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library(sf)

## Linking to GEOS 3.11.2, GDAL 3.7.2, PROJ 9.3.0; sf_use_s2() is TRUE

library(ggplot2)
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##     filter, lag
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

# Load the shapefile
london_boroughs <- st_read("London_Ward.shp")

## Reading layer 'London_Ward' from data source
##   'C:\Users\chuyu\Desktop\Data-Visualisation-Project\Test folder-Yujie Chu\London_Ward.shp'
##   using driver 'ESRI Shapefile'
## Simple feature collection with 657 features and 6 fields
## Geometry type: POLYGON
## Dimension:      XY
## Bounding box:   xmin: 503568.2 ymin: 155850.8 xmax: 561957.5 ymax: 200933.9
## Projected CRS: OSGB36 / British National Grid

# Load the crime data (assuming it's in CSV format)
crime_data <- read.csv("BoroughLevelCrime.csv")

# Summing the total crimes for each borough over the entire timeframe
borough_totals <- crime_data %>%
  group_by(LookUp_BoroughName) %>%
  summarise(Total_Crimes = sum(across(starts_with("X2020"))))

# Merge the crime data with the shapefile
merged_data <- merge(london_boroughs, borough_totals, by.x="DISTRICT", by.y="LookUp_BoroughName")

# Plot the merged data
plot <- ggplot(data=merged_data) +
  geom_sf(aes(fill=Total_Crimes)) +
  scale_fill_gradient(low="Green", high="red") +
  theme_minimal() +
  labs(title="Total Crime by Borough in London (2020)", fill="Total Crimes")

```

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print(plot)
```

