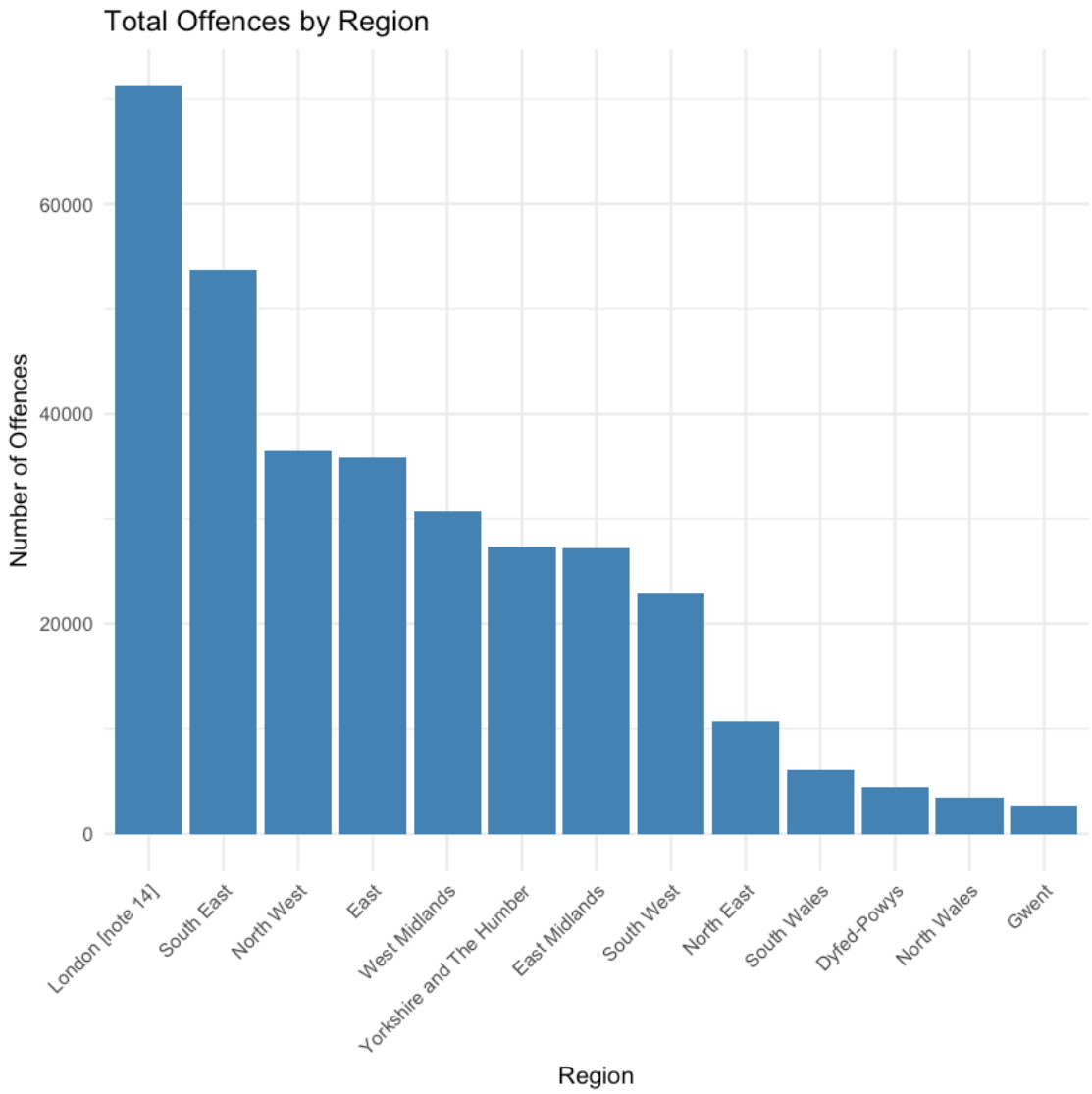
R-Part2

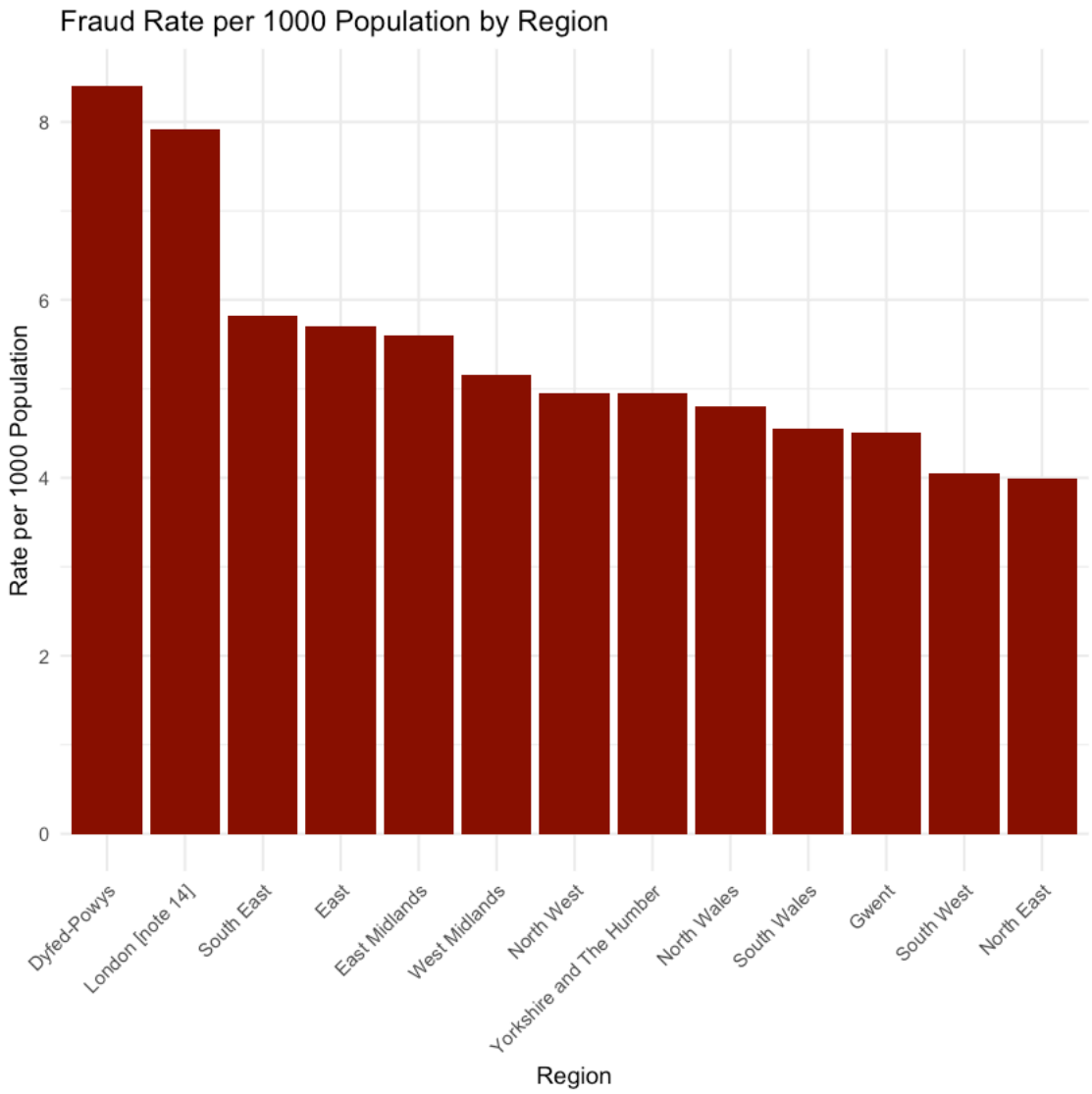
November 29, 2024

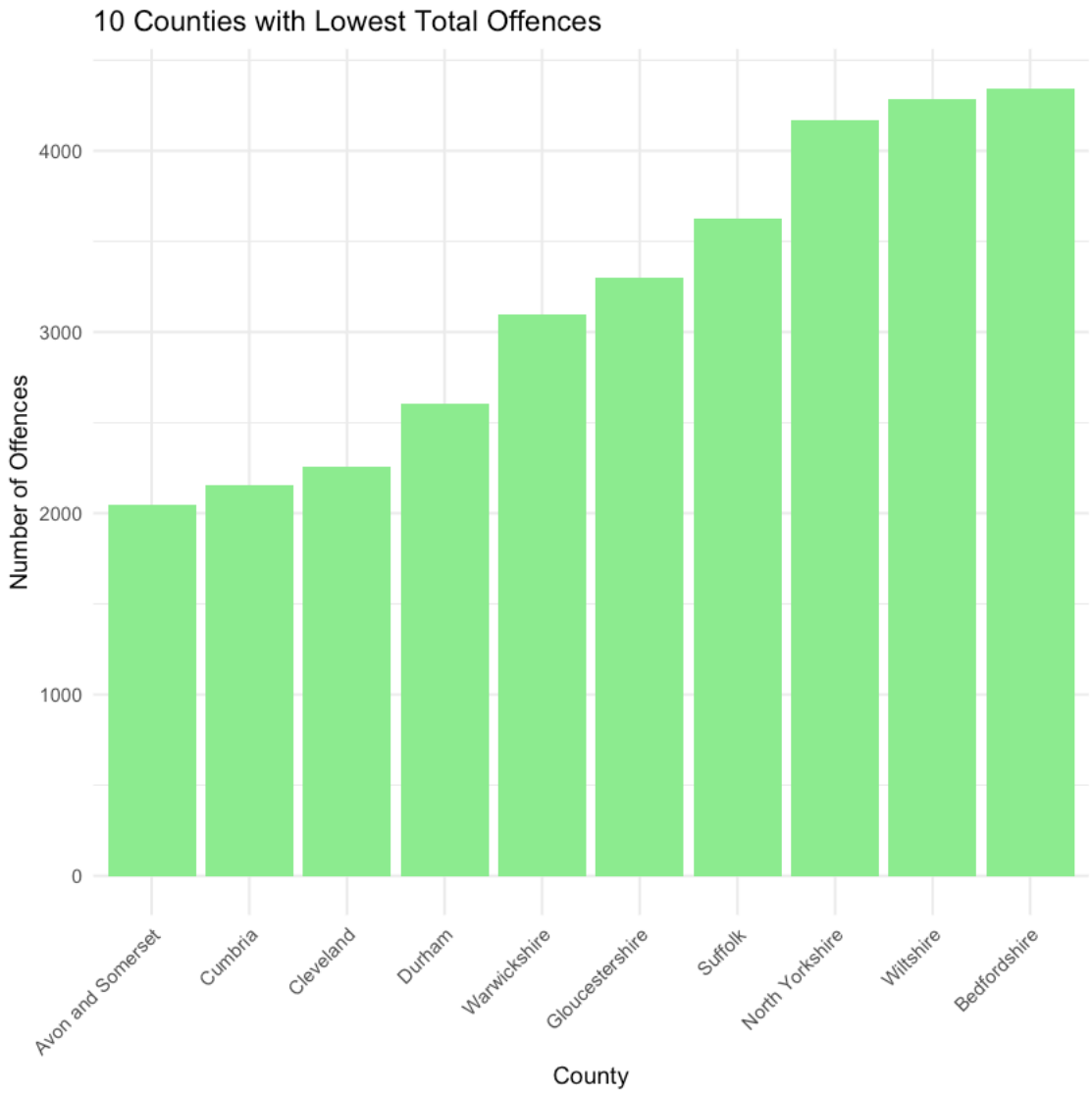
[7]:
```r
# Simple string assignment
file_path <- "../Datasets/cw_r.xlsx"

# Install and load necessary packages (if not already installed)
if (!require(readxl)) install.packages("readxl")
if (!require(dplyr)) install.packages("dplyr")
# Load ggplot2
if (!require(ggplot2)) install.packages("ggplot2")
# Load libraries
if (!require(stringr)) install.packages("stringr")
library(readxl)
library(dplyr)
library(ggplot2)
library(stringr)
```

[8]:
```r
# Load Table 5
table5_data <- read_excel(file_path, sheet = "Table 5", skip = 9, range = "A10:
↪E66")

# Rename columns for clarity
table5_df <- table5_data %>%
  rename(
    Area_Code = `Area Code`,
    Area_Name = `Area Name`,
    Offences = `Number of offences`,
    Rate = `Rate per 1,000 population`,
    Change = `% change from\r\n previous year`
  ) %>%
  filter(!Rate %in% c("[z]", "[u1]")) %>%  # Filter first
