]], .before = "short_name")
  attack_finish_dfs[[i]] <- data.frame(top_attack_finish)
  # ARE FINISHING AND SHOOTING CORRELATED?

  # Top 5 players most likely to score a goal via a header each year
  top_head_acc <- fifa_datasets_list[[i]] %>% arrange(desc(attacking_heading_accuracy)) %>%
    select(short_name, club, nationality, overall, attacking_heading_accuracy) %>% top_n(5)
  top_head_acc <- add_column(top_head_acc, years[[i]], .before = "short_name")
  attack_head_acc_dfs[[i]] <- data.frame(top_head_acc)
}
```

```
## Selecting by attacking_crossing

## Selecting by attacking_finishing

## Selecting by attacking_heading_accuracy

## Selecting by attacking_crossing

## Selecting by attacking_finishing

## Selecting by attacking_heading_accuracy

## Selecting by attacking_crossing

## Selecting by attacking_finishing

## Selecting by attacking_heading_accuracy

## Selecting by attacking_crossing

## Selecting by attacking_finishing

## Selecting by attacking_heading_accuracy

## Selecting by attacking_crossing

## Selecting by attacking_finishing

## Selecting by attacking_heading_accuracy
```

```r
print(do.call("rbind",  attack_crossing_dfs))
```

```
##     years..i..       short_name               club nationality overall
## 1         2016         A. Pirlo    New York City FC       Italy      84
## 2         2016     R. Rodriguez      VfL Wolfsburg Switzerland      83
## 3         2016        L. Baines             Everton     England      83
## 4         2016       A. Kolarov    Manchester City      Serbia      79
## 5         2016       S. Larsson         Sunderland      Sweden      74
## 6         2017        L. Baines             Everton     England      83
## 7         2017         A. Pirlo    New York City FC       Italy      82
## 8         2017     R. Rodríguez      VfL Wolfsburg Switzerland      83
## 9         2017     K. De Bruyne    Manchester City     Belgium      88
## 10        2017      A. Di María Paris Saint-Germain   Argentina      87
## 11        2017       A. Kolarov    Manchester City      Serbia      79
## 12        2017       S. Larsson         Sunderland      Sweden      75
## 13        2018         A. Pirlo    New York City FC       Italy      79
## 14        2018 M. Plattenhardt        Hertha BSC     Germany      78
## 15        2018          Marcelo        Real Madrid      Brazil      87
## 16        2018     K. De Bruyne    Manchester City     Belgium      89
## 17        2018      Pedro León            SD Eibar       Spain      80
## 18        2019     K. De Bruyne    Manchester City     Belgium      91
## 19        2019         Quaresma        Beşiktaş JK    Portugal      84
## 20        2019           P. Max        FC Augsburg     Germany      78
## 21        2019       A. Kolarov               Roma      Serbia      82
## 22        2019      K. Trippier   Tottenham Hotspur     England      82
## 23        2019      Pedro León            SD Eibar       Spain      81
## 24        2020     K. De Bruyne    Manchester City     Belgium      91
## 25        2020       J. Kimmich  FC Bayern München     Germany      86
## 26        2020         Quaresma        Beşiktaş JK    Portugal      81
## 27        2020      Pedro León            SD Eibar       Spain      80
## 28        2020     J. Rodríguez        Real Madrid    Colombia      85
## 29        2020       A. Kolarov               Roma      Serbia      82
##     attacking_crossing
## 1                93+11
## 2                 92+4
## 3                 91+3
## 4                 90+5
## 5                 90+3
## 6                   91
## 7                   91
## 8                 90-2
## 9                   90
## 10                  90
## 11                  90
## 12                  90
## 13                  91
## 14                90+4
## 15                90+3
## 16                  90
## 17                  90
## 18                  93
## 19                  92
## 20                91+1
```

```
## 21                    91
## 22                    91
## 23                    91
## 24                    93
## 25                    91
## 26                    91
## 27                    91
## 28                    90
## 29                    90
```

```r
print(do.call("rbind",   attack_finish_dfs))
```

```
##     years..i..          short_name                 club  nationality  overall
## 1         2016  Cristiano  Ronaldo          Real  Madrid      Portugal       93
## 2         2016            L.  Messi        FC  Barcelona     Argentina       94
## 3         2016           L.  Suárez        FC  Barcelona       Uruguay       90
## 4         2016      Z.  Ibrahimović  Paris  Saint-Germain       Sweden       89
## 5         2016           S.  Agüero      Manchester  City    Argentina       87
## 6         2016         Diego  Costa               Chelsea        Spain       86
## 7         2017            L.  Messi        FC  Barcelona     Argentina       93
## 8         2017           L.  Suárez        FC  Barcelona       Uruguay       92
## 9         2017  Cristiano  Ronaldo          Real  Madrid      Portugal       94
## 10        2017       R.  Lewandowski    FC  Bayern München       Poland       90
## 11        2017          G.  Higuaín              Juventus    Argentina       88
## 12        2018            L.  Messi        FC  Barcelona     Argentina       93
## 13        2018  Cristiano  Ronaldo          Real  Madrid      Portugal       94
## 14        2018           L.  Suárez        FC  Barcelona       Uruguay       92
## 15        2018          G.  Higuaín              Juventus    Argentina       90
## 16        2018       R.  Lewandowski    FC  Bayern München       Poland       91
## 17        2019            L.  Messi        FC  Barcelona     Argentina       94
## 18        2019  Cristiano  Ronaldo              Juventus      Portugal       94
## 19        2019           L.  Suárez        FC  Barcelona       Uruguay       91
## 20        2019             H.  Kane    Tottenham  Hotspur      England       89
## 21        2019           S.  Agüero      Manchester  City    Argentina       89
## 22        2020            L.  Messi        FC  Barcelona     Argentina       94
## 23        2020  Cristiano  Ronaldo              Juventus      Portugal       93
## 24        2020             H.  Kane    Tottenham  Hotspur      England       89
## 25        2020           S.  Agüero      Manchester  City    Argentina       89
## 26        2020           L.  Suárez        FC  Barcelona       Uruguay       89
##     attacking_finishing
## 1                    95
## 2                  93-1
## 3                  90-1
## 4                    90
## 5                    90
## 6                    90
## 7                  95+2
## 8                  94+4
## 9                  93-2
## 10                 91+2
## 11                 91+1
## 12                   95
## 13                 94+1
## 14                   94
```

```
## 15                    91-1
## 16                      91
## 17                      95
## 18                      94
## 19                      94
## 20                      94
## 21                      93
## 22                      95
## 23                      94
## 24                      94
## 25                      93
## 26                      91
```

```r
print(do.call("rbind", attack_head_acc_dfs))
```

```
##    years..i..  short_name                        club nationality overall
## 1        2016    T. Cahill                  Australia   Australia      73
## 2        2016       Aduriz     Athletic Club de Bilbao       Spain      82
## 3        2016        Naldo               VfL Wolfsburg      Brazil      85
## 4        2016     D. Godín             Atlético Madrid     Uruguay      85
## 5        2016   L. de Jong                         PSV Netherlands      79
## 6        2017       Aduriz     Athletic Club de Bilbao       Spain      84
## 7        2017    T. Cahill           Melbourne City FC   Australia      74
## 8        2017        Naldo              FC Schalke 04      Brazil      84
## 9        2017     D. Godín             Atlético Madrid     Uruguay      88
## 10       2017   I. Slimani             Leicester City     Algeria      83
## 11       2017   L. de Jong                         PSV Netherlands      79
## 12       2018       Aduriz     Athletic Club de Bilbao       Spain      84
## 13       2018      B. Dost                 Sporting CP Netherlands      83
## 14       2018    T. Cahill           Melbourne City FC   Australia      70
## 15       2018     D. Godín             Atlético Madrid     Uruguay      88
## 16       2018 Sergio Ramos                 Real Madrid       Spain      90
## 17       2019        Naldo              FC Schalke 04      Brazil      86
## 18       2019       Aduriz     Athletic Club de Bilbao       Spain      83
## 19       2019      B. Dost                 Sporting CP Netherlands      83
## 20       2019  M. Fellaini           Manchester United     Belgium      79
## 21       2019     D. Godín             Atlético Madrid     Uruguay      90
## 22       2019  E. Adebayor        Medipol Başakşehir FK        Togo      79
## 23       2019   L. de Jong                         PSV Netherlands      78
## 24       2020      B. Dost                 Sporting CP Netherlands      82
## 25       2020   L. de Jong                  Sevilla FC Netherlands      82
## 26       2020 L. Pavoletti                    Cagliari       Italy      78
## 27       2020 Sergio Ramos                 Real Madrid       Spain      89
## 28       2020       Aduriz     Athletic Club de Bilbao       Spain      82
## 29       2020  M. Fellaini Shandong Luneng TaiShan FC     Belgium      76
##    attacking_heading_accuracy
## 1                        95+1
## 2                          95
## 3                          93
## 4                        92+5
## 5                        92+4
## 6                        94-1
## 7                        93-2
## 8                          93
```

```
## 9                              92
## 10                             92
## 11                             92
## 12                             94
## 13                           93+1
## 14                             93
## 15                             92
## 16                           91+1
## 17                             94
## 18                             94
## 19                             94
## 20                             93
## 21                             92
## 22                             92
## 23                             92
## 24                             93
## 25                             93
## 26                             93
## 27                             92
## 28                             92
## 29                             92
```

```r
# Movement Stats: movement_acceleration and movement_balance
mov_acc_dfs <- vector(mode = "list", length = 5)
mov_bal_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # Top 5 players with best acceleration
  top_acc <- fifa_datasets_list[[i]] %>% arrange(desc(movement_acceleration)) %>%
    select(short_name, club, nationality, overall, movement_acceleration) %>% top_n(5)
  top_acc <- add_column(top_acc, years[[i]], .before = "short_name")
  mov_acc_dfs[[i]] <- data.frame(top_acc)

  # Top 5 players with best balance
  top_bal <- fifa_datasets_list[[i]] %>% arrange(desc(movement_balance)) %>%
    select(short_name, club, nationality, overall, movement_balance) %>% top_n(5)
  top_bal <- add_column(top_bal, years[[i]], .before = "short_name")
  mov_bal_dfs[[i]] <- data.frame(top_bal)
  # ARE BALANCE AND DRIBBLING CORRELATED?
}
```

```
## Selecting by movement_acceleration

## Selecting by movement_balance

## Selecting by movement_acceleration

## Selecting by movement_balance

## Selecting by movement_acceleration

## Selecting by movement_balance
```

```
## Selecting by movement_acceleration

## Selecting by movement_balance

## Selecting by movement_acceleration

## Selecting by movement_balance
```

```r
print(do.call("rbind", mov_acc_dfs))
```

```
##    years..i..      short_name                    club   nationality
## 1        2016        M. Bolly      Fortuna Düsseldorf   Ivory Coast
## 2        2016    P. Aubameyang      Borussia Dortmund         Gabon
## 3        2016         J. Damm          Tigres U.A.N.L.        Mexico
## 4        2016       T. Walcott                 Arsenal       England
## 5        2016         L. Messi            FC Barcelona     Argentina
## 6        2017        M. Bolly     SpVgg Greuther Fürth   Ivory Coast
## 7        2017    Douglas Costa        FC Bayern München        Brazil
## 8        2017  Héctor Bellerín                 Arsenal         Spain
## 9        2017    P. Aubameyang      Borussia Dortmund         Gabon
## 10       2017            Lucas    Paris Saint-Germain        Brazil
## 11       2017          A. Musa          Leicester City       Nigeria
## 12       2017          J. Damm          Tigres U.A.N.L.        Mexico
## 13       2017          Cedrick       Columbus Crew SC      DR Congo
## 14       2018    Douglas Costa                Juventus        Brazil
## 15       2018  Héctor Bellerín                 Arsenal         Spain
## 16       2018        K. Manneh       Columbus Crew SC        Gambia
## 17       2018   Gelson Martins              Sporting CP      Portugal
## 18       2018      J. Biabiany             Sparta Praha        France
## 19       2019    Douglas Costa                Juventus        Brazil
## 20       2019            Adama Wolverhampton Wanderers         Spain
## 21       2019        K. Mbappé    Paris Saint-Germain        France
## 22       2019        K. Manneh           FC St. Gallen United States
## 23       2019          E. List              Gillingham       England
## 24       2020     Adama Traoré Wolverhampton Wanderers         Spain
## 25       2020        K. Mbappé    Paris Saint-Germain        France
## 26       2020      R. Sterling         Manchester City       England
## 27       2020          S. Mané               Liverpool       Senegal
## 28       2020    Douglas Costa                Juventus        Brazil
## 29       2020      Lucas Moura       Tottenham Hotspur        Brazil
## 30       2020   Gelson Martins               AS Monaco      Portugal
## 31       2020          I. Sarr                 Watford       Senegal
## 32       2020          A. Musa                Al Nassr       Nigeria
## 33       2020         K. Nagai                FC Tokyo         Japan
## 34       2020        K. Manneh           FC Cincinnati United States
## 35       2020          E. List              Gillingham       England
##    overall movement_acceleration
## 1       67                    97
## 2       82                    96
## 3       73                  95+1
## 4       81                  95-2
## 5       94                  95-1
## 6       67                    97
```

```
## 7          84                        96
## 8          79                        96
## 9          86                        95
## 10         82                        95
## 11         78                        95
## 12         73                        95
## 13         69                        95
## 14         82                        96
## 15         81                        96
## 16         70                        96
## 17         81                      95+1
## 18         75                      95+1
## 19         86                        97
## 20         75                        97
## 21         87                        96
## 22         69                        96
## 23         60                      95+1
## 24         74                        97
## 25         89                        96
## 26         88                        96
## 27         88                        95
## 28         84                        95
## 29         83                        95
## 30         82                        95
## 31         78                        95
## 32         73                        95
## 33         69                        95
## 34         68                        95
## 35         62                        95
```

```
print(do.call("rbind",   mov_bal_dfs))
```

```
##      years..i..    short_name                        club  nationality
## 1          2016      G. Krebs               Karlsruher SC       France
## 2          2016  V. Hernández                   Junior FC     Colombia
## 3          2016       Bernard            Shakhtar Donetsk       Brazil
## 4          2016    E. Oztumer          Peterborough United      England
## 5          2016    D. Villalva Tiburones Rojos de Veracruz   Argentina
## 6          2017    E. Oztumer                     Walsall      England
## 7          2017       Bernard            Shakhtar Donetsk       Brazil
## 8          2017 D. Buonanotte        Universidad Católica    Argentina
## 9          2017    D. Villalva Tiburones Rojos de Veracruz   Argentina
## 10         2017      G. Krebs               Karlsruher SC       France
## 11         2017      Fer Cano                RCD Mallorca        Spain
## 12         2018    E. Oztumer                     Walsall      England
## 13         2018       Bernard            Shakhtar Donetsk       Brazil
## 14         2018    S. Wharton            Blackburn Rovers      England
## 15         2018    K. Kadyrov                Terek Grozny       Russia
## 16         2018      L. Messi                FC Barcelona    Argentina
## 17         2018   P. De Blasis              1. FSV Mainz 05    Argentina
## 18         2018        M. Sau                    Cagliari        Italy
## 19         2019        Ronald                 Boavista FC       Brazil
## 20         2019       Bernard                     Everton       Brazil
## 21         2019        T. Itō                 Hamburger SV        Japan
```

```
## 22        2019    E. Oztumer              Bolton Wanderers      England
## 23        2019   T. Mizutani               Shimizu S-Pulse        Japan
## 24        2020    E. Oztumer             Charlton Athletic      England
## 25        2020     R. Fraser                   Bournemouth     Scotland
## 26        2020        T. Itō                  Hamburger SV        Japan
## 27        2020      L. Messi                  FC Barcelona    Argentina
## 28        2020       Bernard                       Everton       Brazil
## 29        2020     S. Kaneko               Shimizu S-Pulse        Japan
## 30        2020        Aridai                  RCD Mallorca        Spain
## 31        2020    S. Horvath             SG Dynamo Dresden      Austria
## 32        2020       Isi Ros                   AD Alcorcón        Spain
## 33        2020 K. Holzweiler                 Viktoria Köln      Germany
##    overall  movement_balance
## 1       66              96+4
## 2       70              96+2
## 3       78              96-1
## 4       65              96-1
## 5       70                96
## 6       67              97+1
## 7       79                96
## 8       76                96
## 9       73                96
## 10      67                96
## 11      64                96
## 12      70              96-1
## 13      79                96
## 14      59              95+3
## 15      58              95+3
## 16      93                95
## 17      77                95
## 18      74                95
## 19      60                99
## 20      80                96
## 21      71                96
## 22      70                96
## 23      56                96
## 24      69                97
## 25      81                96
## 26      68                96
## 27      94                95
## 28      80                95
## 29      70                95
## 30      70                95
## 31      67                95
## 32      65                95
## 33      64                95
```

```r
# Power Stats:  power_shot_power, power_jumping, power_strength
shot_dfs <- vector(mode = "list", length = 5)
jump_dfs <- vector(mode = "list", length = 5)
strength_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {
```

```
  # Top 5 players with best shot power by year
  top_shot <- fifa_datasets_list[[i]] %>% arrange(desc(power_shot_power)) %>%
    select(short_name, club, nationality, overall, power_shot_power) %>% top_n(5)
  top_shot <- add_column(top_shot, years[[i]], .before = "short_name")
  shot_dfs[[i]] <- data.frame(top_shot)
  # ARE SHOOTING AND SHOT POWER CORRELATED?

  # Top 5 players with best power jump by year
  top_jump <- fifa_datasets_list[[i]] %>% arrange(desc(power_jumping)) %>%
    select(short_name, club, nationality, overall, power_jumping) %>% top_n(5)
  top_jump <- add_column(top_jump, years[[i]], .before = "short_name")
  jump_dfs[[i]] <- data.frame(top_jump)
  # ARE JUMPING AND ATTACKING_HEADING_ACCURACY CORRELATED?

