SDS 315 Homework 2

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UTEID: kk38378
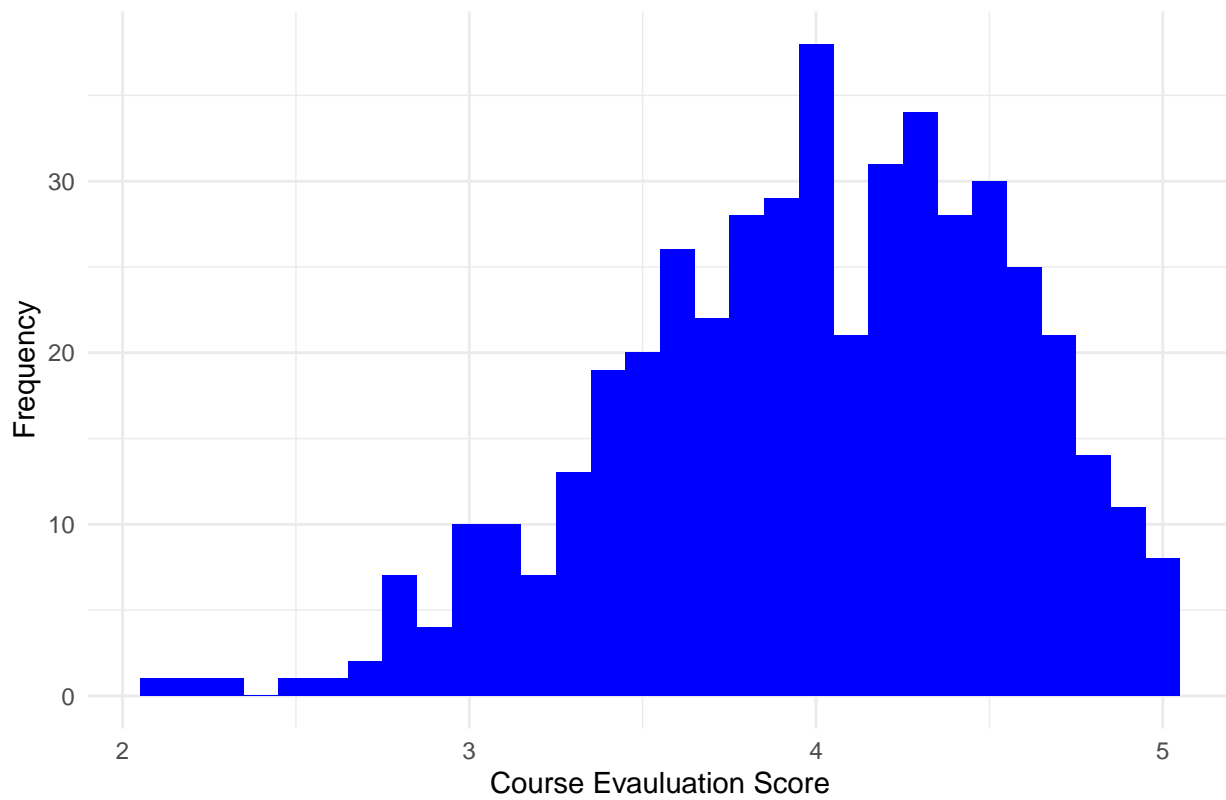
Github Link:

