FPL points predictor Exploratory Data Analysis

This is a file for conductiong explorative data analysis of the premier league players' dataset

Importing the datasets

```
season17 <- read.csv("~/DSI-SRP1/season17.csv", encoding="UTF-8")
season18 <- read.csv("~/DSI-SRP1/season18.csv", encoding="UTF-8")
season19 <- read.csv("~/DSI-SRP1/season19.csv", encoding="UTF-8")
```

Loading the tidyverse package

```
library(tidyverse)
```

```
## -- Attaching packages ---------------------------------------- tidyverse 1.3.0 --

## v ggplot2 3.3.0     v purrr   0.3.4
## v tibble  3.0.1     v dplyr   0.8.5
## v tidyr   1.0.3     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0

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

Calculating correlation coefficients between goal scored and total FPL points

```
message("Correlation between goal scored and total fpl points for 2016/17: ",
        with(season17, cor(goals_scored,total_points)))
```

```
## Correlation between goal scored and total fpl points for 2016/17: 0.700148307138786
```

```
message("Correlation between goal scored and total fpl points for 2017/18: ",
        with(season18, cor(goals_scored,total_points)))
```

```
## Correlation between goal scored and total fpl points for 2017/18: 0.679586851190284
```

```
message("Correlation between goal scored and total fpl points for 2018/19: ",
        with(season19, cor(goals_scored,total_points)))
```

```
## Correlation between goal scored and total fpl points for 2018/19: 0.703249889002981
```

Changing the datatype of the position_index to factor

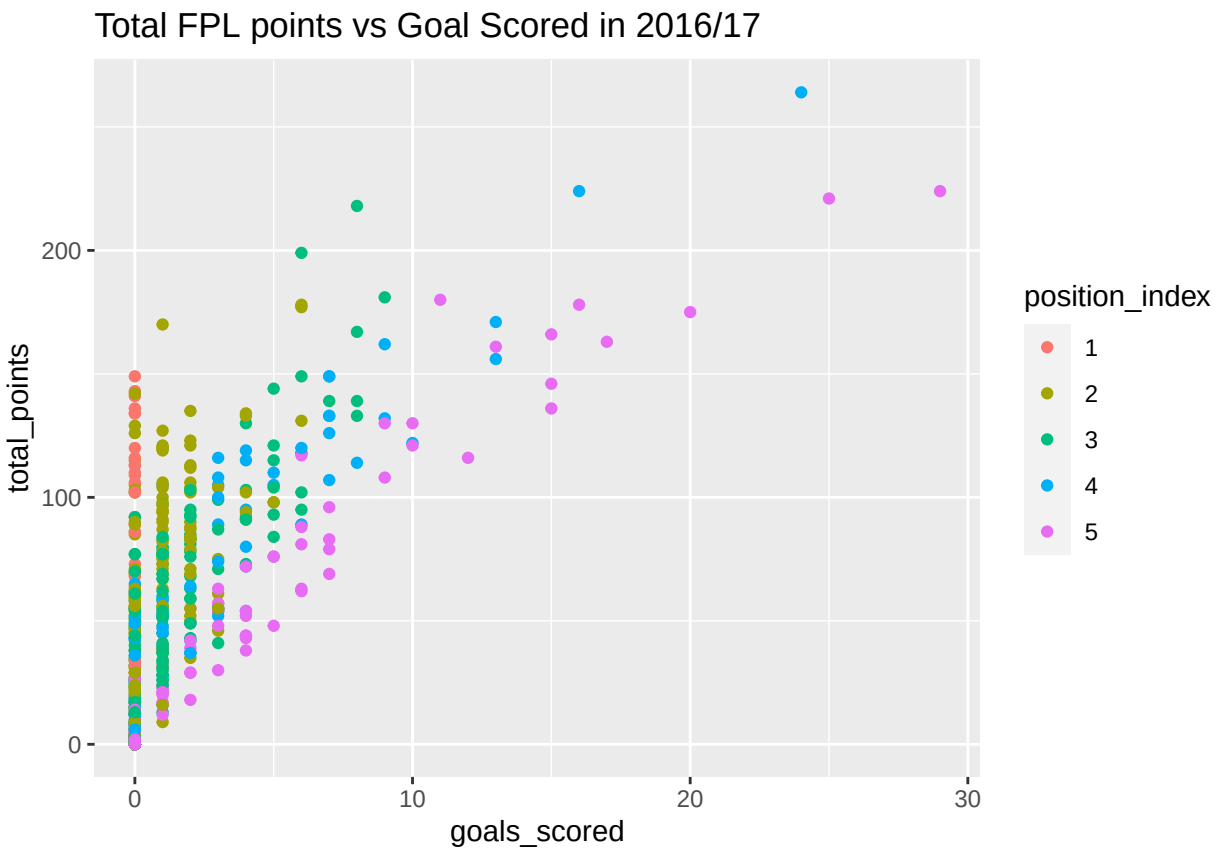
```
season17$position_index <- as_factor(season17$position_index)
season18$position_index <- as_factor(season18$position_index)
season19$position_index <- as_factor(season19$position_index)
```

Creating a funtion to calculate a new metric called total fpl points to game played

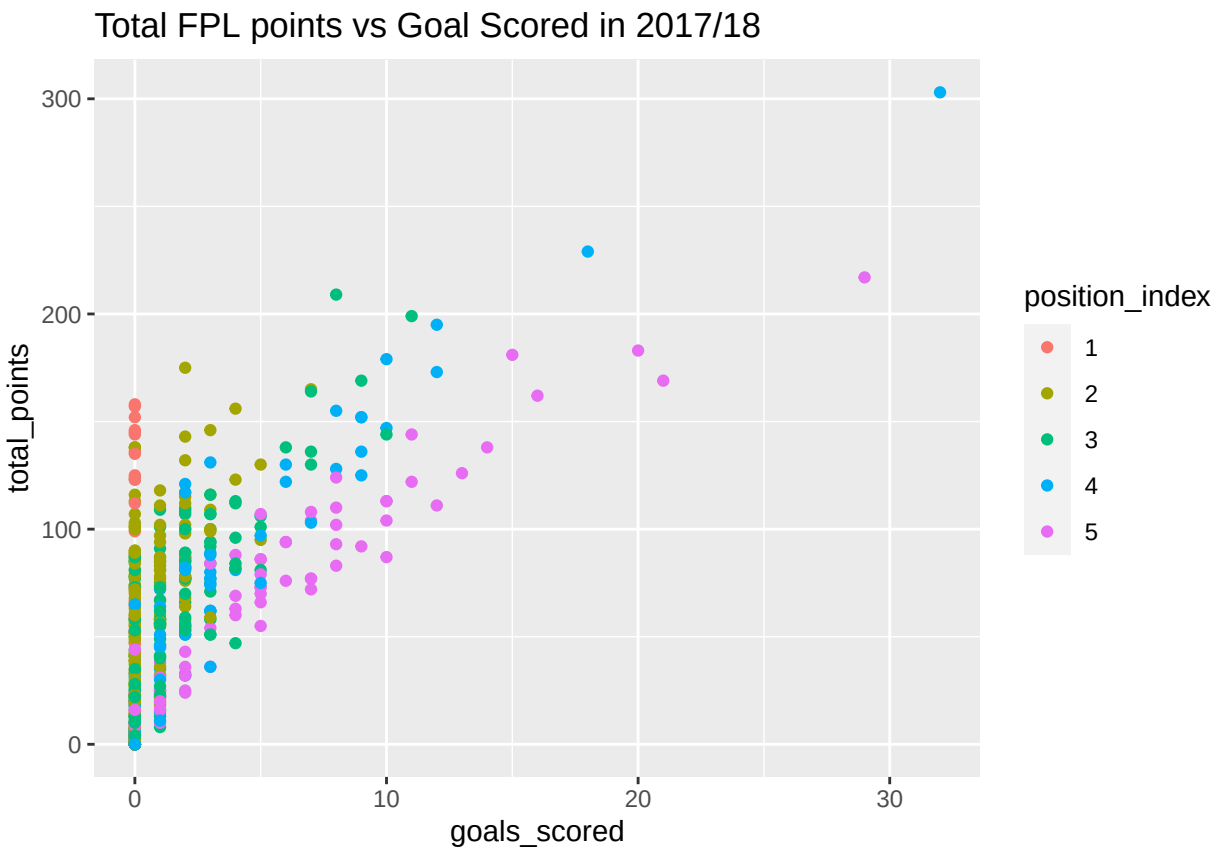
```
fpl_to_gaming <- function(df) {
  df %>%
    mutate(fpl_to_game = (total_points/minutes.played)*90)
}
season17 <- fpl_to_gaming(season17)
season18 <- fpl_to_gaming(season18)
season19 <- fpl_to_gaming(season19)
```

Scatter plots graph to highlight how the goals scored vary with fpl points

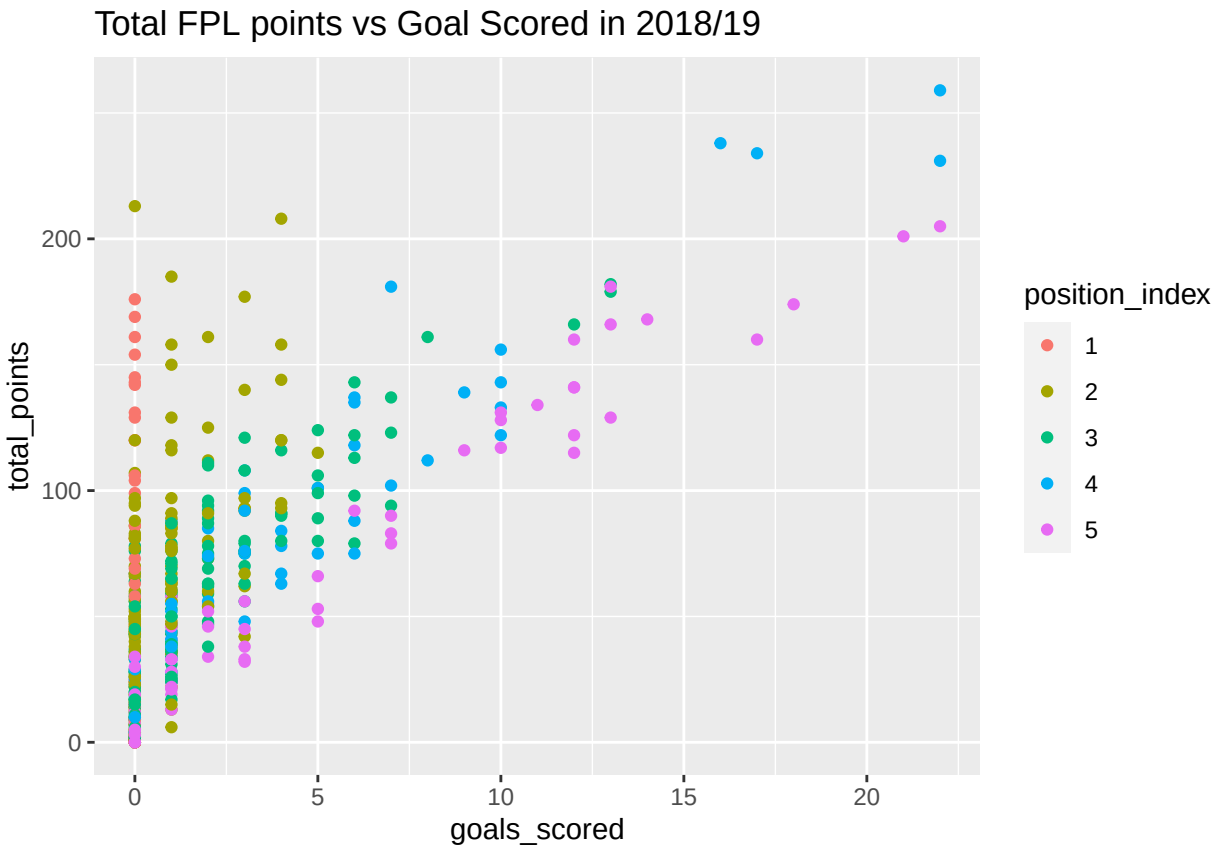
```
ggplot(season17, aes(goals_scored, total_points)) +
  geom_point(aes(color = position_index)) +
  labs(title = "Total FPL points vs Goal Scored in 2016/17")
```




```
ggplot(season18, aes(goals_scored, total_points)) +
  geom_point(aes(color = position_index)) +
  labs(title = "Total FPL points vs Goal Scored in 2017/18")
```