  # Top 5 players with most power strength by year
  top_strength <- fifa_datasets_list[[i]] %>% arrange(desc(power_strength)) %>%
    select(short_name, club, nationality, overall, power_strength) %>% top_n(5)
  top_strength <- add_column(top_strength, years[[i]], .before = "short_name")
  strength_dfs[[i]] <- data.frame(top_strength)

}
```

```
## Selecting by power_shot_power

## Selecting by power_jumping

## Selecting by power_strength

## Selecting by power_shot_power

## Selecting by power_jumping

## Selecting by power_strength

## Selecting by power_shot_power

## Selecting by power_jumping

## Selecting by power_strength

## Selecting by power_shot_power

## Selecting by power_jumping

## Selecting by power_strength

## Selecting by power_shot_power

## Selecting by power_jumping

## Selecting by power_strength
```

```r
print(do.call("rbind",  shot_dfs))
```

```
##    years..i..         short_name                         club  nationality
## 1        2016              Ronny                   Hertha BSC       Brazil
## 2        2016  Cristiano Ronaldo                  Real Madrid     Portugal
## 3        2016               Hulk         Zenit St. Petersburg       Brazil
## 4        2016        L. Podolski              Galatasaray SK      Germany
## 5        2016      Z. Ibrahimović         Paris Saint-Germain       Sweden
## 6        2017  Cristiano Ronaldo                  Real Madrid     Portugal
## 7        2017      Z. Ibrahimović           Manchester United       Sweden
## 8        2017        L. Podolski              Galatasaray SK      Germany
## 9        2017              Naldo                FC Schalke 04       Brazil
## 10       2017            G. Bale                  Real Madrid        Wales
## 11       2018  Cristiano Ronaldo                  Real Madrid     Portugal
## 12       2018              Naldo                FC Schalke 04       Brazil
## 13       2018        L. Podolski                 Vissel Kobe      Germany
## 14       2018      Z. Ibrahimović           Manchester United       Sweden
## 15       2018            G. Bale                  Real Madrid        Wales
## 16       2018         A. Kolarov                         Roma       Serbia
## 17       2019  Cristiano Ronaldo                     Juventus     Portugal
## 18       2019               Hulk             Shanghai SIPG FC       Brazil
## 19       2019          F. Guarín Shanghai Greenland Shenhua FC     Colombia
## 20       2019           V. Ayala    Gimnasia y Esgrima La Plata     Paraguay
## 21       2019            G. Bale                  Real Madrid        Wales
## 22       2019              Naldo                FC Schalke 04       Brazil
## 23       2019        L. Podolski                 Vissel Kobe      Germany
## 24       2020  Cristiano Ronaldo                     Juventus     Portugal
## 25       2020         A. Kolarov                         Roma       Serbia
## 26       2020               Hulk             Shanghai SIPG FC       Brazil
## 27       2020            G. Bale                  Real Madrid        Wales
## 28       2020       K. De Bruyne             Manchester City      Belgium
##    overall power_shot_power
## 1       72             95-1
## 2       93               94
## 3       84               94
## 4       77             93+1
## 5       89               93
## 6       94               94
## 7       90               93
## 8       80               93
## 9       84               92
## 10      90             91+4
## 11      94             94+2
## 12      82               92
## 13      80               92
## 14      88             91-2
## 15      89               91
## 16      79               91
## 17      94               95
## 18      81               94
## 19      76               93
## 20      73               93
## 21      88               92
```

```
## 22        86               92
## 23        78               92
## 24        93               95
## 25        82               95
## 26        80               94
## 27        85               92
## 28        91               91
```

```r
print(do.call("rbind", jump_dfs))
```

```
##     years..i..         short_name                  club
## 1         2016             Aduriz  Athletic Club de Bilbao
## 2         2016              Rodri       Real Valladolid CF
## 3         2016       A. Caracciolo                 Brescia
## 4         2016         C. Beauvue       Olympique Lyonnais
## 5         2016      M. Le Marchand                OGC Nice
## 6         2016           R. Azeez             UD Almería
## 7         2017         D. Mattocks        Portland Timbers
## 8         2017 Cristiano Ronaldo             Real Madrid
## 9         2017       A. Caracciolo            Hellas Verona
## 10        2017      K. Igboananike              DC United
## 11        2017             Regalón             CD Numancia
## 12        2018 Cristiano Ronaldo             Real Madrid
## 13        2018       A. Caracciolo            Hellas Verona
## 14        2018             Aduriz  Athletic Club de Bilbao
## 15        2018            D. Odoi                  Fulham
## 16        2018           T. Cahill        Melbourne City FC
## 17        2018           J. Aidoo                KRC Genk
## 18        2018           J. Núñez             Club Tijuana
## 19        2018         D. Mattocks        Portland Timbers
## 20        2019 Cristiano Ronaldo                Juventus
## 21        2019           E. Sabbi                Hobro IK
## 22        2019          M. Icardi                   Inter
## 23        2019             Aduriz  Athletic Club de Bilbao
## 24        2019          S. Aurier        Tottenham Hotspur
## 25        2019            S. Long              Southampton
## 26        2019         M. Barbieri         Rosario Central
## 27        2020 Cristiano Ronaldo                Juventus
## 28        2020           E. Sabbi                Hobro IK
## 29        2020         T. Hasegawa        Kawasaki Frontale
## 30        2020          M. Icardi                   Inter
## 31        2020         O. Lewicki                Malmö FF
## 32        2020         M. Barbieri         Rosario Central
## 33        2020         T. Sugimoto        Matsumoto Yamaga
##             nationality overall power_jumping
## 1                 Spain      82         96+1
## 2                 Spain      71         95+3
## 3                 Italy      67         95+3
## 4                France      79         95-1
## 5                France      73         94+3
## 6               Nigeria      71         94+3
## 7               Jamaica      66           97
## 8              Portugal      94         95+1
## 9                 Italy      70           95
```

```
## 10                Nigeria       67           95
## 11                  Spain       70         94+1
## 12               Portugal       94           95
## 13                  Italy       71           95
## 14                  Spain       84         94+1
## 15                Belgium       72           94
## 16              Australia       70           94
## 17                  Ghana       67           94
## 18                 Mexico       67           94
## 19                Jamaica       66           94
## 20               Portugal       94           95
## 21          United States       64        94+25
## 22              Argentina       87           94
## 23                  Spain       83           94
## 24            Ivory Coast       81           94
## 25 Republic of Ireland       74           94
## 26              Argentina       70           94
## 27               Portugal       93           95
## 28          United States       68           95
## 29                  Japan       66           95
## 30              Argentina       85           94
## 31                 Sweden       72           94
## 32              Argentina       71           94
## 33                  Japan       61           94
```

```
print(do.call("rbind", strength_dfs))
```

```
##    years..i..    short_name                club      nationality
## 1        2016   A. Akinfenwa       AFC Wimbledon         England
## 2        2016       C. Samba       Dinamo Moscow           Congo
## 3        2016      R. Torres  Seattle Sounders FC          Panama
## 4        2016       F. Baloy          Club Atlas          Panama
## 5        2016       J. Olave      Real Salt Lake        Colombia
## 6        2016     G. Elokobi   Colchester United        Cameroon
## 7        2016          A. Ba  Racing Club de Lens      Mauritania
## 8        2017   A. Akinfenwa   Wycombe Wanderers         England
## 9        2017       C. Samba     Panathinaikos FC           Congo
## 10       2017      R. Torres  Seattle Sounders FC          Panama
## 11       2017          A. Ba  Racing Club de Lens      Mauritania
## 12       2017     G. Elokobi   Colchester United        Cameroon
## 13       2018   A. Akinfenwa   Wycombe Wanderers         England
## 14       2018       C. Samba         Aston Villa           Congo
## 15       2018      O. Onyewu   Philadelphia Union   United States
## 16       2018     K. Sobieraj         Arka Gdynia          Poland
## 17       2018       K. Mbodj     RSC Anderlecht          Senegal
## 18       2019   A. Akinfenwa   Wycombe Wanderers         England
## 19       2019         Wesley      Club Brugge KV          Brazil
## 20       2019       T. Chorý      Viktoria Plzeň  Czech Republic
## 21       2019    K. Koulibaly              Napoli         Senegal
## 22       2019      R. Lukaku   Manchester United         Belgium
## 23       2019        N. Süle    FC Bayern München         Germany
## 24       2019      S. Coates         Sporting CP         Uruguay
## 25       2019 J. Vestergaard         Southampton         Denmark
## 26       2019       K. Mbodji           FC Nantes         Senegal
```

```
## 27        2019     R. Civelli        Club Atlético Banfield       Argentina
## 28        2019       A. Cerri                      Cagliari           Italy
## 29        2019 M. Torsiglieri           Club Atlético Lanús       Argentina
## 30        2019      R. Torres           Seattle Sounders FC          Panama
## 31        2019      F. Ballas             SG Dynamo Dresden         Germany
## 32        2019     U. Ikpeazu          Heart of Midlothian          England
## 33        2019    F. Carvalho              Vålerenga Fotball         Uruguay
## 34        2019       M. Rhead                   Lincoln City         England
## 35        2020   A. Akinfenwa             Wycombe Wanderers          England
## 36        2020   K. Koulibaly                        Napoli          Senegal
## 37        2020      R. Lukaku                         Inter          Belgium
## 38        2020         Wesley                    Aston Villa          Brazil
## 39        2020        N. Süle            FC Bayern München          Germany
## 40        2020      S. Coates                   Sporting CP          Uruguay
## 41        2020      D. Zapata                      Atalanta         Colombia
## 42        2020      K. Waston                 FC Cincinnati       Costa Rica
## 43        2020       A. Cerri                      Cagliari            Italy
## 44        2020      O. Oularé              Standard de Liège         Belgium
## 45        2020      F. Ballas             SG Dynamo Dresden          Germany
## 46        2020     U. Ikpeazu           Heart of Midlothian          England
## 47        2020      I. Marega La Berrichonne de Châteauroux           France
## 48        2020    T. Petrášek             Raków Częstochowa Czech Republic
## overall power_strength
## 1      64          98+1
## 2      78          96+1
## 3      71          95+2
## 4      72            95
## 5      71            95
## 6      69            95
## 7      64            95
## 8      64            98
## 9      78            96
## 10     72            95
## 11     65            95
## 12     63            95
## 13     64            98
## 14     74            96
## 15     69            96
## 16     67          95+4
## 17     78          94+6
## 18     66            97
## 19     76          95+3
## 20     61            95
## 21     87            94
## 22     87            94
## 23     84            94
## 24     82            94
## 25     80            94
## 26     78            94
## 27     76            94
## 28     72            94
## 29     72            94
## 30     72            94
## 31     70            94
```

```
## 32        68              94
## 33        67              94
## 34        60              94
## 35        65              97
## 36        89              95
## 37        85              95
## 38        79              95
## 39        85              94
## 40        82              94
## 41        82              94
## 42        73              94
## 43        72              94
## 44        71              94
## 45        70              94
## 46        67              94
## 47        65              94
## 48        65              94
```

```
# Mentality Stats: mentality_positioning, mentality_penalties and mentality_vision
position_dfs <- vector(mode = "list", length = 5)
penalty_dfs <- vector(mode = "list", length = 5)
vision_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # Top 5 players with best position sense by year
  top_posit <- fifa_datasets_list[[i]] %>% arrange(desc(mentality_positioning)) %>%
    select(short_name, club, nationality, overall, team_position, mentality_positioning) %>% top_n(5)
  top_posit <- add_column(top_posit, years[[i]], .before = "short_name")
  position_dfs[[i]] <- data.frame(top_posit)

  # Top 5 best penalty takers by year
  top_penalty <- fifa_datasets_list[[i]] %>% arrange(desc(mentality_penalties)) %>%
    select(short_name, club, nationality, overall, mentality_penalties) %>% top_n(5)
  top_penalty <- add_column(top_penalty, years[[i]], .before = "short_name")
  penalty_dfs[[i]] <- data.frame(top_penalty)
  # ARE ATTACKING FINISHING AND PENALTIES CORRELATED?

  # Top 5 players with best vision by year
  top_vision <- fifa_datasets_list[[i]] %>% arrange(desc(mentality_vision)) %>%
    select(short_name, club, nationality, overall, mentality_vision) %>% top_n(5)
  top_vision <- add_column(top_vision, years[[i]], .before = "short_name")
  vision_dfs[[i]] <- data.frame(top_vision)
  # ARE VISION AND PASSING CORRELATED?

}
```

```
## Selecting by mentality_positioning

## Selecting by mentality_penalties

## Selecting by mentality_vision

## Selecting by mentality_positioning
```

```
## Selecting by mentality_penalties

## Selecting by mentality_vision

## Selecting by mentality_positioning

## Selecting by mentality_penalties

## Selecting by mentality_vision

## Selecting by mentality_positioning

## Selecting by mentality_penalties

## Selecting by mentality_vision

## Selecting by mentality_positioning

## Selecting by mentality_penalties

## Selecting by mentality_vision
```

```
print(do.call("rbind", position_dfs))
```

```
##    years..i..        short_name                club nationality overall
## 1        2016         T. Müller   FC Bayern München     Germany      86
## 2        2016 Cristiano Ronaldo         Real Madrid    Portugal      93
## 3        2016         L. Suárez        FC Barcelona     Uruguay      90
## 4        2016          C. Tévez        Boca Juniors   Argentina      86
## 5        2016          L. Messi        FC Barcelona   Argentina      94
## 6        2017         T. Müller   FC Bayern München     Germany      87
## 7        2017 Cristiano Ronaldo         Real Madrid    Portugal      94
## 8        2017          L. Messi        FC Barcelona   Argentina      93
## 9        2017        G. Higuaín            Juventus   Argentina      88
## 10       2017         L. Suárez        FC Barcelona     Uruguay      92
## 11       2018 Cristiano Ronaldo         Real Madrid    Portugal      94
## 12       2018          L. Messi        FC Barcelona   Argentina      93
## 13       2018         T. Müller   FC Bayern München     Germany      86
## 14       2018         E. Cavani Paris Saint-Germain     Uruguay      87
## 15       2018         L. Suárez        FC Barcelona     Uruguay      92
## 16       2018        G. Higuaín            Juventus   Argentina      90
## 17       2019 Cristiano Ronaldo            Juventus    Portugal      94
## 18       2019          L. Messi        FC Barcelona   Argentina      94
## 19       2019           H. Kane   Tottenham Hotspur     England      89
## 20       2019         E. Cavani Paris Saint-Germain     Uruguay      89
## 21       2019         T. Müller   FC Bayern München     Germany      86
## 22       2020 Cristiano Ronaldo            Juventus    Portugal      93
## 23       2020          L. Messi        FC Barcelona   Argentina      94
## 24       2020           H. Kane   Tottenham Hotspur     England      89
## 25       2020         S. Agüero     Manchester City   Argentina      89
## 26       2020         E. Cavani Paris Saint-Germain     Uruguay      88
```

```
##    team_position  mentality_positioning
## 1             CF                    94
## 2             LM                  93+2
## 3             ST                  91+3
## 4            CAM                  91+1
## 5             RW                  90-2
## 6             RW                  96+2
## 7             LW                  94+1
## 8             RW                  93+3
## 9             LS                  92+2
## 10            ST                  92+1
## 11            LW                  95+1
## 12            RW                    93
## 13            RM                    93
## 14            ST                  92+3
## 15            ST                    92
## 16            ST                    92
## 17            LW                    95
## 18            RW                    94
## 19            ST                    93
## 20            ST                    93
## 21           RCM                    93
## 22            LW                    95
## 23            RW                    94
## 24            ST                    93
## 25            ST                    93
## 26            ST                    93
```

```
print(do.call("rbind", penalty_dfs))
```

```
##    years..i..      short_name                    club nationality overall
## 1        2016      R. Lambert     West Bromwich Albion     England      75
## 2        2016     M. Balotelli                   Milan       Italy      80
## 3        2016      David Villa         New York City FC       Spain      80
## 4        2016      N. Ortigoza  San Lorenzo de Almagro    Paraguay      72
## 5        2016  Z. Ibrahimović     Paris Saint-Germain      Sweden      89
## 6        2017      R. Lambert             Cardiff City     England      75
## 7        2017     M. Balotelli                OGC Nice       Italy      79
## 8        2017  Z. Ibrahimović       Manchester United      Sweden      90
## 9        2017      N. Ortigoza  San Lorenzo de Almagro    Paraguay      75
## 10       2017        L. Baines                 Everton     England      83
## 11       2017        T. Simons          Club Brugge KV     Belgium      74
## 12       2018     M. Balotelli                OGC Nice       Italy      82
## 13       2018          Fabinho               AS Monaco      Brazil      83
## 14       2018  Z. Ibrahimović       Manchester United      Sweden      88
## 15       2018      P. Verhaegh           VfL Wolfsburg Netherlands      77
## 16       2018       D. Perotti                    Roma   Argentina      81
## 17       2019     M. Balotelli                OGC Nice       Italy      83
## 18       2019          Fabinho               Liverpool      Brazil      85
## 19       2019          H. Kane       Tottenham Hotspur     England      89
## 20       2019       D. Perotti                    Roma   Argentina      81
## 21       2019     R. Boudebouz              Real Betis     Algeria      80
## 22       2019       R. Jiménez Wolverhampton Wanderers      Mexico      78
## 23       2019        L. Baines                 Everton     England      78
```

```
## 24        2020       M. Kruse           Fenerbahçe SK     Germany       83
## 25        2020        Fabinho               Liverpool      Brazil       85
## 26        2020      S. Haller         West Ham United      France       83
## 27        2020    M. Balotelli                Brescia       Italy       82
## 28        2020  L. Milivojević        Crystal Palace      Serbia       81
##    mentality_penalties
## 1                 96+1
## 2                   92
## 3                   92
## 4                 91+1
## 5                   91
## 6                   96
## 7                   92
## 8                   91
## 9                   91
## 10                  90
## 11                  90
## 12                  92
## 13                91+3
## 14                  91
## 15                90+4
## 16                90+2
## 17                  92
## 18                  91
## 19                  90
## 20                  90
## 21                  90
## 22                  90
## 23                  90
## 24                  92
## 25                  91
## 26                  91
## 27                  91
## 28                  91
```

```r
print(do.call("rbind",   vision_dfs))
```

```
##    years..i..     short_name              club nationality overall
## 1        2016       A. Pirlo  New York City FC       Italy      84
## 2        2016    David Silva   Manchester City       Spain      88
## 3        2016 Cesc Fàbregas            Chelsea       Spain      87
## 4        2016        M. Özil           Arsenal     Germany      87
## 5        2016       L. Messi      FC Barcelona   Argentina      94
## 6        2016       F. Totti              Roma       Italy      80
## 7        2017       A. Pirlo  New York City FC       Italy      82
## 8        2017        M. Özil           Arsenal     Germany      89
## 9        2017    David Silva   Manchester City       Spain      87
## 10       2017       F. Totti              Roma       Italy      80
## 11       2017 Cesc Fàbregas            Chelsea       Spain      86
## 12       2018        M. Özil           Arsenal     Germany      88
## 13       2018    David Silva   Manchester City       Spain      87
## 14       2018 Cesc Fàbregas            Chelsea       Spain      86
## 15       2018   K. De Bruyne   Manchester City     Belgium      89
## 16       2018     C. Eriksen Tottenham Hotspur     Denmark      87
```

```
## 17        2019        L. Messi       FC Barcelona   Argentina       94
## 18        2019  K. De Bruyne    Manchester City     Belgium       91
## 19        2019       L. Modrić        Real Madrid     Croatia       91
## 20        2019   David Silva    Manchester City       Spain       89
## 21        2019      C. Eriksen Tottenham Hotspur     Denmark       88
## 22        2019         M. Özil            Arsenal     Germany       86
## 23        2019 Cesc Fàbregas            Chelsea       Spain       84
## 24        2020        L. Messi       FC Barcelona   Argentina       94
## 25        2020  K. De Bruyne    Manchester City     Belgium       91
## 26        2020      C. Eriksen Tottenham Hotspur     Denmark       88
## 27        2020       L. Modrić        Real Madrid     Croatia       90
## 28        2020   David  Silva    Manchester City       Spain       88
##    mentality_vision
## 1                94
## 2              93+3
## 3                93
## 4                92
## 5                90
## 6                90
## 7                94
## 8                93
## 9              92-1
## 10             91+1
## 11             91-1
## 12             92-1
## 13               92
## 14               91
## 15             90+2
## 16             90+1
## 17               94
## 18               94
## 19               92
## 20               92
## 21               91
## 22               91
## 23               91
## 24               94
## 25               94
## 26               92
## 27               91
## 28               91
```