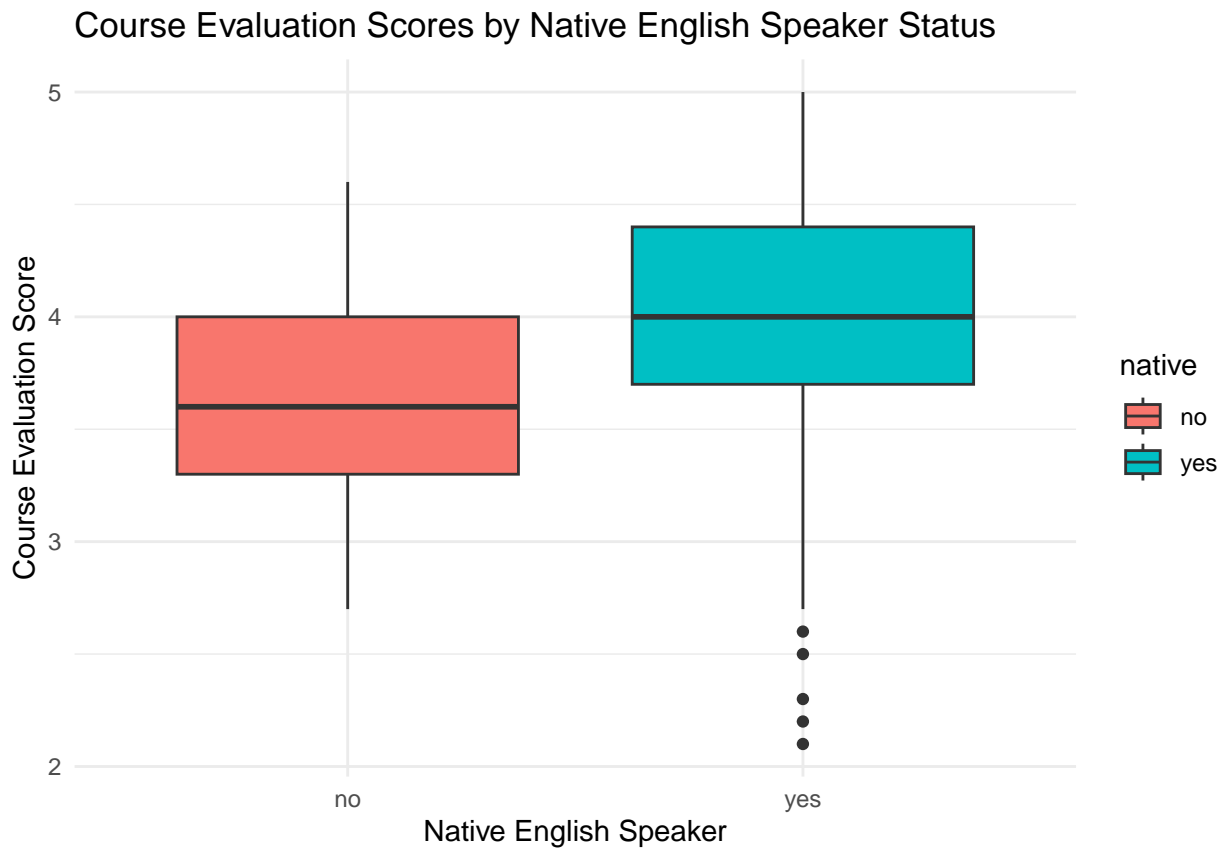https://github.com/karthikeyakasa/SDS2025.git

Problem 1

Part a)

Distribution of Course Evaluation Courses

This histogram displays the frequency of different course evaluation scores, helping to visualize how scores are spread across the dataset.
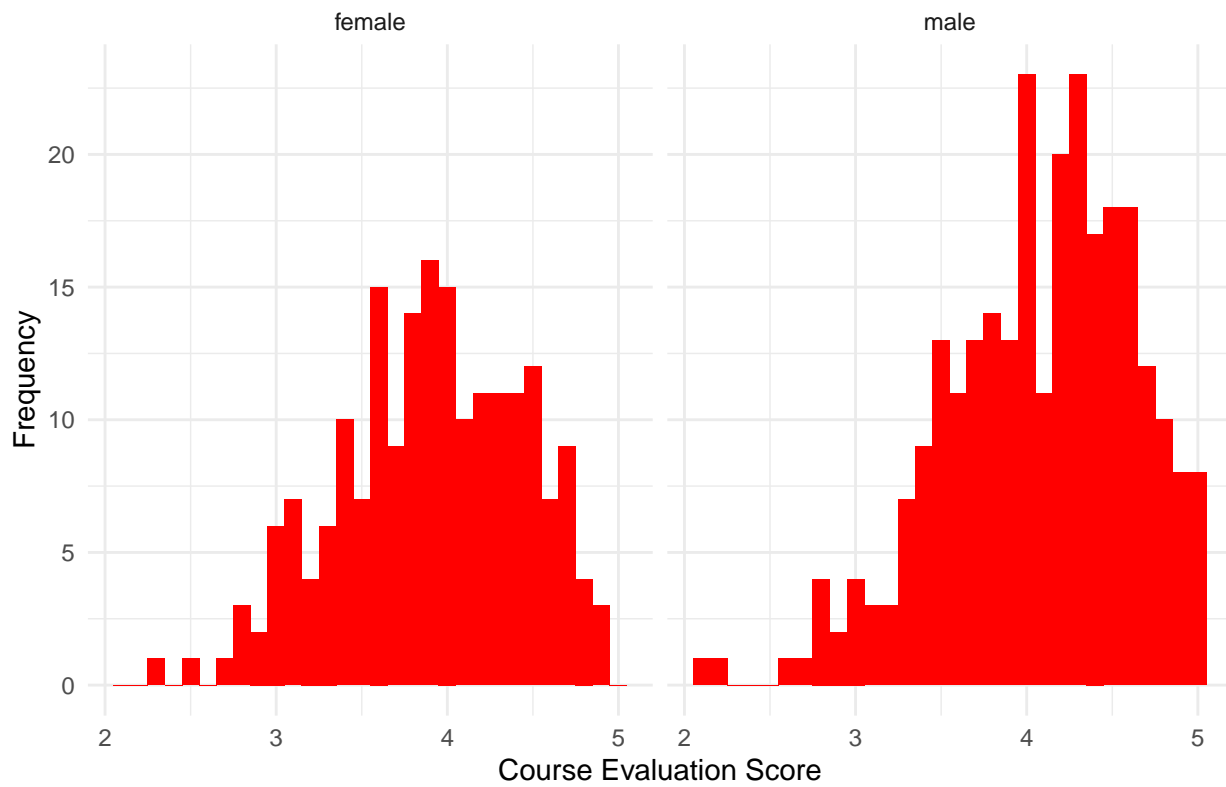
Part b)

