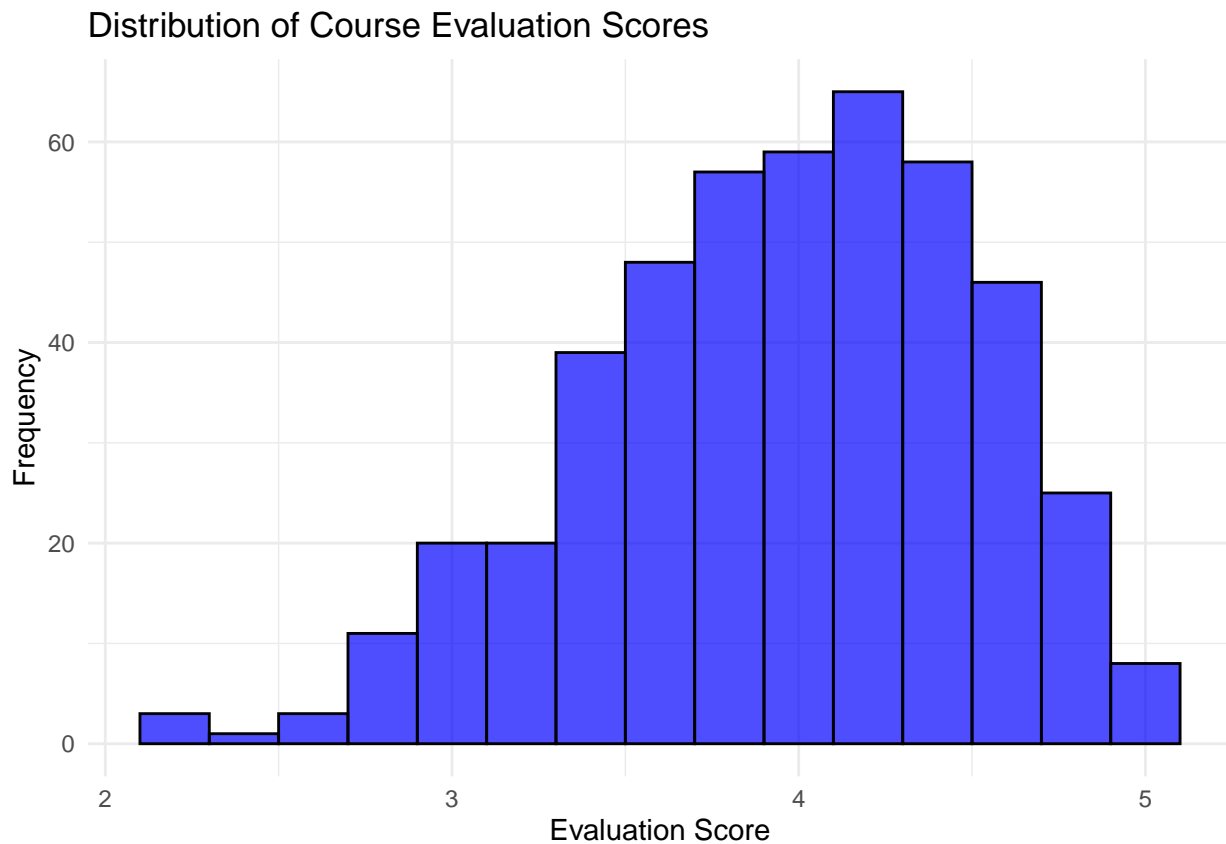# 315HW2

Elan Satchit - ES45873

2025-01-21

Github Repo
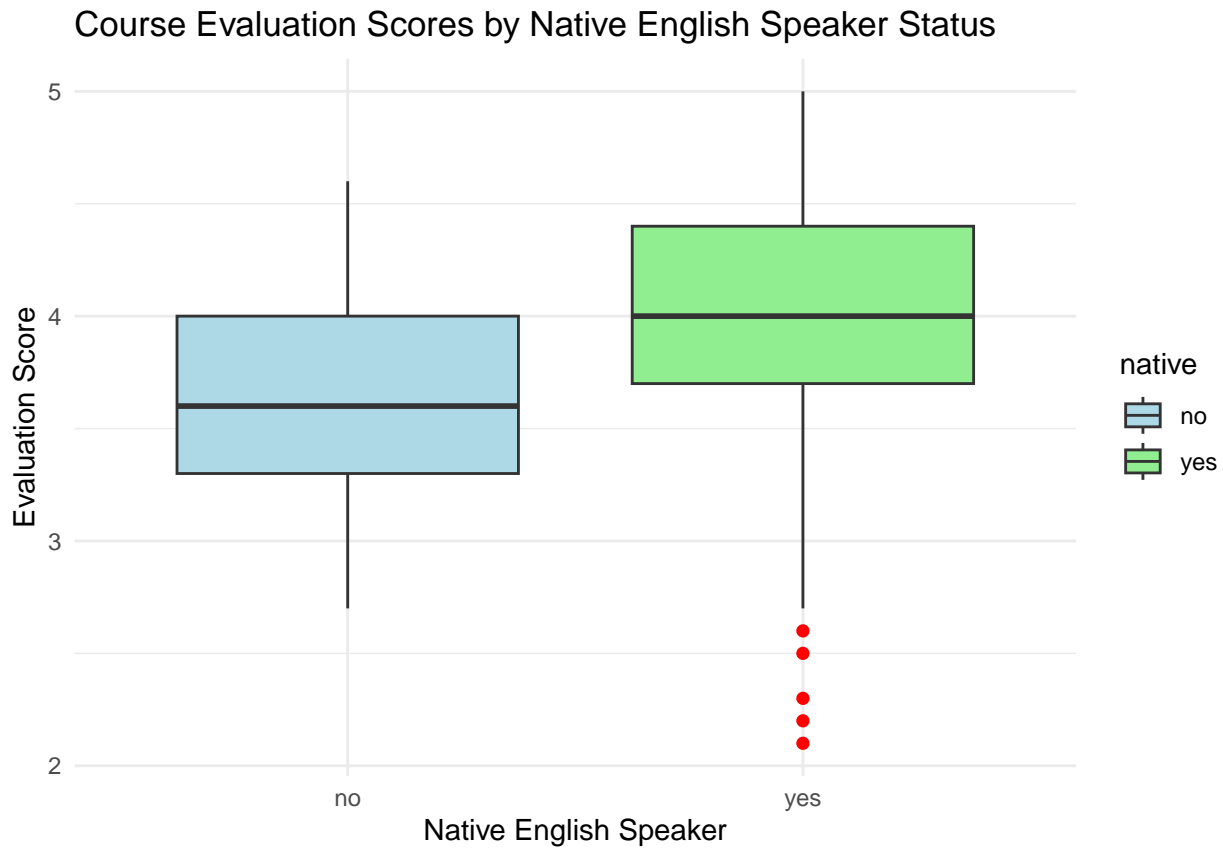
Problem 1

Part A

This histogram illustrates the distribution of course evaluation scores across all professors, measured on a scale of 1 to 5. The scores are heavily skewed towards higher ratings, with the majority of evaluations clustered between 3.5 and 5, indicating overall positive feedback.

Part B

Course Evaluation Scores by Native English Speaker Status

This boxplot compares the distribution of course evaluation scores for professors who are native English speakers