```
# Defending Stats:  defending_marking,  defending_standing_tackle,  defending_sliding_tackle
marking_dfs <- vector(mode = "list", length = 5)
stand_tackle_dfs <- vector(mode = "list", length = 5)
slide_tackle_dfs <- vector(mode = "list", length = 5)

for (i in seq_along(fifa_datasets_list)) {

  # Top 5 players best markers by year
  top_mark <- fifa_datasets_list[[i]] %>% arrange(desc(defending_marking)) %>%
    select(short_name, club, nationality, overall, defending_marking) %>% top_n(5)
  top_mark <- add_column(top_mark, years[[i]], .before = "short_name")
  marking_dfs[[i]] <- data.frame(top_mark)
```

```r
  # Top 5 best players at standing tackle by year
  top_stand_t <- fifa_datasets_list[[i]] %>% arrange(desc(defending_standing_tackle)) %>%
    select(short_name, club, nationality, overall, defending_standing_tackle) %>% top_n(5)
  top_stand_t <- add_column(top_stand_t, years[[i]], .before = "short_name")
  stand_tackle_dfs[[i]] <- data.frame(top_stand_t)

  # Top 5 best players at sliding tackle by year
  top_slide_t <- fifa_datasets_list[[i]] %>% arrange(desc(defending_sliding_tackle)) %>%
    select(short_name, club, nationality, overall, defending_sliding_tackle) %>% top_n(5)
  top_slide_t <- add_column(top_slide_t, years[[i]], .before = "short_name")
  slide_tackle_dfs[[i]] <- data.frame(top_slide_t)

}
```

```
## Selecting by defending_marking

## Selecting by defending_standing_tackle

## Selecting by defending_sliding_tackle

## Selecting by defending_marking

## Selecting by defending_standing_tackle

## Selecting by defending_sliding_tackle

## Selecting by defending_marking

## Selecting by defending_standing_tackle

## Selecting by defending_sliding_tackle

## Selecting by defending_marking

## Selecting by defending_standing_tackle

## Selecting by defending_sliding_tackle

## Selecting by defending_marking

## Selecting by defending_standing_tackle

## Selecting by defending_sliding_tackle
```

```r
print(do.call("rbind", marking_dfs))
```

```
##      years..i..      short_name                   club
## 1    2016           G. Chiellini               Juventus
## 2          2016     Thiago Silva    Paris Saint-Germain
## 3          2016      F. Wiedwald      SV Werder Bremen
## 4          2016         Ederson            SL Benfica
## 5          2016         S. Viera             Junior FC
## 6          2016      B. Khuzwayo         Kaizer Chiefs
## 7          2016        J. Wiland              Malmö FF
## 8          2016        M. Müller  1. FC Kaiserslautern
## 9          2016          A. Weis         FSV Frankfurt
## 10         2016         E. Lobos           CD Cobresal
## 11         2016      R. Cierzniak          Wisła Kraków
## 12         2016         B. Samba     AS Nancy Lorraine
## 13         2016      M. McGovern Hamilton Academical FC
## 14         2016         A. Stolz    TSG 1899 Hoffenheim
## 15         2016       G. Vailati         FC Basel 1893
## 16         2016     S. Radlinger           Hannover 96
## 17         2016          S. Bain             Dundee FC
## 18         2016           C. Day             Stevenage
## 19         2016      Kim Min Sik       Jeonnam Dragons
## 20         2016       H. Bonmann     Borussia Dortmund
## 21         2016        P. Camara FC Sochaux-Montbéliard
## 22         2016         A. Favre             FC Zürich
## 23         2016        M. Herzog         FC St. Gallen
## 24         2016      R. Mandanda            AC Ajaccio
## 25         2016        C. Abella         Atlético Huila
## 26         2016          G. Sava               Dundalk
## 27         2016          J. Hall       Adelaide United
## 28         2017     G. Chiellini              Juventus
## 29         2017       J. Boateng      FC Bayern München
## 30         2017     Thiago Silva   Paris Saint-Germain
## 31         2017      A. Barzagli              Juventus
## 32         2017        P. Klandt            SC Freiburg
## 33         2018     G. Chiellini              Juventus
## 34         2018     Thiago Silva   Paris Saint-Germain
## 35         2018      A. Barzagli              Juventus
## 36         2018       M. Böcskör        SV Mattersburg
## 37         2018          Ederson       Manchester City
## 38         2018           Sergio              RC Celta
## 39         2018         D. Boyko           Beşiktaş JK
## 40         2018      F. Wiedwald          Leeds United
## 41         2018     M. Dmitrović              SD Eibar
## 42         2018      Edgar Badía      CF Reus Deportiu
## 43         2018        J. Wiland           Hammarby IF
## 44         2018  M. Higashiguchi           Gamba Osaka
## 45         2018       Y. Sanpian          CD O‾Higgins
## 46         2018         S. Viera             Junior FC
## 47         2018  André Milazisco           Ponte Preta
## 48         2018          F. Nita               Romania
## 49         2018        K. Müller  1. FC Heidenheim 1846
## 50         2018          A. Weis   SSV Jahn Regensburg
## 51         2018      B. Khuzwayo         Kaizer Chiefs
## 52         2018        P. Klandt           SC Freiburg
## 53         2018     D. Bernhardt             VfR Aalen
```

## 54	2018	J. Contreras	Venezuela
## 55	2018	M. Müller	1. FC Kaiserslautern
## 56	2018	E. Mendy	Stade de Reims
## 57	2018	A. Camura	CD Huachipato
## 58	2018	M. McGovern	Norwich City
## 59	2018	Márcio Velinha	Palmeiras
## 60	2018	R. Mandanda	AC Ajaccio
## 61	2018	L. Bostyn	SV Zulte-Waregem
## 62	2018	B. Uphoff	Karlsruher SC
## 63	2018	H. Koffi	LOSC Lille
## 64	2018	K. Broll	SG Sonnenhof Großaspach
## 65	2018	S. Şahin-Radlinger	Hannover 96
## 66	2018	A. Stolz	TSG 1899 Hoffenheim
## 67	2018	P. Dahlberg	IFK Göteborg
## 68	2018	S. Bain	Dundee FC
## 69	2018	B. Samba	Stade Malherbe Caen
## 70	2018	C. Merville	Valenciennes FC
## 71	2018	A. Poggenborg	SC Fortuna Köln
## 72	2018	S. Arai	Kawasaki Frontale
## 73	2018	Adrián López	RCD Espanyol
## 74	2018	G. Vailati	FC Basel 1893
## 75	2018	N. Kato	Omiya Ardija
## 76	2018	Ricardo Moura	CD Tondela
## 77	2018	D. Sappa	Estudiantes de La Plata
## 78	2018	J. Castillo	U.N.A.M.
## 79	2018	R. Martínez	Godoy Cruz
## 80	2018	Y. van Osch	PSV
## 81	2018	Quique Cebriá	SD Eibar
## 82	2018	K. Shimura	Júbilo Iwata
## 83	2018	V. Vorel	Sparta Praha
## 84	2018	E. Zelazny	ESTAC Troyes
## 85	2018	S. Anchoverri	Club Olimpo
## 86	2018	Rafael Broetto	Clube Sport Marítimo
## 87	2018	F. Lončarić	Tromsø IL
## 88	2018	M. Cavallotti	Argentinos Juniors
## 89	2018	M. van de Meulenhof	PSV
## 90	2018	T. Nobile	FC Pro Vercelli 1892
## 91	2018	T. Casali	SV Mattersburg
## 92	2018	T. Aupic	Paris FC
## 93	2018	B. Gaye	DSC Arminia Bielefeld
## 94	2018	Sergio García	Real Zaragoza
## 95	2018	G. Gómez	Racing Club
## 96	2018	M. Funk	SpVgg Greuther Fürth
## 97	2018	F. Stritzel	SV Darmstadt 98
## 98	2018	M. Bruhn	FC Helsingør
## 99	2018	T. Okubo	FC Tokyo
## 100	2018	F. Dmitrovic	SCR Altach
## 101	2018	E. Dahlin	IFK Göteborg
## 102	2018	R. Hironaga	Sanfrecce Hiroshima
## 103	2018	C. Day	Stevenage
## 104	2018	L. Radliński	Sandecja Nowy Sącz
## 105	2018	J. Albrecht	SV Wehen Wiesbaden
## 106	2018	Lee Jae Hyeong	Jeonbuk Hyundai Motors
## 107	2018	Gorka Giralt	Real Oviedo

##	108	2018	B. Derksen	Roda JC Kerkrade
##	109	2018	S. Cleveland	Chicago Fire
##	110	2018	L. Chiappero	Defensa y Justicia
##	111	2018	V. Karakuş	Kayserispor
##	112	2018	S. Custers	VVV-Venlo
##	113	2018	G. Banaziak	Amiens SC
##	114	2018	R. Jendrusch	FC Erzgebirge Aue
##	115	2018	A. García	Atlético Huila
##	116	2018	F. Due	Randers FC
##	117	2018	G. Sava	Dundalk
##	118	2018	K. Martin	FC Lausanne-Sport
##	119	2018	N. Berchtold	FC Sion
##	120	2018	K. Chorążka	Wisła Kraków
##	121	2018	J. Holmes	Bournemouth
##	122	2018	J. Bruhns	SC Fortuna Köln
##	123	2018	R. Lovett	Cheltenham Town
##	124	2018	R. Piscitelli	Benevento
##	125	2018	J. Turner	Bolton Wanderers
##	126	2018	S. George	Carlisle United
##	127	2018	B. Gómez	Rionegro Águilas
##	128	2018	H. Acevedo	Deportivo Cali
##	129	2018	P. Ovchinnikov	PFC CSKA Moscow
##	130	2018	M. Bleve	Ternana
##	131	2018	E. Benedettini	Novara
##	132	2018	A. Yiğiter	Fenerbahçe SK
##	133	2018	V. Cabezas	Deportivo Pasto
##	134	2018	G. Coudert	Tours FC
##	135	2018	M. Nilsson	Malmö FF
##	136	2018	P. Burke	Finn Harps
##	137	2018	B. Petersen	Kaizer Chiefs
##	138	2018	R. Díaz	Querétaro
##	139	2018	Lee Hyun Woo	Daegu FC
##	140	2018	J. Caicedo	Deportivo Pasto
##	141	2018	T. Brinkmann	SC Paderborn 07
##	142	2018	D. Thürkauf	SV Werder Bremen II
##	143	2018	H. Hawsawi	Al Fayha
##	144	2018	S. Schmidt	FC Carl Zeiss Jena
##	145	2018	K. Humeler	Club Atlético Talleres
##	146	2018	J. Muñoz	Club León
##	147	2018	G. Nyberg	AIK
##	148	2018	A. André Jr	Bristol Rovers
##	149	2018	K. Nasurov	Terek Grozny
##	150	2018	S. Tsuji	Sagan Tosu
##	151	2018	J. García	Santos Laguna
##	152	2018	D. Adamov	FC Krasnodar
##	153	2018	L. Wackerle	SKN St. Pölten
##	154	2018	Park Hyeong Min	GwangJu FC
##	155	2018	S. Więckowicz	Arka Gdynia
##	156	2018	W. Henry	Swindon Town
##	157	2018	M. Cerofolini	Fiorentina
##	158	2018	A. Kelsey	Scunthorpe United
##	159	2019	A. Barzagli	Juventus
##	160	2019	G. Chiellini	Juventus
##	161	2019	M. Škriniar	Inter

```
## 162        2019      K. Koulibaly              Napoli
## 163        2019             Piqué          FC Barcelona
## 164        2020      G. Chiellini              Juventus
## 165        2020       M. Škriniar                 Inter
## 166        2020       V. van Dijk             Liverpool
## 167        2020      K. Koulibaly                Napoli
## 168        2020          N. Kanté               Chelsea
## 169        2020  Sergio Busquets          FC Barcelona
## 170        2020          D. Godín                 Inter
## 171        2020        M. Hummels     Borussia Dortmund
## 172        2020   T. Alderweireld     Tottenham Hotspur
## 173        2020        L. Bonucci              Juventus
## 174        2020        C. Lenglet          FC Barcelona
## 175        2020       D. De Rossi          Boca Juniors
##          nationality overall defending_marking
## 1              Italy      87              91+1
## 2             Brazil      88              90+2
## 3            Germany      74              9-16
## 4             Brazil      72              9-16
## 5            Uruguay      70              9-16
## 6       South Africa      68              9-16
## 7             Sweden      68              9-16
## 8            Germany      67              9-16
## 9            Germany      67              9-16
## 10             Chile      67              9-16
## 11            Poland      66              9-16
## 12             Congo      65              9-16
## 13  Northern Ireland      65              9-16
## 14           Germany      65              9-16
## 15       Switzerland      64              9-16
## 16           Austria      63              9-16
## 17          Scotland      63              9-16
## 18           England      63              9-16
## 19     Korea Republic     63              9-16
## 20           Germany      61              9-16
## 21           Senegal      60              9-16
## 22       Switzerland      60              9-16
## 23       Switzerland      60              9-16
## 24            France      59              9-16
## 25          Colombia      57              9-16
## 26             Italy      56              9-16
## 27         Australia      51              9-16
## 28             Italy      88              92+2
## 29           Germany      90              91+7
## 30            Brazil      89                90
## 31             Italy      86                90
## 32           Germany      69               9-5
## 33             Italy      89                92
## 34            Brazil      88                90
## 35             Italy      85                90
## 36           Austria      60              9-13
## 37            Brazil      83                 9
## 38             Spain      77                 9
## 39           Ukraine      77                 9
```

```
## 40         Germany  76         9
## 41          Serbia  74         9
## 42           Spain  72         9
## 43          Sweden  72         9
## 44           Japan  72         9
## 45           Chile  71         9
## 46         Uruguay  71         9
## 47          Brazil  71         9
## 48         Romania  70         9
## 49         Germany  69         9
## 50         Germany  69         9
## 51    South Africa  69         9
## 52         Germany  69         9
## 53         Germany  69         9
## 54       Venezuela  68         9
## 55         Germany  68         9
## 56          France  68         9
## 57           Chile  68         9
## 58 Northern Ireland  68         9
## 59          Brazil  68         9
## 60        DR Congo  67         9
## 61         Belgium  67         9
## 62         Germany  67         9
## 63    Burkina Faso  66         9
## 64         Germany  66         9
## 65         Austria  66         9
## 66         Germany  66         9
## 67          Sweden  65         9
## 68        Scotland  65         9
## 69           Congo  65         9
## 70          France  65         9
## 71         Germany  65         9
## 72           Japan  65         9
## 73           Spain  64         9
## 74     Switzerland  64         9
## 75           Japan  64         9
## 76        Portugal  64         9
## 77       Argentina  63         9
## 78          Mexico  63         9
## 79       Argentina  63         9
## 80     Netherlands  62         9
## 81           Spain  62         9
## 82           Japan  62         9
## 83  Czech Republic  62         9
## 84          France  62         9
## 85       Argentina  62         9
## 86          Brazil  62         9
## 87         Croatia  62         9
## 88       Argentina  62         9
## 89     Netherlands  61         9
## 90           Italy  61         9
## 91         Austria  61         9
## 92          France  61         9
## 93         Germany  60         9
```

```
## 94                Spain    60         9
## 95            Argentina    60         9
## 96              Germany    60         9
## 97              Germany    60         9
## 98              Denmark    60         9
## 99                Japan    60         9
## 100              Serbia    59         9
## 101              Sweden    59         9
## 102               Japan    59         9
## 103             England    59         9
## 104              Poland    59         9
## 105             Germany    58         9
## 106      Korea Republic    58         9
## 107               Spain    58         9
## 108         Netherlands    58         9
## 109       United States    58         9
## 110           Argentina    58         9
## 111              Turkey    57         9
## 112         Netherlands    57         9
## 113              France    57         9
## 114             Germany    57         9
## 115            Colombia    57         9
## 116             Denmark    57         9
## 117             Romania    57         9
## 118         Switzerland    56         9
## 119         Switzerland    55         9
## 120              Poland    55         9
## 121           Australia    55         9
## 122             Germany    55         9
## 123             England    55         9
## 124               Italy    55         9
## 125             England    54         9
## 126             England    54         9
## 127            Colombia    54         9
## 128            Colombia    54         9
## 129              Russia    54         9
## 130               Italy    54         9
## 131          San Marino    54         9
## 132              Turkey    53         9
## 133            Colombia    53         9
## 134              France    53         9
## 135              Sweden    53         9
## 136 Republic of Ireland    53         9
## 137        South Africa    53         9
## 138              Mexico    53         9
## 139      Korea Republic    53         9
## 140            Colombia    53         9
## 141             Germany    53         9
## 142         Switzerland    52         9
## 143        Saudi Arabia    52         9
## 144             Germany    52         9
## 145           Argentina    52         9
## 146              Mexico    52         9
## 147              Sweden    52         9
```

```
## 148         France   52          9
## 149         Russia   51          9
## 150          Japan   51          9
## 151         Mexico   50          9
## 152         Russia   50          9
## 153        Austria   50          9
## 154  Korea Republic   50          9
## 155         Poland   49          9
## 156        England   49          9
## 157          Italy   48          9
## 158        England   46          9
## 159          Italy   84         94
## 160          Italy   89         93
## 161       Slovakia   85         92
## 162        Senegal   87         91
## 163          Spain   87         91
## 164          Italy   89         94
## 165       Slovakia   86         92
## 166    Netherlands   90         91
## 167        Senegal   89         91
## 168         France   89         90
## 169          Spain   89         90
## 170        Uruguay   88         90
## 171        Germany   87         90
## 172        Belgium   87         90
## 173          Italy   86         90
## 174         France   85         90
## 175          Italy   82         90
```

```
print(do.call("rbind", stand_tackle_dfs))
```

```
##    years..i..      short_name                   club   nationality
## 1        2016    Thiago Silva    Paris Saint-Germain        Brazil
## 2        2016    G. Chiellini               Juventus         Italy
## 3        2016      J. Boateng      FC Bayern München       Germany
## 4        2016      V. Kompany        Manchester City       Belgium
## 5        2016       A. Pyatov       Shakhtar Donetsk       Ukraine
## 6        2016        G. Curci         1. FSV Mainz 05         Italy
## 7        2016       P. Garcés             Colo-Colo          Chile
## 8        2016      H. Lindner    Eintracht Frankfurt       Austria
## 9        2016        S. Viera              Junior FC       Uruguay
## 10       2016     B. Khuzwayo         Kaizer Chiefs  South Africa
## 11       2016     S. Kotsolis        Panathinaikos FC        Greece
## 12       2016      N. Mäenpää  Brighton & Hove Albion       Finland
## 13       2016       O. Werner FC Sochaux-Montbéliard       Belgium
## 14       2016      Z. MacMath        Colorado Rapids United States
## 15       2016     J. Carrasso               FC Metz        France
## 16       2016       D. Davari  DSC Arminia Bielefeld          Iran
## 17       2016   L. Hirschfeld      Vålerenga Fotball        Canada
## 18       2016 K. Stamatopoulos                   AIK        Canada
## 19       2016       R. Pillot            KV Kortrijk        France
## 20       2016      R. Vollath          Karlsruher SC       Germany
## 21       2016         L. Staw          FK Bodø/Glimt        Norway
## 22       2016      E. Horvath               Molde FK United States
```