Course Evaluation Scores by Native English Speaker Status

Comparing course evaluation scores based on native English speaker status. Insights into how language background might influence student feedback.
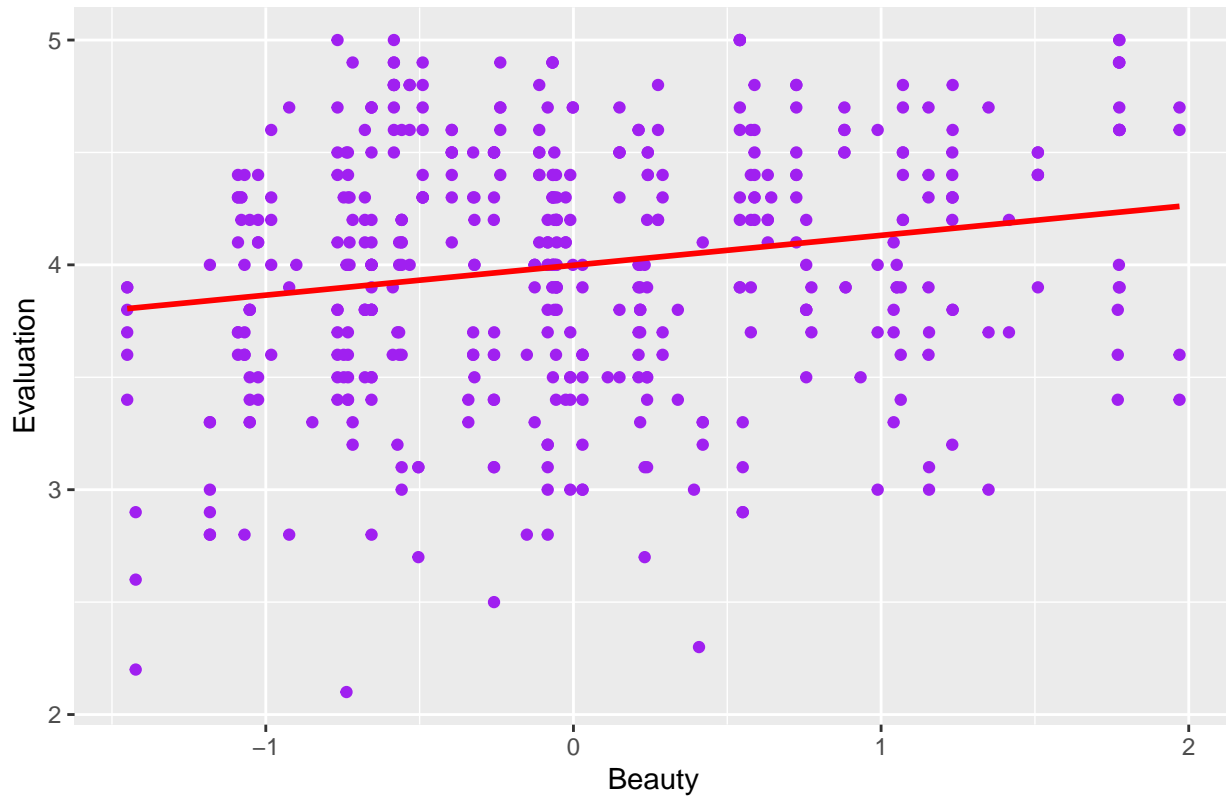
Part c)

Course Evaluation Scores by Gender

Exploring course evaluation scores across gender. A closer look at the distribution of feedback.