```
ggplot(season19, aes(goals_scored, total_points)) +
  geom_point(aes(color = position_index)) +
  labs(title = "Total FPL points vs Goal Scored in 2018/19")
```

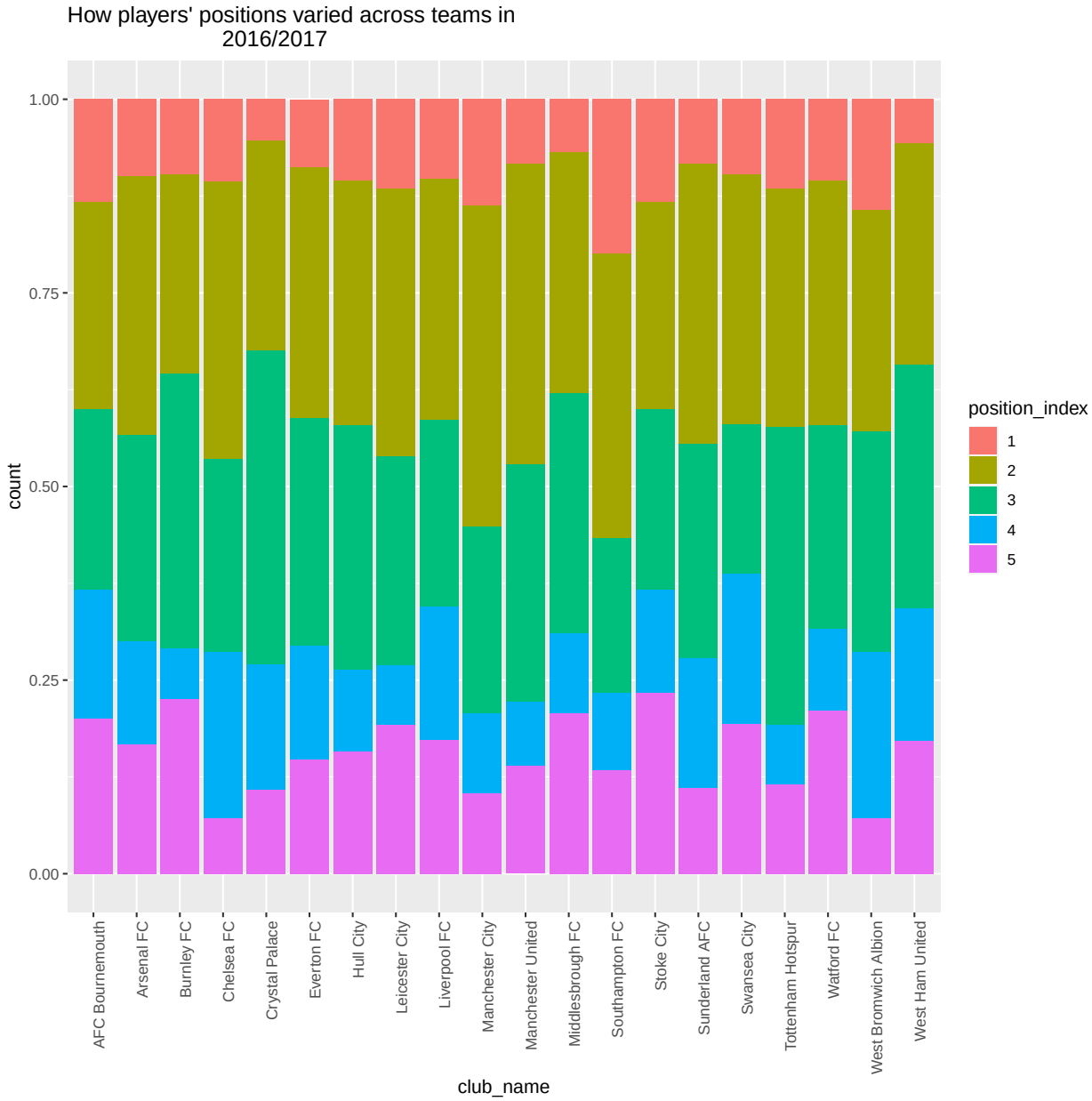


Bar graphs to show how the number of players vary per team with regards to position

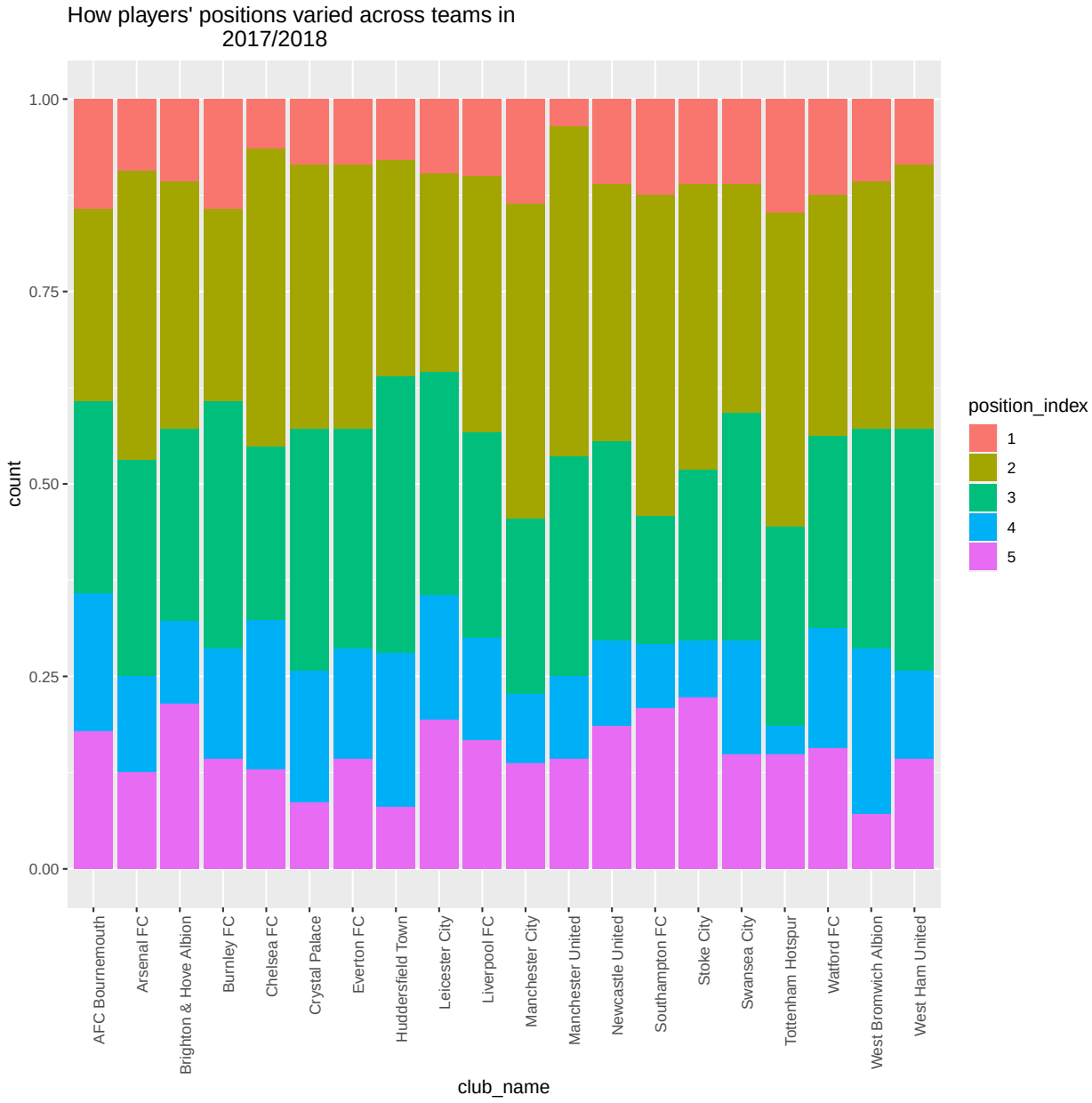
```
position_bar <- function(df) {
  df %>%
    ggplot(aes(club_name)) +
    geom_bar(aes(fill = position_index),position = "fill") +
    theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
    labs(title = sprintf("How players' positions varied across teams in
                         %s", unique(df$season)))
}
```

Plotting the bar charts

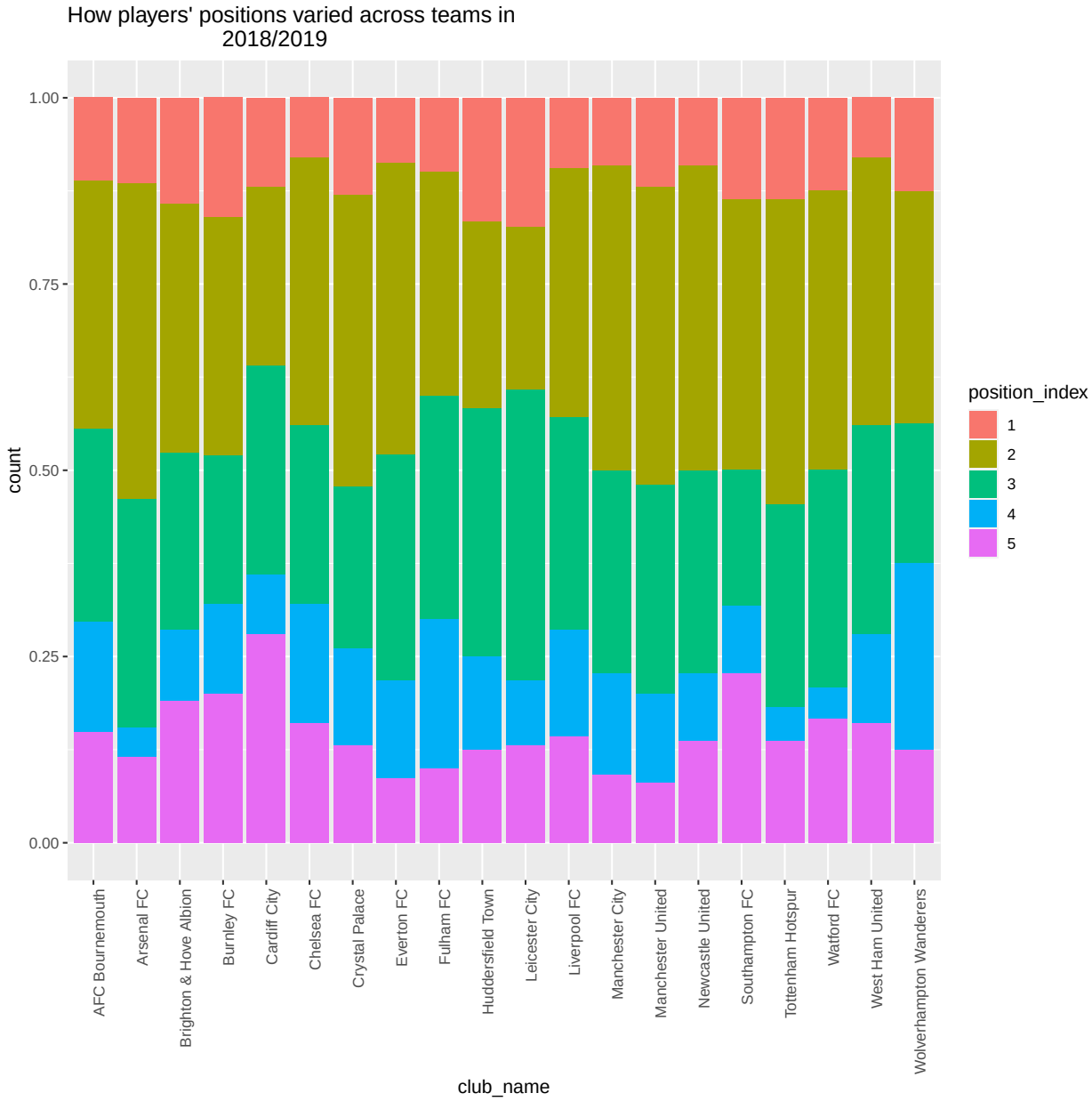
```
position_bar(season17)
```




```
position_bar(season18)
```




```
position_bar(season19)
```

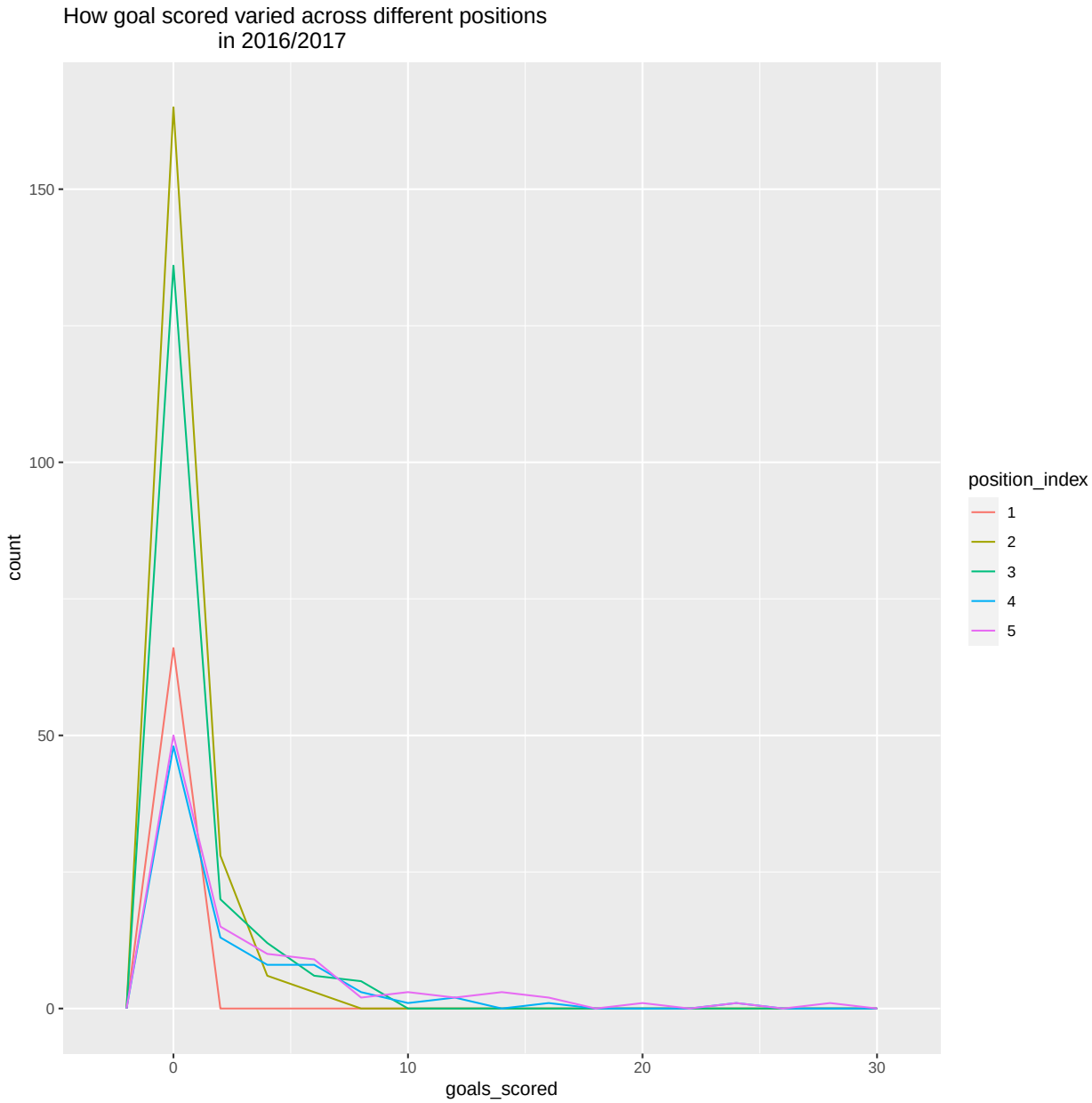


Creating frequency plot for goal scored and how it varies for the players' position

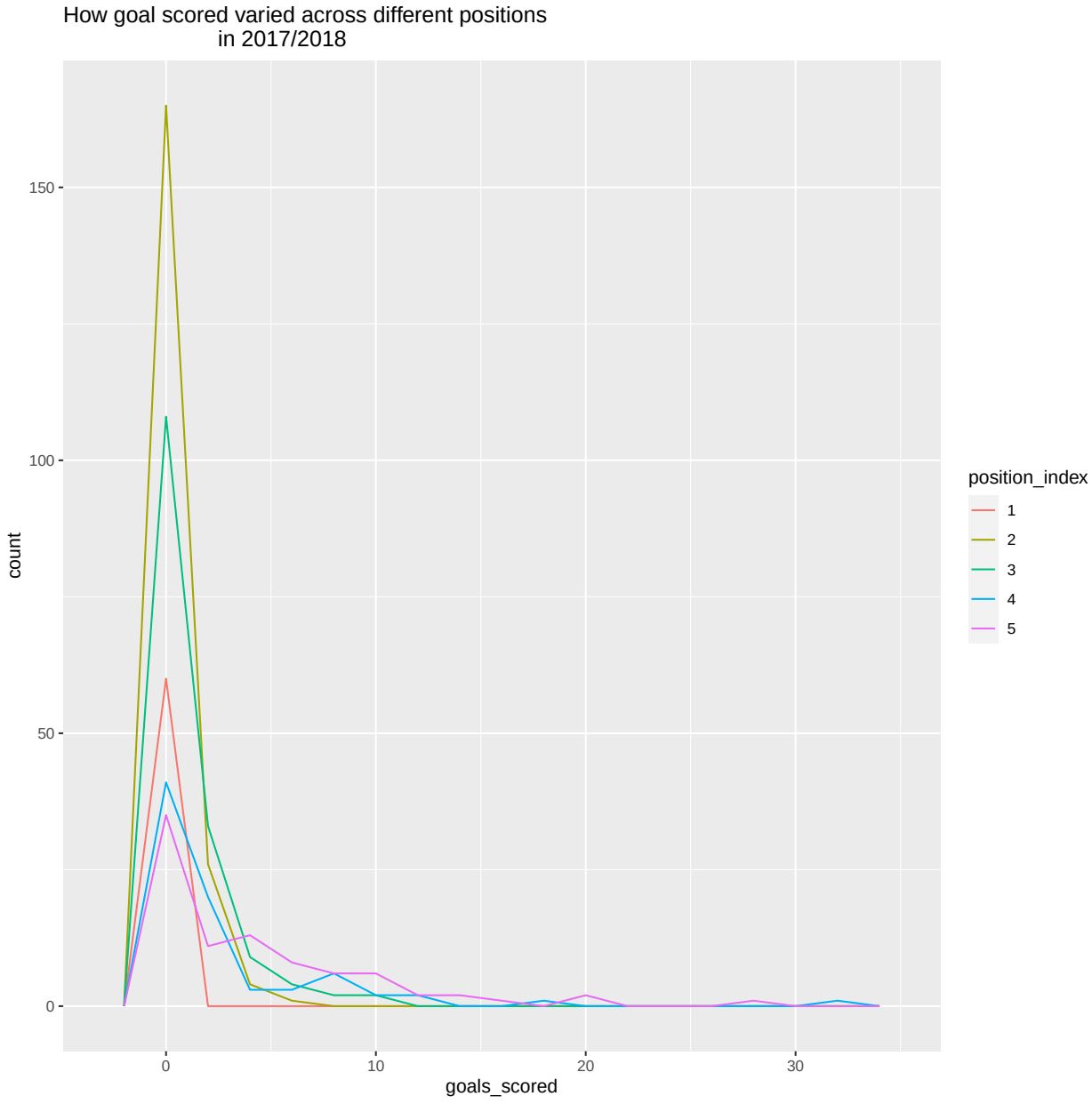
```
goal_freqplot <- function(df) {
  df %>%
    ggplot(aes(x = goals_scored)) +
    geom_freqpoly(aes(color = position_index), binwidth = 2) +
    labs(title = sprintf("How goal scored varied across different positions
                         in %s", unique(df$season)))
}
```

Plotting the graphs

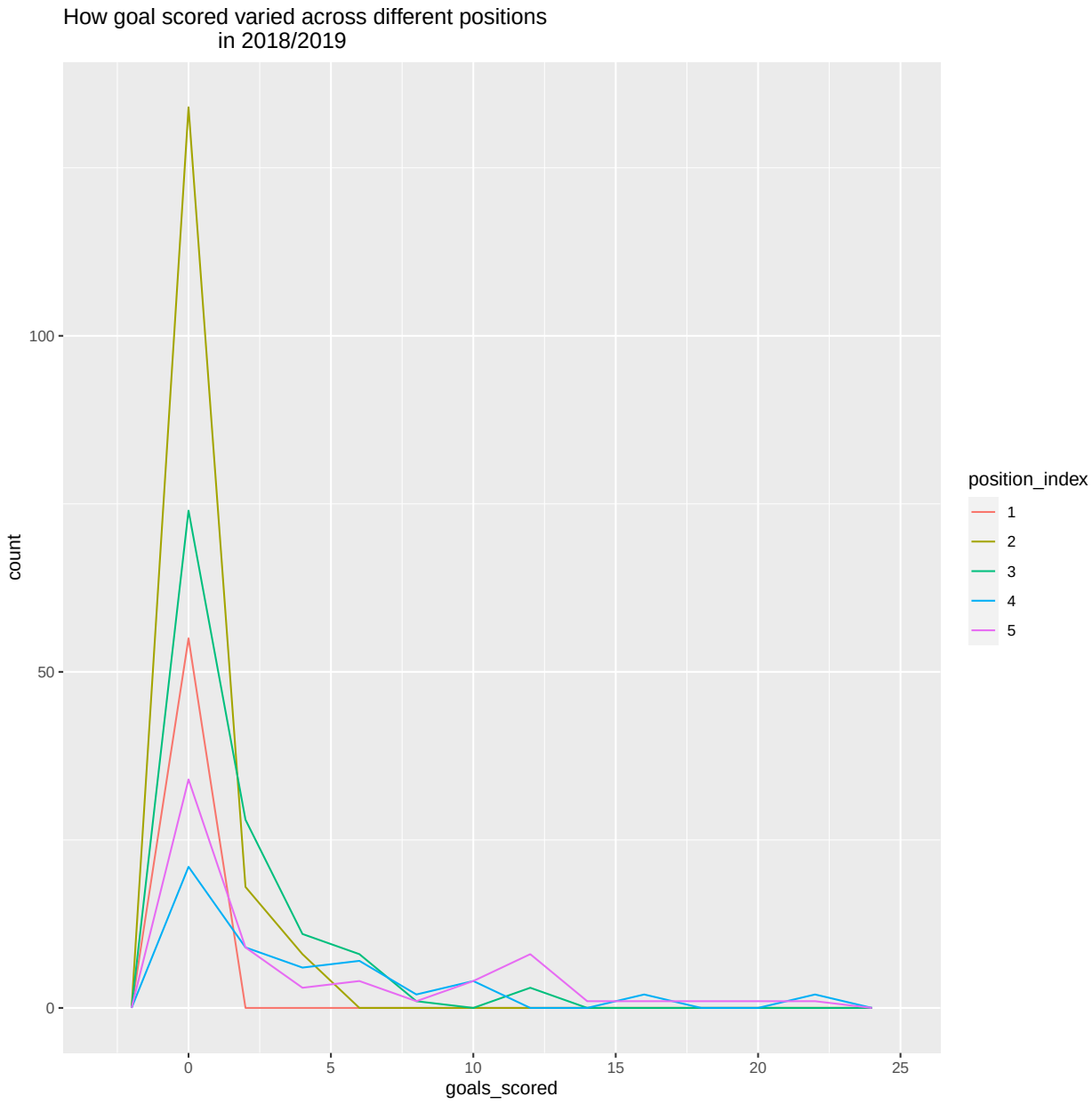
```
goal_freqplot(season17)
```