versus those who are not. Native English speakers generally have slightly higher median evaluation scores and fewer outliers compared to non-native speakers, potentially reflecting a bias or communication-related differences.

Part C

Distribution of Course Evaluation Scores by Instructor Gender
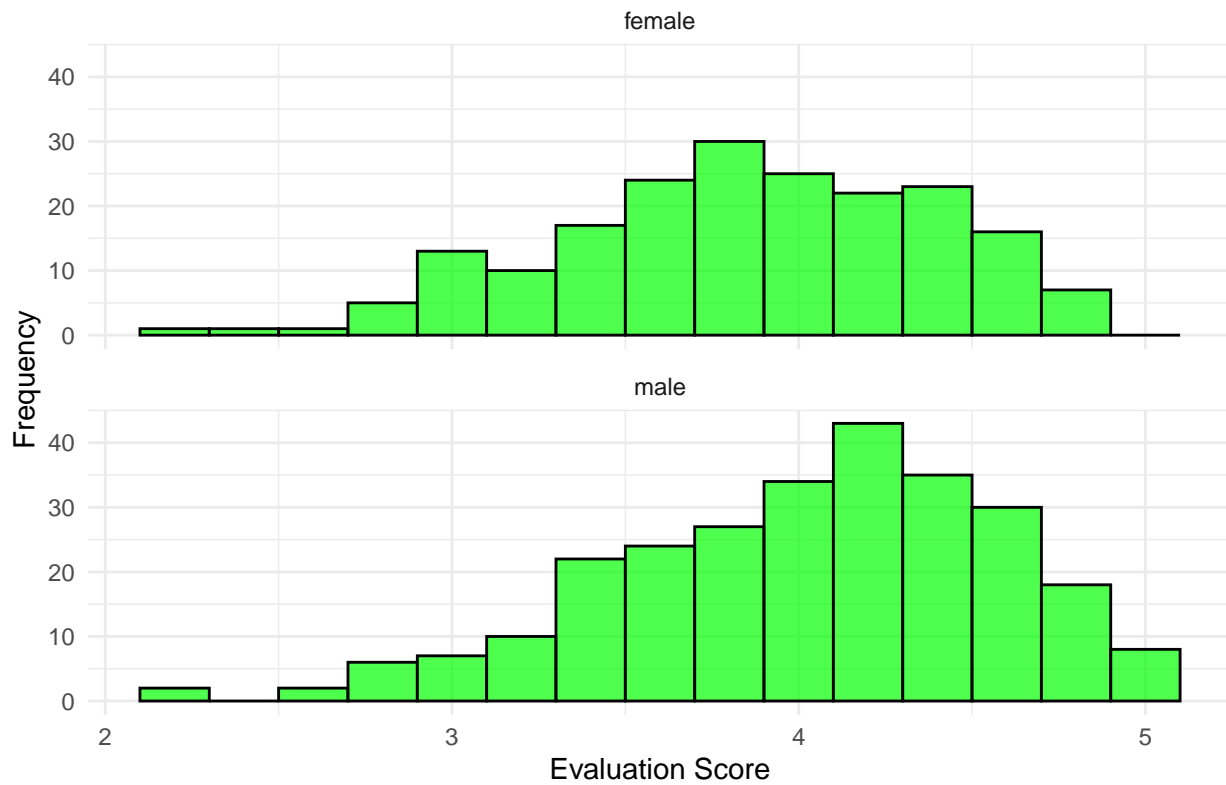
This faceted histogram shows the distribution of course evaluation scores separately for male and female instructors. Both genders exhibit similar overall patterns, but male instructors have a slightly broader distribution of scores, with more variability observed in their evaluations.