Part d)

Evaluation vs. Beauty with Regression Line

This scatter plot shows the relationship between perceived beauty and course evaluation scores, with a linear regression line (in red) illustrating the trend. The correlation coefficient is 0.19, suggesting a weak positive relationship between beauty and course evaluations, though the correlation is not strong enough to indicate a substantial influence.

Problem 2

Part a)

Average Hourly Bike Rentals Across All Hours of the Day
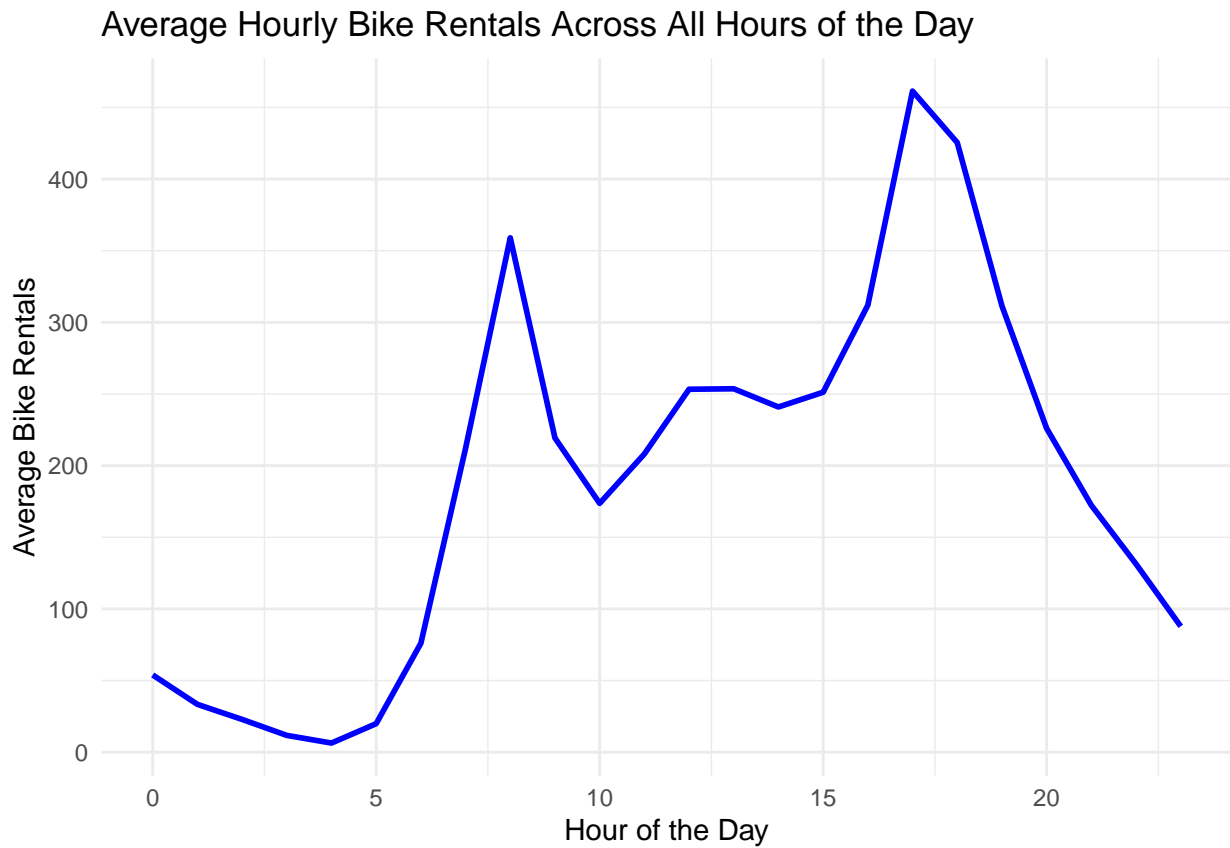
Trends in average hourly bike rentals (rentals per hour) across all hours of the day. The plot illustrates the variation in bike rentals, highlighting peak and off-peak hours throughout the day.
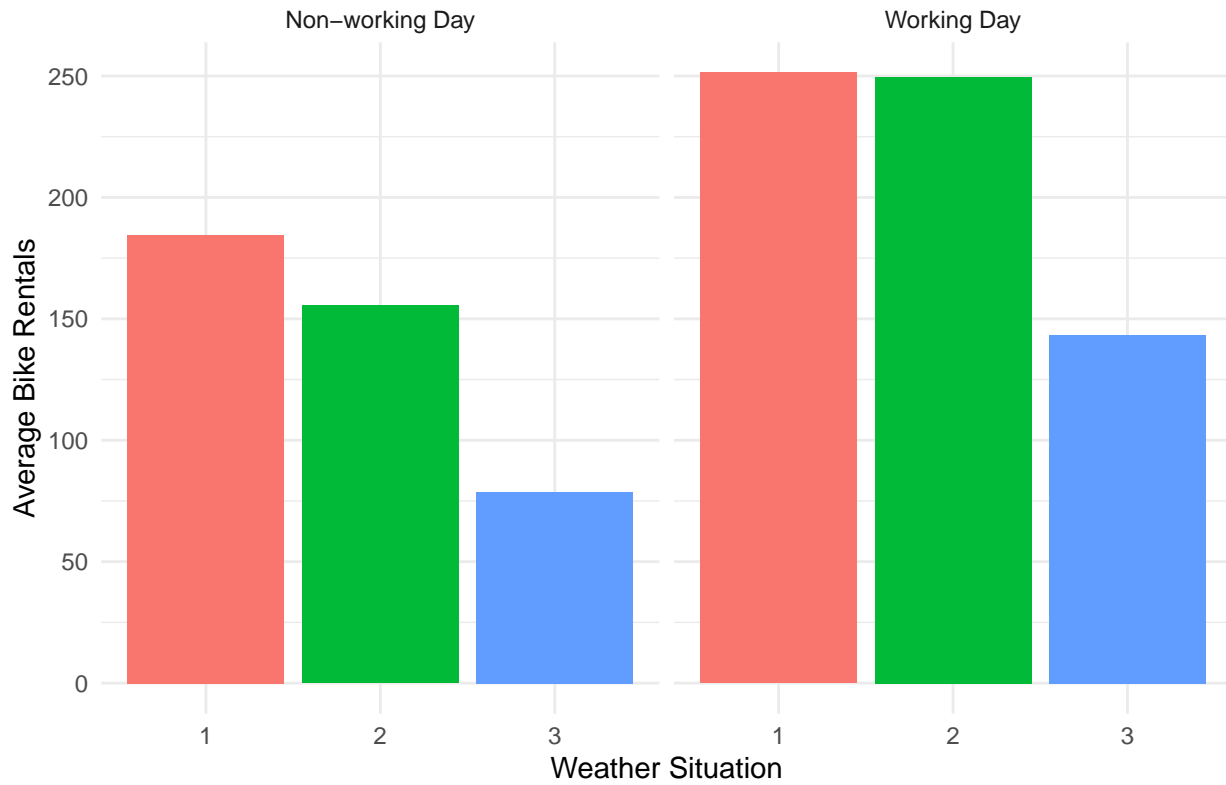
Part b)