```
goal_freqplot(season18)
```




```
goal_freqplot(season19)
```

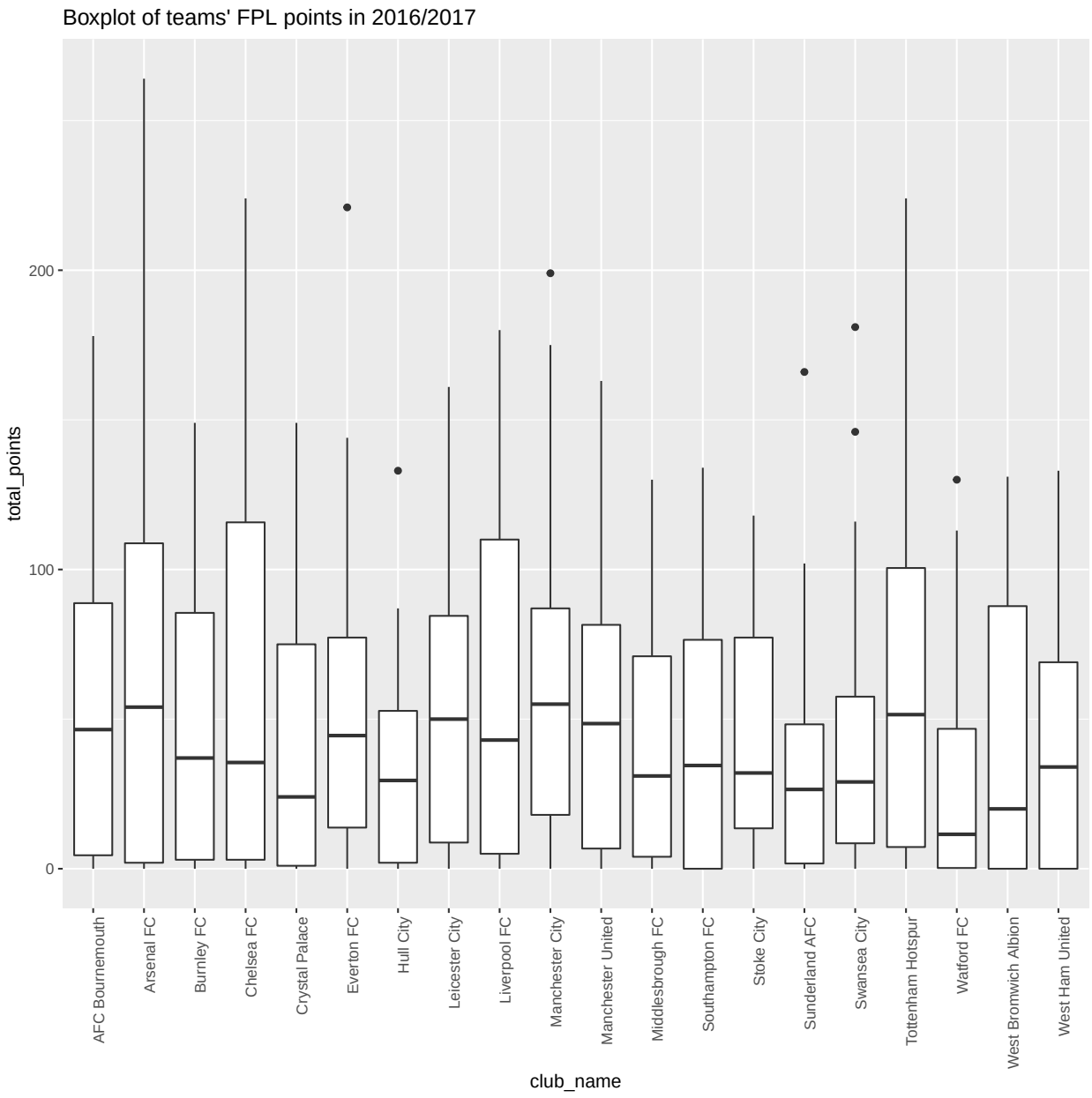


Creating boxplots to show the distiribution of the teams' fpl points according to their players

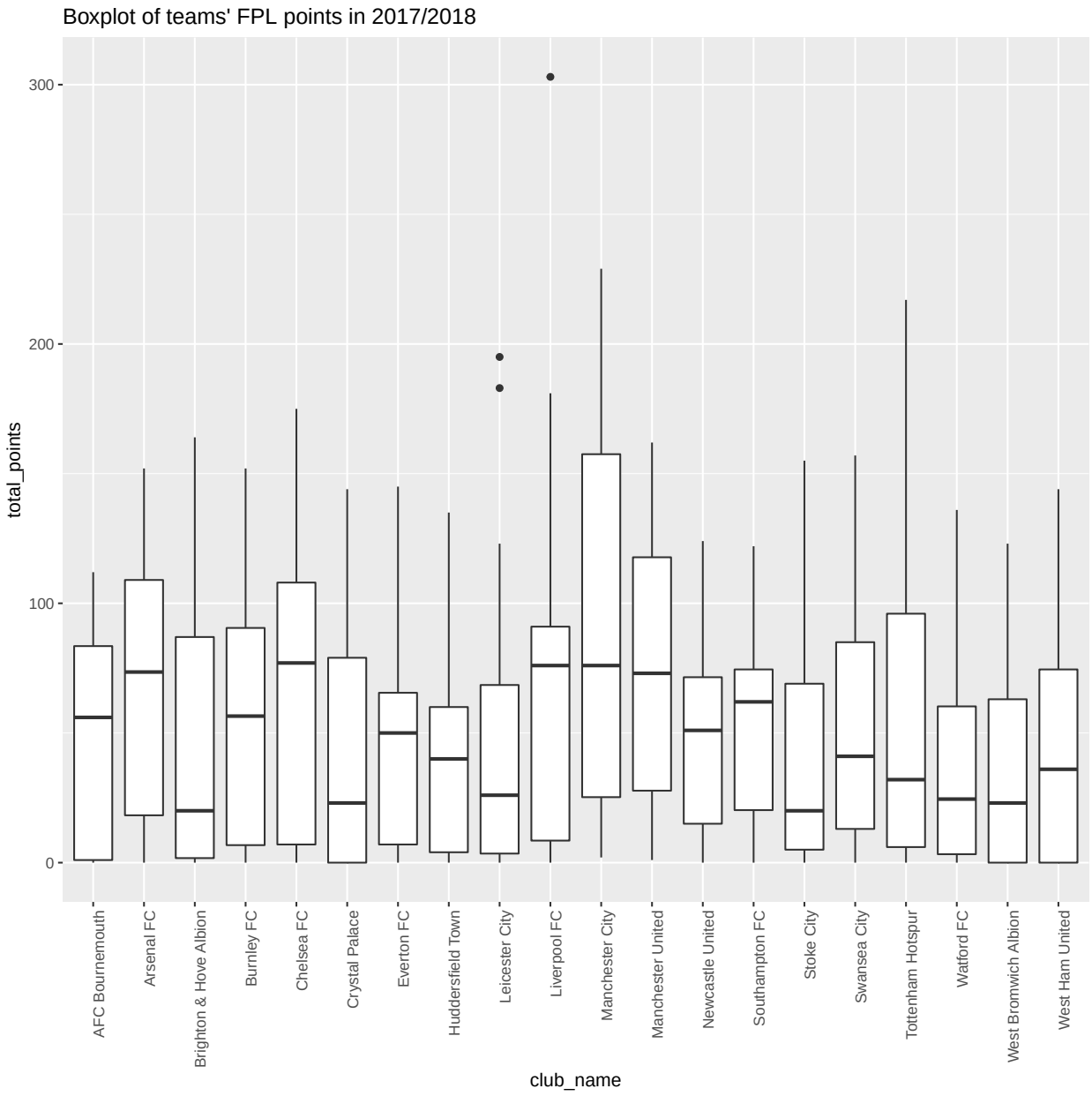
```
boxplot_fpl <- function(df) {
  df %>%
    ggplot() +
    geom_boxplot(aes(x = club_name, y = total_points), na.rm = TRUE)+
    theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
    labs(title = sprintf("Boxplot of teams' FPL points in %s",
                         unique(df$season)))
}
```

Plotting the graphs

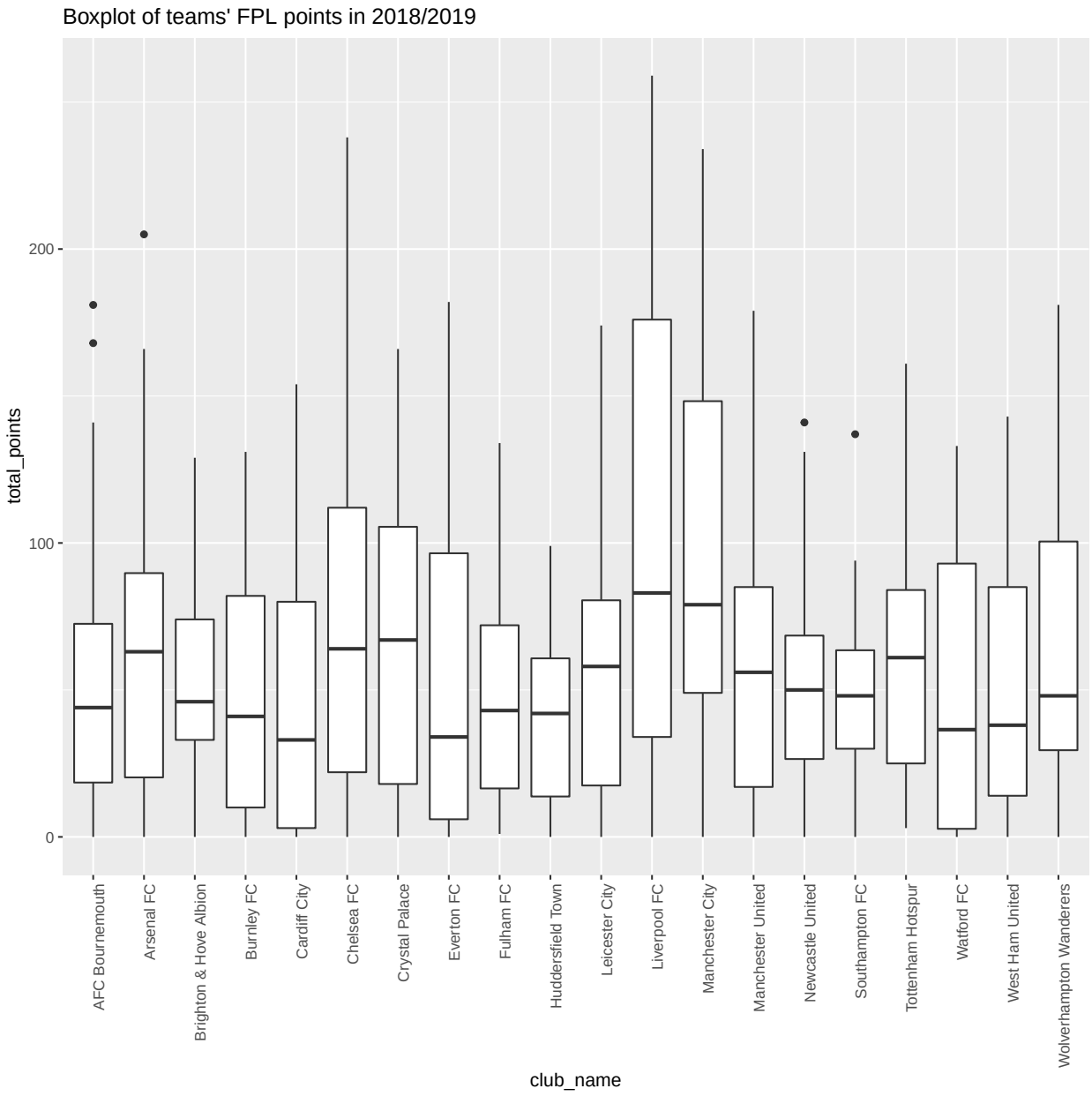
```
boxplot_fpl(season17)
```




