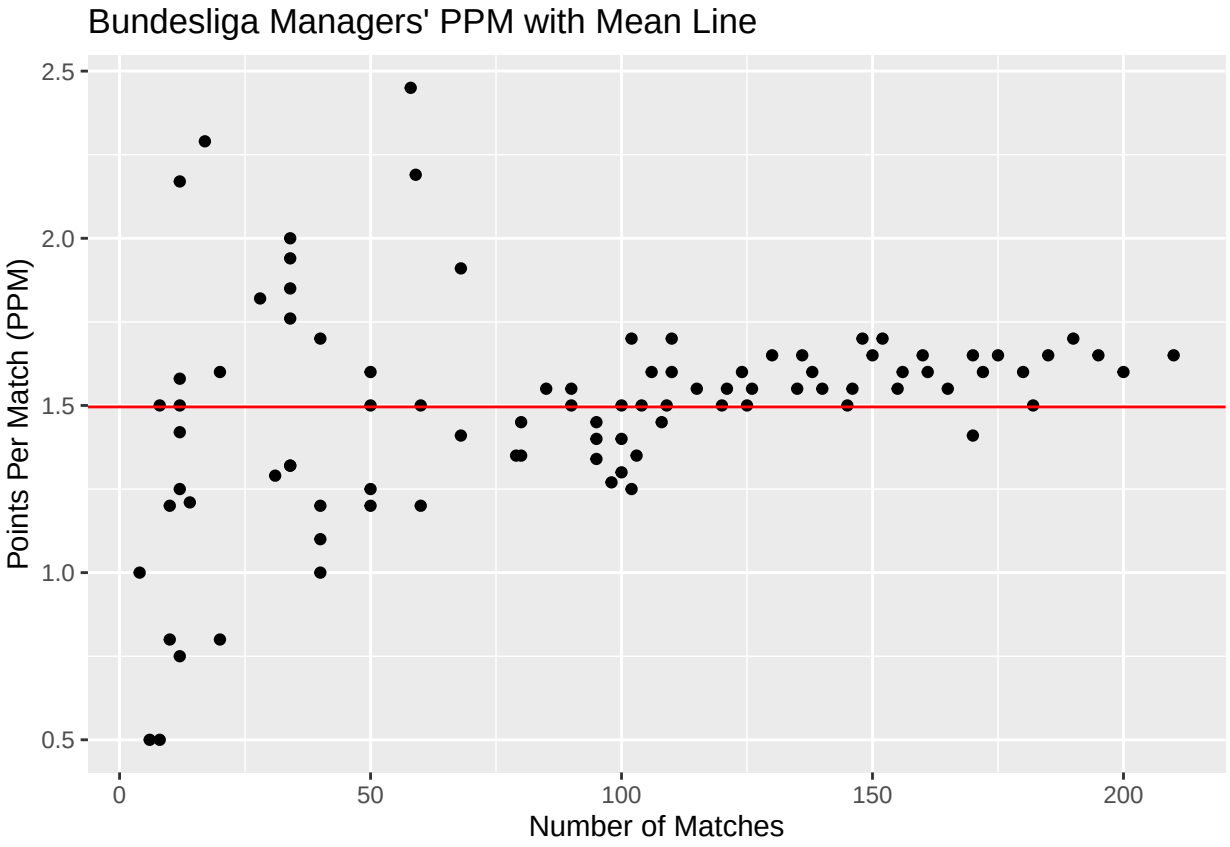
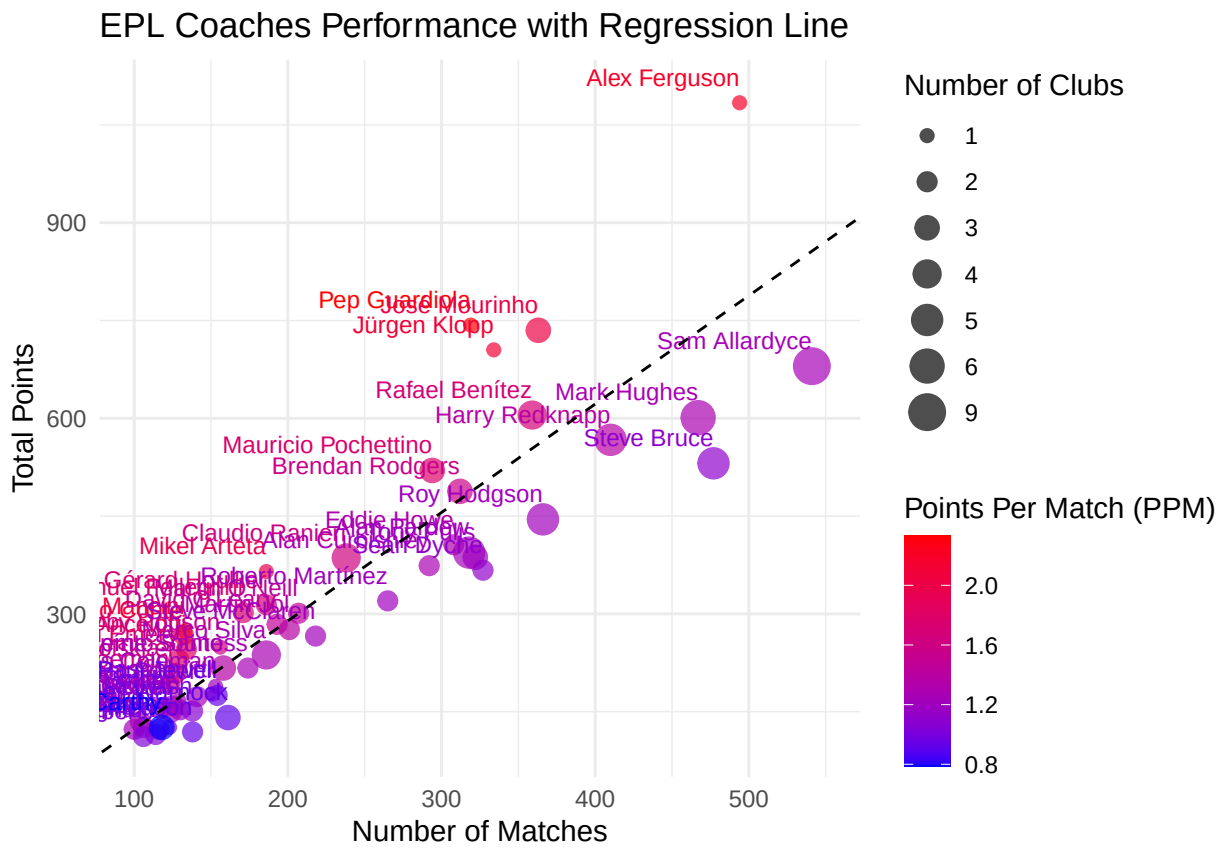
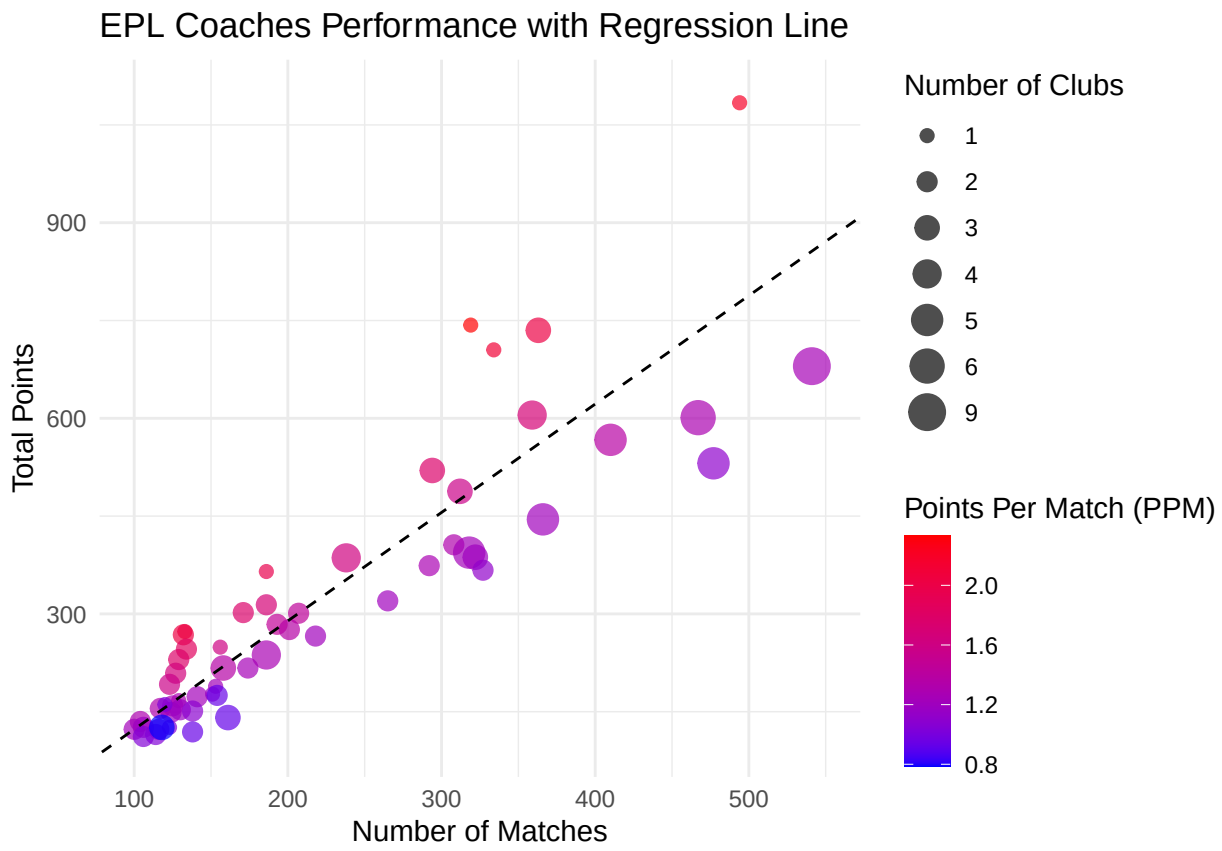
Gor Arutiunian

2024-12-11





In this plot, we can see how Bundesliga managers' performance, measured by Points Per Match (PPM), varies with the number of matches they have managed. Each point represents a manager, while the red horizontal line marks the league's average PPM. This provides a clear visual comparison of individual manager performances relative to the league's mean.



In this plot, we can observe the performance of EPL coaches, showing the relationship between the number of matches managed and the total points they earned. The size of each point represents the number of clubs a coach has worked with, while the color gradient from blue to red indicates their Points Per Match (PPM). The dashed regression line highlights the overall trend in performance. This simplified visualization emphasizes key patterns while avoiding additional labeling for individual coaches.