Average Bike Rentals by Hour of the Day and Working Day Status

Trends in average bike rentals (rentals per hour) by hour of the day, separated by working day status. The plot compares average rentals on working days versus non-working days, showcasing variations in bike rental patterns throughout the day.

Part c)

## Average Bike Rentals at 9 AM by Weather Situation and Working Day Statu

Average bike rentals (rentals per day) at 9 AM, categorized by weather situation and working day status. The plot compares rental trends under different weather conditions, showing how they vary between working and non-working days.

Problem 3

Part a)

## Average Boardings by Hour of Day, Day of Week, and Month
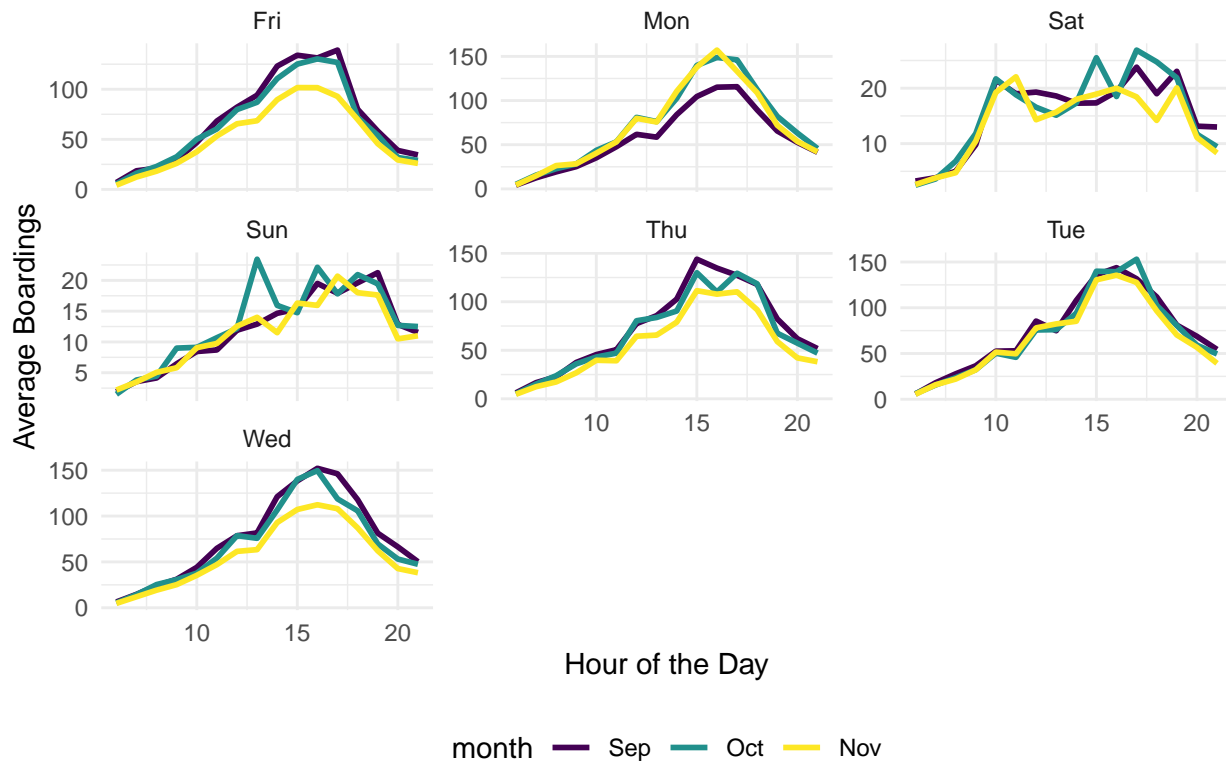
This graph shows the average number of boardings by hour of the day, broken down by day of the week, with each month (September, October, and November) represented by a different line. Overall, there isn't much difference between the months, but you can see a clear spike around 3 PM every day, indicating a consistent peak in ridership during that time.