```
boxplot_fpl(season18)
```

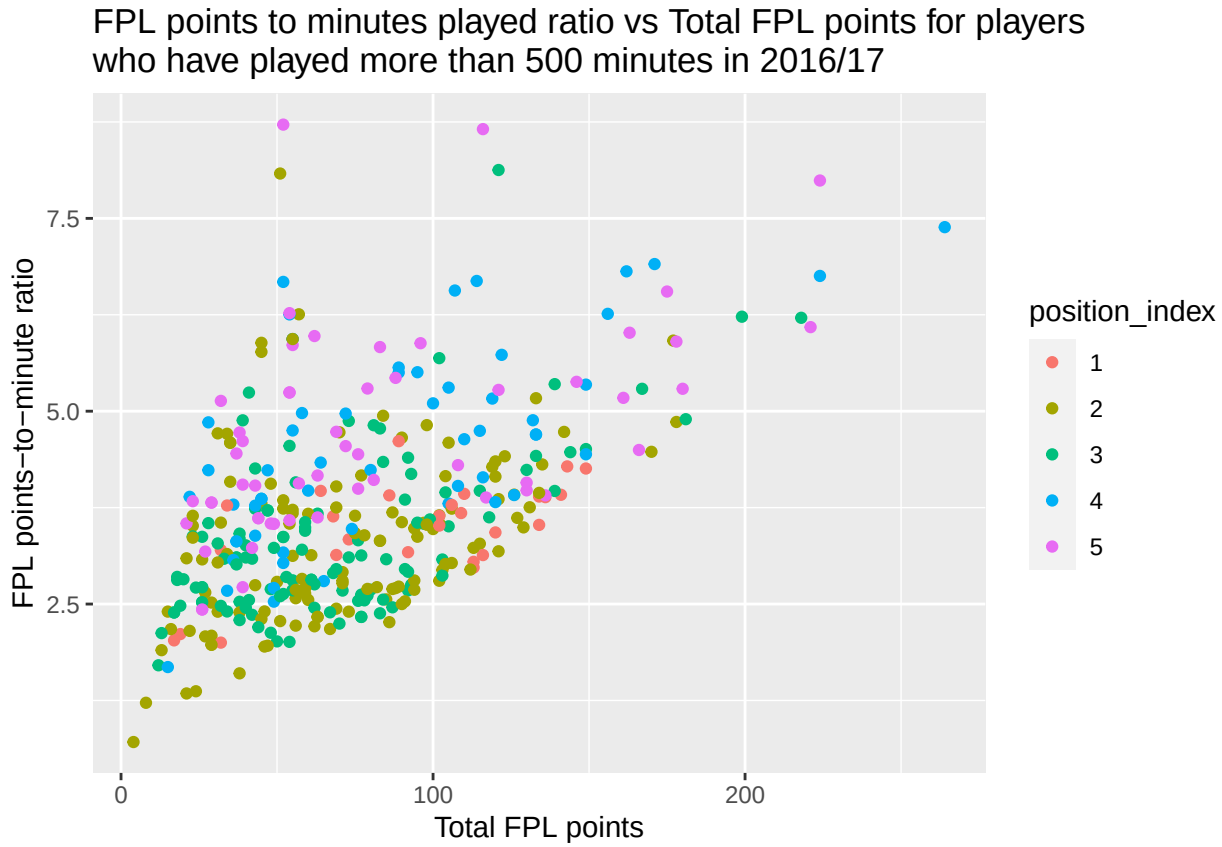



```
boxplot_fpl(season19)
```

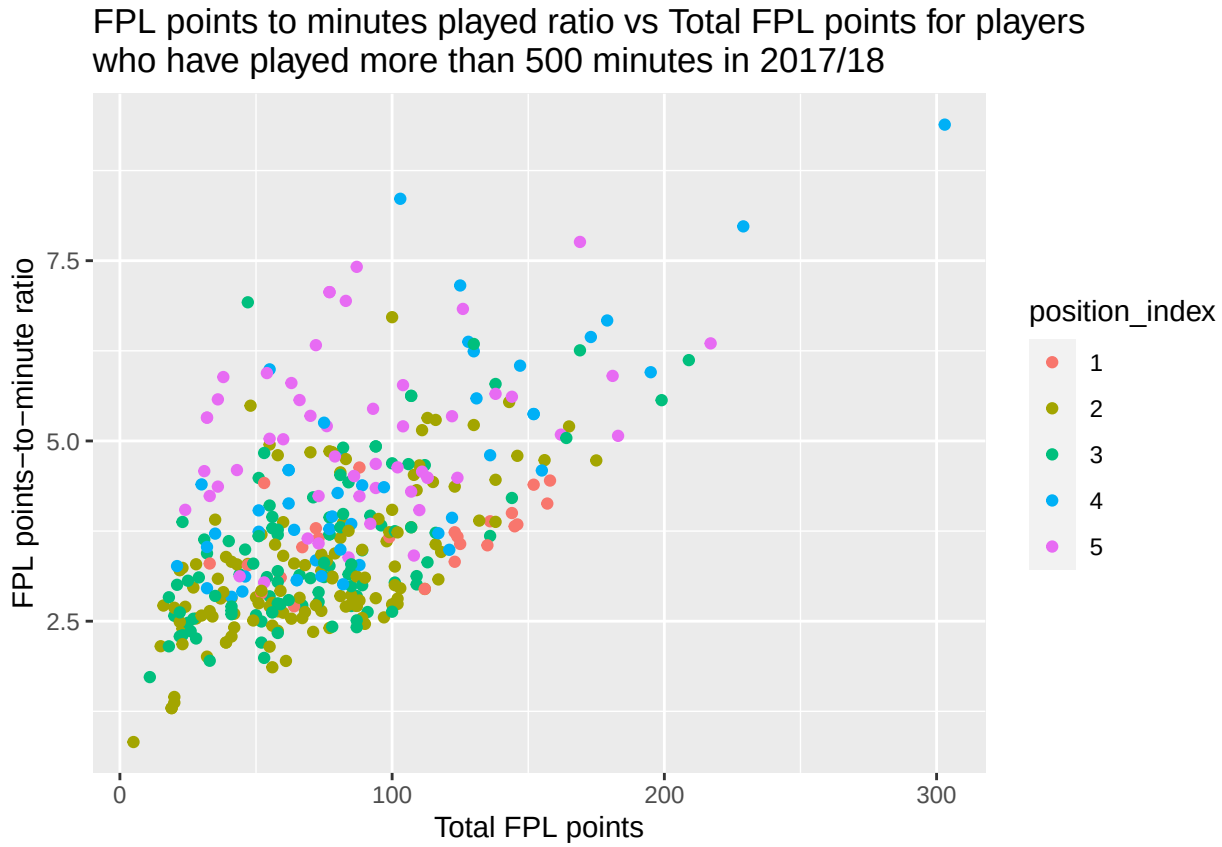


Scatter plots showing the FPL points to game ratio vs the total FPL points for each season

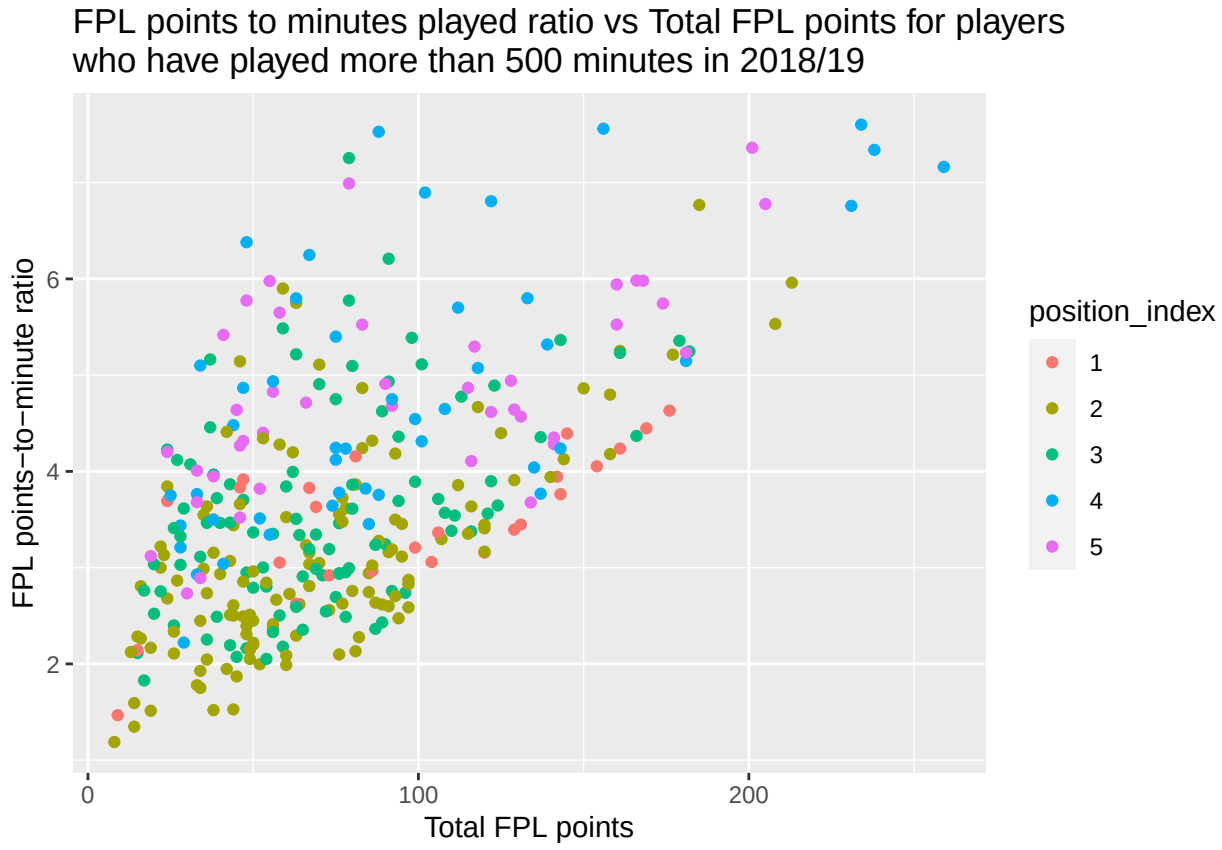
```
season17 %>%
  filter(minutes.played >= 500) %>%
  ggplot() +
  geom_point(aes(total_points, fpl_to_game, color = position_index), na.rm = TRUE) +
  labs(x = "Total FPL points", y = "FPL points-to-minute ratio",
  title = title1)
```




```
season18 %>%
  filter(minutes.played >= 500) %>%
  ggplot() +
  geom_point(aes(total_points, fpl_to_game, color = position_index), na.rm = TRUE) +
  labs(x = "Total FPL points", y = "FPL points-to-minute ratio",
  title = title2)
```



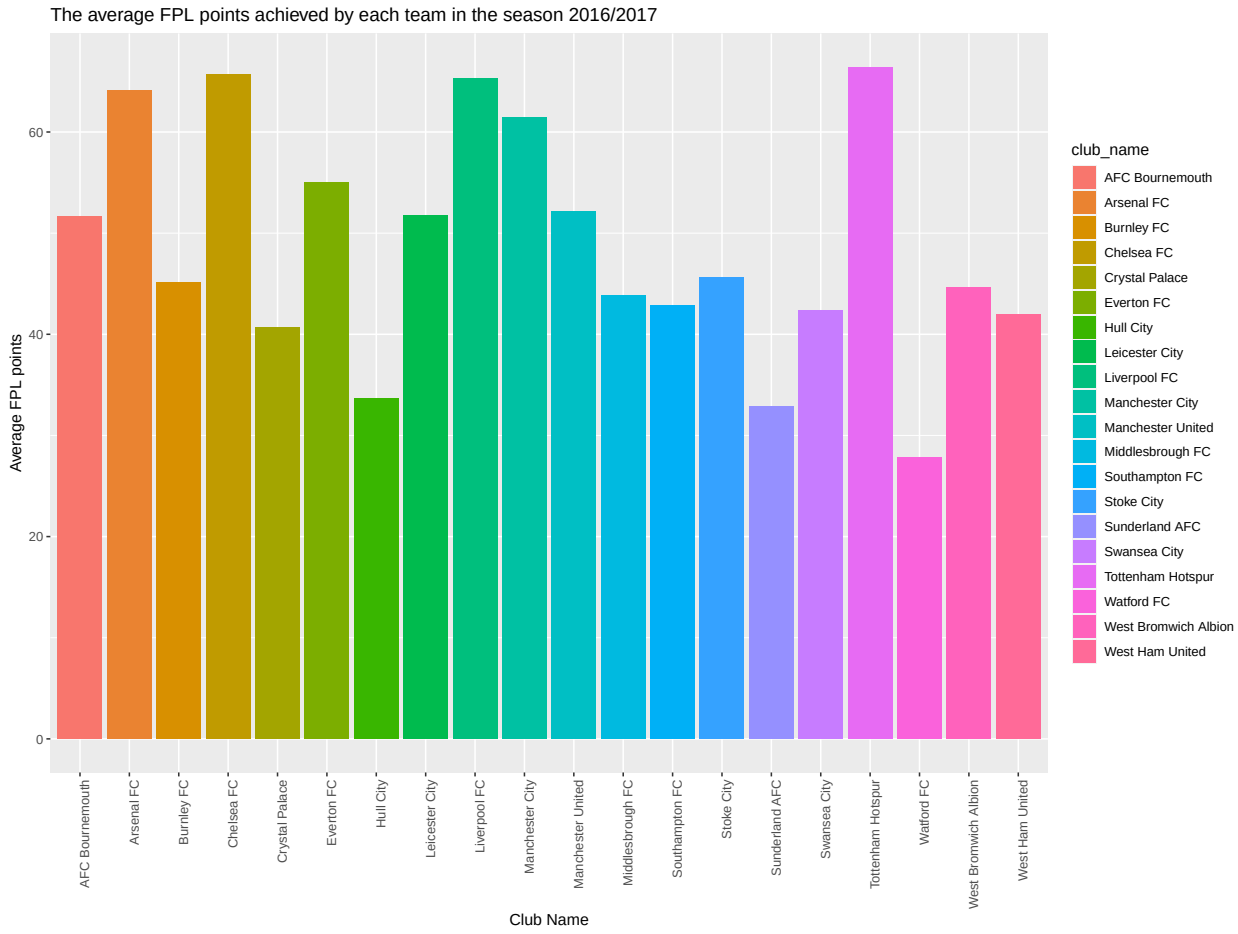

```
season19 %>%
  filter(minutes.played >= 500) %>%
  ggplot() +
  geom_point(aes(total_points, fpl_to_game, color = position_index), na.rm = TRUE) +
  labs(x = "Total FPL points", y = "FPL points-to-minute ratio",
       title = title3)
```



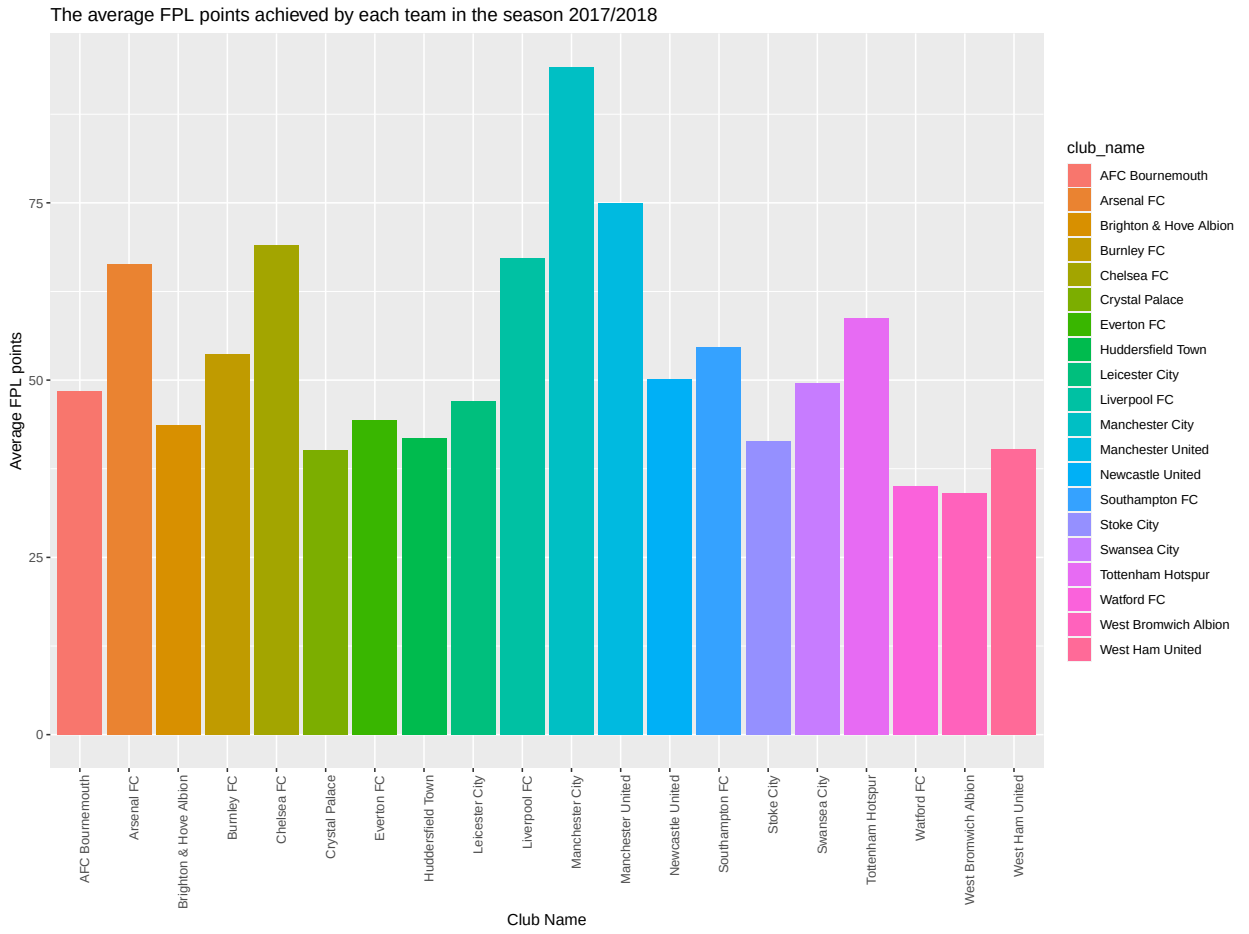
Calculating the average fpl points per team and building a bar chart to show the average fpl points per team

```
avg_fpl_point <- function(df) {
  df %>%
    group_by(club_name) %>%
    summarize(average = mean(total_points, na.rm = TRUE)) %>%
    ggplot() +
    geom_bar(aes(x = club_name, y = average, fill = club_name), stat = "identity") +
    theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
    labs(x = "Club Name", y = "Average FPL points",
    title = sprintf("The average FPL points achieved by each team in the season %s",
    unique(df$season)))
}
```

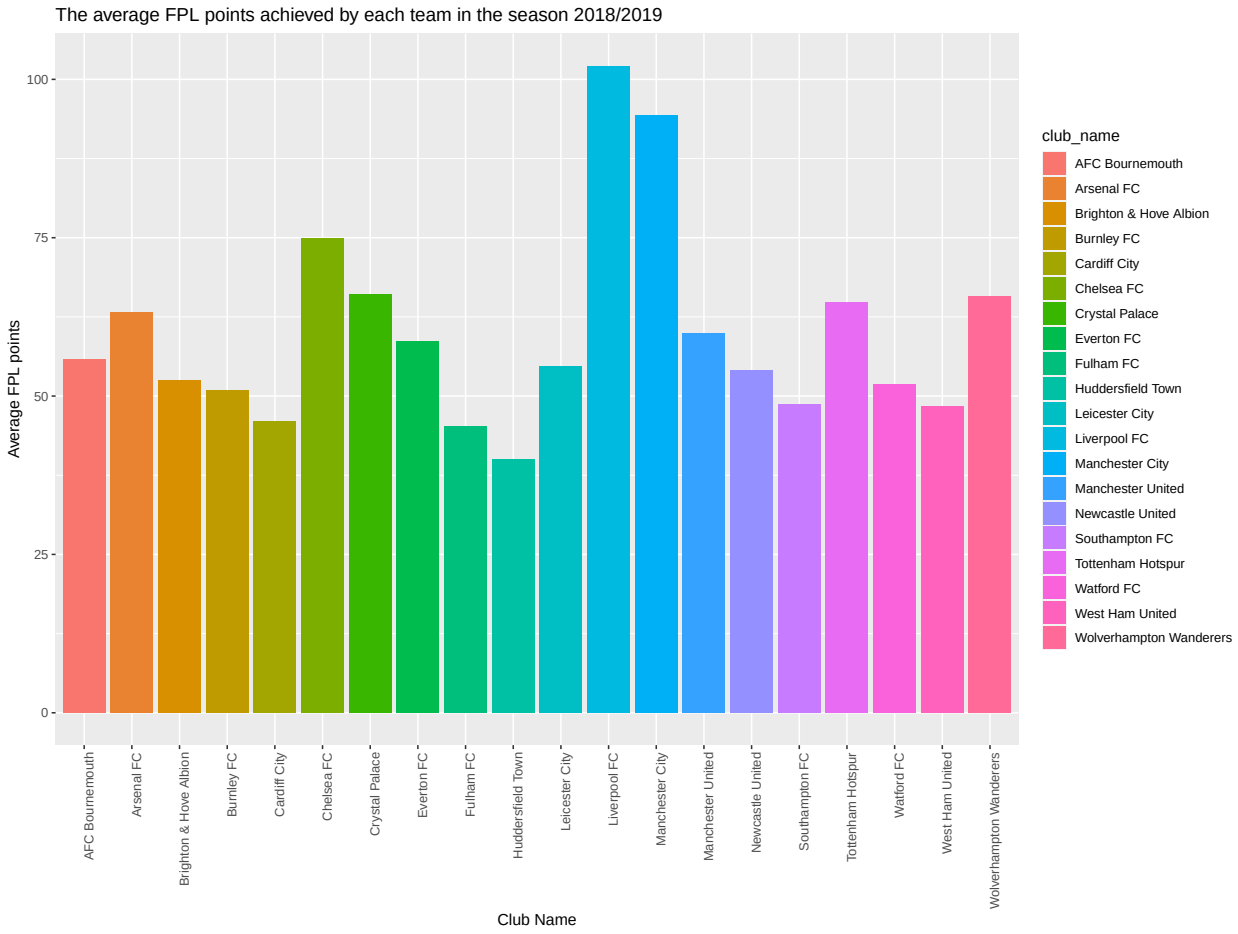
```
avg_fpl_point(season17)
```