```
## 23          2016          A. Favre                FC Zürich    Switzerland
## 24          2016         C. Abella            Atlético Huila       Colombia
## 25          2016           G. Sava                  Dundalk          Italy
## 26          2016        E. Balayev      Eintracht Frankfurt     Azerbaijan
## 27          2017        J. Boateng        FC Bayern München        Germany
## 28          2017      G. Chiellini                 Juventus          Italy
## 29          2017        M. Hummels        FC Bayern München        Germany
## 30          2017      Thiago Silva      Paris Saint-Germain         Brazil
## 31          2017       A. Barzagli                 Juventus          Italy
## 32          2017        V. Kompany          Manchester City        Belgium
## 33          2017           Miranda                    Inter         Brazil
## 34          2018      G. Chiellini                 Juventus          Italy
## 35          2018        M. Hummels        FC Bayern München        Germany
## 36          2018        J. Boateng        FC Bayern München        Germany
## 37          2018   T. Alderweireld        Tottenham Hotspur        Belgium
## 38          2018          Sokratis        Borussia Dortmund         Greece
## 39          2019      G. Chiellini                 Juventus          Italy
## 40          2019      Sergio Ramos              Real Madrid          Spain
## 41          2019        M. Hummels        FC Bayern München        Germany
## 42          2019          N. Kanté                  Chelsea         France
## 43          2019   T. Alderweireld        Tottenham Hotspur        Belgium
## 44          2020       V. van Dijk                Liverpool    Netherlands
## 45          2020          N. Kanté                  Chelsea         France
## 46          2020      G. Chiellini                 Juventus          Italy
## 47          2020      K. Koulibaly                   Napoli        Senegal
## 48          2020   T. Alderweireld        Tottenham Hotspur        Belgium
## 49          2020          I. Gueye      Paris Saint-Germain        Senegal
##    overall defending_standing_tackle
## 1       88                      91+1
## 2       87                      91+1
## 3       87                      90+2
## 4       85                      90+2
## 5       79                      9-16
## 6       72                      9-16
## 7       72                      9-16
## 8       70                      9-16
## 9       70                      9-16
## 10      68                      9-16
## 11      68                      9-16
## 12      67                      9-16
## 13      67                      9-16
## 14      66                      9-16
## 15      66                      9-16
## 16      65                      9-16
## 17      63                      9-16
## 18      63                      9-16
## 19      62                      9-16
## 20      61                      9-16
## 21      61                      9-16
## 22      60                      9-16
## 23      60                      9-16
## 24      57                      9-16
## 25      56                      9-16
## 26      55                      9-16
```

```
## 27        90                    94+4
## 28        88                    92+2
## 29        87                    91+4
## 30        89                      91
## 31        86                      90
## 32        86                      90
## 33        86                      90
## 34        89                      92
## 35        88                      92
## 36        88                    91-1
## 37        86                    90+2
## 38        86                    90+1
## 39        89                      93
## 40        91                      92
## 41        89                      92
## 42        89                      91
## 43        85                      91
## 44        90                      92
## 45        89                      91
## 46        89                      91
## 47        89                      90
## 48        87                      90
## 49        83                      90
```

```r
print(do.call("rbind", slide_tackle_dfs))
```

```
##      years..i..       short_name                   club
## 1          2016          P. Lahm      FC Bayern München
## 2          2016      G. Chiellini              Juventus
## 3          2016       J. Boateng      FC Bayern München
## 4          2016     Sergio Ramos            Real Madrid
## 5          2016             Pepe            Real Madrid
## 6          2017          P. Lahm      FC Bayern München
## 7          2017       J. Boateng      FC Bayern München
## 8          2017      A. Barzagli               Juventus
## 9          2017     Sergio Ramos            Real Madrid
## 10         2017             Pepe            Real Madrid
## 11         2017     G. Chiellini               Juventus
## 12         2018     Sergio Ramos            Real Madrid
## 13         2018       M. Hummels      FC Bayern München
## 14         2018       J. Boateng      FC Bayern München
## 15         2018     G. Chiellini               Juventus
## 16         2018      A. Schwolow            SC Freiburg
## 17         2018    Dani Hernández            CD Tenerife
## 18         2018       V. Acerval             Colo-Colo
## 19         2018  Victorino Magela             Palmeiras
## 20         2018    A. El-Shenawy                  Egypt
## 21         2018      H. Donadell   Universidad de Chile
## 22         2018    Nivo Serpinho                 Grêmio
## 23         2018     Joel Pereira      Manchester United
## 24         2018             Mika             Sunderland
## 25         2018         S. Viera              Junior FC
## 26         2018        A. Adanuy          CD Huachipato
## 27         2018   P. Leciejewski                SK Brann
```

## 28	2018	A. Lukse	SCR Altach
## 29	2018	Victor Fachinhas	Atlético Mineiro
## 30	2018	R. Zapata	Independiente Santa Fe
## 31	2018	T. Kirschbaum	1. FC Nürnberg
## 32	2018	T. Wellenreuther	Willem II
## 33	2018	S. Bruzzese	KV Kortrijk
## 34	2018	K. Kronholm	Holstein Kiel
## 35	2018	J. Mall	SV Darmstadt 98
## 36	2018	Y. Thuram	Le Havre AC
## 37	2018	D. Albil	Independiente
## 38	2018	T. Boss	SC Fortuna Köln
## 39	2018	M. Caillard	En Avant de Guingamp
## 40	2018	E. Redoga	San Luis de Quillota
## 41	2018	Alminho Boas	Vitória
## 42	2018	K. Eisele	FC Hansa Rostock
## 43	2018	A. Meyer	VfB Stuttgart
## 44	2018	A. Horwath	SK Brann
## 45	2018	T. Königsmann	SpVgg Greuther Fürth
## 46	2018	D. Reimann	Borussia Dortmund
## 47	2018	G. Doherty	Derry City
## 48	2018	E. Gründemann	FC Hansa Rostock
## 49	2018	F. Sollacaro	AC Ajaccio
## 50	2018	K. Martin	FC Lausanne-Sport
## 51	2018	R. Coulter	Bray Wanderers
## 52	2018	F. Kraft	VfL Bochum 1848
## 53	2019	Sergio Ramos	Real Madrid
## 54	2019	G. Chiellini	Juventus
## 55	2019	M. Hummels	FC Bayern München
## 56	2019	R. Nainggolan	Inter
## 57	2019	A. Schwolow	SC Freiburg
## 58	2019	M. Kozáčik	Viktoria Plzeň
## 59	2019	Victorino Magela	Bahia
## 60	2019	Nivo Serpinho	Chapecoense
## 61	2019	S. Viera	Junior FC
## 62	2019	Dani Hernández	CD Tenerife
## 63	2019	Joel Pereira	Vitória de Setúbal
## 64	2019	K. Kronholm	Holstein Kiel
## 65	2019	Victor Fachinhas	Ceará Sporting Club
## 66	2019	Mika	Os Belenenses
## 67	2019	R. Zapata	Independiente Santa Fe
## 68	2019	Cheng Yuelei	Guangzhou R&F FC
## 69	2019	T. Kirschbaum	Bayer 04 Leverkusen
## 70	2019	Kaíque Mutto	Atlético Mineiro
## 71	2019	Y. Thuram	Le Havre AC
## 72	2019	T. Boss	SG Dynamo Dresden
## 73	2019	S. Bruzzese	KV Kortrijk
## 74	2019	A. Lukse	SCR Altach
## 75	2019	T. Wellenreuther	Willem II
## 76	2019	P. Leciejewski	Zagłębie Lubin
## 77	2019	Z. Laaroubi	Ohod Club
## 78	2019	B. Maubleu	Grenoble Foot 38
## 79	2019	J. Deumeland	IK Start
## 80	2019	C. Patterson-Sewell	Toronto FC
## 81	2019	D. Reimann	Holstein Kiel

```
## 82          2019            K. Eisele                    Hallescher FC
## 83          2019           M. Caillard            En Avant de Guingamp
## 84          2019             A. Meyer                   VfB Stuttgart
## 85          2019              P. Gori                       Benevento
## 86          2019             Yang Jun             Tianjin Quanjian FC
## 87          2019           A. Horwath                 Real Salt Lake
## 88          2019        T. Königsmann          SpVgg Greuther Fürth
## 89          2019           G. Doherty                     Derry City
## 90          2019          L. Weinkauf                    Hannover 96
## 91          2019        E. Gründemann               FC Hansa Rostock
## 92          2019            N. Quindt         VfL Sportfreunde Lotte
## 93          2019         F. Maddaloni Chamois Niortais Football Club
## 94          2019         F. Sollacaro                     AC Ajaccio
## 95          2019             F. Kraft                VfL Bochum 1848
## 96          2019         K. Yoshimaru                    Vissel Kobe
## 97          2019           N. Stephan          FC Würzburger Kickers
## 98          2020         Sergio Ramos                    Real Madrid
## 99          2020        R. Nainggolan                       Cagliari
## 100         2020         G. Chiellini                       Juventus
## 101         2020           K. Manolas                         Napoli
## 102         2020           A. Laporte                Manchester City
## 103         2020        J. Vertonghen              Tottenham Hotspur
## 104         2020             A. Vidal                   FC Barcelona
## 105         2020           T. Delaney              Borussia Dortmund
##                nationality overall defending_sliding_tackle
## 1              Germany      87                        95
## 2                Italy      87                      91+4
## 3              Germany      87                      91+1
## 4                Spain      87                        90
## 5             Portugal      84                        90
## 6              Germany      88                        95
## 7              Germany      90                        91
## 8                Italy      86                      90+2
## 9                Spain      89                        90
## 10            Portugal      88                        90
## 11               Italy      88                        90
## 12               Spain      90                      91+1
## 13             Germany      88                      90+3
## 14             Germany      88                      90-1
## 15               Italy      89                        90
## 16             Germany      75                         9
## 17           Venezuela      75                         9
## 18               Chile      74                         9
## 19              Brazil      74                         9
## 20               Egypt      73                         9
## 21               Chile      73                         9
## 22              Brazil      73                         9
## 23            Portugal      71                         9
## 24            Portugal      71                         9
## 25             Uruguay      71                         9
## 26               Chile      70                         9
## 27              Poland      70                         9
## 28             Austria      70                         9
## 29              Brazil      70                         9
```

```
## 30              Colombia   69         9
## 31               Germany   69         9
## 32               Germany   68         9
## 33               Belgium   68         9
## 34         United States   68         9
## 35           Switzerland   67         9
## 36                France   66         9
## 37             Argentina   64         9
## 38               Germany   63         9
## 39                France   63         9
## 40                 Chile   63         9
## 41                Brazil   63         9
## 42               Germany   62         9
## 43               Germany   62         9
## 44         United States   62         9
## 45               Germany   61         9
## 46               Germany   60         9
## 47      Northern Ireland   60         9
## 48               Germany   58         9
## 49                France   57         9
## 50           Switzerland   56         9
## 51   Republic of Ireland   54         9
## 52               Germany   52         9
## 53                 Spain   91        91
## 54                 Italy   89        90
## 55               Germany   89        90
## 56               Belgium   85        90
## 57               Germany   77         9
## 58              Slovakia   75         9
## 59                Brazil   74         9
## 60                Brazil   73         9
## 61               Uruguay   72         9
## 62             Venezuela   72         9
## 63              Portugal   71         9
## 64         United States   70         9
## 65                Brazil   70         9
## 66              Portugal   69         9
## 67              Colombia   69         9
## 68              China PR   69         9
## 69               Germany   69         9
## 70                Brazil   69         9
## 71                France   68         9
## 72               Germany   67         9
## 73               Belgium   67         9
## 74               Austria   67         9
## 75               Germany   66         9
## 76                Poland   66         9
## 77               Morocco   66         9
## 78                France   64         9
## 79               Germany   64         9
## 80         United States   64         9
## 81               Germany   63         9
## 82               Germany   63         9
## 83                France   63         9
```

```
## 84           Germany  63    9
## 85             Italy  63    9
## 86          China PR  62    9
## 87     United States  62    9
## 88           Germany  61    9
## 89  Northern Ireland  60    9
## 90           Germany  59    9
## 91           Germany  58    9
## 92           Germany  58    9
## 93            France  58    9
## 94            France  57    9
## 95           Germany  55    9
## 96             Japan  54    9
## 97           Germany  49    9
## 98             Spain  89   90
## 99           Belgium  83   90
## 100            Italy  89   89
## 101           Greece  85   89
## 102           France  87   88
## 103          Belgium  87   88
## 104            Chile  84   88
## 105          Denmark  82   88
```

```r
# Team Stats

for (i in seq_along(fifa_datasets_list)) {

  # Top 10 teams with highest average player overall
  top_10_teams <- fifa_datasets_list[[i]] %>%
    filter(!club %in% c("Uruguay","Colombia","Mexico","Netherlands")) %>%
    group_by(club) %>% summarise(avg_player_ovr = mean(overall)) %>%
    arrange(desc(avg_player_ovr)) %>% top_n(10)
  print(paste("Year", years[[i]], ":"))
  print(top_10_teams)

  # Top 10 teams with highest average player overall in
  # the starting 11 excluding subs and reserves
  top_10_special <- fifa_datasets_list[[i]] %>%
    filter(!club %in% c("Uruguay","Colombia","Mexico","Netherlands")) %>%
    filter(!team_position %in% c("SUB","RES")) %>%
    group_by(club) %>% summarise(avg_player_ovr = mean(overall)) %>%
    arrange(desc(avg_player_ovr)) %>% top_n(10)
  print(paste("Year", years[[i]], ":", "excluding reserves ans substitute players"))
  print(top_10_special)

  # Worst 10 teams:
  worst_teams <- fifa_datasets_list[[i]] %>%
    filter(!club %in% c("Uruguay","Colombia","Mexico","Netherlands","India"))%>%
    filter(!team_position %in% c("SUB","RES")) %>%
    group_by(club) %>%
    summarise(avg_player_ovr = mean(overall)) %>%
    arrange(avg_player_ovr) %>% top_n(10)
  print(paste("Year", years[[i]], ":", "worst 10 teams"))
  print(worst_teams)
```

```
  # Top 10 most valuable squads:
  most_val_team <- fifa_datasets_list[[i]] %>% group_by(club)%>%
    summarise(squad_value_eur = sum(value_eur)) %>% arrange(desc(squad_value_eur)) %>% top_n(10)
  print(paste("Year", years[[i]], ":", "most valuable squads"))
  print(most_val_team)

  # Top 10 high weekly wage teams:
  most_wage_team <- fifa_datasets_list[[i]] %>% group_by(club)%>%
    summarise(wage_value_eur = sum(wage_eur)) %>% arrange(desc(wage_value_eur)) %>% top_n(10)
  print(paste("Year", years[[i]], ":", "high weekly wage"))
  print(most_wage_team)
}
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2016 :"
## # A tibble: 10 x 2
##    club                avg_player_ovr
##    <chr>                        <dbl>
##  1 Brazil                        81
##  2 Juventus                      79.3
##  3 FC Bayern München             78.7
##  4 FC Barcelona                  78.6
##  5 Austria                       78
##  6 Manchester City               77.2
##  7 Real Madrid                   77.1
##  8 Atlético Madrid               76.9
##  9 Paris Saint-Germain           76.8
## 10 Napoli                        76.7
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2016 : excluding reserves ans substitute players"
## # A tibble: 10 x 2
##    club                avg_player_ovr
##    <chr>                        <dbl>
##  1 FC Barcelona                  86.1
##  2 Real Madrid                   85.5
##  3 FC Bayern München             84.9
##  4 Paris Saint-Germain           83.6
##  5 Chelsea                       83.4
##  6 Manchester City               82.4
##  7 Juventus                      82
##  8 Manchester United             82
##  9 Arsenal                       81.7
## 10 Atlético Madrid               81.5
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2016 : worst 10 teams"
## # A tibble: 10 x 2
```

```
##     club                  avg_player_ovr
##     <chr>                          <dbl>
##   1 Atlético Madrid                 81.5
##   2 Arsenal                         81.7
##   3 Juventus                        82
##   4 Manchester United               82
##   5 Manchester City                 82.4
##   6 Chelsea                         83.4
##   7 Paris Saint-Germain             83.6
##   8 FC Bayern München               84.9
##   9 Real Madrid                     85.5
##  10 FC Barcelona                    86.1

## Selecting by squad_value_eur

## [1] "Year 2016 : most valuable squads"
## # A tibble: 10 x 2
##     club                  squad_value_eur
##     <chr>                           <int>
##   1 FC Bayern München           615490000
##   2 Real Madrid                 610475000
##   3 FC Barcelona                584950000
##   4 Chelsea                     484850000
##   5 Paris Saint-Germain         441390000
##   6 Manchester City             434150000
##   7 Arsenal                     401890000
##   8 Juventus                    390100000
##   9 Manchester United           366715000
##  10 Borussia Dortmund           349365000

## Selecting by wage_value_eur

## [1] "Year 2016 : high weekly wage"
## # A tibble: 10 x 2
##     club                  wage_value_eur
##     <chr>                          <int>
##   1 FC Barcelona                 3501000
##   2 FC Bayern München            3472000
##   3 Real Madrid                  3304000
##   4 Chelsea                      2880000
##   5 Manchester City              2814000
##   6 Paris Saint-Germain          2759000
##   7 Juventus                     2656000
##   8 Arsenal                      2635000
##   9 Borussia Dortmund            2398000
##  10 Manchester United            2250000

## Selecting by avg_player_ovr

## [1] "Year 2017 :"
## # A tibble: 10 x 2
##     club                  avg_player_ovr
```

```
##    <chr>                    <dbl>
##  1 Juventus                  81
##  2 Argentina                 80
##  3 Italy                     80
##  4 Brazil                    79.7
##  5 FC Bayern München         79.5
##  6 Portugal                  79
##  7 Turkey                    79
##  8 Real Madrid               78.5
##  9 Manchester United         77.9
## 10 FC Barcelona              77.8

## Selecting by avg_player_ovr

## [1] "Year 2017 : excluding reserves ans substitute players"
## # A tibble: 10 x 2
##    club                avg_player_ovr
##    <chr>                        <dbl>
##  1 Real Madrid                   87.8
##  2 FC Bayern München             87.5
##  3 FC Barcelona                  87
##  4 Juventus                      85.4
##  5 Arsenal                       84.5
##  6 Chelsea                       84.5
##  7 Atlético Madrid               83.9
##  8 Paris Saint-Germain           83.9
##  9 Manchester City               83.6
## 10 Manchester United             82.9

## Selecting by avg_player_ovr

## [1] "Year 2017 : worst 10 teams"
## # A tibble: 10 x 2
##    club                avg_player_ovr
##    <chr>                        <dbl>
##  1 Manchester United             82.9
##  2 Manchester City               83.6
##  3 Atlético Madrid               83.9
##  4 Paris Saint-Germain           83.9
##  5 Arsenal                       84.5
##  6 Chelsea                       84.5
##  7 Juventus                      85.4
##  8 FC Barcelona                  87
##  9 FC Bayern München             87.5
## 10 Real Madrid                   87.8

## Selecting by squad_value_eur

## [1] "Year 2017 : most valuable squads"
## # A tibble: 10 x 2
##    club                squad_value_eur
##    <chr>                         <int>
```