The graph also highlights a drop in boardings on Mondays in September, which might be due to a public holiday or fewer people using transit after the weekend. Similarly, ridership seems lower on Wednesdays, Thursdays, and Fridays in November, likely because of colder weather or shifts in commuting patterns. Despite some month-to-month variation, the overall trend shows a predictable peak around 3 PM each day.

Part b)

Boardings vs. Temperature by Hour of Day and Weekend Status

weekend ● Weekday ● Weekend
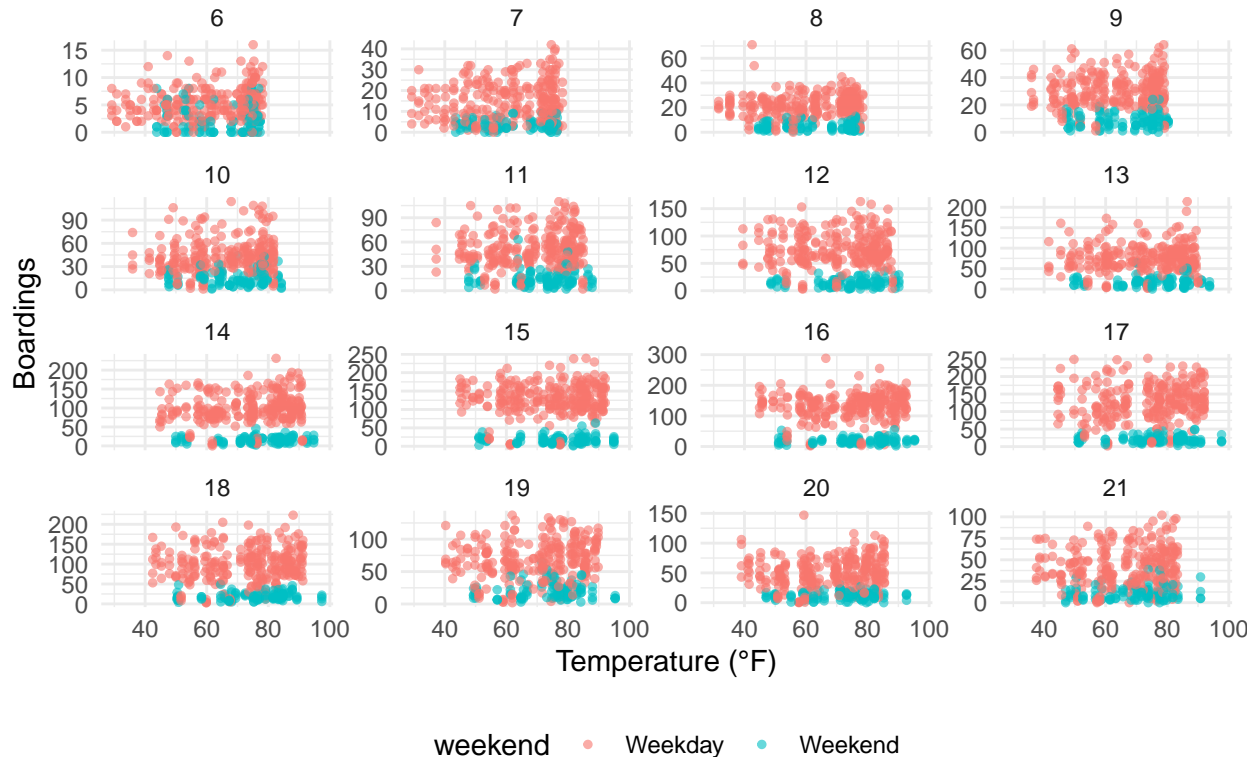
This scatter plot shows the relationship between temperature (x) and boardings (y) at different hours of the day, with points colored by whether it's a weekday or weekend. Each facet represents a specific hour, letting us see how boardings change as the temperature fluctuates throughout the day.