  mutate(Rate = as.numeric(Rate))          # Then convert to numeric

# Separate regions and counties
regions_df <- table5_df %>%
  filter(str_detect(Area_Code, "^E12|^W15")) %>%
  arrange(desc(Offences))

counties_df <- table5_df %>%
```

```r
  filter(str_detect(Area_Code, "^E23|^W23")) %>%
  arrange(Offences)

# Plot regions by offences and rate
p1 <- ggplot(regions_df, aes(x = reorder(Area_Name, -Offences), y = Offences)) +
  geom_bar(stat = "identity", fill = "steelblue") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
  labs(title = "Total Offences by Region",
       x = "Region",
       y = "Number of Offences")

p2 <- ggplot(regions_df, aes(x = reorder(Area_Name, -Rate), y = Rate)) +
  geom_bar(stat = "identity", fill = "darkred") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
  labs(title = "Fraud Rate per 1000 Population by Region",
       x = "Region",
       y = "Rate per 1000 Population")

# Plot lowest offence counties
p3 <- counties_df %>%
  head(10) %>%
  ggplot(aes(x = reorder(Area_Name, Offences), y = Offences)) +
  geom_bar(stat = "identity", fill = "lightgreen") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
  labs(title = "10 Counties with Lowest Total Offences",
       x = "County",
       y = "Number of Offences")

print(p1)
print(p2)
print(p3)
```


Total Offences by Region
Number of Offences
60000
40000
20000
0
London [note 14]
South East
North West
East
West Midlands
Yorkshire and The Humber
East Midlands
South West
North East
South Wales
Dyfed-Powys
North Wales
Gwent
Region


Fraud Rate per 1000 Population by Region
Rate per 1000 Population
0
2
4
6
8
Dyfed-Powys
London [note 14]
South East
East
East Midlands
West Midlands
North West
Yorkshire and The Humber
North Wales
South Wales
Gwent
South West
North East
Region


10 Counties with Lowest Total Offences
Number of Offences
0
1000
2000
3000
4000
Avon and Somerset
Cumbria
Cleveland
Durham
Warwickshire
Gloucestershire
Suffolk
North Yorkshire
Wiltshire
Bedfordshire
County