Part D

Relationship Between Attractiveness and Course Evaluation Scores
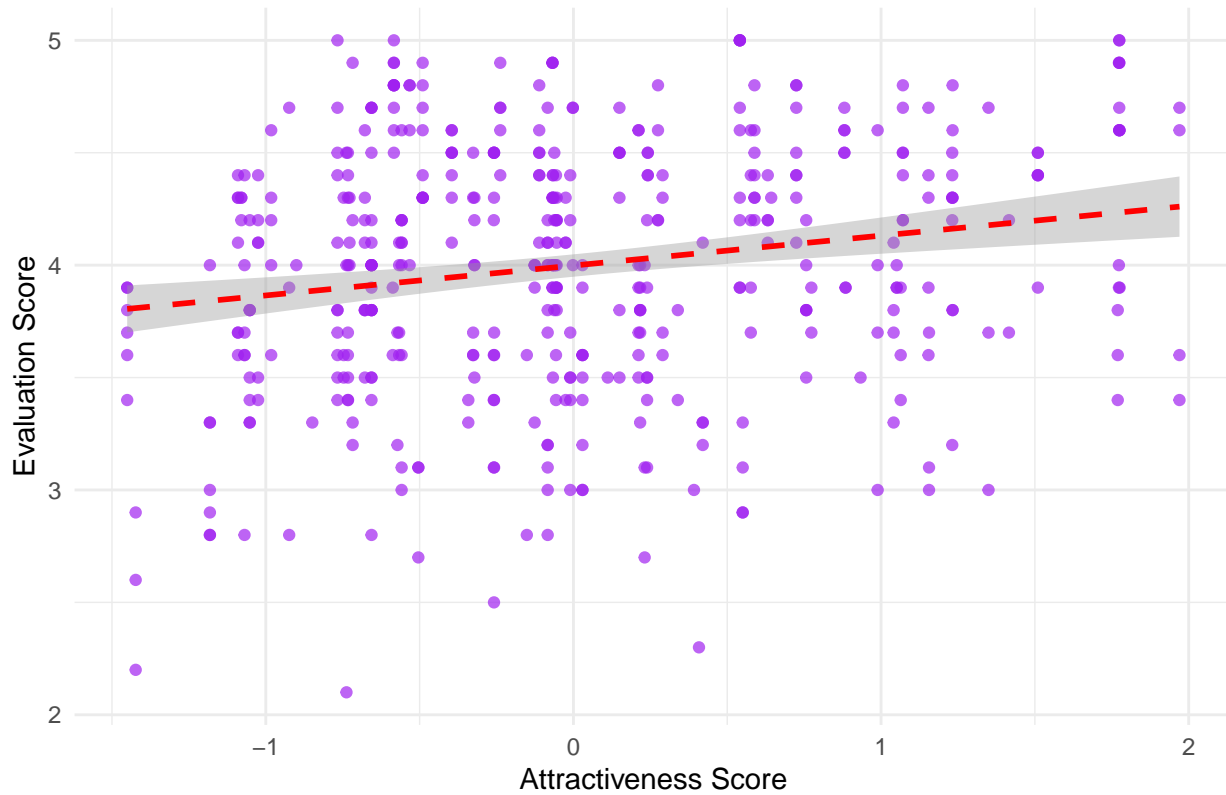
This scatterplot explores the association between professors' physical attractiveness and their course evaluation scores. A positive trend is observed, suggesting that higher attractiveness scores correlate with higher course evaluations, though the effect appears modest.
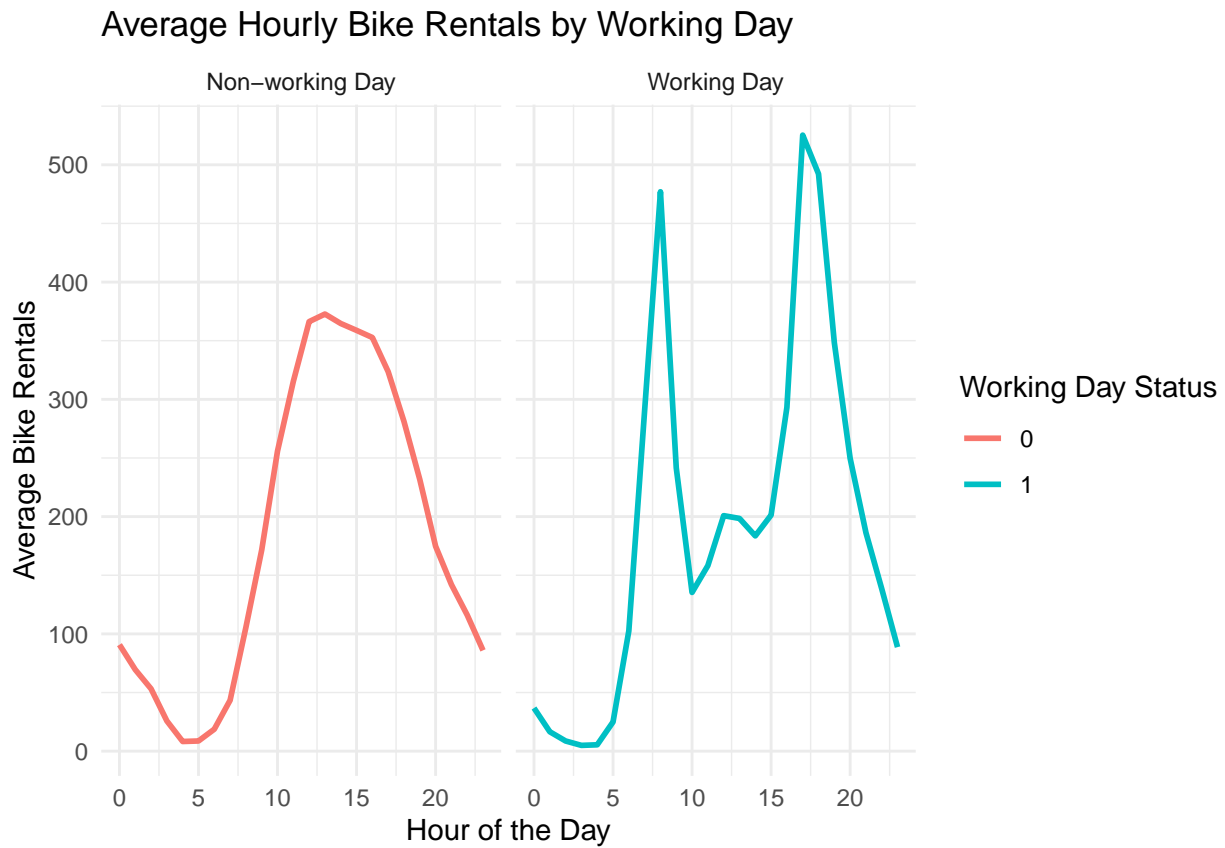
# Problem 2