From the plot, it seems that temperature doesn't have a strong impact on the number of boardings when we account for the time of day and whether it's a weekend or not. While there are some variations in boardings across temperatures, there's no clear pattern—boarding numbers don't consistently go up or down as the temperature rises or falls. For instance, at 9 AM, boardings are pretty evenly spread across a range of temperatures, and the same holds true for both weekdays and weekends. This suggests that other factors, like the time of day or specific events, might be more influential in driving ridership than the weather itself.

Part 4

Part a)

Table 1: Top 10 Songs with the Most Weeks on the Billboard Chart

	performer	song	week
19500	Imagine Dragons	Radioactive	87
20493	AWOLNATION	Sail	79
2877	The Weeknd	Blinding Lights	76
12125	Jason Mraz	I'm Yours	76
10200	LeAnn Rimes	How Do I Live	69
4626	OneRepublic	Counting Stars	68
18706	LMFAO Featuring Lauren Bennett & GoonRock	Party Rock Anthem	68
7444	Jewel	Foolish Games/You Were Meant For Me	65

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	performer	song	week
20212	Adele	Rolling In The Deep	65
2478	Carrie Underwood	Before He Cheats	64

The table displays the top 10 songs with the most weeks on the Billboard chart, including the performer, song title, and the total number of weeks each song spent on the chart.

Part b)

Musical Diversity of Billboard Top 100 Over Time
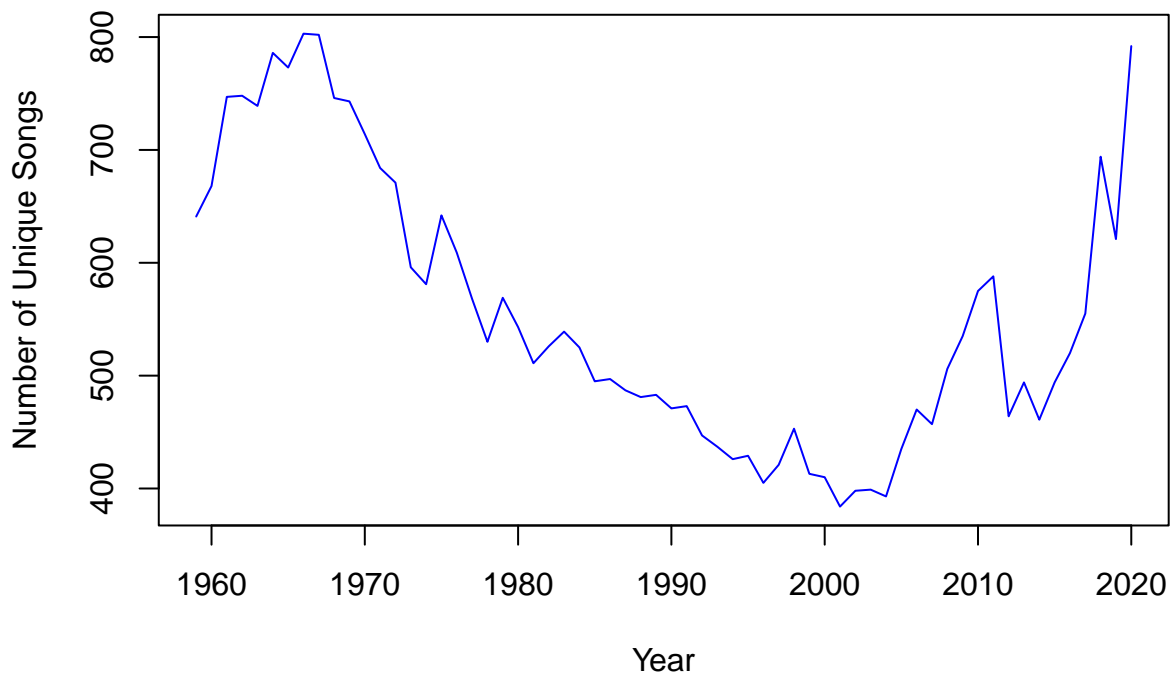
This plot shows how the diversity of songs on the Billboard Top 100 has changed from 1959 to 2020. Overall, we see a decrease in unique songs until 2000, with a particularly noticeable jump after the early 1990s. This suggests that the charts became more varied, with a wider mix of genres and artists breaking through. There are some large dips along the way, which probably reflect periods when a few dominant artists or genres held a tight grip on the charts. The sharp rise in diversity in the 2000s likely reflects the influence of digital platforms and streaming services, which made it easier for a wider range of music to gain mainstream attention.