```
##  1 Real Madrid            772175000
##  2 FC Barcelona           702575000
##  3 FC Bayern München      651890000
##  4 Manchester United      565235000
##  5 Chelsea                519480000
##  6 Arsenal                512225000
##  7 Atlético Madrid        493245000
##  8 Paris Saint-Germain    492475000
##  9 Juventus               485125000
## 10 Manchester City        483045000

## Selecting by wage_value_eur

## [1] "Year 2017 : high weekly wage"
## # A tibble: 10 x 2
##    club                 wage_value_eur
##    <chr>                         <int>
##  1 Real Madrid                 2734000
##  2 FC Barcelona                2550000
##  3 FC Bayern München           2484000
##  4 Manchester United           2225000
##  5 Juventus                    2177000
##  6 Chelsea                     2090000
##  7 Arsenal                     2064000
##  8 Manchester City             1958000
##  9 Borussia Dortmund           1897000
## 10 Paris Saint-Germain         1872000

## Selecting by avg_player_ovr

## [1] "Year 2018 :"
## # A tibble: 11 x 2
##    club                 avg_player_ovr
##    <chr>                         <dbl>
##  1 Portugal                       83
##  2 FC Barcelona                   82.4
##  3 Belgium                        82
##  4 Juventus                       81.7
##  5 Real Madrid                    81.0
##  6 Brazil                         80
##  7 Sweden                         80
##  8 FC Bayern München              79.4
##  9 Paris Saint-Germain            78.0
## 10 Manchester United              77.7
## 11 Napoli                         77.7

## Selecting by avg_player_ovr

## [1] "Year 2018 : excluding reserves ans substitute players"
## # A tibble: 10 x 2
##    club                 avg_player_ovr
##    <chr>                         <dbl>
```

```
##  1 Real Madrid                87.6
##  2 FC Bayern München          87.2
##  3 FC Barcelona               86.2
##  4 Juventus                   85.6
##  5 Chelsea                    84.6
##  6 Atlético Madrid            84.5
##  7 Paris Saint-Germain        84.1
##  8 Tottenham Hotspur          83.8
##  9 Arsenal                    83.7
## 10 Manchester United          83.7

## Selecting by avg_player_ovr

## [1] "Year 2018 : worst 10 teams"
## # A tibble: 10 x 2
##    club                 avg_player_ovr
##    <chr>                         <dbl>
##  1 Arsenal                        83.7
##  2 Manchester United              83.7
##  3 Tottenham Hotspur              83.8
##  4 Paris Saint-Germain            84.1
##  5 Atlético Madrid                84.5
##  6 Chelsea                        84.6
##  7 Juventus                       85.6
##  8 FC Barcelona                   86.2
##  9 FC Bayern München              87.2
## 10 Real Madrid                    87.6

## Selecting by squad_value_eur

## [1] "Year 2018 : most valuable squads"
## # A tibble: 10 x 2
##    club                 squad_value_eur
##    <chr>                          <int>
##  1 Real Madrid                826750000
##  2 FC Bayern München          748825000
##  3 FC Barcelona               715000000
##  4 Chelsea                    671910000
##  5 Paris Saint-Germain        631750000
##  6 Juventus                   617100000
##  7 Manchester United          610625000
##  8 Manchester City            578715000
##  9 Atlético Madrid            566150000
## 10 Tottenham Hotspur          525955000

## Selecting by wage_value_eur

## [1] "Year 2018 : high weekly wage"
## # A tibble: 10 x 2
##    club                 wage_value_eur
##    <chr>                         <int>
##  1 Real Madrid                 4751000
```

```
##  2 FC Barcelona              4532000
##  3 Manchester United         3557000
##  4 Chelsea                   3545000
##  5 FC Bayern München         3273000
##  6 Juventus                  3165000
##  7 Manchester City           3157000
##  8 Arsenal                   3007000
##  9 Liverpool                 2752000
## 10 Everton                   2499000
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2019 :"
## # A tibble: 10 x 2
##    club                avg_player_ovr
##    <chr>                        <dbl>
##  1 Juventus                      82.2
##  2 FC Barcelona                  80.3
##  3 Argentina                     80
##  4 Napoli                        79.8
##  5 Inter                         79.7
##  6 FC Bayern München             78.5
##  7 Milan                         78.0
##  8 Real Madrid                   77.8
##  9 Sweden                        77.7
## 10 Manchester United             77.5
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2019 : excluding reserves ans substitute players"
## # A tibble: 10 x 2
##    club                 avg_player_ovr
##    <chr>                         <dbl>
##  1 Real Madrid                    87.7
##  2 FC Barcelona                   87.6
##  3 FC Bayern München              86.4
##  4 Juventus                       86.3
##  5 Manchester City                86.2
##  6 Atlético Madrid                85.3
##  7 Paris Saint-Germain            84.7
##  8 Tottenham Hotspur              84.7
##  9 Chelsea                        84.4
## 10 Manchester United              84.1
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2019 : worst 10 teams"
## # A tibble: 10 x 2
##    club                 avg_player_ovr
##    <chr>                         <dbl>
##  1 Manchester United              84.1
##  2 Chelsea                        84.4
```

```
## 3 Paris Saint-Germain 84.7
## 4 Tottenham Hotspur 84.7
## 5 Atlético Madrid 85.3
## 6 Manchester City 86.2
## 7 Juventus 86.3
## 8 FC Bayern München 86.4
## 9 FC Barcelona 87.6
## 10 Real Madrid 87.7
```

```
## Selecting by squad_value_eur
```

```
## [1] "Year 2019 : most valuable squads"
## # A tibble: 10 x 2
## club squad_value_eur
## <chr> <int>
## 1 Real Madrid 880075000
## 2 FC Barcelona 837925000
## 3 Manchester City 757395000
## 4 FC Bayern München 715310000
## 5 Juventus 691975000
## 6 Atlético Madrid 641280000
## 7 Manchester United 627550000
## 8 Chelsea 620360000
## 9 Paris Saint-Germain 612725000
## 10 Tottenham Hotspur 600710000
```

```
## Selecting by wage_value_eur
```

```
## [1] "Year 2019 : high weekly wage"
## # A tibble: 10 x 2
## club wage_value_eur
## <chr> <int>
## 1 Real Madrid 4961000
## 2 FC Barcelona 4747000
## 3 Manchester City 3721000
## 4 Manchester United 3522000
## 5 Juventus 3271000
## 6 Chelsea 3266000
## 7 Liverpool 2911000
## 8 Tottenham Hotspur 2528000
## 9 Arsenal 2514000
## 10 FC Bayern München 2413000
```

```
## Selecting by avg_player_ovr
```

```
## [1] "Year 2020 :"
## # A tibble: 10 x 2
## club avg_player_ovr
## <chr> <dbl>
## 1 FC Bayern München 81.3
## 2 Real Madrid 80.1
## 3 Juventus 80.1
```

```
##   4 FC Barcelona                 78.4
##   5 Bayer 04 Leverkusen          77.3
##   6 Chelsea                      77.1
##   7 Manchester City              77
##   8 Napoli                       76.9
##   9 Manchester United            76.8
##  10 Tottenham Hotspur            76.5

## Selecting by avg_player_ovr

## [1] "Year 2020 : excluding reserves ans substitute players"
## # A tibble: 10 x 2
##     club                 avg_player_ovr
##     <chr>                         <dbl>
##   1 FC Barcelona                   87.6
##   2 Real Madrid                    86.7
##   3 Manchester City                86.4
##   4 Liverpool                      85.7
##   5 FC Bayern München              85.5
##   6 Juventus                       85.3
##   7 Paris Saint-Germain            85.2
##   8 Tottenham Hotspur              84.1
##   9 Borussia Dortmund              83.6
##  10 Atlético Madrid                83.2

## Selecting by avg_player_ovr

## [1] "Year 2020 : worst 10 teams"
## # A tibble: 10 x 2
##     club                 avg_player_ovr
##     <chr>                         <dbl>
##   1 Atlético Madrid                83.2
##   2 Borussia Dortmund              83.6
##   3 Tottenham Hotspur              84.1
##   4 Paris Saint-Germain            85.2
##   5 Juventus                       85.3
##   6 FC Bayern München              85.5
##   7 Liverpool                      85.7
##   8 Manchester City                86.4
##   9 Real Madrid                    86.7
##  10 FC Barcelona                   87.6

## Selecting by squad_value_eur

## [1] "Year 2020 : most valuable squads"
## # A tibble: 10 x 2
##     club                 squad_value_eur
##     <chr>                          <int>
##   1 Real Madrid                897850000
##   2 FC Barcelona               869300000
##   3 Manchester City            845745000
##   4 Juventus                   735475000
```

```
##   5 Liverpool                   693265000
##   6 FC Bayern München           688775000
##   7 Paris Saint-Germain         687550000
##   8 Tottenham Hotspur           649850000
##   9 Atlético Madrid             590375000
##  10 Borussia Dortmund           532325000
```

```
## Selecting by wage_value_eur
```

```
## [1] "Year 2020 : high weekly wage"
## # A tibble: 10 x 2
##    club                    wage_value_eur
##    <chr>                            <int>
##  1 Real Madrid                    5354000
##  2 FC Barcelona                   4950000
##  3 Manchester City                3984000
##  4 Juventus                       3750000
##  5 Manchester United              2874000
##  6 Chelsea                        2806000
##  7 Liverpool                      2667000
##  8 Tottenham Hotspur              2603000
##  9 FC Bayern München              2516000
## 10 Paris Saint-Germain            2396000
```

```
# FIFA World 11 - AGED 23 OR LESS

unique(fifa20$team_position)
```

```
##  [1] "RW"  "LW"  "CAM" "GK"  "RCM" "LCB" "ST"  "CDM" "LDM" "RM"  "RCB"
## [12] "LCM" "LM"  "CF"  "SUB" "LB"  "LS"  "RB"  "RDM" "RES" "RAM" "RS"
## [23] "RF"  "CM"  "CB"  "LF"  "LAM" ""    "RWB" "LWB"
```

```
# Assuming a 4231 formation, we come up with the best team for each year.

for (i in seq_along(fifa_datasets_list)) {
  print(paste("Year", years[[i]], ":"))
  fifa_team_leq_23 <- fifa_datasets_list[[i]] %>% filter(age <= 23)
  team_of_the_year(fifa_team_leq_23)
}
```

```
## [1] "Year 2016 :"
```

```
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
```

```
##        short_name team_position overall
## 1           Morata            LS      81
## 2           Neymar            LW      88
## 3         M. Salah            RW      80
## 4       D. Berardi            RW      80
## 5    J. Rodríguez            CAM      87
## 6      M. Verratti           RCM      84
## 7         P. Pogba           LCM      86
## 8    R. Rodriguez             LB      83
## 9         Carvajal            RB      81
## 10        D. Alaba           LCB      85
## 11      S. Mustafi           RCB      82
## 12         B. Leno            GK      84
## [1] "Year 2017 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##          short_name team_position overall
## 1          P. Dybala            RS      85
## 2              Lucas            LW      82
## 3        R. Sterling            RW      82
## 4         D. Berardi            RW      82
## 5         R. Barkley           CAM      81
## 6    Bernardo Silva           RAM      81
## 7        M. Verratti           RCM      85
## 8           P. Pogba           LDM      88
## 9       R. Rodríguez            LB      83
## 10         S. Aurier            RB      83
## 11        A. Laporte           LCB      84
## 12          E. Bailly          RCB      82
## 13        Marquinhos           RCB      82
## 14           J. Oblak           GK      87
## [1] "Year 2018 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
```

```
## Selecting by overall
## Selecting by overall

##          short_name team_position overall
## 1          H. Kane            ST      86
## 2        O. Dembélé           LW      83
## 3         K. Mbappé           RW      83
## 4         P. Dybala          CAM      88
## 5           Fabinho          RDM      83
## 6          N. Keïta          RDM      83
## 7              Saúl          LCM      82
## 8       T. Bakayoko          LCM      82
## 9              Gayà           LB      79
## 10  Héctor Bellerín          RWB      81
## 11       J. Kimmich           RB      81
## 12       A. Laporte          LCB      84
## 13        E. Bailly          RCB      84
## 14          Ederson           GK      83
## [1] "Year 2019 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##              short_name team_position overall
## 1             T. Werner            LS      83
## 2               L. Sané            LW      86
## 3             K. Mbappé            RW      87
## 4               D. Alli           CAM      84
## 5   S. Milinković-Savić            CM      85
## 6                  Saúl           LCM      85
## 7   S. Milinković-Savić            CM      85
## 8              Grimaldo            LB      81
## 9              B. Mendy            LB      81
## 10           J. Kimmich            RB      85
## 11          V. Lindelöf           LCB      79
## 12              N. Aké           LCB      79
## 13             K. Rekik           LCB      79
## 14          M. Škriniar           RCB      85
## 15                 Kepa            GK      83
## [1] "Year 2020 :"

## Selecting by overall
## Selecting by overall
## Selecting by overall
```

```
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall
## Selecting by overall

##              short_name team_position overall
## 1            K. Havertz            RF      84
## 2              K. Coman            LW      84
## 3             K. Mbappé            RW      89
## 4               D. Alli           CAM      84
## 5           L. Torreira           RDM      82
## 6           Rúben Neves            CM      82
## 7            F. de Jong           LCM      85
## 8              Grimaldo            LB      83
## 9  T. Alexander-Arnold             RB      83
## 10         L. Hernández           LCB      84
## 11              N. Süle           RCB      85
## 12        G. Donnarumma            GK      85
```

ONLY for Year 2020

```
# HIGHEST RATED PLAYERS FOR FAMOUS JERSEY NUMBERS: 1,2,3,4,5,6,7,8,9,10,11

fifa20 %>% filter(team_jersey_number==1) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name    team_jersey_number overall
##   <chr>                      <int>   <int>
## 1 M. ter Stegen                  1      90
```

```
#Ter Stegen

fifa20 %>% filter(team_jersey_number==2) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name team_jersey_number overall
##   <chr>                   <int>   <int>
## 1 D. Godín                    2      88
```

```r
#Godin

fifa20 %>% filter(team_jersey_number==3) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name   team_jersey_number overall
##   <chr>                     <int>   <int>
## 1 G. Chiellini                  3      89
```

```r
#Chiellini

fifa20 %>% filter(team_jersey_number==4) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name  team_jersey_number overall
##   <chr>                    <int>   <int>
## 1 V. van Dijk                  4      90
```

```r
#Van Dijk

fifa20 %>% filter(team_jersey_number==5) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name       team_jersey_number overall
##   <chr>                         <int>   <int>
## 1 Sergio Busquets                   5      89
```

```r
#Busquets

fifa20 %>% filter(team_jersey_number==6) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name team_jersey_number overall
##   <chr>                   <int>   <int>
## 1 P. Pogba                    6      88
```

```r
#Pogba

fifa20 %>% filter(team_jersey_number==7) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name        team_jersey_number overall
##   <chr>                          <int>   <int>
## 1 Cristiano Ronaldo                  7      93
```

```r
#Ronaldo

fifa20 %>% filter(team_jersey_number==8) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name team_jersey_number overall
##   <chr>                   <int>   <int>
## 1 T. Kroos                    8      88
```

```r
#Toni Kroos

fifa20 %>% filter(team_jersey_number==9) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 2 x 3
##   short_name    team_jersey_number overall
##   <chr>                      <int>   <int>
## 1 L. Suárez                      9      89
## 2 R. Lewandowski                 9      89
```

```r
#Lewandowski

fifa20 %>% filter(team_jersey_number==10) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name team_jersey_number overall
##   <chr>                   <int>   <int>
## 1 L. Messi                   10      94
```

```r
#Messi

fifa20 %>% filter(team_jersey_number==11) %>%
  arrange(desc(overall))%>%
  select(short_name, team_jersey_number, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 3
##   short_name team_jersey_number overall
##   <chr>                   <int>   <int>
## 1 M. Salah                   11      90
```

```r
#Salah
```

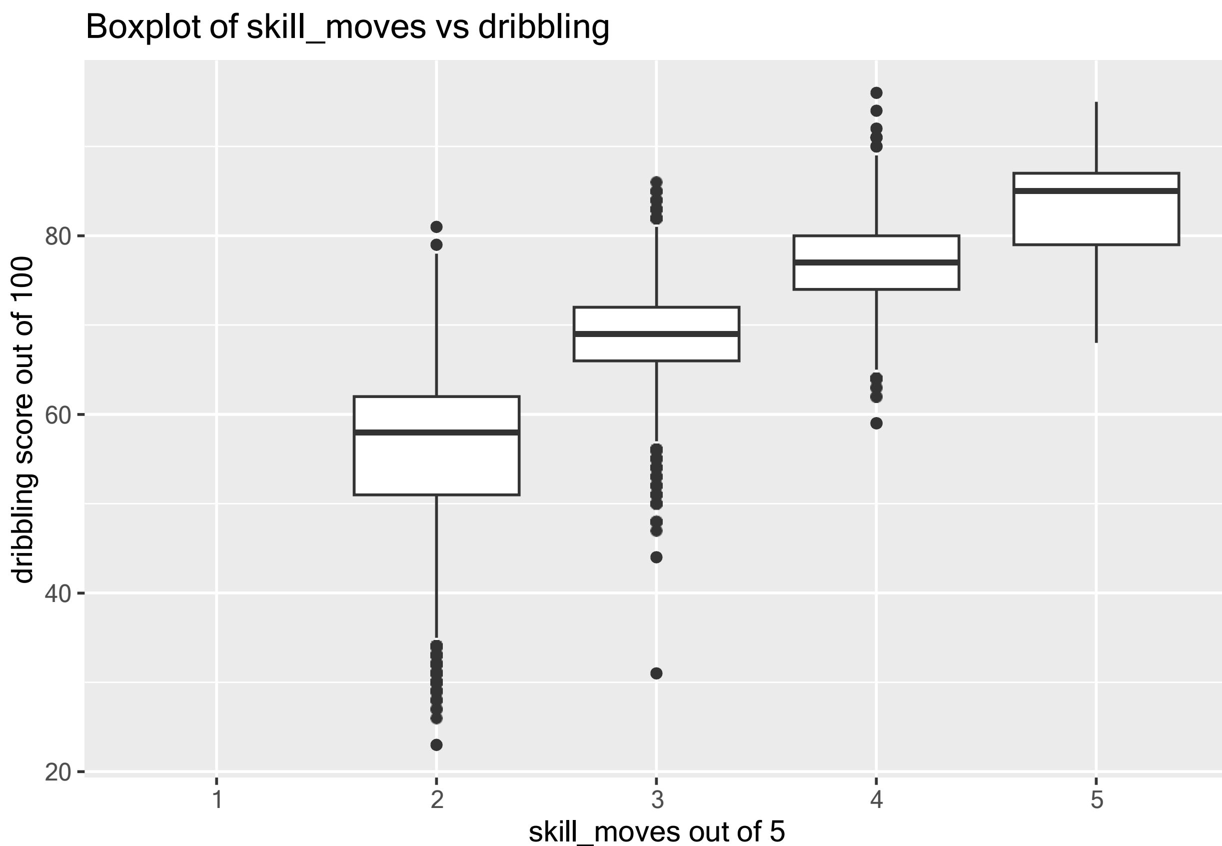
```r
# PLAYERS WITH THE BEST SKILL MOVES WITH OVERALL >=85
fifa20  %>%  filter(overall>=85,skill_moves==5)%>%arrange(desc(skill_moves))  %>%
  select(short_name,  club,  nationality,  team_position,overall,skill_moves)  %>%
  group_by(skill_moves) %>% top_n(1) %>% ungroup()
```