Plot A

Average Hourly Bike Rentals
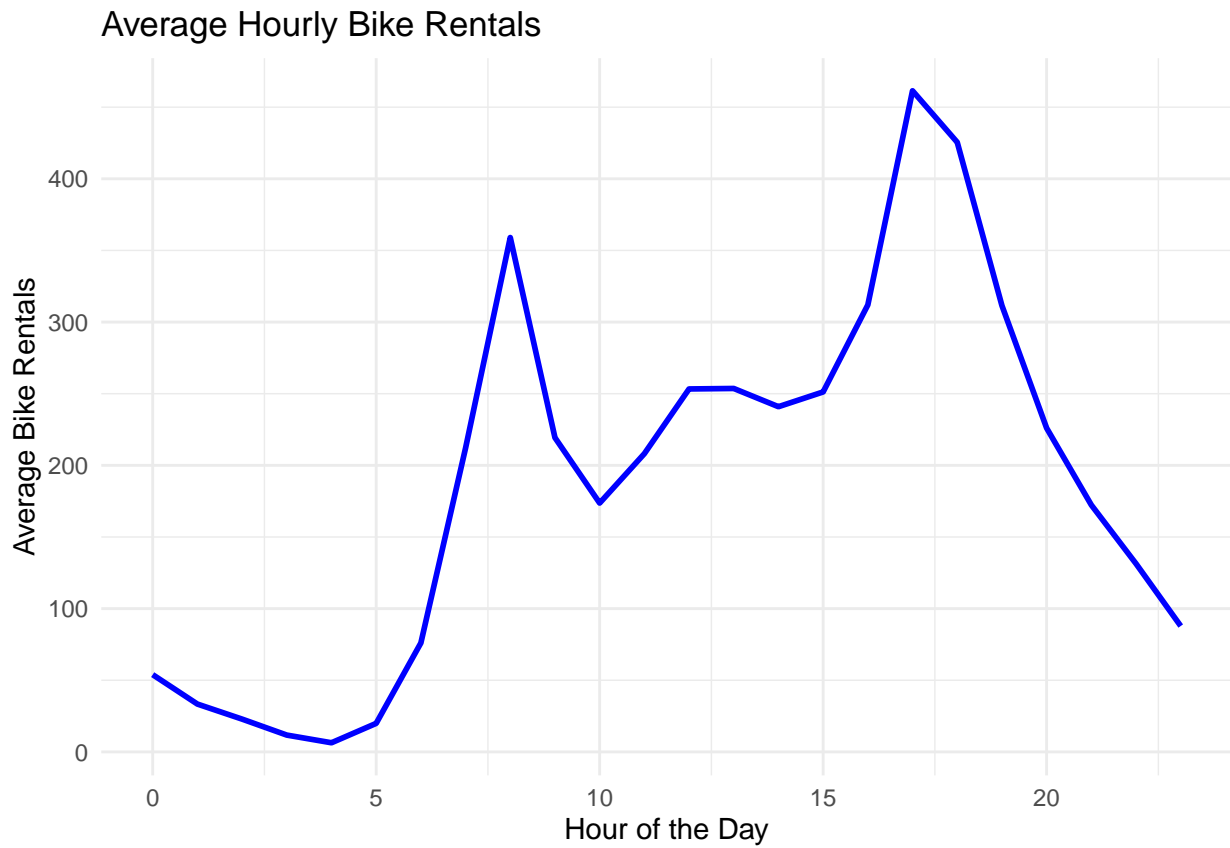
This line graph displays the average hourly bike rentals across all hours of the day. Rentals peak during morning and evening commute hours (8 AM and 5 PM), reflecting the use of bike-sharing systems for work-related travel.