```
avg_fpl_point(season18)
```



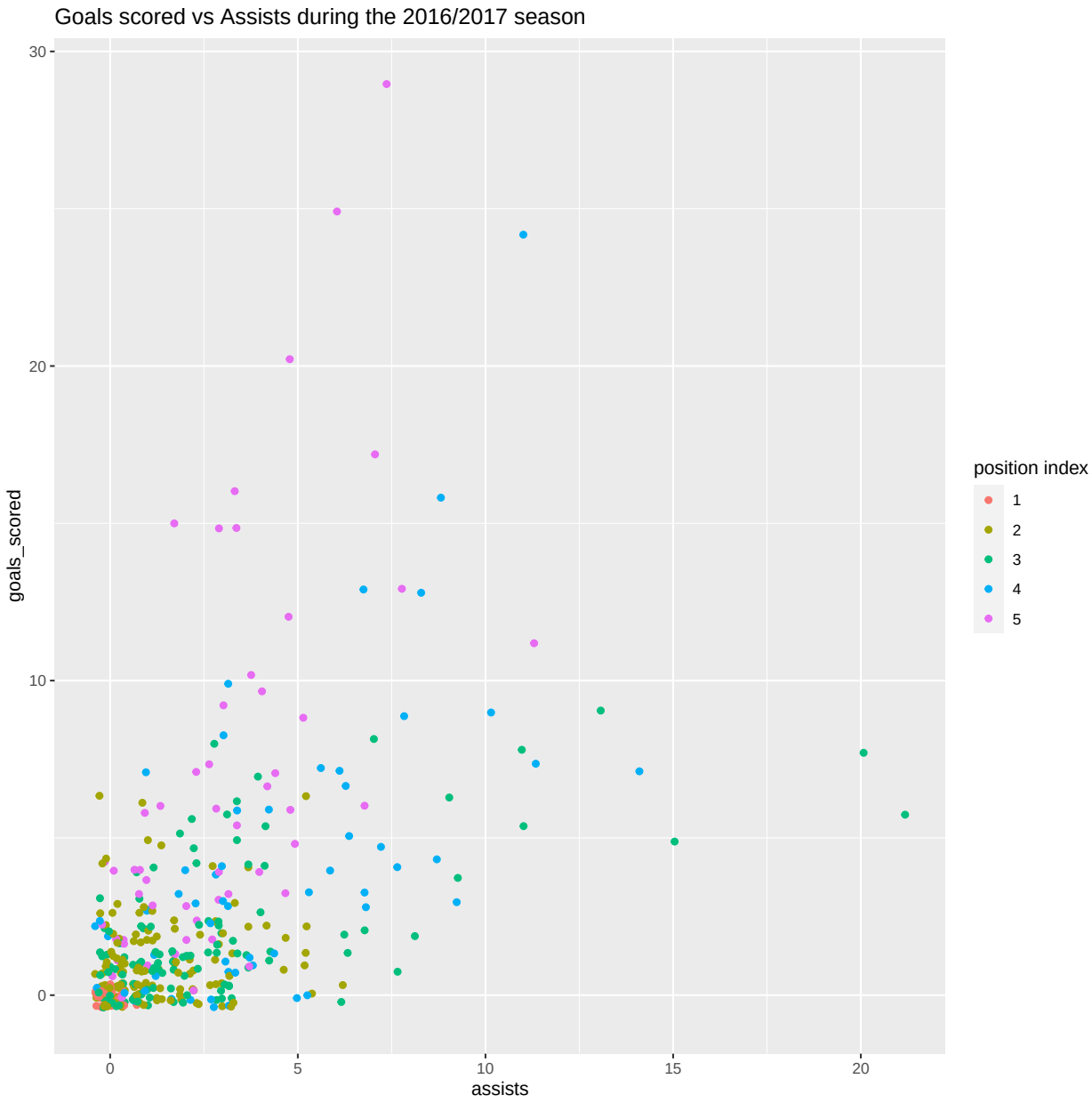

```
avg_fpl_point(season19)
```



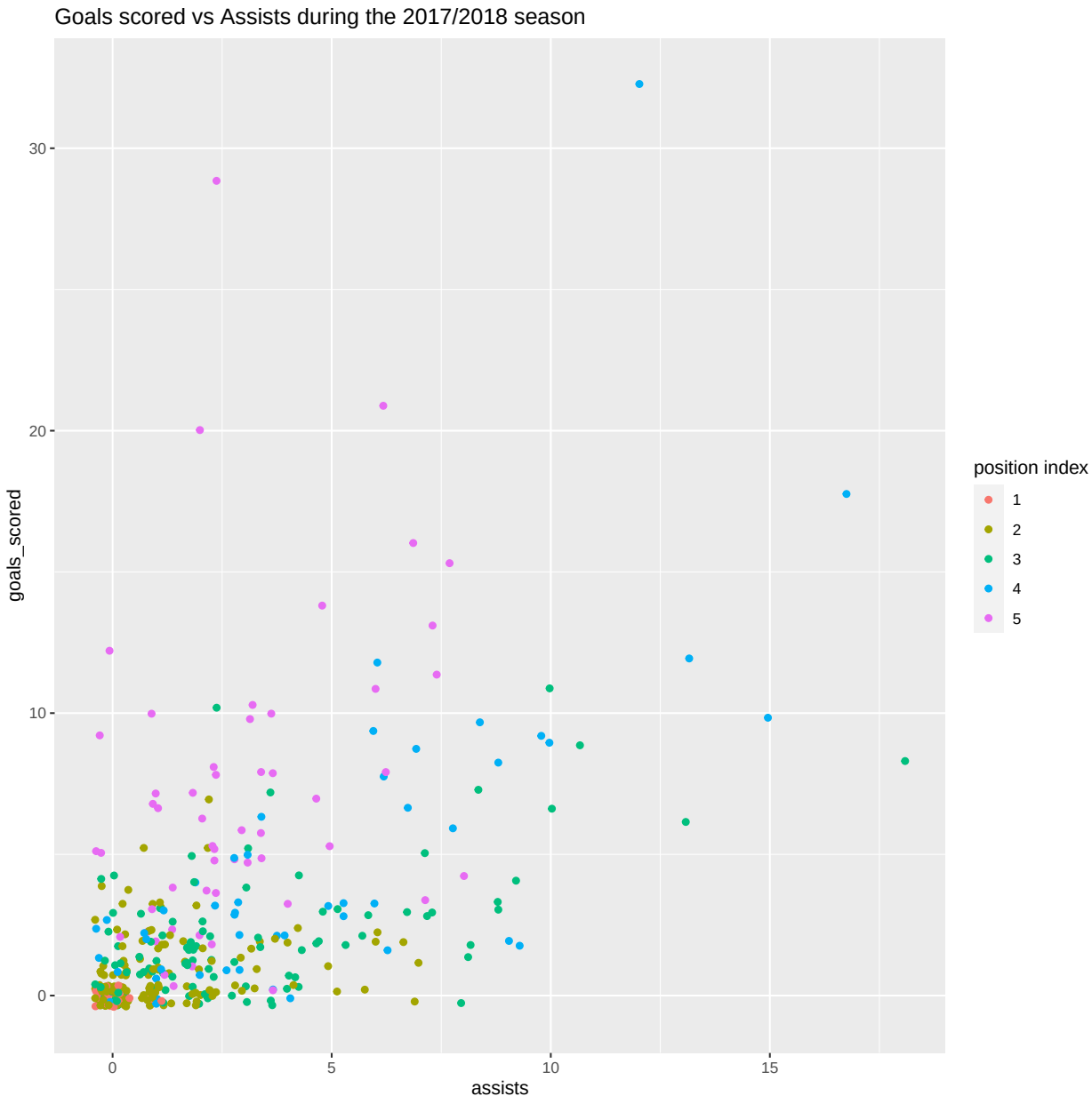
Plotting graphs of goals scored vs assists made for every season

```
goals_vs_assist <- function(df) {
  df %>%
    filter(minutes.played >= 500) %>%
    ggplot(aes(assists, goals_scored)) +
    geom_point(aes(color = position_index), position = "jitter") +
    labs(title = sprintf("Goals scored vs Assists during the %s season",
    unique(df$season)), color = "position index")
}
```

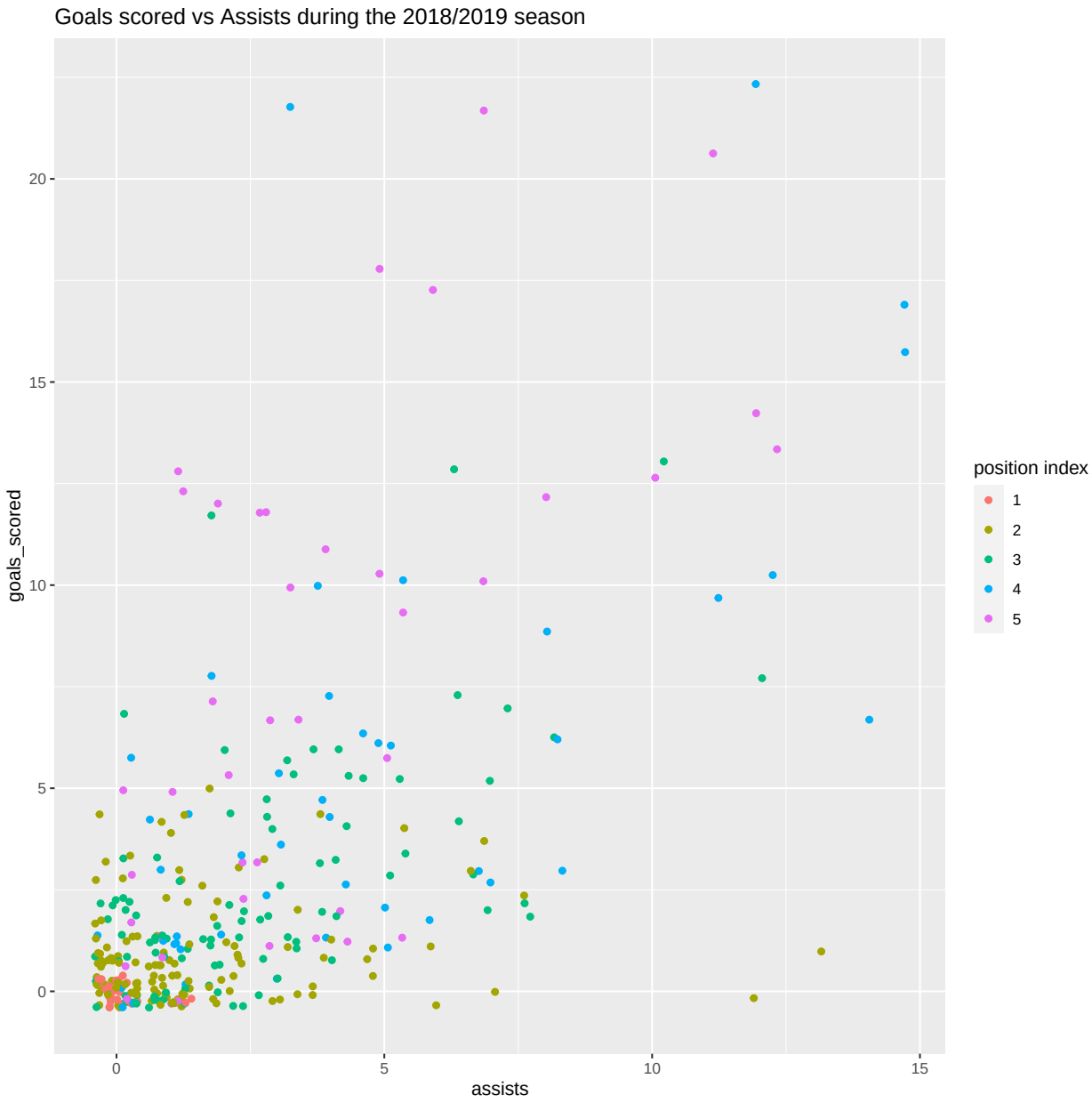
```
goals_vs_assist(season17)
```




```
goals_vs_assist(season18)
```




```
goals_vs_assist(season19)
```



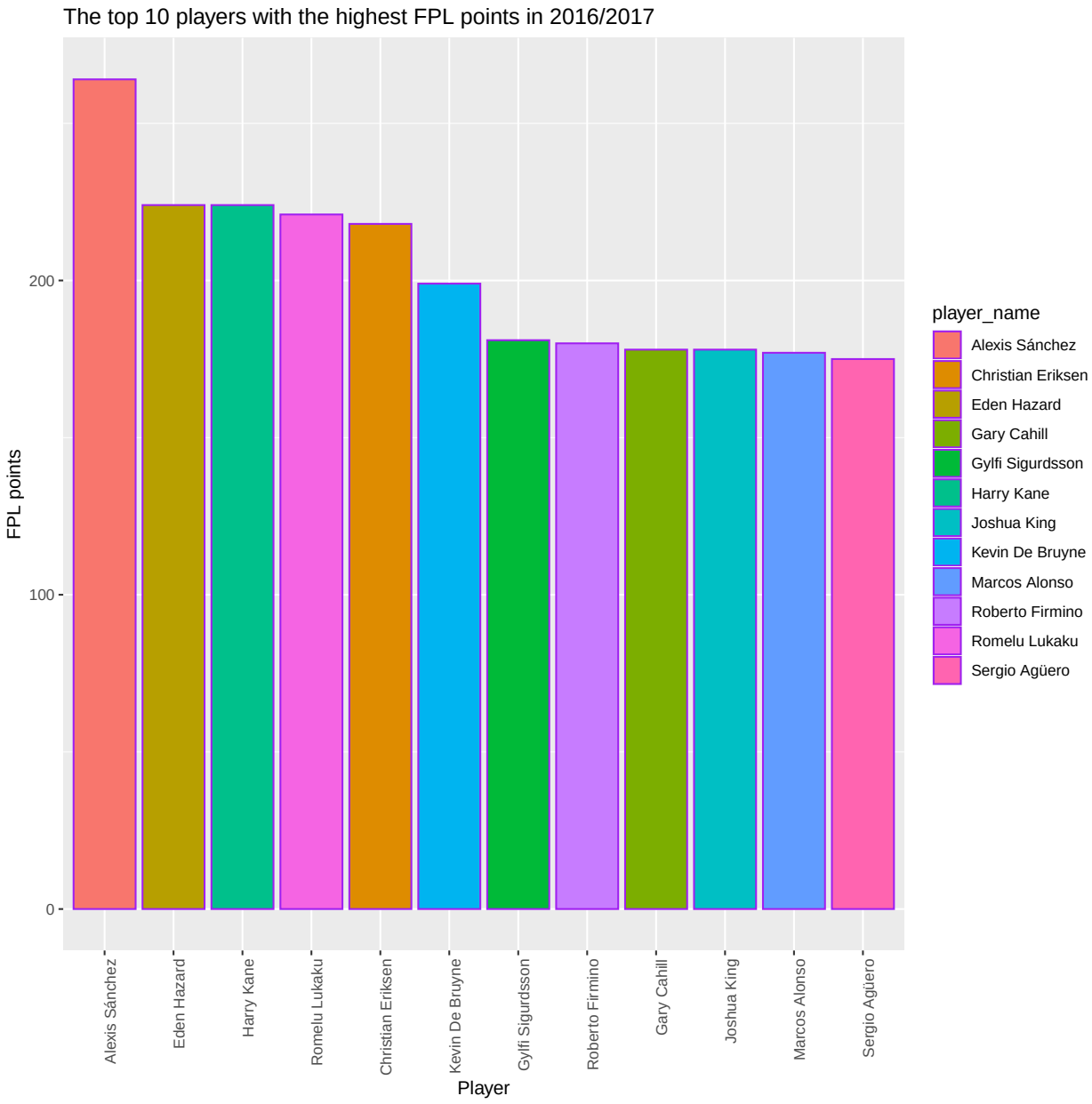
Ranking the players with the top 10 fpl points per season

```
fpl_point_rank <- function(df) {
  df %>%
    mutate(ranking = dense_rank(desc(total_points))) %>%
    filter(ranking <= 10) %>%
    arrange(desc(total_points)) %>%
    select(ranking, player_name, total_points) %>%
    print() %>%
    ggplot(aes(reorder(player_name, -total_points), total_points, fill = player_name)) +
    geom_bar(stat = "identity", color = "purple") +
    theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
```

```
    labs(title = sprintf("The top 10 players with the highest FPL points in %s",
    unique(df$season)), x = "Player", y = "FPL points")
}
```

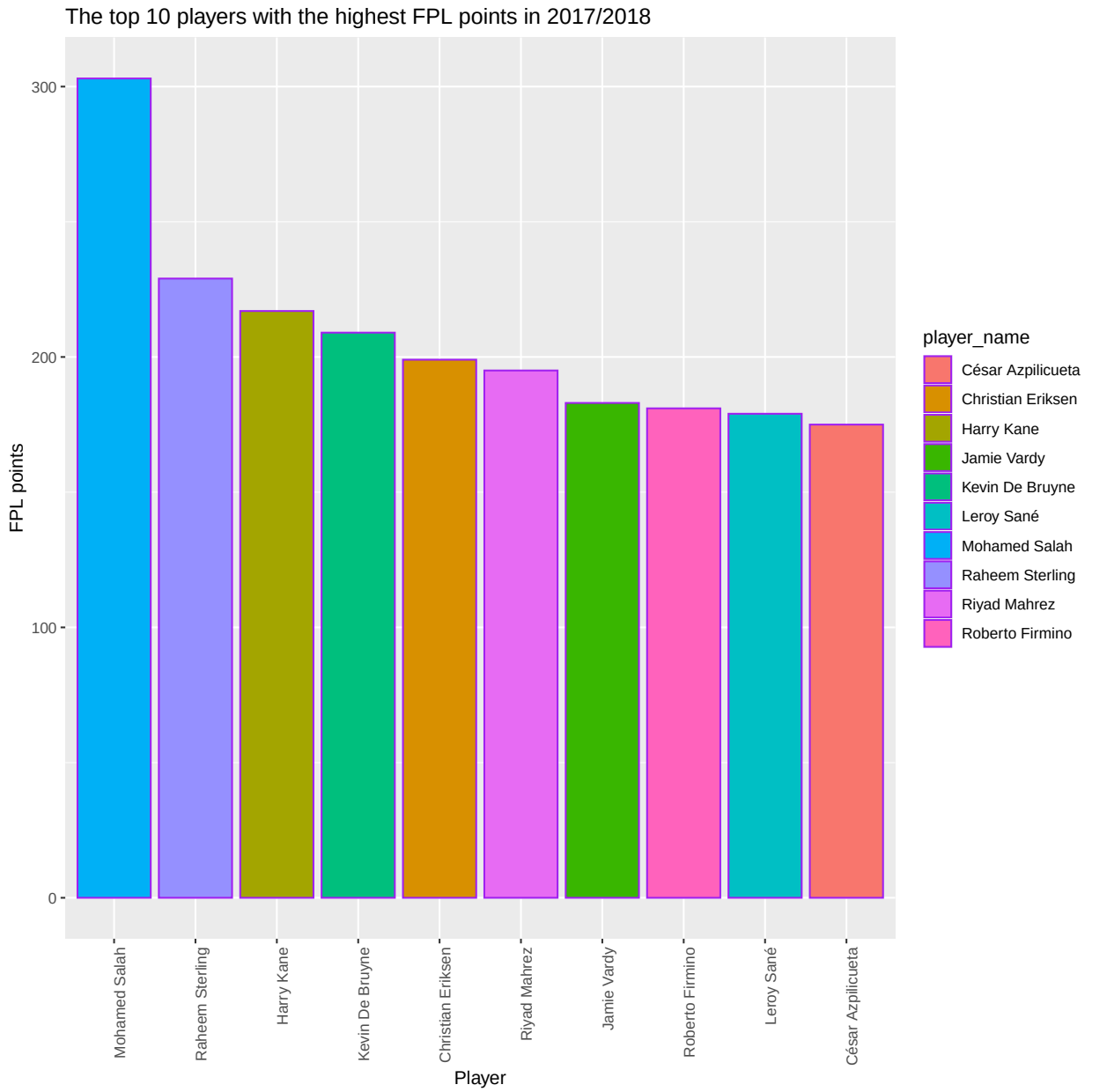
```
fpl_point_rank(season17)
```