```
library(dplyr)
library(ggplot2)

# Manager data
managers <- data.frame(
  Manager = c("Stefano Pioli", "Simone Inzaghi", "Maurizio Sarri", "Igor Tudor"),
  StartSeason = c(2014, 2016, 2021, 2024),
  EndSeason = c(2016, 2021, 2024, 2024)  # Igor Tudor ends in 2024
)

# Filter Lazio games from the 2014 season onwards
lazio_games <- f_data_sm %>%
  filter((HOMETEAM == "Lazio" | AWAYTEAM == "Lazio") & SEASON >= 2014) %>%
  mutate(
    GoalsFor = case_when(
      HOMETEAM == "Lazio" ~ FTHG,  # Goals scored by Lazio when at home
      AWAYTEAM == "Lazio" ~ FTAG   # Goals scored by Lazio when away
    ),
    GoalsAgainst = case_when(
      HOMETEAM == "Lazio" ~ FTAG,  # Goals conceded by Lazio when at home
```

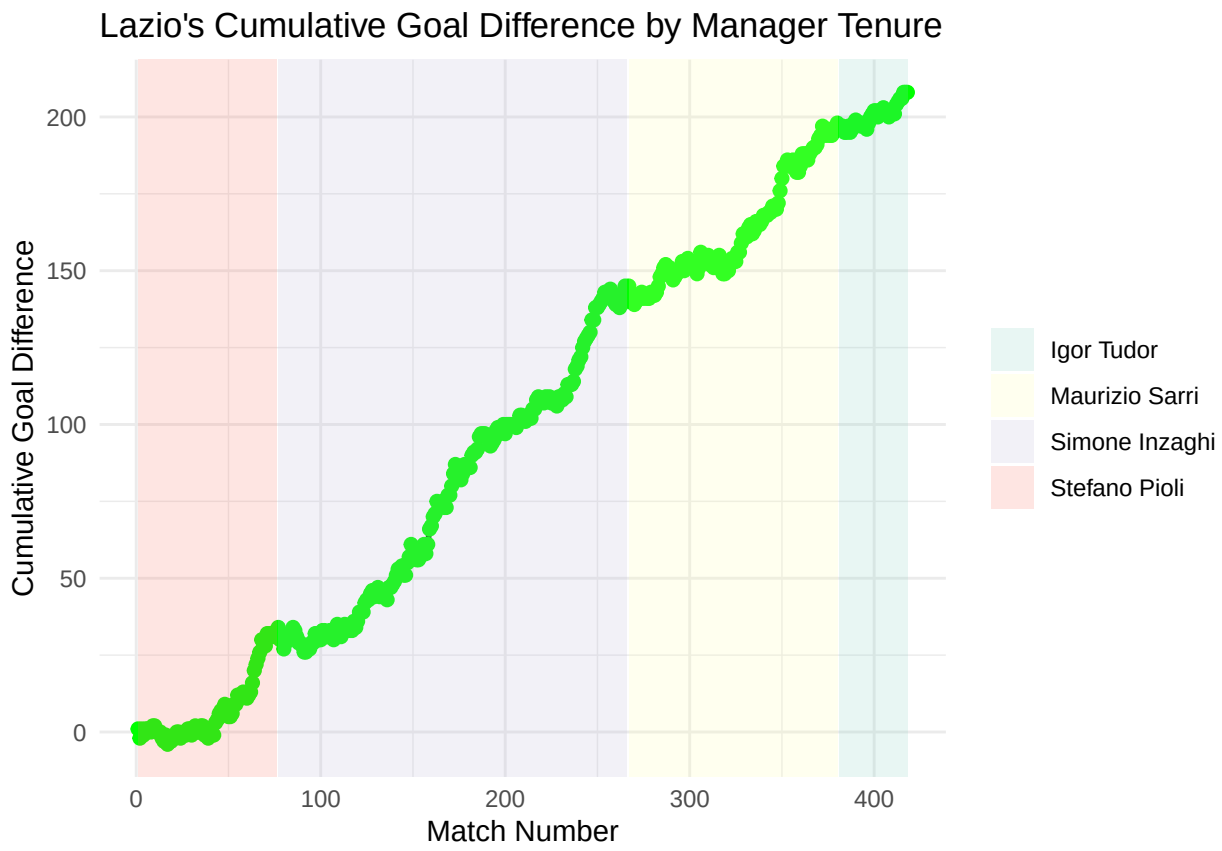
```
      AWAYTEAM == "Lazio" ~ FTHG  # Goals conceded by Lazio when away
    ),