Plot B

Average Hourly Bike Rentals by Working Day

This faceted line graph shows average hourly bike rentals, separated by working and non-working days. On working days, bike rentals exhibit sharp peaks during commute hours, while non-working days display a more gradual increase, with higher activity during midday hours.

Plot C

Average Bike Rentals at 9 AM by Weather Situation
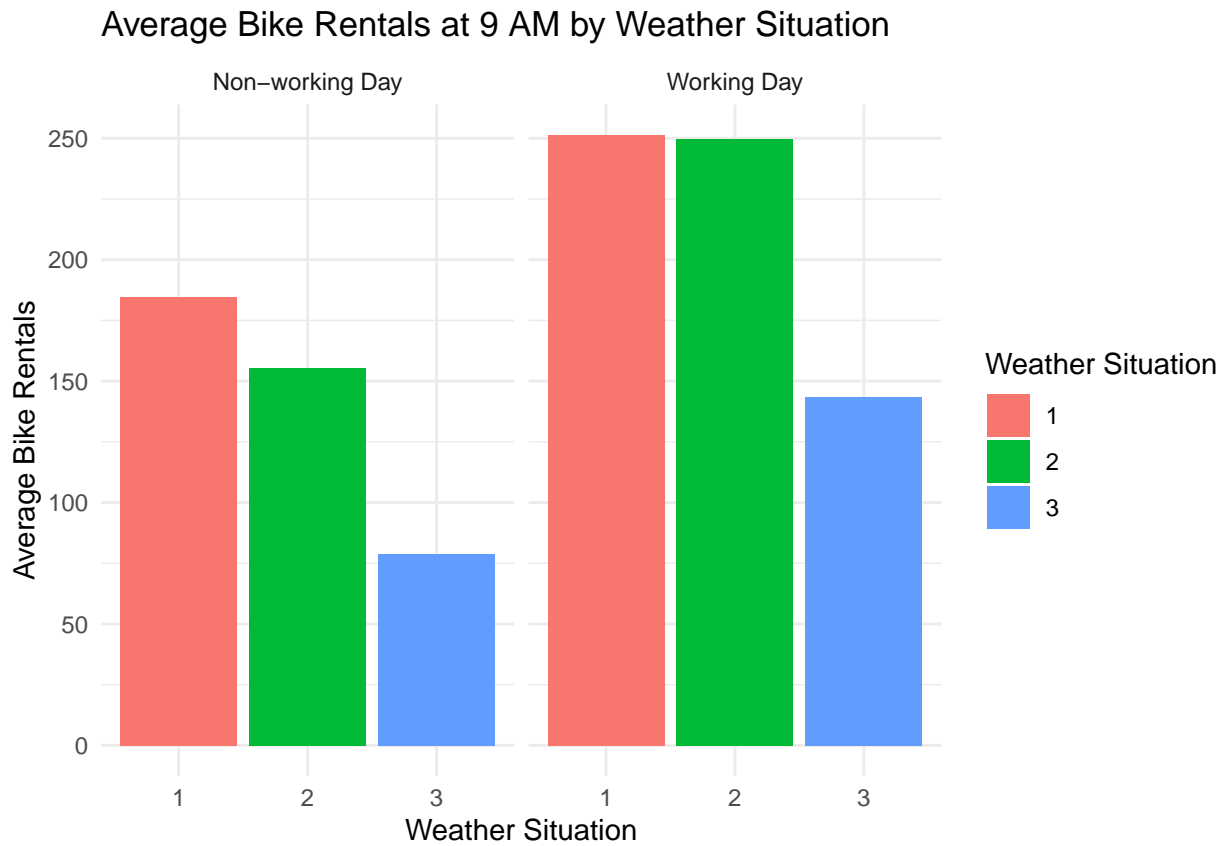
This faceted bar plot depicts average bike rentals at 9 AM by weather situation, separated by working and non-working days. Clear weather consistently sees the highest ridership, while adverse weather conditions like rain or snow significantly reduce bike rentals.