Part c)

Number of Ten−Week Hits for Artists with at Least 30 Hits
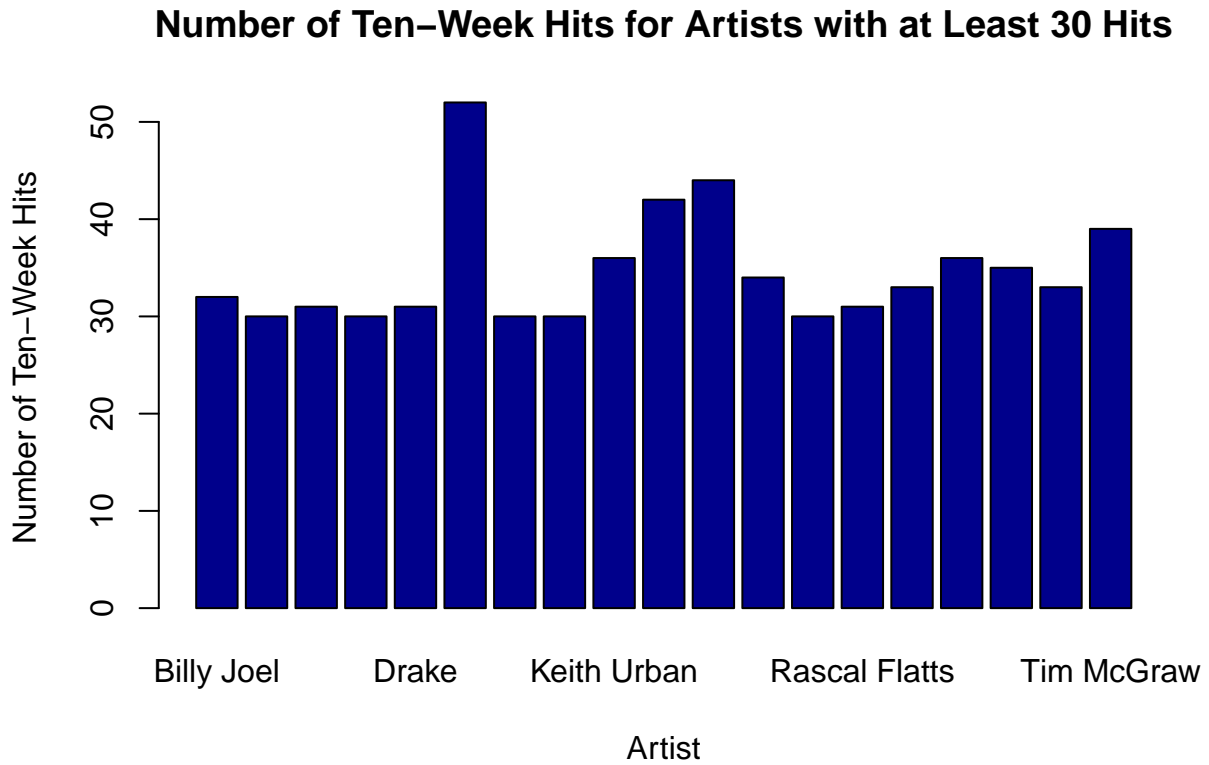
This bar plot shows the number of "ten-week hits" for the 19 artists with at least 30 songs that spent 10 or more weeks on the Billboard Top 100. Each bar represents how many songs by each artist achieved this level of chart success.