```
## Selecting by skill_moves

## # A tibble: 9 x 6
##   short_name      club          nationality team_position overall skill_moves
##   <chr>           <chr>         <chr>       <chr>           <int>       <int>
## 1 Cristiano Ron~ Juventus      Portugal    LW                 93           5
## 2 Neymar Jr      Paris Saint~ Brazil      CAM                92           5
## 3 K. Mbappé      Paris Saint~ France      RW                 89           5
## 4 P. Pogba       Manchester ~ France      LDM                88           5
## 5 Thiago         FC Bayern M~ Spain       CDM                87           5
## 6 A. Di María    Paris Saint~ Argentina   LW                 86           5
## 7 Coutinho       FC Bayern M~ Brazil      LCM                86           5
## 8 Z. Ibrahimović LA Galaxy     Sweden      ST                 85           5
## 9 Marcelo        Real Madrid   Brazil      LB                 85           5
```

```r
# PLAYERS WITH BEST WEAK FOOT WITH OVERALL >=85
fifa20 %>% filter(overall>=85,weak_foot==5)%>%arrange(desc(weak_foot)) %>%
  select(short_name, club, nationality, team_position,overall,weak_foot) %>%
  group_by(weak_foot) %>% top_n(1) %>% ungroup()
```

```
## Selecting by weak_foot

## # A tibble: 5 x 6
##   short_name   club             nationality   team_position overall weak_foot
##   <chr>        <chr>            <chr>         <chr>           <int>     <int>
## 1 Neymar Jr    Paris Saint-G~ Brazil        CAM                92         5
## 2 K. De Bruyne Manchester Ci~ Belgium       RCM                91         5
## 3 C. Eriksen   Tottenham Hot~ Denmark       RM                 88         5
## 4 T. Kroos     Real Madrid      Germany       LCM                88         5
## 5 H. Son       Tottenham Hot~ Korea Republ~ LM                 87         5
```

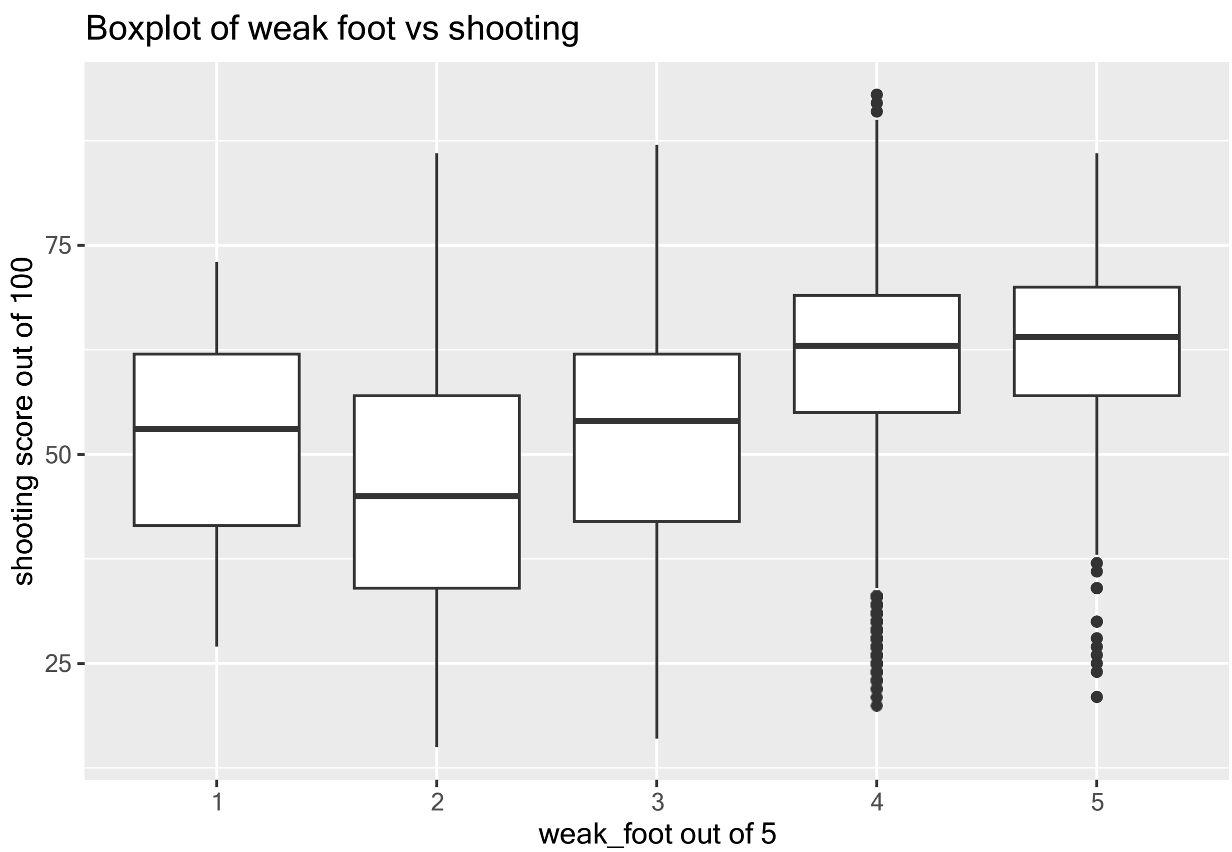
```
# Boxplot of skill_moves vs dribbling
fifa20 %>% ggplot(aes(as.factor(skill_moves),dribbling))+geom_boxplot()+
  labs(x="skill_moves out of 5",y="dribbling score out of 100",
       title = "Boxplot of skill_moves vs dribbling")
```




```
#They are positively correlated
#Strength of correlation:
cor(fifa20$skill_moves, fifa20$dribbling, method = "spearman",
                   use = "complete.obs")
```

```
## [1] 0.7873962
```

```
# High positive correlation.

# Are players with a strong weak foot good at shooting?
# Boxplot of weak foot vs shooting
fifa20 %>% ggplot(aes(as.factor(weak_foot),shooting))+geom_boxplot()+
  labs(x="weak_foot out of 5",y="shooting score out of 100",
       title = "Boxplot of weak foot vs shooting")
```




```
# Strength of correlation:
cor(fifa20$weak_foot, fifa20$shooting, method = "spearman",
    use = "complete.obs")
```

```
## [1] 0.3237961
```

```
# Weak positive correlation
```

```
# Split work rate into 2 columns: attack and defence work rate:
fifa20 <- separate(fifa20, work_rate, into = c("attack_workrate","defence_workrate"),
             sep = "/")
# Good players with high attack and defence workrates:
fifa20%>%filter(overall>=85,attack_workrate=="High",defence_workrate=="High")%>%
  arrange(desc(overall))%>%
  select(short_name, club, nationality, team_position,
         attack_workrate, defence_workrate, overall)%>%group_by(overall)%>%
  top_n(1)%>%ungroup()
```

```
## Selecting by overall
```

```
## # A tibble: 18 x 7
##    short_name club  nationality team_position attack_workrate
##    <chr>      <chr> <chr>       <chr>         <chr>
##  1 K. De Bru~ Manc~ Belgium     RCM           High
```

```
##   2 L. Modrić   Real~ Croatia     RCM           High
##   3 H. Kane     Tott~ England     ST            High
##   4 A. Griezm~ FC B~ France      LW            High
##   5 C. Eriksen Tott~ Denmark     RM            High
##   6 E. Cavani  Pari~ Uruguay     ST            High
##   7 Bernardo ~ Manc~ Portugal    RW            High
##   8 H. Son      Tott~ Korea Repu~ LM            High
##   9 J. Verton~ Tott~ Belgium     LCB           High
##  10 Roberto F~ Live~ Brazil      CF            High
##  11 T. Müller  FC B~ Germany     SUB           High
##  12 A. Lacaze~ Arse~ France      ST            High
##  13 Saúl        Atlé~ Spain       LCM           High
##  14 A. Robert~ Live~ Scotland    LB            High
##  15 Bruno Fer~ Spor~ Portugal    RCM           High
##  16 Carvajal   Real~ Spain       RB            High
##  17 Iago Aspas RC C~ Spain       RS            High
##  18 Koke        Atlé~ Spain       RM            High
## # ... with 2 more variables: defence_workrate <chr>, overall <int>
```

```
# Laziest players on fifa20
fifa20%>%filter(attack_workrate=="Low",defence_workrate=="Low")%>%
  arrange(desc(overall))%>%
  select(short_name, club, nationality, team_position,
         attack_workrate, defence_workrate, overall)%>%group_by(overall)%>%
  top_n(1)%>%ungroup()
```

```
## Selecting by overall
```

```
## # A tibble: 35 x 7
##    short_name club  nationality team_position attack_workrate
##    <chr>      <chr> <chr>       <chr>         <chr>
##  1 C. Strand~ Öreb~ Sweden      LS            Low
##  2 M. Kramer  ADO ~ Netherlands SUB           Low
##  3 A. Fink    Karl~ Germany     SUB           Low
##  4 S. Ameobi  Nott~ England     SUB           Low
##  5 P. Forsell HJK ~ Finland     RES           Low
##  6 C. Kazim-~ Tibu~ Turkey      RS            Low
##  7 N. Schmidt VfL ~ Germany     SUB           Low
##  8 A. Ba      AJ A~ Mauritania  SUB           Low
##  9 Abraham G~ Tibu~ Spain       LDM           Low
## 10 E. Kujović Djur~ Sweden      RES           Low
## # ... with 25 more rows, and 2 more variables: defence_workrate <chr>,
## #   overall <int>
```

```
# SUMMARIES OF FEW COLUMNS
sum_stats <- fifa20 %>% select(overall, potential, value_eur, wage_eur,
                               release_clause_eur,
                   pace, shooting, passing,
                   dribbling, physic, defending)
summary(sum_stats)
```

```
##     overall        potential       value_eur            wage_eur
```

```
##  Min.    :48.00   Min.    :49.00   Min.    :         0   Min.    :      0
##  1st Qu.:62.00   1st Qu.:67.00   1st Qu.:   325000   1st Qu.:   1000
##  Median :66.00   Median :71.00   Median :   700000   Median :   3000
##  Mean   :66.24   Mean   :71.55   Mean   :  2484038   Mean   :   9457
##  3rd Qu.:71.00   3rd Qu.:75.00   3rd Qu.:  2100000   3rd Qu.:   8000
##  Max.   :94.00   Max.   :95.00   Max.   :105500000   Max.   :565000
##
##  release_clause_eur       pace          shooting        passing
##  Min.   :     13000   Min.   :24.0   Min.   :15.0   Min.   :24.00
##  1st Qu.:    563000   1st Qu.:61.0   1st Qu.:42.0   1st Qu.:50.00
##  Median :   1200000   Median :69.0   Median :54.0   Median :58.00
##  Mean   :   4740717   Mean   :67.7   Mean   :52.3   Mean   :57.23
##  3rd Qu.:   3700000   3rd Qu.:75.0   3rd Qu.:63.0   3rd Qu.:64.00
##  Max.   :195800000   Max.   :96.0   Max.   :93.0   Max.   :92.00
##  NA's   :1298         NA's   :2036   NA's   :2036   NA's   :2036
##    dribbling          physic          defending
##  Min.   :23.00   Min.   :27.00   Min.   :15.00
##  1st Qu.:57.00   1st Qu.:59.00   1st Qu.:36.00
##  Median :64.00   Median :66.00   Median :56.00
##  Mean   :62.53   Mean   :64.88   Mean   :51.55
##  3rd Qu.:69.00   3rd Qu.:72.00   3rd Qu.:65.00
##  Max.   :96.00   Max.   :90.00   Max.   :90.00
##  NA's   :2036    NA's   :2036    NA's   :2036
```

```r
#release_clause_eur is NA for 1298 players, this is because these players do not
#have a release clause inlcuded in their current contract.

#pace, shooting, passing, dribbling, defending and physic is NA for 2036 players,
#lets find out why
pace_na <- fifa20 %>% filter(is.na(pace),is.na(dribbling),is.na(shooting),
                             is.na(passing),is.na(defending),is.na(physic)) %>%
  select(short_name, club, nationality, team_position, overall)
dim(pace_na) #2036 players with NAs.
```

```
## [1] 2036    5
```

```r
#team positions of these players:
unique(pace_na$team_position)
```

```
## [1] "GK"  "SUB" "RES" ""
```

```r
#We can see that goalkeepers, subs and reserve team players do not have
#values for these 6 attributes.
pace_na %>% filter(team_position=="")
```

```
## # A tibble: 40 x 5
##    short_name      club      nationality team_position overall
##    <chr>           <chr>     <chr>       <chr>           <int>
##  1 J. Serendero    Uruguay   Uruguay     ""                 80
##  2 A. Lunev        Russia    Russia      ""                 79
##  3 L. Sáreda       Uruguay   Uruguay     ""                 79
##  4 P. Dárenas      Uruguay   Uruguay     ""                 75
```

```
##   5 H. Lindner     Austria   Austria    ""                    74
##   6 M. Borjan      Canada    Canada     ""                    74
##   7 J. Santigaro   Ecuador   Ecuador    ""                    74
##   8 A. El-Shenawy  Egypt     Egypt      ""                    73
##   9 A. Shunin      Russia    Russia     ""                    73
##  10 V. Belec       Slovenia  Slovenia   ""                    72
## # ... with 30 more rows
```

```
#There are 40 rows in this dataframe where the position is "". These players
#are fictional and do not belong to any club.
```

```
# RELEASE CLAUSE EDA
# Players with the highest release clauses in euros:
fifa20 %>% arrange(desc(release_clause_eur)) %>%
  select(short_name, club, nationality, overall, wage_eur,
         value_eur, release_clause_eur)
```

```
## # A tibble: 18,278 x 7
##    short_name club  nationality overall wage_eur value_eur release_clause_~
##    <chr>      <chr> <chr>         <int>    <int>     <int>            <int>
##  1 L. Messi   FC B~ Argentina        94   565000  95500000        195800000
##  2 Neymar Jr  Pari~ Brazil           92   290000 105500000        195200000
##  3 K. Mbappé  Pari~ France           89   155000  93500000        191700000
##  4 E. Hazard  Real~ Belgium          91   470000  90000000        184500000
##  5 K. De Bru~ Manc~ Belgium          91   370000  90000000        166500000
##  6 J. Oblak   Atlé~ Slovenia         91   125000  77500000        164700000
##  7 H. Kane    Tott~ England          89   220000  83000000        159800000
##  8 V. van Di~ Live~ Netherlands      90   200000  78000000        150200000
##  9 M. Salah   Live~ Egypt            90   240000  80500000        148900000
## 10 M. ter St~ FC B~ Germany          90   250000  67500000        143400000
## # ... with 18,268 more rows
```

```
# Messi and Neymar have the highest release clauses in euros

# Are value and release clause correlated?
cor(fifa20$value_eur, fifa20$release_clause_eur, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.9937346
```

```
# We see that value and release clause have very high positive correlation,
# correlation coeeficient almost equal to 1.

# Are wage and release clause correlated?
cor(fifa20$wage_eur, fifa20$release_clause_eur, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.8538087
```

```
# We also see that wage and release clause have high positive correlation.
```

```r
# Do talented young players have high release clauses?
elite_young <- fifa20 %>% filter(age <= 23)%>%
  mutate(elite_pot_inc = potential-overall)%>%
  select(short_name, club, nationality, overall, potential,
         elite_pot_inc, release_clause_eur) %>%
  arrange(desc(elite_pot_inc))
elite_young
```

```
## # A tibble: 7,318 x 7
##    short_name club  nationality overall potential elite_pot_inc##
      <chr>      <chr> <chr>          <int>     <int>         <int>
##  1 G. Bazunu  Manc~ Republic o~      59        84            25
##  2 S. Ramos ~ Boca~ Argentina        56        81            25
##  3 B. Mumba   Sund~ England          55        80            25
##  4 S. Spasov  Oxfo~ Bulgaria         49        74            25
##  5 Tao Qiang~ Hebe~ China PR         48        73            25
##  6 B. McPher~ Grim~ England          48        73            25
##  7 K. Bafoun~ Boru~ France           59        83            24
##  8 L. Cheval~ LOSC~ France           58        82            24
##  9 J. García  Cruz~ Mexico           55        79            24
## 10 H. Mnoga   Port~ England          53        77            24
## # ... with 7,308 more rows, and 1 more variable: release_clause_eur <int>
```

```r
# Check if 'elite_pot_inc' and 'release_clause_eur' are correlated
cor(elite_young$elite_pot_inc, elite_young$release_clause_eur,
    method = "pearson",use = "complete.obs")
```

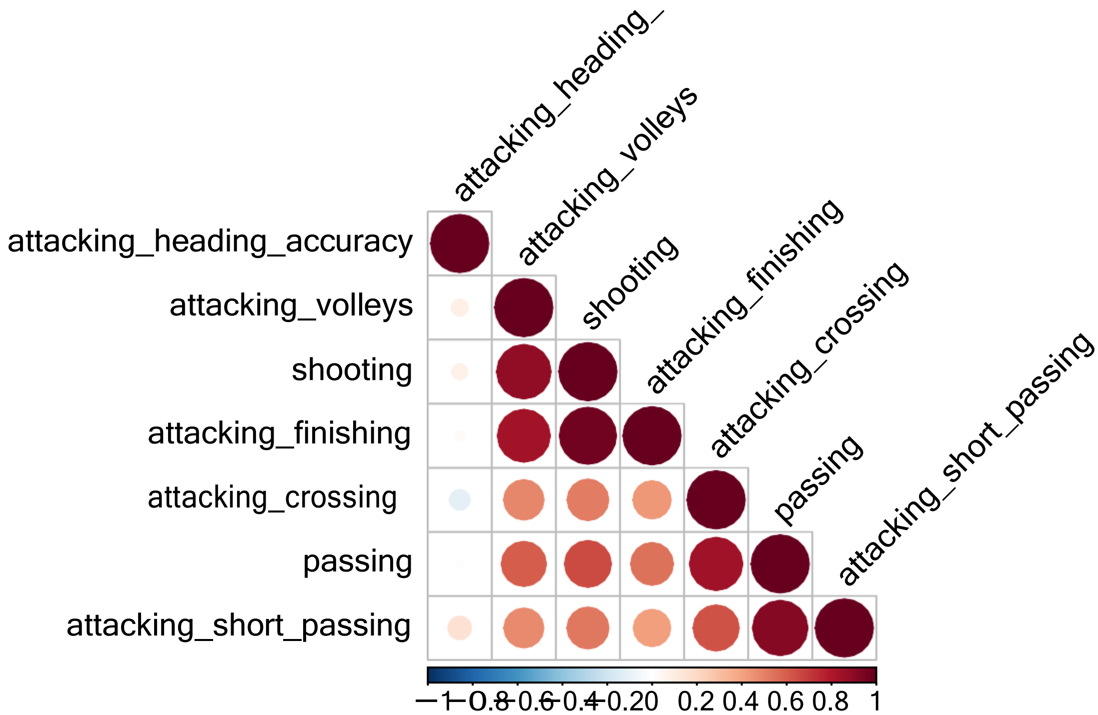
```
## [1] -0.2187238
```

```r
# They have a low negative correlation. One would expect, higher possibility of
# increase in overall would result in the player having a bigger release clause
# but that is not the case here.