Problem 3

Faceted Line Graph

Average Boardings by Hour of Day, Day of Week, and Month
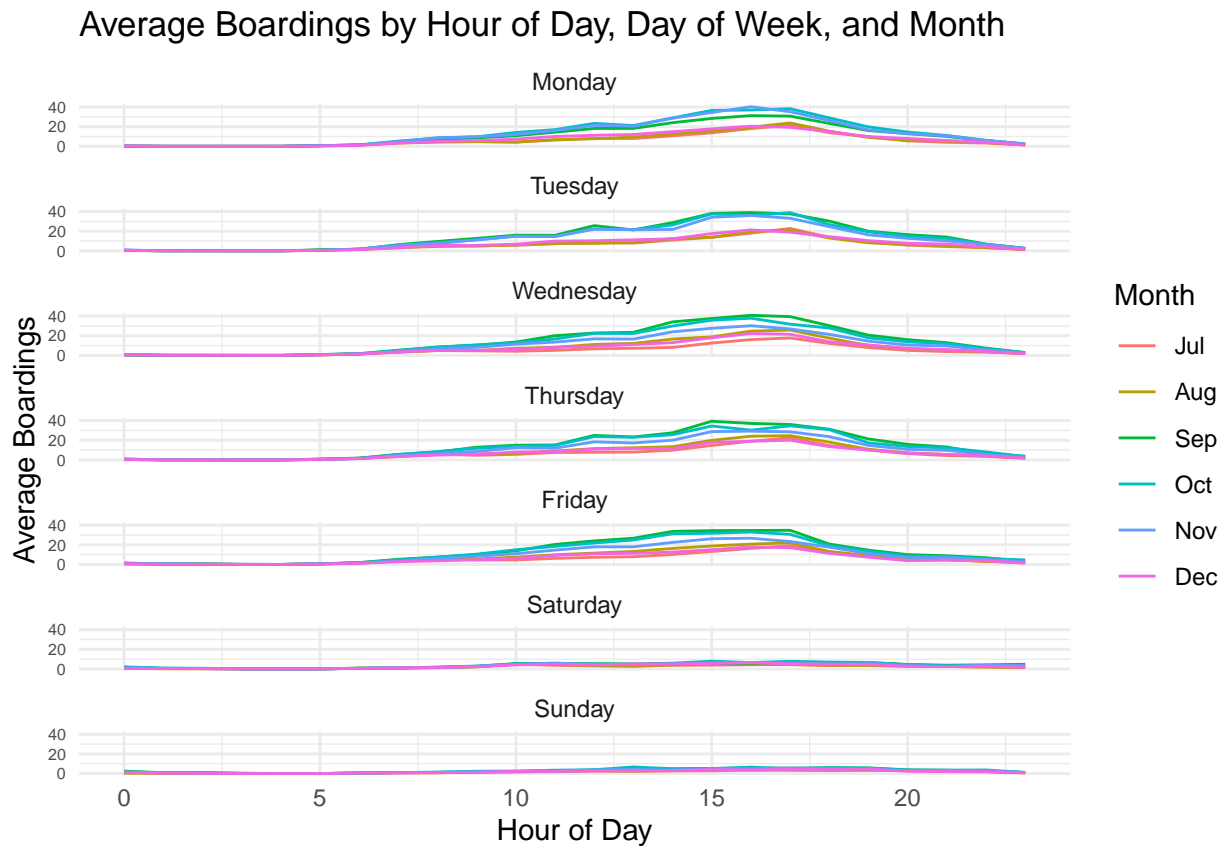
This faceted line graph presents the average hourly boardings for each day of the week, with separate lines for different months. Peak boarding hours are broadly similar across days, occurring around 8 AM and 5 PM. Monday boardings in September are lower, likely due to the start of the semester, while boardings on Wednesday-Friday in November are reduced, potentially due to Thanksgiving break.