```
##    ranking       player_name total_points
## 1        1    Alexis Sánchez          264
## 2        2       Eden Hazard          224
## 3        2        Harry Kane          224
## 4        3     Romelu Lukaku          221
## 5        4 Christian Eriksen          218
## 6        5   Kevin De Bruyne          199
## 7        6  Gylfi Sigurdsson          181
## 8        7   Roberto Firmino          180
## 9        8       Gary Cahill          178
## 10       8       Joshua King          178
## 11       9     Marcos Alonso          177
## 12      10     Sergio Agüero          175
```



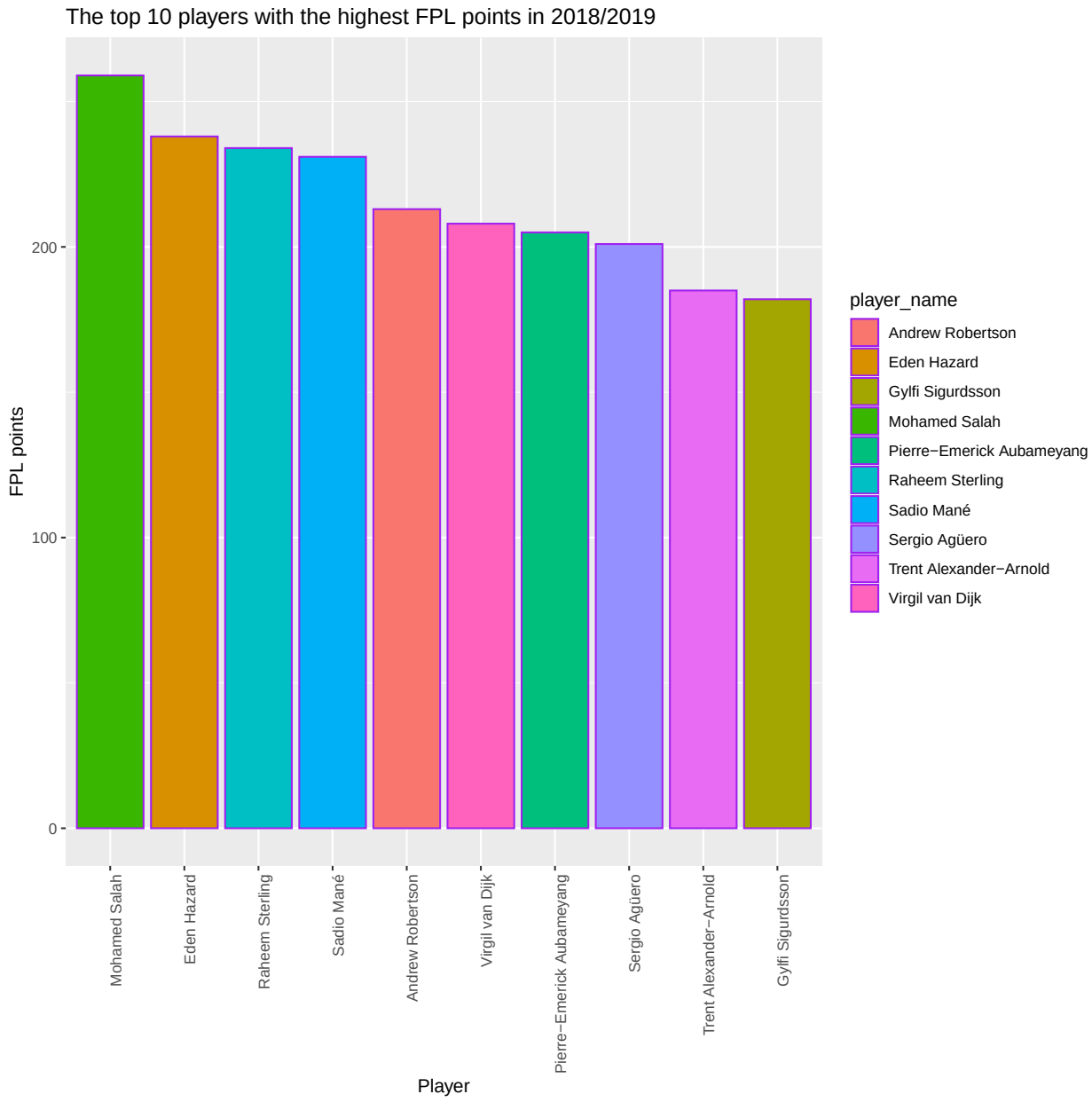

```
fpl_point_rank(season18)
```

```
##    ranking       player_name total_points
## 1        1     Mohamed Salah          303
## 2        2   Raheem Sterling          229
## 3        3        Harry Kane          217
## 4        4   Kevin De Bruyne          209
## 5        5 Christian Eriksen          199
## 6        6      Riyad Mahrez          195
## 7        7       Jamie Vardy          183
## 8        8   Roberto Firmino          181
## 9        9        Leroy Sané          179
## 10      10 César Azpilicueta          175
```




```
fpl_point_rank(season19)
```

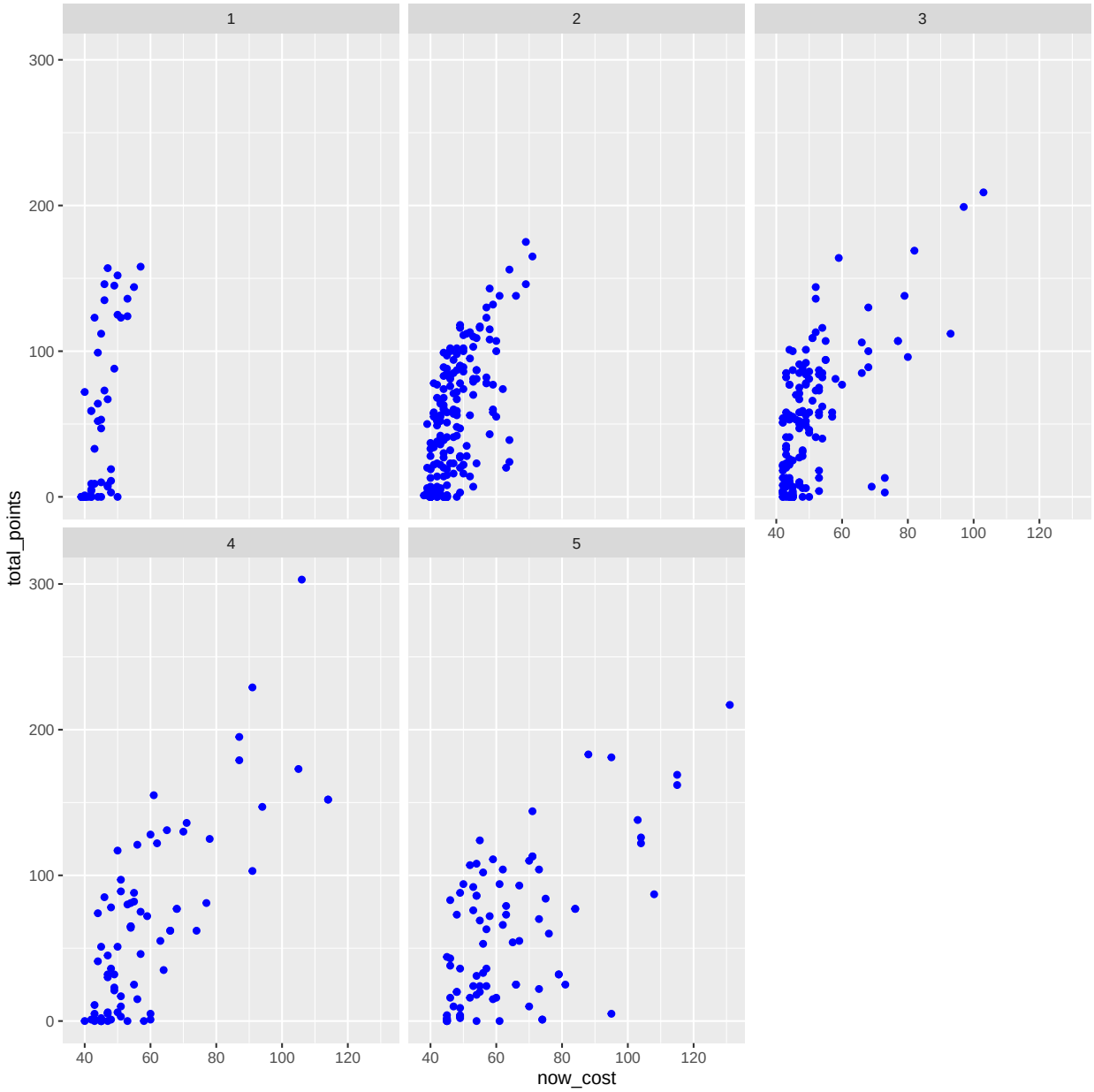
```
##    ranking              player_name total_points
## 1        1            Mohamed Salah          259
## 2        2              Eden Hazard          238
## 3        3          Raheem Sterling          234
## 4        4              Sadio Mané          231
## 5        5         Andrew Robertson          213
## 6        6          Virgil van Dijk          208
## 7        7 Pierre-Emerick Aubameyang          205
## 8        8            Sergio Agüero          201
## 9        9  Trent Alexander-Arnold          185
## 10      10         Gylfi Sigurdsson          182
```



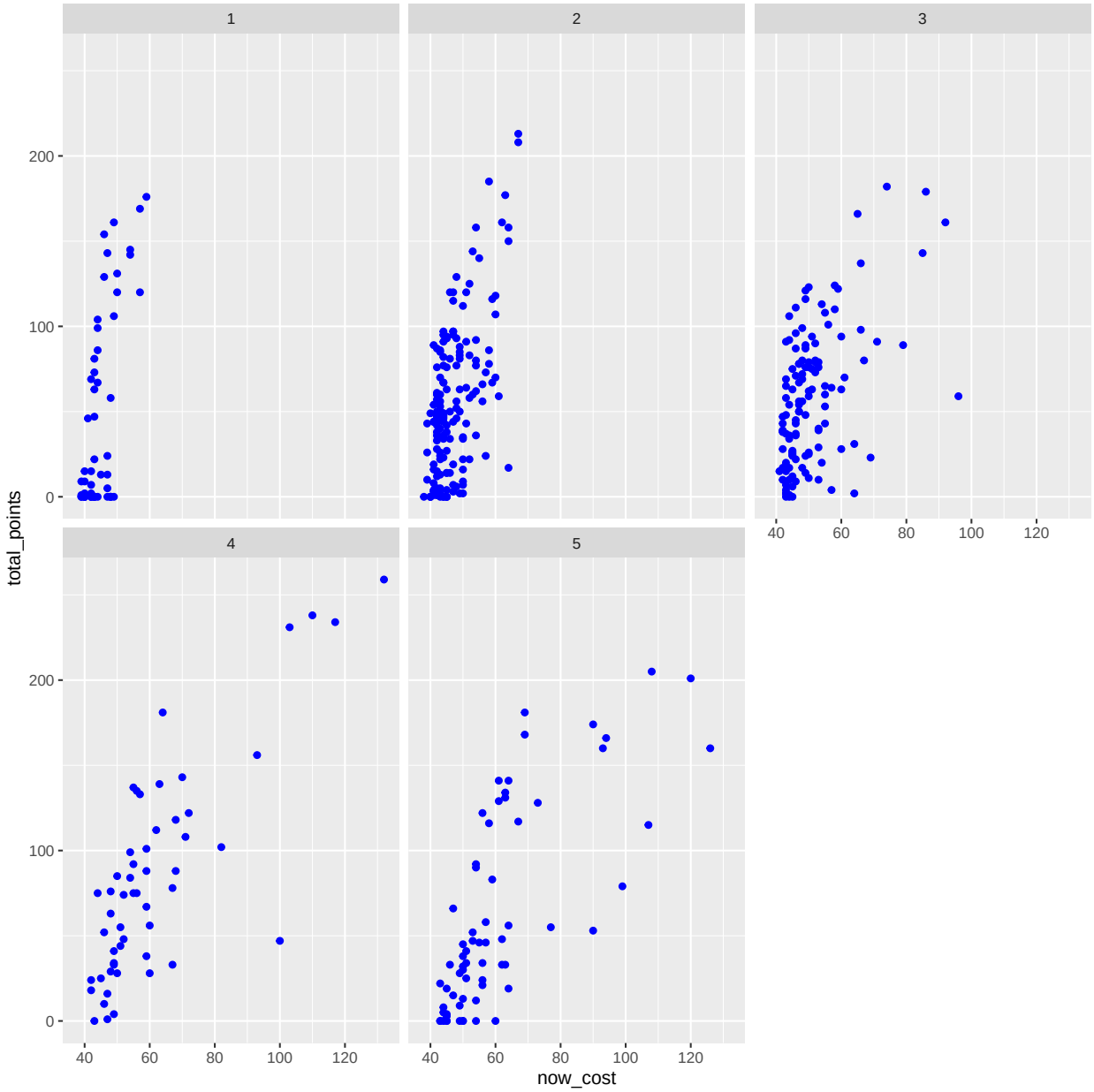
Plotting the total FPL points vs players' cost for every season

```
library(modelr)
options(na.action = na.warn)
value <- function(df) {
  ggplot(df, aes(x = now_cost)) +
  geom_point(aes(y = total_points), color = "blue") +
  facet_wrap(~position_index)
}
```