# Do older players have smaller release clauses?
cor(fifa20$age, fifa20$release_clause_eur, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.06574811
```

```r
# There is negligable correlation between these 2 variables which is surprising.
```

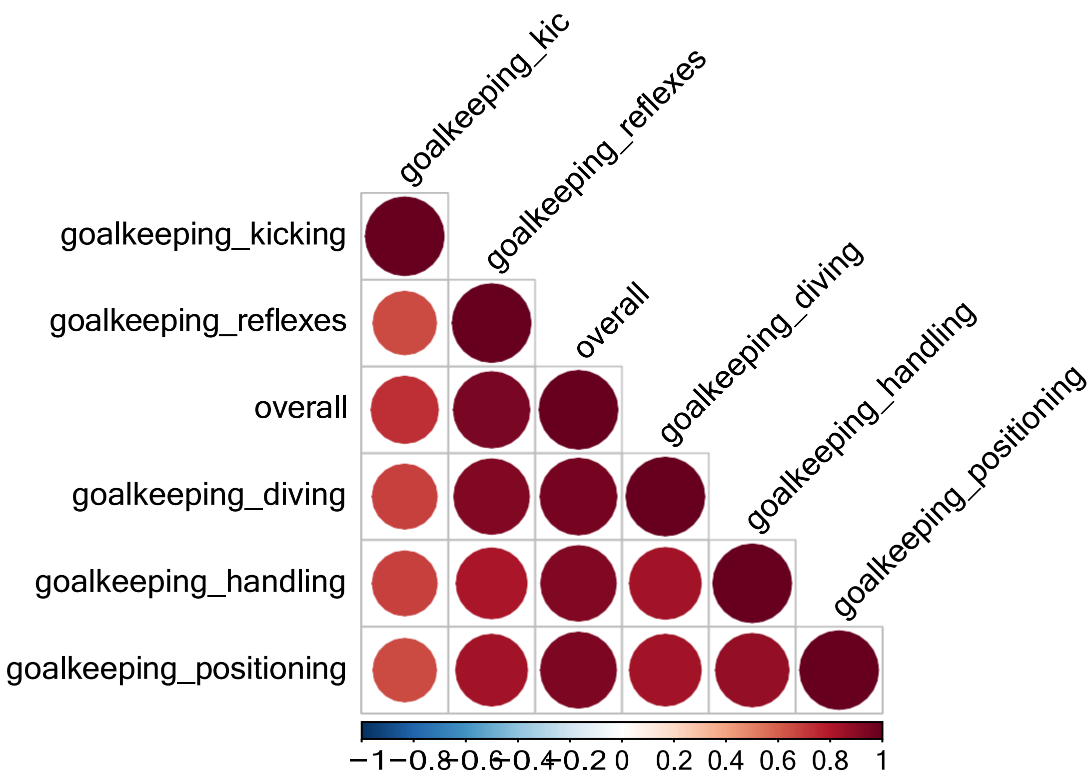
```r
# Correlation for attack, goalkeeping, defending and power stats

# ATTACK STATS:
attack_stats <- fifa20%>% select(shooting, passing, attacking_crossing,
                                 attacking_finishing, attacking_heading_accuracy,
                                 attacking_short_passing, attacking_volleys)
source("http://www.sthda.com/upload/rquery_cormat.r")
require("corrplot")
rquery.cormat(attack_stats)
```




```
## $r
##                            attacking_heading_accuracy attacking_volleys
## attacking_heading_accuracy                          1
## attacking_volleys                               0.081                 1
## shooting                                        0.071              0.88
## attacking_finishing                             0.021              0.83
## attacking_crossing                              -0.12              0.48
## passing                                        0.0092               0.6
## attacking_short_passing                          0.16              0.47
##                            shooting attacking_finishing attacking_crossing
## attacking_heading_accuracy
## attacking_volleys
## shooting                          1
## attacking_finishing            0.96                   1
## attacking_crossing             0.51                0.43                  1
## passing                        0.65                0.54               0.84
## attacking_short_passing        0.52                0.41               0.63
##                            passing attacking_short_passing
## attacking_heading_accuracy
## attacking_volleys
## shooting
## attacking_finishing
## attacking_crossing
## passing                          1
## attacking_short_passing       0.91                       1
##
```

```
## $p
##                          attacking_heading_accuracy attacking_volleys
## attacking_heading_accuracy                        0
## attacking_volleys                                 0                 0
## shooting                                      2e-19                 0
## attacking_finishing                               0                 0
## attacking_crossing                                0                 0
## passing                                        0.24                 0
## attacking_short_passing                           0                 0
##                          shooting attacking_finishing attacking_crossing
## attacking_heading_accuracy
## attacking_volleys
## shooting                        0
## attacking_finishing             0                   0
## attacking_crossing              0                   0                  0
## passing                         0                   0                  0
## attacking_short_passing         0                   0                  0
##                          passing attacking_short_passing
## attacking_heading_accuracy
## attacking_volleys
## shooting
## attacking_finishing
## attacking_crossing
## passing                        0
## attacking_short_passing        0                       0
##
## $sym
##                          attacking_heading_accuracy attacking_volleys
## attacking_heading_accuracy 1
## attacking_volleys                                   1
## shooting                                            +
## attacking_finishing                                 +
## attacking_crossing                                  .
## passing                                             .
## attacking_short_passing                             .
##                          shooting attacking_finishing attacking_crossing
## attacking_heading_accuracy
## attacking_volleys
## shooting                 1
## attacking_finishing      B        1
## attacking_crossing       .        .                   1
## passing                  ,        .                   +
## attacking_short_passing  .        .                   ,
##                          passing attacking_short_passing
## attacking_heading_accuracy
## attacking_volleys
## shooting
## attacking_finishing
## attacking_crossing
## passing                  1
## attacking_short_passing  *       1
## attr(,"legend")
## [1] 0 ‘ ’ 0.3 ‘.’ 0.6 ‘,’ 0.8 ‘+’ 0.9 ‘*’ 0.95 ‘B’ 1
```

```
#Almost all pairs are positively correlated to each other.
#One exception is the correlation b/w heading and crossing. There is a -ve
#correlation b/w these 2 variables and it makes sense since a good crosser of the
#ball is the one delivering the crosses to the player whos good at heading.


# GOALKEEPING STATS:
gk_stats <- fifa20%>% filter(team_position=="GK")%>%
  select(overall, goalkeeping_diving, goalkeeping_handling,goalkeeping_kicking,
         goalkeeping_positioning, goalkeeping_reflexes)
source("http://www.sthda.com/upload/rquery_cormat.r")
require("corrplot")
rquery.cormat(gk_stats)
```

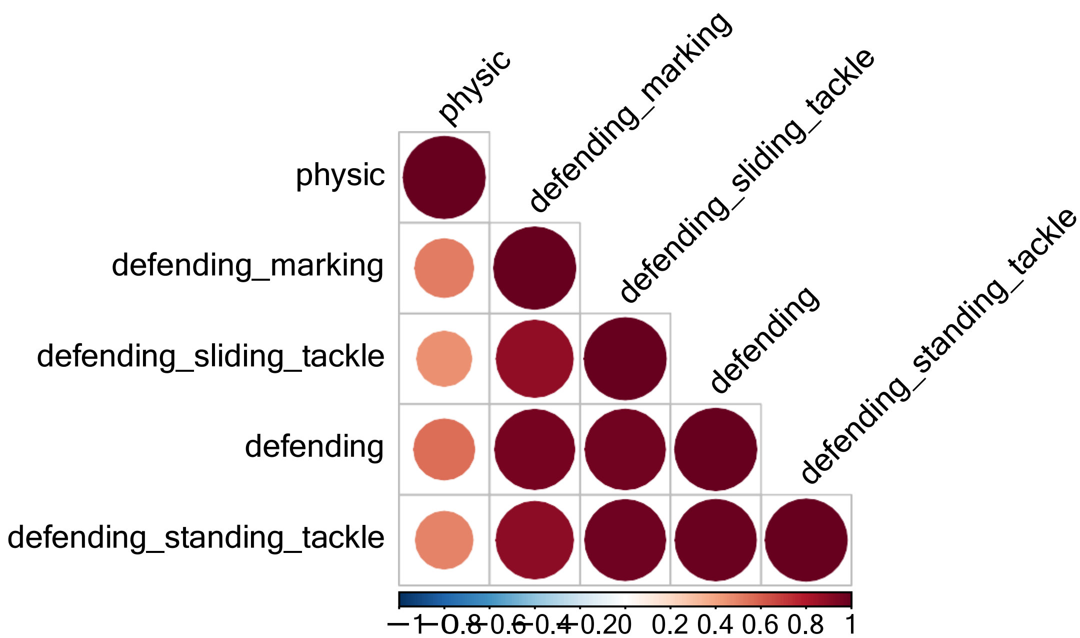



```
## $r
##                         goalkeeping_kicking goalkeeping_reflexes overall
## goalkeeping_kicking                       1
##  goalkeeping_reflexes                  0.65                    1
## overall                                0.73                 0.94       1
## goalkeeping_diving                     0.68                 0.92    0.95
## goalkeeping_handling                   0.68                 0.81    0.92
## goalkeeping_positioning                0.65                 0.83    0.93
##                         goalkeeping_diving goalkeeping_handling
## goalkeeping_kicking
##  goalkeeping_reflexes
```

```
## overall
## goalkeeping_diving                          1
## goalkeeping_handling                    0.83                      1
## goalkeeping_positioning                 0.83                   0.87
##                          goalkeeping_positioning
## goalkeeping_kicking
## goalkeeping_reflexes
## overall
## goalkeeping_diving
## goalkeeping_handling
## goalkeeping_positioning                       1
##
## $p
##                          goalkeeping_kicking  goalkeeping_reflexes  overall
## goalkeeping_kicking                        0
## goalkeeping_reflexes                 2.8e-82                     0
## overall                            2.3e-111 1.50000000019285e-315        0
## goalkeeping_diving                   1.1e-89              4.9e-272        0
## goalkeeping_handling                 2.9e-90              1.1e-154 1.5e-272
## goalkeeping_positioning                1e-81              1.5e-169 2.7e-290
##                          goalkeeping_diving goalkeeping_handling
## goalkeeping_kicking
## goalkeeping_reflexes
## overall
## goalkeeping_diving                          0
## goalkeeping_handling                 2.9e-168                    0
## goalkeeping_positioning              1.9e-168                1e-204
##                          goalkeeping_positioning
## goalkeeping_kicking
## goalkeeping_reflexes
## overall
## goalkeeping_diving
## goalkeeping_handling
## goalkeeping_positioning                       0
##
## $sym
##                          goalkeeping_kicking goalkeeping_reflexes overall
## goalkeeping_kicking      1
## goalkeeping_reflexes     ,                   1
## overall                  ,                   *                    1
## goalkeeping_diving       ,                   *                    *
## goalkeeping_handling     ,                   +                    *
## goalkeeping_positioning  ,                   +                    *
##                          goalkeeping_diving goalkeeping_handling
## goalkeeping_kicking
## goalkeeping_reflexes
## overall
## goalkeeping_diving       1
## goalkeeping_handling     +                  1
## goalkeeping_positioning  +                  +
##                          goalkeeping_positioning
## goalkeeping_kicking
## goalkeeping_reflexes
## overall
```

```
##   goalkeeping_diving
## goalkeeping_handling
## goalkeeping_positioning 1
## attr(,"legend")
## [1] 0 ' ' 0.3 '.' 0.6 ',' 0.8 '+' 0.9 '*' 0.95 'B' 1
```

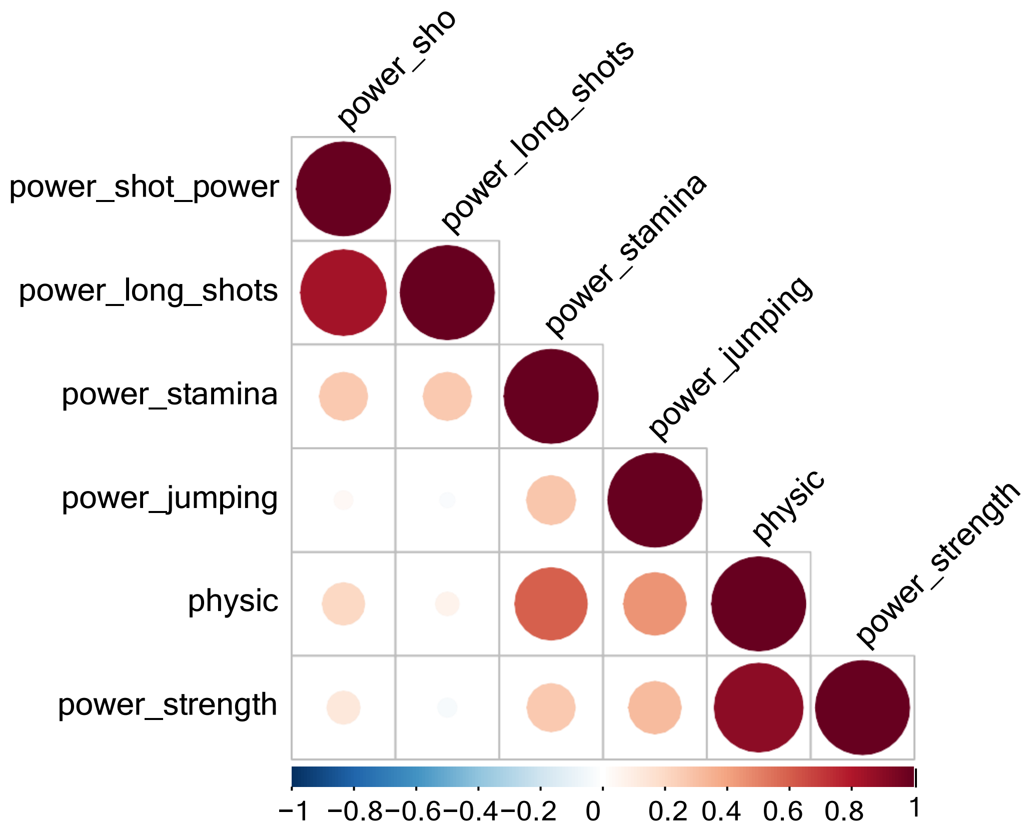
```r
#kicking is not as highly correlated to GK overall when compapred to
#other goalkeeping attributes.


# DEFENDING STATS:
defence_stats <- fifa20%>% select(defending, defending_marking,
                                  defending_standing_tackle, defending_sliding_tackle,
                                  physic)
source("http://www.sthda.com/upload/rquery_cormat.r")
require("corrplot")
rquery.cormat(defence_stats)
```




```
## $r
##                           physic  defending_marking
## physic                         1
## defending_marking           0.51                  1
## defending_sliding_tackle    0.45               0.88
## defending                   0.55               0.95
## defending_standing_tackle   0.49               0.89
```

```
##                              defending_sliding_tackle defending
## physic
## defending_marking
## defending_sliding_tackle                           1
## defending                                        0.96         1
## defending_standing_tackle                        0.97      0.98
##                              defending_standing_tackle
## physic
## defending_marking
## defending_sliding_tackle
## defending
## defending_standing_tackle                             1
##
## $p
##                              physic defending_marking
## physic                            0
## defending_marking                 0                 0
## defending_sliding_tackle          0                 0
## defending                         0                 0
## defending_standing_tackle         0                 0
##                              defending_sliding_tackle defending
## physic
## defending_marking
## defending_sliding_tackle                           0
## defending                                          0         0
## defending_standing_tackle                          0         0
##                              defending_standing_tackle
## physic
## defending_marking
## defending_sliding_tackle
## defending
## defending_standing_tackle                             0
##
## $sym
##                              physic defending_marking
## physic                       1
## defending_marking            .      1
## defending_sliding_tackle     .      +
## defending                    .      *
## defending_standing_tackle    .      +
##                              defending_sliding_tackle defending
## physic
## defending_marking
## defending_sliding_tackle     1
## defending                    B                        1
## defending_standing_tackle    B                        B
##                              defending_standing_tackle
## physic
## defending_marking
## defending_sliding_tackle
## defending
## defending_standing_tackle    1
## attr(,"legend")
## [1] 0 ' ' 0.3 '.' 0.6 ',' 0.8 '+' 0.9 '*' 0.95 'B' 1
```

```r
#Though physique is not highly correlated to defence stats, having a high
#physique rating out of 100 implies that the player is good at defending.


# POWER STATS:
power_stats <- fifa20%>%select(physic, power_shot_power, power_jumping,
                              power_stamina, power_strength, power_long_shots)
source("http://www.sthda.com/upload/rquery_cormat.r")
require("corrplot")
rquery.cormat(power_stats)
```




```
## $r

##                  power_shot_power power_long_shots power_stamina
## power_shot_power                1
## power_long_shots             0.83                1
## power_stamina                0.26             0.26             1
## power_jumping               0.037           -0.023          0.27
## physic                        0.2             0.06          0.59
## power_strength               0.12           -0.038          0.26
##                  power_jumping physic power_strength
## power_shot_power
## power_long_shots
## power_stamina
## power_jumping                1
## physic                    0.44      1
```

```
## power_strength                  0.31     0.89                   1
##
## $p
##                   power_shot_power  power_long_shots           power_stamina
## power_shot_power                 0
## power_long_shots                 0                 0
## power_stamina                    0                 0                       0
## power_jumping              2.3e-56           9.8e-72                       0
## physic                    4.3e-152           1.5e-14                       0
## power_strength              6e-110           5.1e-17 1.69999999988919e-314
##                   power_jumping  physic  power_strength
## power_shot_power
## power_long_shots
## power_stamina
## power_jumping                0
## physic                       0       0
## power_strength               0       0              0
##
## $sym
##                   power_shot_power power_long_shots power_stamina
## power_shot_power  1
## power_long_shots  +                1
## power_stamina                                       1
## power_jumping
## physic                                              .
## power_strength
##                   power_jumping physic power_strength
## power_shot_power
## power_long_shots
## power_stamina
## power_jumping     1
## physic            .             1
## power_strength    .             +      1
## attr(,"legend")
## [1] 0 ' ' 0.3 '.' 0.6 ',' 0.8 '+' 0.9 '*' 0.95 'B' 1
```

```r
#long shots and sho power have high +ve correlation which makes sense
#power strength and physique have high +ve correlation too which makes sense.
```

```r
# INTERCEPTIONS AND DEFENDING:
cor(fifa20$defending, fifa20$mentality_interceptions, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.961099
```

```r
# Very high +ve correlation

# INTERCEPTIONS FOR DEFNSIVE MIDS, WING BACKS AND CENTRE BACKS:

# DEFENSIVE MIDS:
mid_int_def <- fifa20%>%filter(team_position %in% c("CDM","LDM","RCM","LCM","CM"))
cor(mid_int_def$defending, mid_int_def$mentality_interceptions)
```

```
## [1] 0.9254998
```

```r
#  Very  high  positive  correlation(.93)

# WING BACKS:
wb_int_def <- fifa20%>%filter(team_position %in% c("LB","RB","LWB","RWB"))
cor(wb_int_def$defending, wb_int_def$mentality_interceptions)
```

```
## [1] 0.9085694
```

```r
# CENTRE BACKS:
cb_int_def <- fifa20%>%filter(team_position %in% c("LCB","RCB"))
cor(cb_int_def$defending, cb_int_def$mentality_interceptions)
```

```
## [1] 0.9202419
```

```r
# Mid way between defensive mids and wingbacks
```

```r
# POSITIONING AND FINISHING:
cor(fifa20$mentality_positioning, fifa20$attacking_finishing, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.895442
```

```r
# Very high positive correlation.
```

```r
# STANDING TACKLING AND DEFENDING

# STANDING TACKLING FOR DEFNSIVE MIDS, WING BACKS AND CENTRE BACKS:

# DEFENSIVE MIDS:
mid_sttack_def <- fifa20%>%filter(team_position %in% c("CDM","LDM","RCM","LCM","CM"))
cor(mid_sttack_def$defending, mid_sttack_def$defending_standing_tackle)
```

```
## [1] 0.9506021
```

```r
#  Very  high  positive  correlation(.95)

# WING BACKS:
wb_sttack_def <- fifa20%>%filter(team_position %in% c("LB","RB","LWB","RWB"))
cor(wb_sttack_def$defending, wb_sttack_def$defending_standing_tackle)
```

```
## [1] 0.9444266
```

```r
# CENTRE BACKS:
cb_sttack_def <- fifa20%>%filter(team_position %in% c("LCB","RCB"))
cor(cb_sttack_def$defending, cb_sttack_def$defending_standing_tackle)
```

```
## [1] 0.9554827
```

```
cor(fifa20$passing, fifa20$mentality_vision, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.8792501
```

```
# Very high +ve correlation.