    GoalDifference = GoalsFor - GoalsAgainst,  # Goal difference for each match
    MatchNumber = row_number(),  # Add a sequential match number
    Manager = case_when(  # Assign manager based on season
      SEASON >= 2014 & SEASON < 2016 ~ "Stefano Pioli",
      SEASON >= 2016 & SEASON < 2021 ~ "Simone Inzaghi",
      SEASON >= 2021 & SEASON < 2024 ~ "Maurizio Sarri",
      SEASON >= 2024 ~ "Igor Tudor"  # Last manager for 2024
    )
  )

# Calculate cumulative goal difference
lazio_games <- lazio_games %>%
  mutate(CumulativeGD = cumsum(GoalDifference))

# Create manager periods with exact match ranges
manager_periods <- lazio_games %>%
  group_by(Manager) %>%
  summarize(
    StartMatch = min(MatchNumber),
    EndMatch = max(MatchNumber)
  )

# Plot cumulative goal difference with manager tenure
ggplot(lazio_games, aes(x = MatchNumber, y = CumulativeGD)) +
  geom_line(colour = "darkgreen", size = 1) +
  geom_point(colour = "green", size = 2) +
  geom_rect(data = manager_periods, aes(
    xmin = StartMatch, xmax = EndMatch,
    ymin = -Inf, ymax = Inf,
    fill = Manager
  ), alpha = 0.2, inherit.aes = FALSE) +  # Shading for manager periods
  scale_fill_brewer(palette = "Set3") +  # Color palette for managers
  ggtitle("Lazio's Cumulative Goal Difference by Manager Tenure") +
  xlab("Match Number") +
  ylab("Cumulative Goal Difference") +
  theme_minimal() +
  theme(legend.title = element_blank())
```

```
## Warning: Using ‘size‘ aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use ‘linewidth‘ instead.
## This warning is displayed once every 8 hours.
## Call ‘lifecycle::last_lifecycle_warnings()‘ to see where this warning was
## generated.
```


Lazio's Cumulative Goal Difference by Manager Tenure
Cumulative Goal Difference
200
150
100
50
0
0
100
200
300
400
Match Number
Igor Tudor
Maurizio Sarri
Simone Inzaghi
Stefano Pioli