```
value(season18)
```



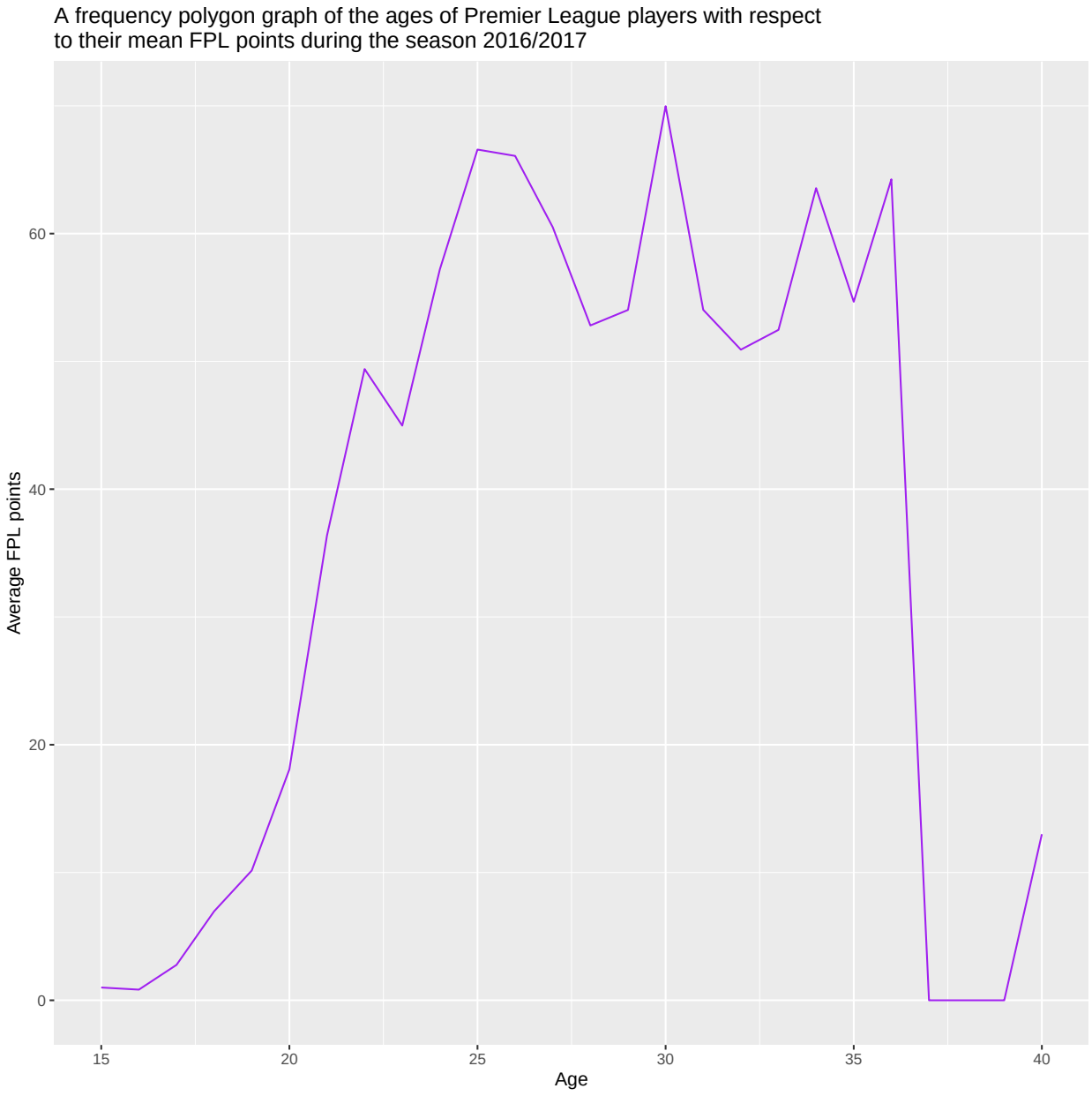

```
value(season19)
```



Visualizing how age has an impact on FPL points

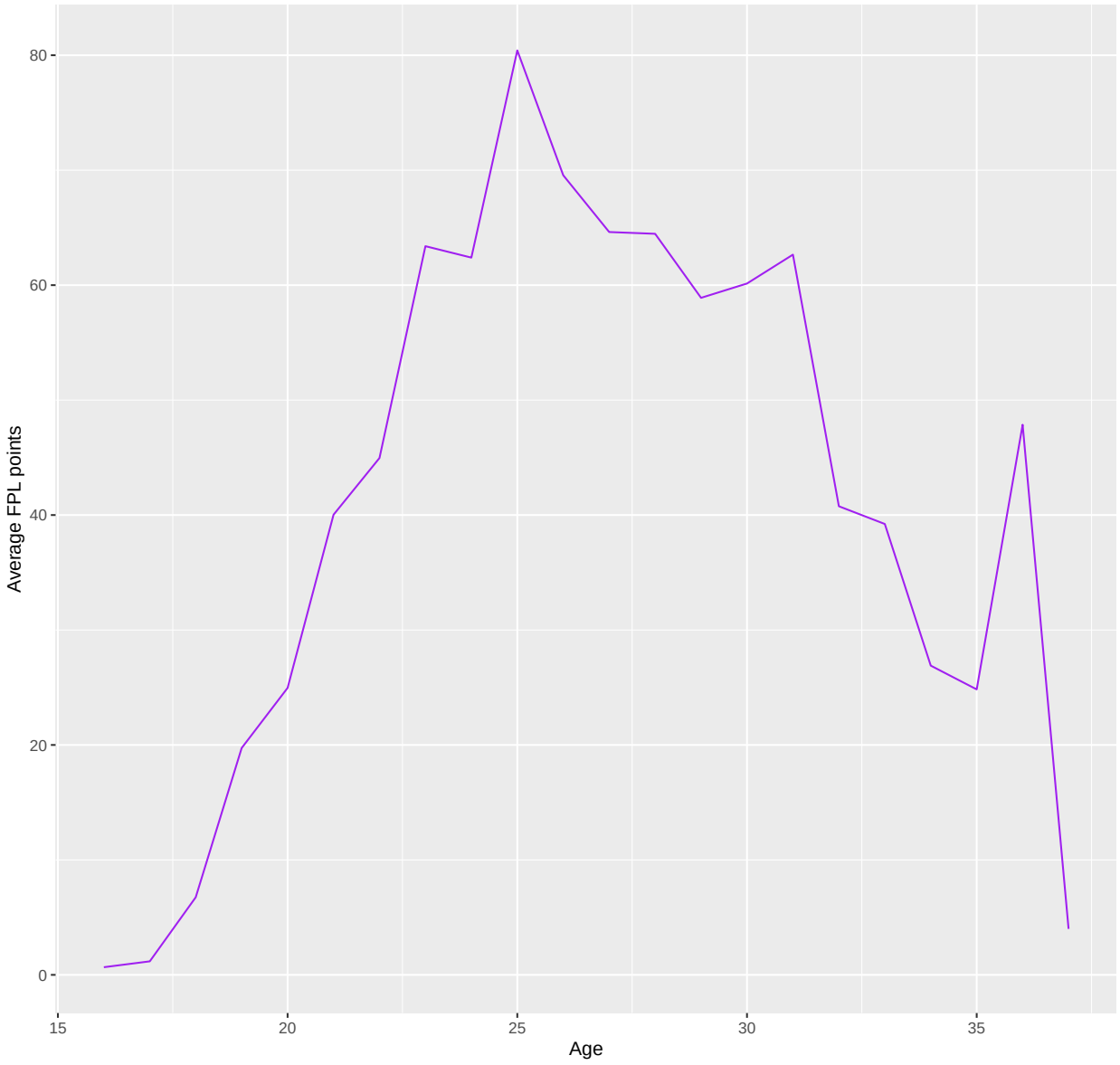
```
age_freq <- function(df) {
  df %>%
    group_by(age) %>%
    summarize(mean = mean(total_points, na.rm = TRUE)) %>%
    ggplot(aes(x = age, y = mean)) + geom_freqpoly(stat = "identity", color = "purple") +
labs(title = sprintf(title, unique(df$season)), x = "Age",
     y = "Average FPL points")
}
```

```
age_freq(season17)
```



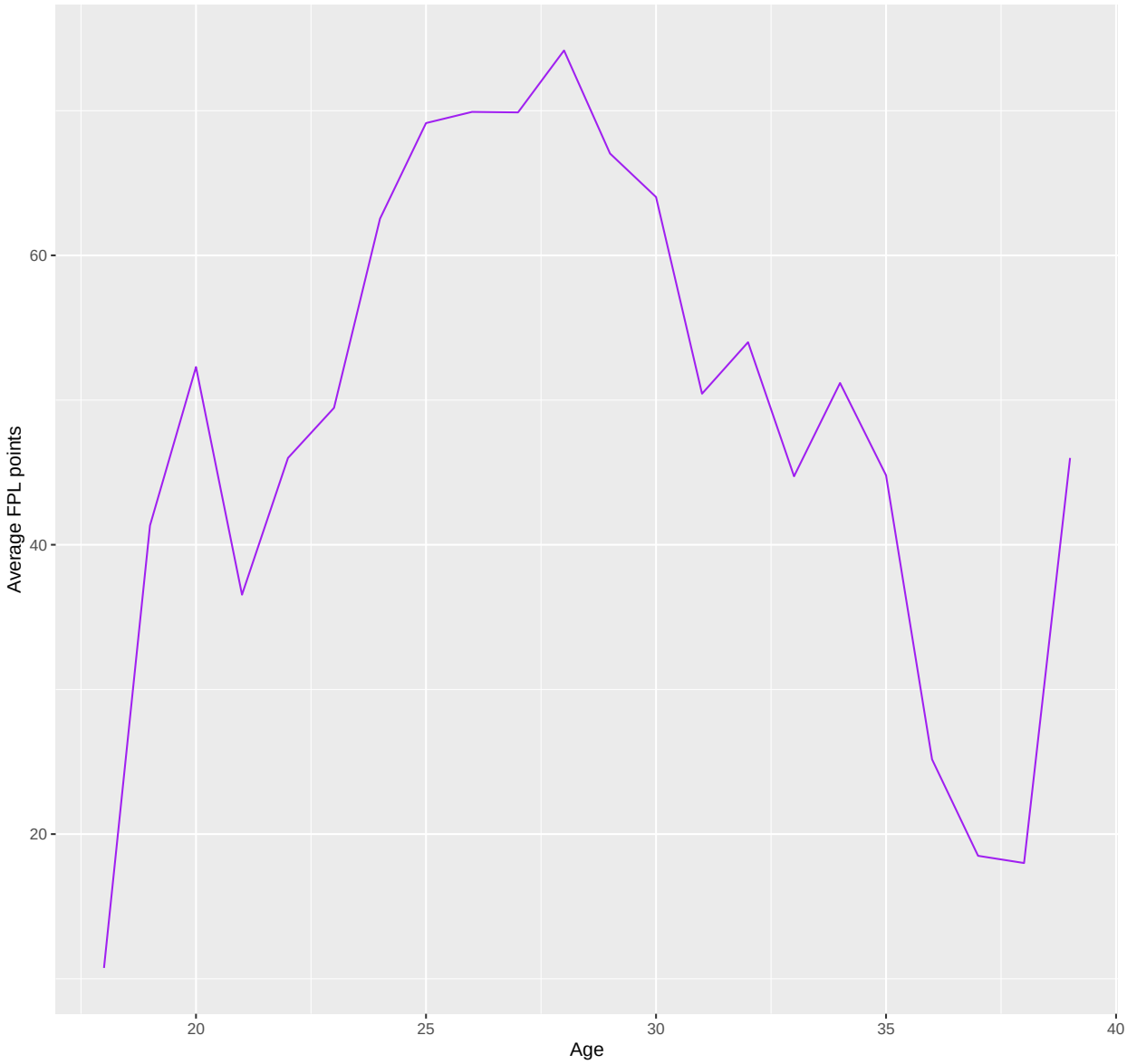

```
age_freq(season18)
```

A frequency polygon graph of the ages of Premier League players with respect to their mean FPL points during the season 2017/2018




```
age_freq(season19)
```

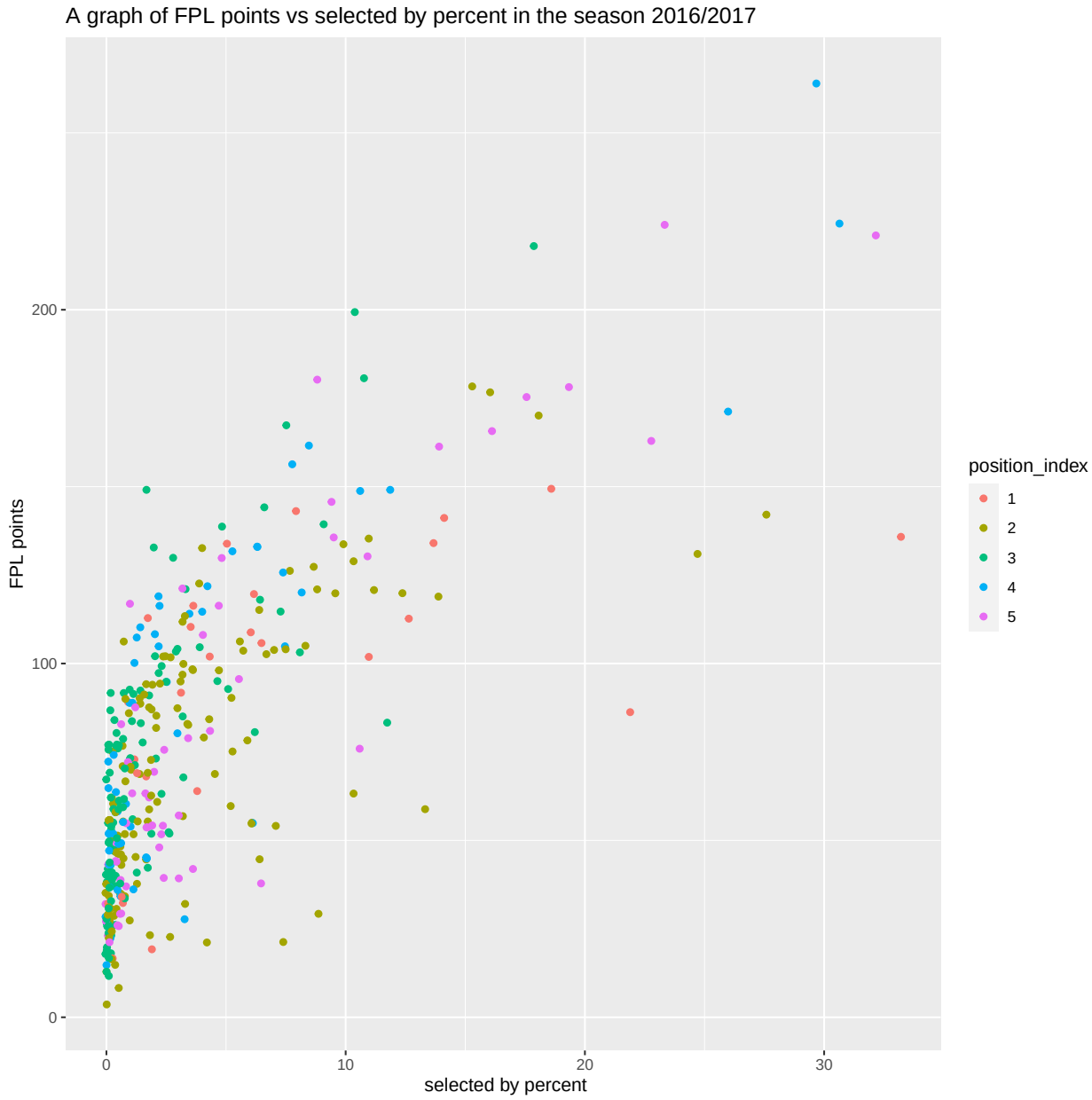
A frequency polygon graph of the ages of Premier League players with respect to their mean FPL points during the season 2018/2019



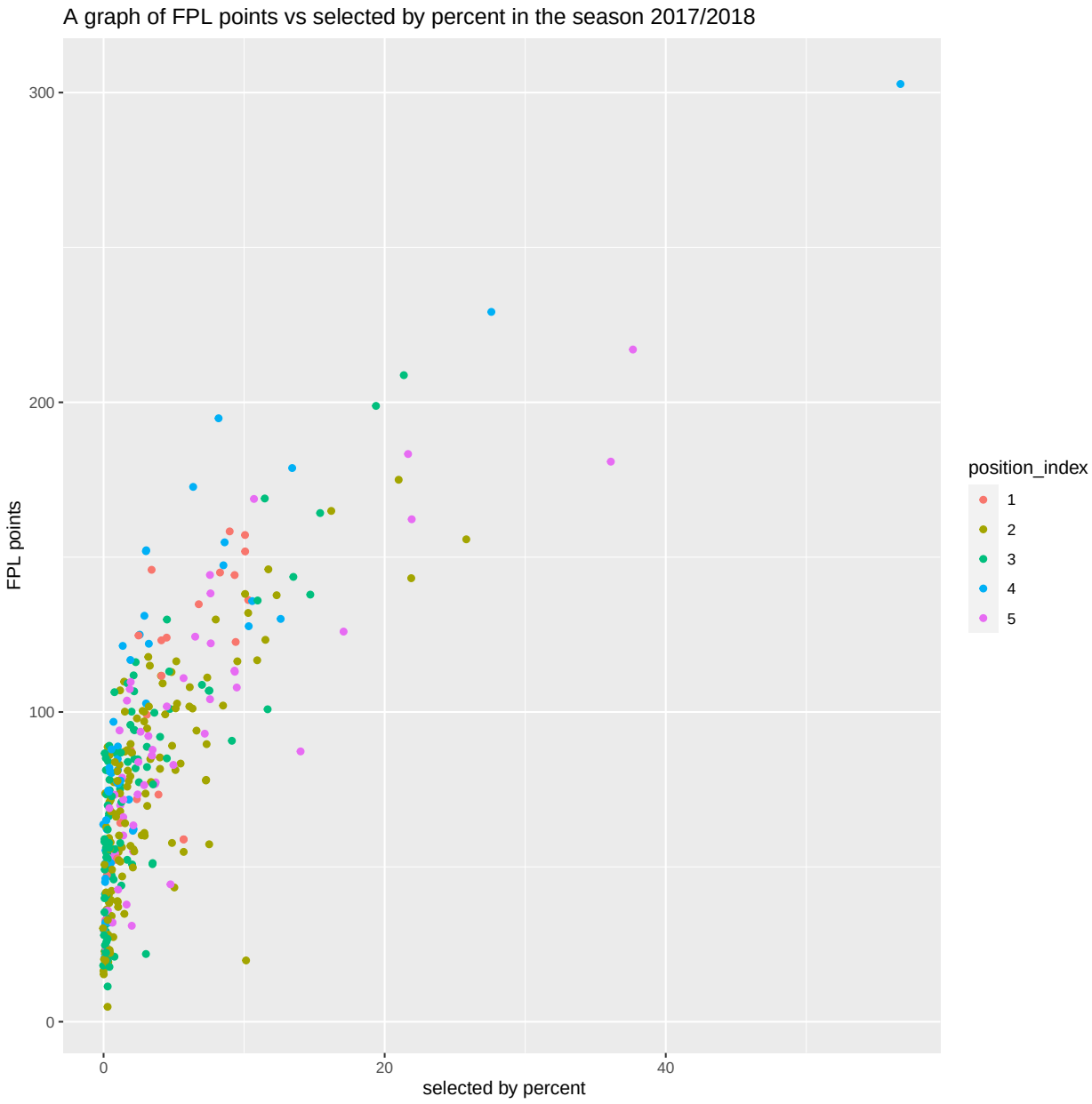
How selected by percent varies with the total FPL points per season

```
sel_fpl <- function(df) {
  df %>%
    filter(minutes.played >= 500) %>%
    ggplot(aes(selected_by_percent, total_points)) +
    geom_point(aes(color = position_index), position = "jitter") +
    labs(
    title = sprintf("A graph of FPL points vs selected by percent in the season %s",
    unique(df$season)), x = " selected by percent", y = "FPL points")
}
```