Faceted Scatter Plot

Boardings vs Temperature by Hour of Day
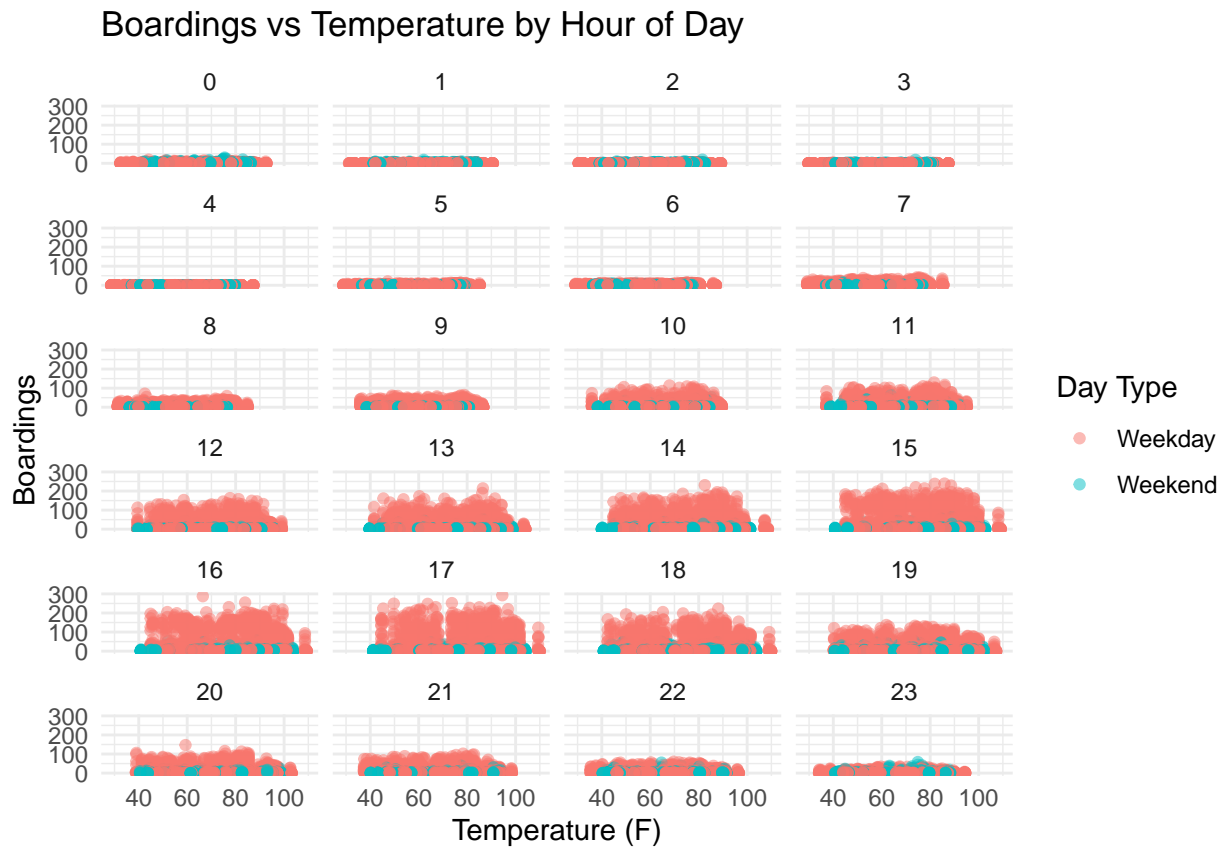
This faceted scatterplot shows boardings as a function of temperature, separated by hour of day and colored by whether it is a weekday or weekend. Higher temperatures are generally associated with more boardings, particularly during midday hours, though the effect varies depending on the time and type of day.

Problem 4

Part A

Table 1: Top 10 Most Popular Songs by Total Weeks on Billboard Top 100

| performer	song	count
Imagine Dragons	Radioactive	87
AWOLNATION	Sail	79
Jason Mraz	I'm Yours	76
The Weeknd	Blinding Lights	76
LeAnn Rimes	How Do I Live	69
LMFAO Featuring Lauren Bennett & GoonRock	Party Rock Anthem	68
OneRepublic	Counting Stars	68
Adele	Rolling In The Deep	65
Jewel	Foolish Games/You Were Meant For Me	65
Carrie Underwood	Before He Cheats	64

This table lists the top 10 most popular songs since 1958, ranked by the total number of weeks spent on the Billboard Top 100 chart. "Radioactive" by Imagine Dragons holds the top spot with 87 weeks, showcasing its sustained popularity.

Part B

Musical Diversity Over Time
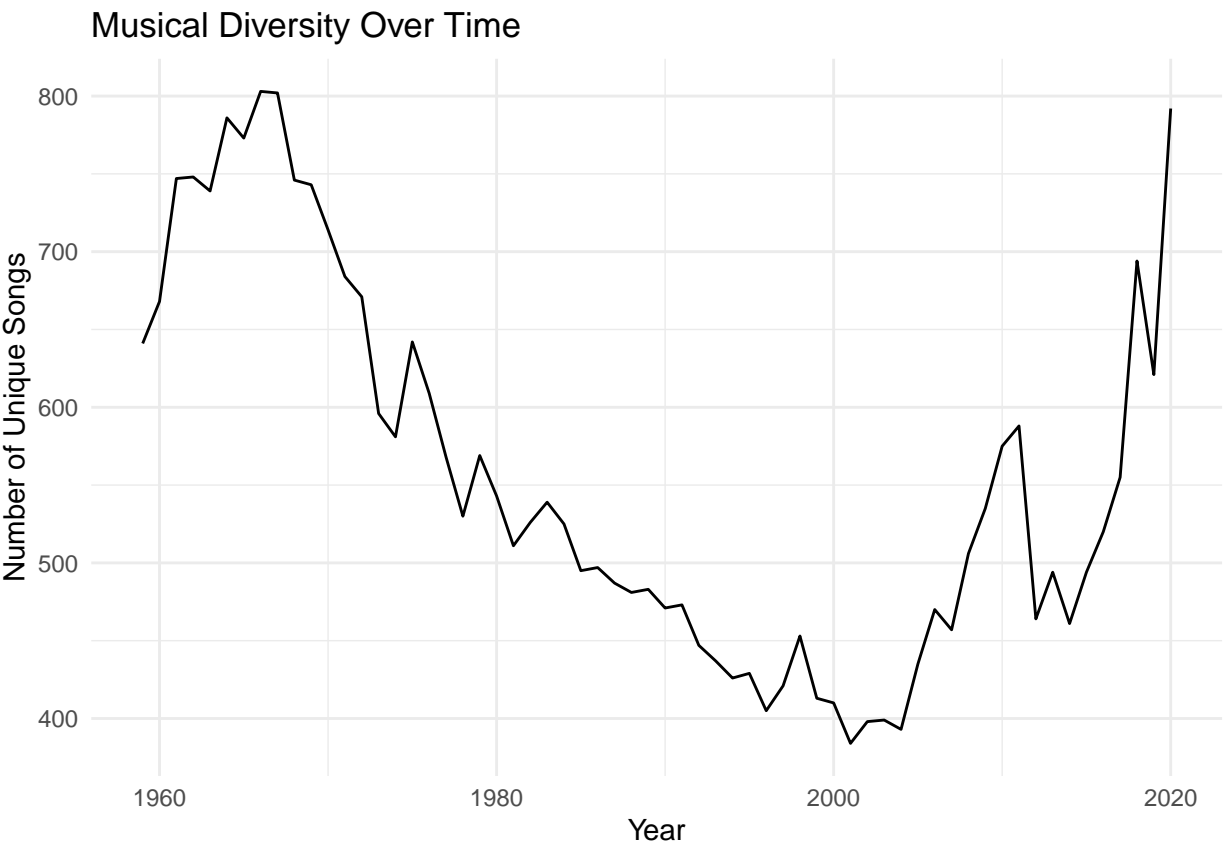
This line graph illustrates the number of unique songs appearing on the Billboard Top 100 each year. Musical diversity has steadily increased since 1960, reflecting broader changes in the music industry and consumer preferences.