# FINISHING AND PENALTIES:
cor(fifa20$attacking_finishing, fifa20$mentality_penalties, method = "pearson",
    use = "complete.obs")
```

```
## [1] 0.8471015
```

```
# Very high +ve correlation.
```

DIFFERENCES BETWEEN FORWARD LINE, MIDFIELD AND DEFENCE:

```
# PACE

# Wingers:
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_pace = mean(pace))    #78.6
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     78.6
```

```
# Strikers and forwards:
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_pace = mean(pace))    #70.4
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     70.4
```

```
# Attacking mids:
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_pace = mean(pace))    #75.9
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     75.9
```

```r
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_pace = mean(pace))    #64.7
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     64.7
```

```r
# Wing backs:
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_pace = mean(pace))    #73.7
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     73.7
```

```r
# Centre backs:
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_pace = mean(pace))    #57.5
```

```
## # A tibble: 1 x 1
##   avg_pace
##      <dbl>
## 1     57.5
```

```r
# Wingers are the fastest and cbs are the slowest.
```

```r
# SHOOTING:

# Wingers:
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_shooting = mean(shooting))    #65.7
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         65.7
```

```r
#Strikers and forwards:
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_shooting = mean(shooting))    #68.6
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         68.6
```

```r
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_shooting = mean(shooting))     #63.1
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         63.1
```

```r
#Defensive mids:
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_shooting = mean(shooting))     #57.8
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         57.8
```

```r
#Wing backs:
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_shooting = mean(shooting))     #47.8
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         47.8
```

```r
#Centre backs:
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_shooting = mean(shooting))     #38.3
```

```
## # A tibble: 1 x 1
##   avg_shooting
##          <dbl>
## 1         38.3
```

```r
# Strikers have the best shooting and centre backs have the worst shooting.
```

```r
# PASSING

# Wingers:
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_passing = mean(passing))     #63.8
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        63.8
```

```r
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_passing = mean(passing))    #57.6
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        57.6
```

```r
# Attacking mids:
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_passing = mean(passing))    #64.9
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        64.9
```

```r
# Defensive mids:
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_passing = mean(passing))    #65.5
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        65.5
```

```r
# Wing backs:
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_passing = mean(passing))    #60.6
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        60.6
```

```r
# Centre backs:
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_passing = mean(passing))    #50.8
```

```
## # A tibble: 1 x 1
##   avg_passing
##         <dbl>
## 1        50.8
```

```r
# Defensive mids have the best passing and centre backs have the worst passing.
```

```r
# DRIBBLING

# Wingers
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_dribbling = mean(dribbling))    #72.3
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            72.3
```

```
# Strikers and forwards:
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_dribbling = mean(dribbling))    #67.7
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            67.7
```

```
# Attacking mids:
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_dribbling = mean(dribbling))    #71.1
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            71.1
```

```
# Defensive mids:
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_dribbling = mean(dribbling))    #67.3
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            67.3
```

```
# Wing backs:
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_dribbling = mean(dribbling))    #65.3
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            65.3
```

```
# Centre backs:
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_dribbling = mean(dribbling))    #51.9
```

```
## # A tibble: 1 x 1
##   avg_dribbling ##
                <dbl>
## 1            51.9
```

```r
#Wingers have the best dribbling and centre backs have the worst dribbling.
```

```r
# DEFENDING

# Wingers
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_defending = mean(defending))     #37.0
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          37.0
```

```r
# Strikers and forwards:
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_defending = mean(defending))     #33.4
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          33.4
```

```r
# Attacking mids:
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_defending = mean(defending))   #42.6
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          42.6
```

```r
# Defensive mids:
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_defending = mean(defending))     #61.8
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          61.8
```

```r
# Wing backs:
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_defending = mean(defending))     #64.3
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          64.3
```

```
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_defending = mean(defending))    #68.4
```

```
## # A tibble: 1 x 1
##   avg_defending
##           <dbl>
## 1          68.4
```

```
# Centre backs have the best defense and forwards/strikers have the worst defense.
```

```
# PHYSIC

# Wingers
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  summarise(avg_physic = mean(physic))    #61.5
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       61.5
```

```
# Strikers and forwards:
fifa20 %>% filter(team_position %in% c("ST","CF","LS","RS","RF","LF")) %>%
  summarise(avg_physic = mean(physic))    #68.9
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       68.9
```

```
# Attacking mids:
fifa20 %>% filter(team_position %in% c("CAM","RM","LM","RAM","LAM")) %>%
  summarise(avg_physic = mean(physic)) #61.6
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       61.6
```

```
# Defensive mids:
fifa20 %>% filter(team_position %in% c("RCM","CDM","LDM","LCM","RDM","CM")) %>%
  summarise(avg_physic = mean(physic))   #69.4
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       69.4
```

```r
fifa20 %>% filter(team_position %in% c("RB","LB","LWB","RWB")) %>%
  summarise(avg_physic = mean(physic))  #68.5
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       68.5
```

```r
# Centre backs:
fifa20 %>% filter(team_position %in% c("RCB","LCB","CB")) %>%
  summarise(avg_physic = mean(physic))  #73.6
```

```
## # A tibble: 1 x 1
##   avg_physic
##        <dbl>
## 1       73.6
```

```r
# Centre backs have the best physic and wingers/attacking mids have the worst physic.
```

```r
# Very good players who are slow:
good_slow <- fifa20 %>% filter(overall >= 85) %>%
  arrange(pace) %>%
  select(short_name, club, team_position, overall, pace)
head(good_slow, 5)
```

```
## # A tibble: 5 x 5
##   short_name      club              team_position overall  pace
##   <chr>           <chr>             <chr>           <int> <int>
## 1 Parejo          Valencia CF       RCM                86    41
## 2 Sergio Busquets FC Barcelona      CDM                89    42
## 3 T. Kroos        Real Madrid       LCM                88    45
## 4 M. Hummels      Borussia Dortmund LCB                87    51
## 5 J. Rodríguez    Real Madrid       SUB                85    55
```

```r
# Very fast players who are bad overall
fast_bad <- fifa20 %>% filter(overall <= 70) %>%
  arrange(desc(pace))%>%
  select(short_name, club, team_position, overall, pace)
head(fast_bad, 5)
```

```
## # A tibble: 5 x 5
##   short_name club                  team_position overall  pace
##   <chr>      <chr>                 <chr>           <int> <int>
## 1 K. Nagai   FC Tokyo              LS                 69    95
## 2 A. Chalá   Deportivo Toluca      LWB                66    95
## 3 K. Manneh  FC Cincinnati         SUB                68    94
## 4 C. Bărbuț  Universitatea Craiova RW                 68    94
## 5 J. Aguirre Rosario Central       SUB                68    94
```

```r
# Good players who are physically weak:
good_weak <- fifa20 %>% filter(overall >= 85) %>%
  arrange(physic)%>%
  select(short_name, club, team_position, overall, physic)
head(good_weak, 5)
```

```
## # A tibble: 5 x 5
##   short_name club            team_position overall physic
##   <chr>      <chr>           <chr>           <int>  <int>
## 1 L. Insigne Napoli          LS                 87     47
## 2 D. Mertens Napoli          SUB                87     53
## 3 A. Gómez   Atalanta        CAM                85     55
## 4 R. Sterling Manchester City LW                88     57
## 5 David Silva Manchester City LCM               88     57
```

```r
# Strong players who are bad overall:
strong_bad <- fifa20 %>% filter(overall <= 70) %>%
  arrange(desc(physic))%>%
  select(short_name, club, team_position, overall, physic)
head(strong_bad, 5)
```

```
## # A tibble: 5 x 5
##   short_name  club              team_position overall physic
##   <chr>       <chr>             <chr>           <int>  <int>
## 1 M. Bostwick Lincoln City      RCB                68 88
## 2 B. Fofana   Gaz Metan Mediaş SUB                 68     88
## 3 A. Coly     Kristiansund BK   RB                 65     88
## 4 Fali        Cádiz CF          SUB                70     87
## 5 J. Marquis  Portsmouth        ST                 69     87
```

```r
# Centre backs attack the goal during set pieces to chip in with headers

# Which centre backs are good at attacking the goal with their heads?
fifa20 %>% filter(team_position %in% c("LCB","RCB","CB"))%>%
  arrange(desc(attacking_heading_accuracy)) %>%
  select(short_name, club, overall, attacking_heading_accuracy) %>% top_n(1)
```

```
## Selecting by attacking_heading_accuracy

## # A tibble: 1 x 4
##   short_name   club        overall attacking_heading_accuracy
##   <chr>        <chr>         <int>                      <int>
## 1 Sergio Ramos Real Madrid      89                         92
```

```r
# Sergio Ramos expected.


# Wing backs overlap with the wingers while attacking to deliver key crosses into the box

# Which wing/full backs are the best crossers?
fifa20 %>% filter(team_position %in% c("RB","RWB","LWB","LB")) %>%
  arrange(desc(attacking_crossing)) %>%
  select(short_name, club, overall, attacking_crossing) %>% top_n(1)
```

```
## Selecting by attacking_crossing

## # A tibble: 1 x 4
##   short_name club              overall  attacking_crossing
##   <chr>      <chr>               <int>               <int>
## 1 J. Kimmich FC Bayern München      86                  91
```

```
#Joshua Kimmich expected.
```

```
# Wingers who are very good crossers:
fifa20 %>% filter(team_position %in% c("RW","LW")) %>%
  arrange(desc(attacking_crossing)) %>%
  select(short_name, club, overall, attacking_crossing) %>% top_n(5)
```

```
## Selecting by attacking_crossing

## # A tibble: 7 x 4
##   short_name        club                     overall  attacking_crossing
##   <chr>             <chr>                      <int>               <int>
## 1 L. Messi          FC Barcelona                  94                  88
## 2 M. Acuña          Sporting CP                   81                  87
## 3 A. Di María       Paris Saint-Germain           86                  86
## 4 Bernardo Silva    Manchester City               87                  85
## 5 Cristiano Ronaldo Juventus                      93                  84
## 6 D. Payet          Olympique de Marseille        81                  84
## 7 P. Groß           Brighton & Hove Albion        78                  84
```

```
#Target men are strikers who are tall, strong and good at heading.
# Best target men:
fifa20 %>% filter(height_cm >= 180, physic >= 75)%>%
  filter(team_position %in% c("ST","CF","LS","RS","RF","LF","SUB")) %>%
  arrange(desc(attacking_heading_accuracy)) %>%
  select(short_name, club, overall, attacking_heading_accuracy) %>% top_n(5)
```

```
## Selecting by attacking_heading_accuracy

## # A tibble: 5 x 4
##   short_name  club        overall attacking_heading_accuracy
##   <chr>       <chr>         <int>                      <int>
## 1 B. Dost     Sporting CP      82                         93
## 2 L. de Jong  Sevilla FC       82                         93
## 3 L. Pavoletti Cagliari        78                         93
## 4 O. Giroud   Chelsea          82                         91
## 5 M. Smith    Millwall         68                         91
```

```
# Very good players who are poor at penalties: cxcluding fbs, wbs, cbs, gks and subs
# since they dont generally take penalties

fifa20 %>% filter(overall >=85) %>%
  filter(!team_position %in% c("RB","RWB","LWB","LB","GK","LCB","RCB","CB","SUB"))%>%
  arrange(mentality_penalties) %>%
  select(short_name, club, overall, mentality_penalties) %>% top_n(5)
```

```
## Selecting by mentality_penalties

## # A tibble: 5 x 4
##   short_name   club                overall mentality_penalties
##   <chr>        <chr>                 <int>               <int>
## 1 Z. Ibrahimović LA Galaxy              85                  89
## 2 Neymar Jr    Paris Saint-Germain      92                  90
## 3 H. Kane      Tottenham Hotspur        89                  90
## 4 M. Reus      Borussia Dortmund        88                  90
## 5 Fabinho      Liverpool                85                  91
```

```
# Wingers who cut in and shoot to score goals:

# They are false wingers: right wingers with preferred foot as
# left and have good shooting and vice versa

fifa20 %>% filter(team_position=="RW", preferred_foot=="Left")%>%
  arrange(desc(shooting))%>%
  select(short_name, club, shooting, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 4
##   short_name club         shooting overall
##   <chr>      <chr>           <int>   <int>
## 1 L. Messi   FC Barcelona       92      94
```

```
fifa20 %>% filter(team_position=="LW", preferred_foot=="Right")%>%
  arrange(desc(shooting))%>%
  select(short_name, club, shooting, overall) %>% top_n(1)
```

```
## Selecting by overall

## # A tibble: 1 x 4
##   short_name        club     shooting overall
##   <chr>             <chr>       <int>   <int>
## 1 Cristiano Ronaldo Juventus       93      93
```

COMPARISON BETWEEN MESSI AND RONALDO: MAJOR STATS OUT OF 100

```
#BASIC STATS:
messi_ronaldo_basic <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(age, height_cm, weight_kg, overall, value_eur, wage_eur, release_clause_eur,
         international_reputation, weak_foot, skill_moves)

# 6 MAIN ATTRIBUTES:
```

```r
messi_ronaldo_6main <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(pace, shooting, passing, dribbling, defending, physic)

# ATTACK ATTRIBUTES:
messi_ronaldo_attack <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(attacking_crossing, attacking_finishing, attacking_heading_accuracy,
         attacking_short_passing, attacking_volleys)

# MOVEMENT ATTRIBUTES:
messi_ronaldo_move <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(movement_acceleration, movement_sprint_speed, movement_agility,
         movement_reactions, movement_balance)

# POWER ATTRIBUTES:
messi_ronaldo_power <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(power_shot_power, power_jumping, power_stamina,
         power_strength, power_long_shots)

# DEFENSE ATTRIBUTES:
messi_ronaldo_def <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(defending_marking, defending_standing_tackle, defending_sliding_tackle)

# MENTALITY ATTRIBUTES:
messi_ronaldo_ment <- fifa20 %>%
  filter(short_name =="L. Messi" | short_name=="Cristiano Ronaldo") %>%
  select(mentality_aggression, mentality_interceptions, mentality_positioning,
         mentality_penalties, mentality_vision, mentality_composure)

# Difference in basic stats:
diff_basic <- data.frame(diff(as.matrix(messi_ronaldo_basic)))
diff_basic
```

```
##   age height_cm weight_kg overall value_eur wage_eur release_clause_eur
## 1   2        17        11      -1 -37000000  -160000          -99300000
##   international_reputation weak_foot skill_moves
## 1                        0         0           1
```

```r
# Difference in 6 main attributes:
diff_6main <- data.frame(diff(as.matrix(messi_ronaldo_6main)))
diff_6main
```

```
##   pace shooting passing dribbling defending physic
## 1    3        1     -10        -7        -4     12
```

```r
# Difference in attack attributes:
diff_attack <- data.frame(diff(as.matrix(messi_ronaldo_attack)))
diff_attack
```

```
##   attacking_crossing   attacking_finishing   attacking_heading_accuracy
## 1                   -4                    -1                           19
##   attacking_short_passing attacking_volleys
## 1                      -9                -1
```

```
# Difference in movement attributes:
diff_move <- data.frame(diff(as.matrix(messi_ronaldo_move)))
diff_move
```

```
##   movement_acceleration movement_sprint_speed movement_agility
## 1                    -2                     7               -6
##   movement_reactions movement_balance
## 1                  1              -24
```

```
# Difference in defence attributes:
diff_def <- data.frame(diff(as.matrix(messi_ronaldo_def)))
diff_def
```

```
##   defending_marking defending_standing_tackle defending_sliding_tackle
## 1                -5                        -5                       -2
```

```
# Difference in power attributes:
diff_power <- data.frame(diff(as.matrix(messi_ronaldo_power)))
diff_power
```

```
##   power_shot_power power_jumping power_stamina power_strength
## 1                9            27            10             10
##   power_long_shots
## 1               -1
```

```
# Difference in mentality attributes:
diff_ment <- data.frame(diff(as.matrix(messi_ronaldo_ment)))
diff_ment
```

```
##   mentality_aggression   mentality_interceptions   mentality_positioning
## 1                   15                       -11                       1
##   mentality_penalties mentality_vision  mentality_composure
## 1                  10              -12                   -1
```

```
# These are the differences between messi and ronaldo.
# Who has got the best overall stats?

total_diff <- bind_cols(diff_6main, diff_attack, diff_def, diff_ment,
          diff_move, diff_power)
total_diff
```

```
##   pace shooting passing dribbling defending physic attacking_crossing
## 1    3        1     -10        -7        -4     12                 -4
##   attacking_finishing   attacking_heading_accuracy   attacking_short_passing
## 1                  -1                           19                        -9
##   attacking_volleys defending_marking defending_standing_tackle
```

```
## 1                        -1                          -5                                    -5
##    defending_sliding_tackle mentality_aggression mentality_interceptions
## 1                                 -2                               15                               -11
##    mentality_positioning    mentality_penalties    mentality_vision
## 1                                 1                          10                      -12
##    mentality_composure movement_acceleration movement_sprint_speed
## 1                           -1                              -2                                 7
##    movement_agility movement_reactions movement_balance power_shot_power
## 1                     -6                           1                     -24                        9
##    power_jumping power_stamina power_strength power_long_shots
## 1                  27                    10                     10                        -1
```

```r
# Adding values across columns:
sum <- 0
for (i in 1:length(total_diff))
{
 sum <- sum + total_diff[[i]]
}
print(sum)
```

```
## [1] 20
```

```r
# OVERALL RONALDO LEADS MESSI BY 20 POINTS IN NUMERIC STATS.
```