```
sel_fpl(season17)
```

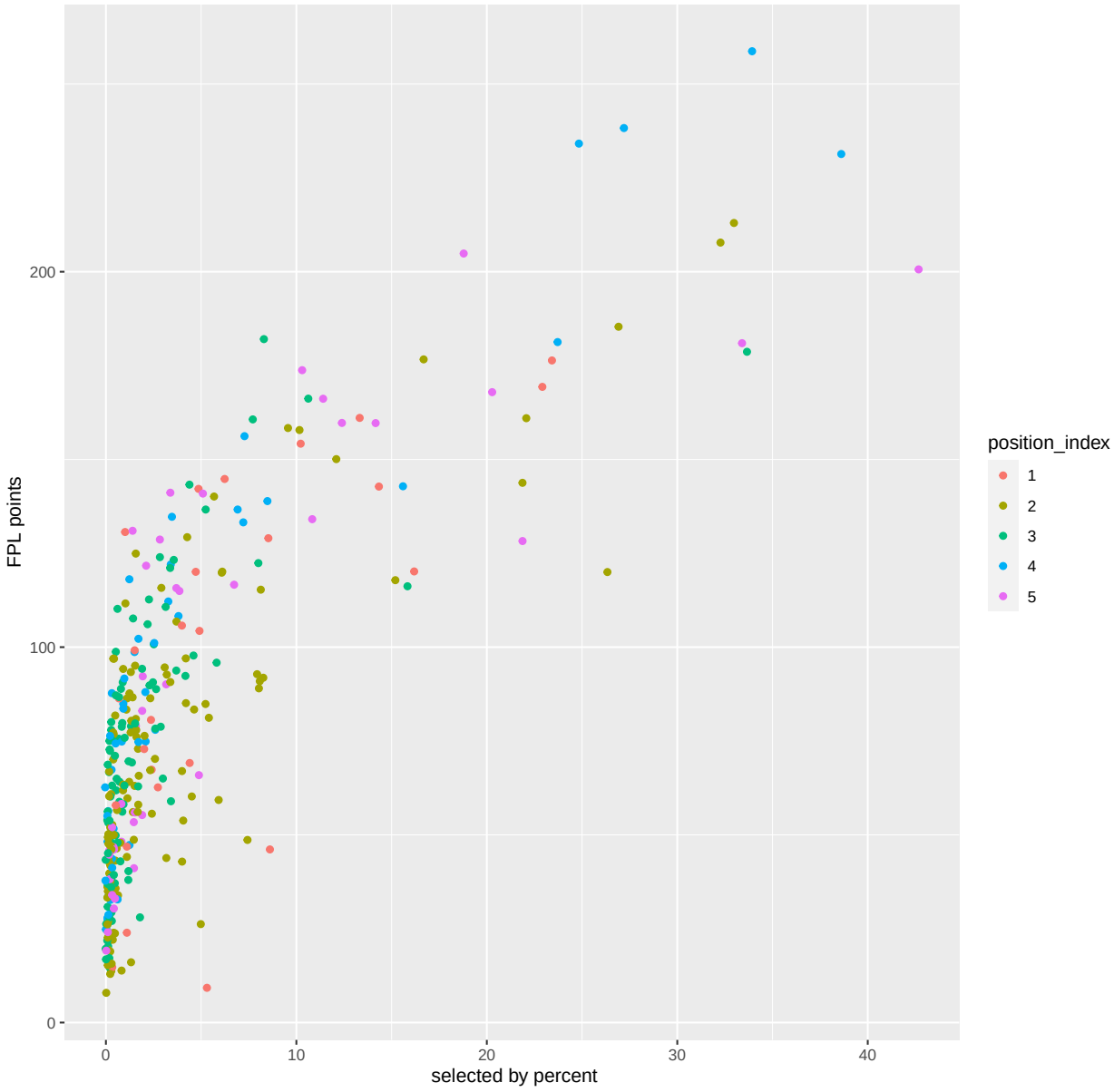



```
sel_fpl(season18)
```




```
sel_fpl(season19)
```

A graph of FPL points vs selected by percent in the season 2018/2019

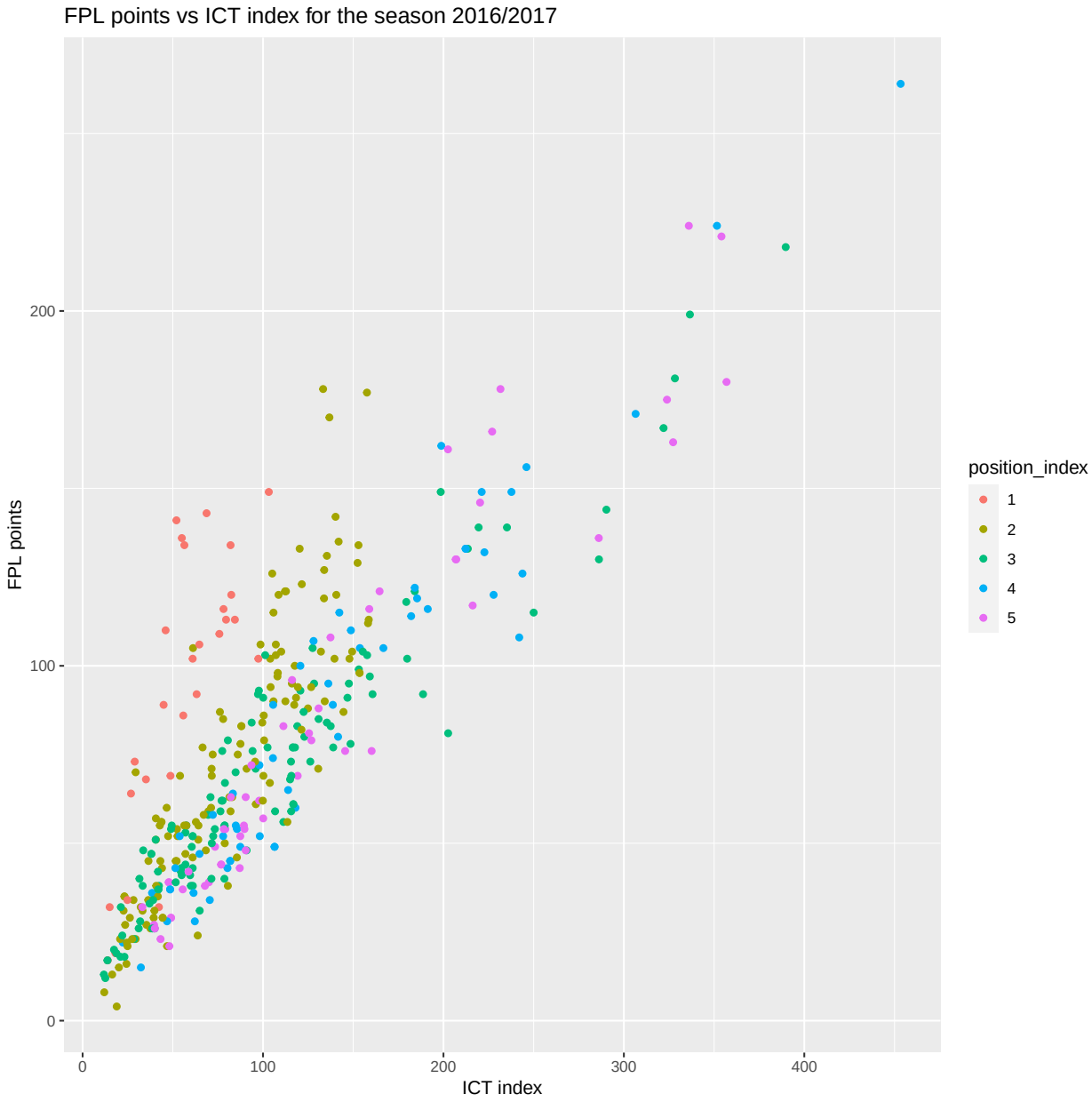


Creating a function that plots FPL points vs ICT index

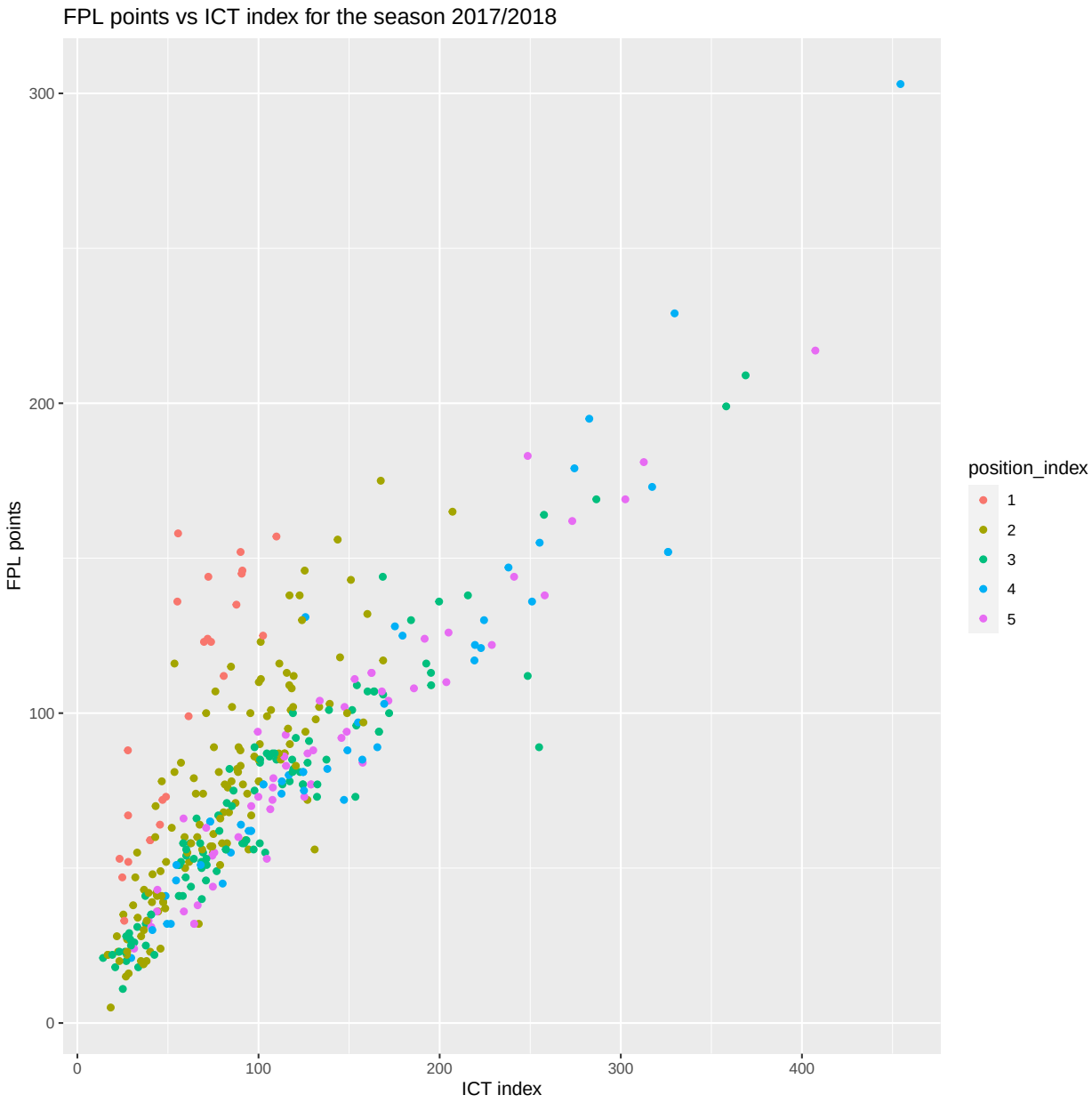
```
fpl_vs_ict <- function(df) {
  df %>%
    filter(minutes.played >= 500) %>%
    ggplot() +
    geom_point(aes(ict_index,total_points, color = position_index)) +
    labs(title = sprintf("FPL points vs ICT index for the season %s",
                         unique(df$season)), x = "ICT index", y = "FPL points")
}
```

Plotting a graph of FPL points vs ICT index

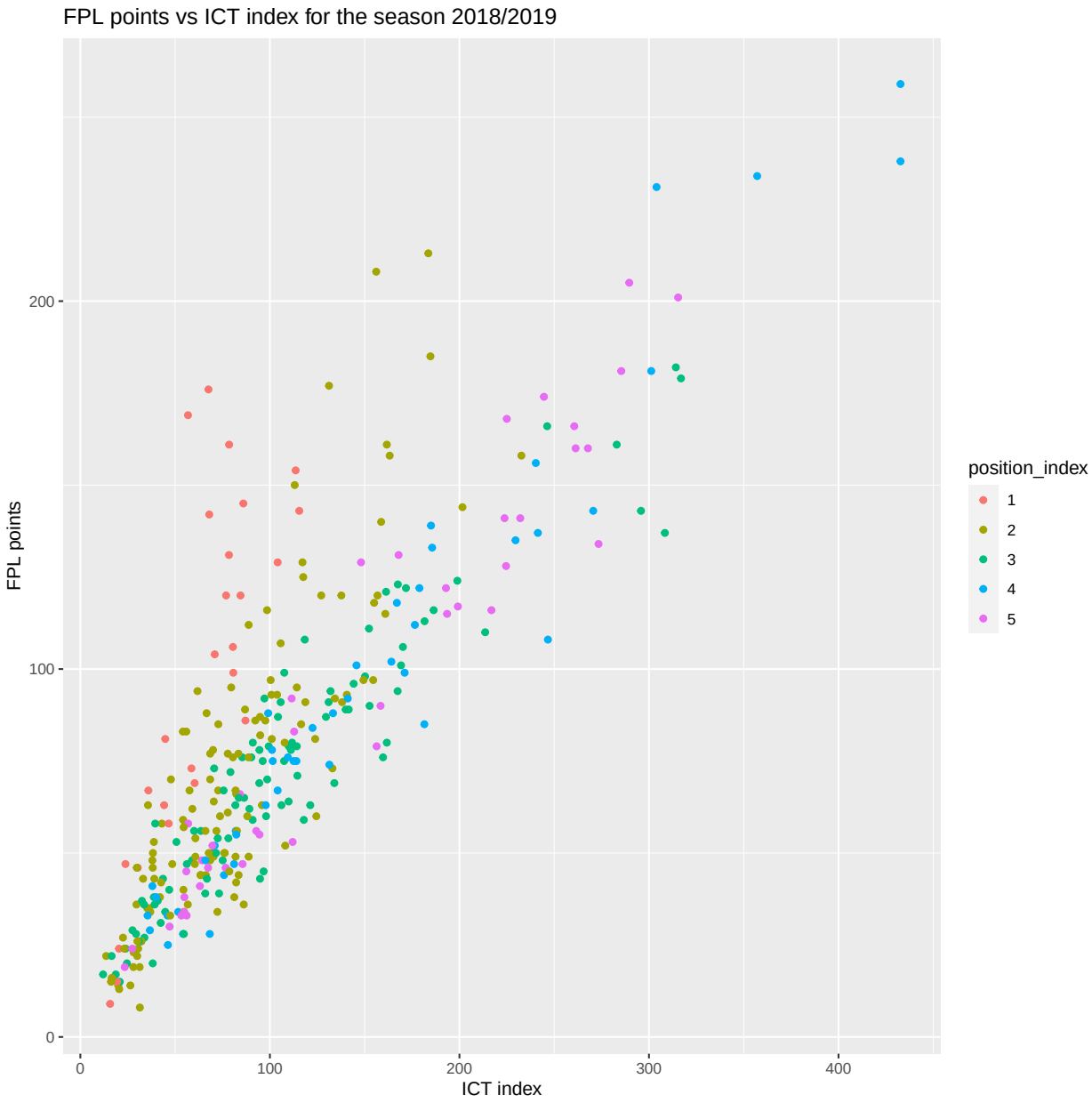
```
fpl_vs_ict(season17)
```




```
fpl_vs_ict(season18)
```




```
fpl_vs_ict(season19)
```



Creating a function for printing out the first ten rows alongside selected columns

```
quickview <- function(df) {
  df1 <- df %>%
    select(c(player_name,club_name,total_points,
             minutes.played, fpl_to_game))
  knitr::kable(df1[1:10,],
caption = sprintf("The first 10 rows of the season %s dataset with specific columns",
unique(df$season)))
}
```

Applying the function to the datasets

```
quickview(season17)
```

Table 1: The first 10 rows of the season 2016/2017 dataset with specific columns

player_name	club_name	total_points	minutes.played	fpl_to_game
Joe Hart	Manchester City	0	0	NaN
Claudio Bravo	Manchester City	73	1968	3.338415
Willy Caballero	Manchester City	64	1452	3.966942
Angus Gunn	Manchester City	0	0	NaN
Nicolás Otamendi	Manchester City	100	2592	3.472222
Vincent Kompany	Manchester City	57	820	6.256098
John Stones	Manchester City	59	2014	2.636544
Eliaquim Mangala	Manchester City	0	0	NaN
Jason Denayer	Manchester City	56	1878	2.683706
Aleksandar Kolarov	Manchester City	95	2535	3.372781

```
quickview(season18)
```

Table 2: The first 10 rows of the season 2017/2018 dataset with specific columns

player_name	club_name	total_points	minutes.played	fpl_to_game
Thibaut Courtois	Chelsea FC	136	3150	3.885714
Willy Caballero	Chelsea FC	11	270	3.666667
Antonio Rüdiger	Chelsea FC	115	2336	4.430651
Andreas Christensen	Chelsea FC	79	2067	3.439768
Gary Cahill	Chelsea FC	74	2082	3.198847
Kurt Zouma	Chelsea FC	87	2887	2.712158
Fikayo Tomori	Chelsea FC	0	0	NaN
Trevoh Chalobah	Chelsea FC	0	0	NaN
Ethan Ampadu	Chelsea FC	1	10	9.000000
Marcos Alonso	Chelsea FC	165	2855	5.201401

```
quickview(season19)
```

Table 3: The first 10 rows of the season 2018/2019 dataset with specific columns

player_name	club_name	total_points	minutes.played	fpl_to_game
Ederson Santana de Moraes	Manchester City	169	3420	4.447368
Claudio Bravo	Manchester City	0	0	NaN
John Stones	Manchester City	83	1761	4.241908
Aymeric Laporte	Manchester City	177	3056	5.212696
Nicolás Otamendi	Manchester City	70	1233	5.109489
Vincent Kompany	Manchester City	58	1220	4.278689

player_name	club_name	total_points	minutes.played	fpl_to_game
Philippe Sandler	Manchester City	0	0	NaN
Benjamin Mendy	Manchester City	59	900	5.900000
Oleksandr Zinchenko	Manchester City	44	1151	3.440487
Kyle Walker	Manchester City	150	2776	4.863112

Writing the files to csv files

```
s17 <- file('season2017.csv', encoding = "UTF-8")
write.csv(season17, file = s17)
s18 <- file('season2018.csv', encoding = 'UTF-8')
write.csv(season18, file = s18)
s19 <- file('season2019.csv', encoding = "UTF-8")
write.csv(season19, file = s19)
```