Part C

Artists with At Least 30 Ten–Week Hits
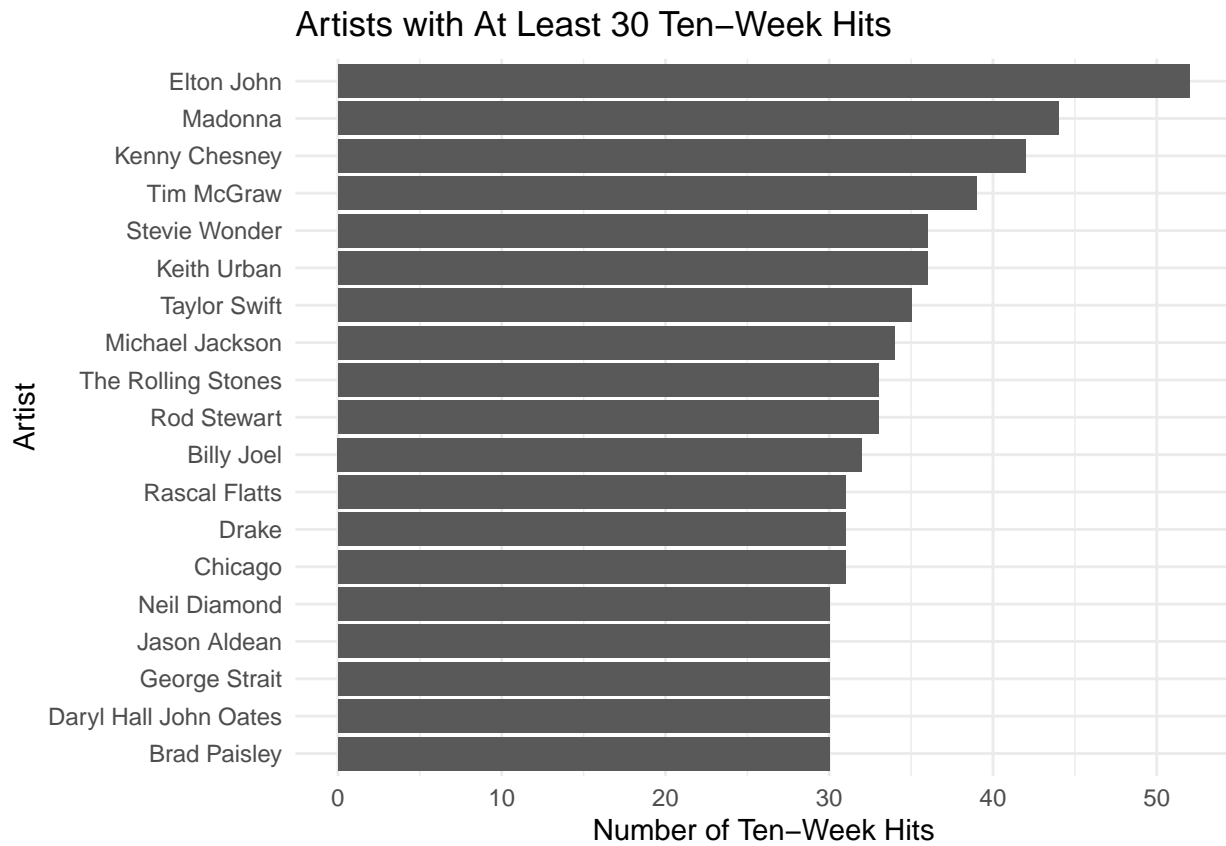
This horizontal bar plot highlights artists with at least 30 songs that appeared on the Billboard Top 100 for at least 10 weeks. Elton John leads the list, demonstrating a consistent ability to produce enduring hits.