Formula 1:

I ♥ Lewis Hamilton

This project is the Final Project for DSC 106 by Jiyeon Song.
"I will win again" - Lewis Hamilton

Welcome to the exhilarating world of Formula 1, the pinnacle of motorsport where speed, skill, and strategy come together in a thrilling spectacle of technology and athleticism.
From the roar of the engines to the precision of the pit crews, Formula 1 is a high-stakes competition that captivates fans around the world.

In this project, we will explore five key data visualizations that illuminate the fascinating world of Formula 1.
From the performance of individual drivers to the dynamics of the entire field, these visualizations offer unique insights into the complexities of this electrifying sport.

So buckle up, rev your engines, and get ready to dive into the exciting world of Formula 1!

Question 1: Relationship between duration of pit stop and lap time

Plot:

- Color scheme: Formula 1 Official Logo Color scheme
- Marks: points
- Channels: horizontal & vertical
- x axis: Lap time in millisecond
- y axis: Pit stop time in millisecond

The relationship between the duration of pit stops and lap times in Formula 1 is a critical aspect of the race strategy.
Pit stops are an essential part of the race, as they allow teams to change tires, refuel, and make necessary repairs to the car.
However, a longer pit stop can result in a significant loss of time on the track, which can ultimately impact a driver's overall race performance.

Based on the given results, we can see that most drivers' pit stop times are in the range of 18000 to 40000 milliseconds, indicating that teams are generally efficient in completing their pit stops within this range.
Meanwhile, we can see that drivers' lap times vary widely, ranging from 58000 to 260000 milliseconds.

Overall, the relationship between pit stop duration and lap time is complex and multifaceted, and there are many factors that can impact this relationship, such as the type of tire used, the fuel load, and the driver's skill level.
However, by analyzing the data provided, we can begin to understand the importance of efficient pit stops in maximizing a driver's performance on the track.

Question 2-a: Which driver went on the podium(the first, second, and third-placed drivers) the most?

Plot:

- Color scheme: Formula 1 Official Logo Color scheme
- Marks: area
- Channels: area(driver's name size)

A word cloud is a type of data visualization that displays words in a visual format, with the size of each word corresponding to the frequency of its appearance in a given text or dataset.
In this case, we created a word cloud that contains the names of Formula 1 drivers and the number of times they have finished on the podium.

Before we start looking at the data, we can learn a word, podium, in Formula 1.
The podium in Formula 1 refers to the top three positions in a race, with the driver who finishes first standing on the highest step, followed by the second and third-place drivers.
The podium is an important achievement for drivers, as it signifies a successful race performance and often results in valuable points towards the driver's championship.

By creating a word cloud that represents the success of Formula 1 drivers in terms of podium finishes, we can gain insights into the top-performing drivers in the sport.
In our case, we can say Schumacher, Hamilton, Verstappen, Alonso, and more are the drivers who went on the podium many times.
The drivers with the largest text in the word cloud will be those who have achieved the most podium finishes, and these drivers are likely to be considered among the most successful and skilled competitors in the sport.

Question 2-b: Which constructor team went on the podium(the first, second, and third-placed drivers) the most?

Plot:

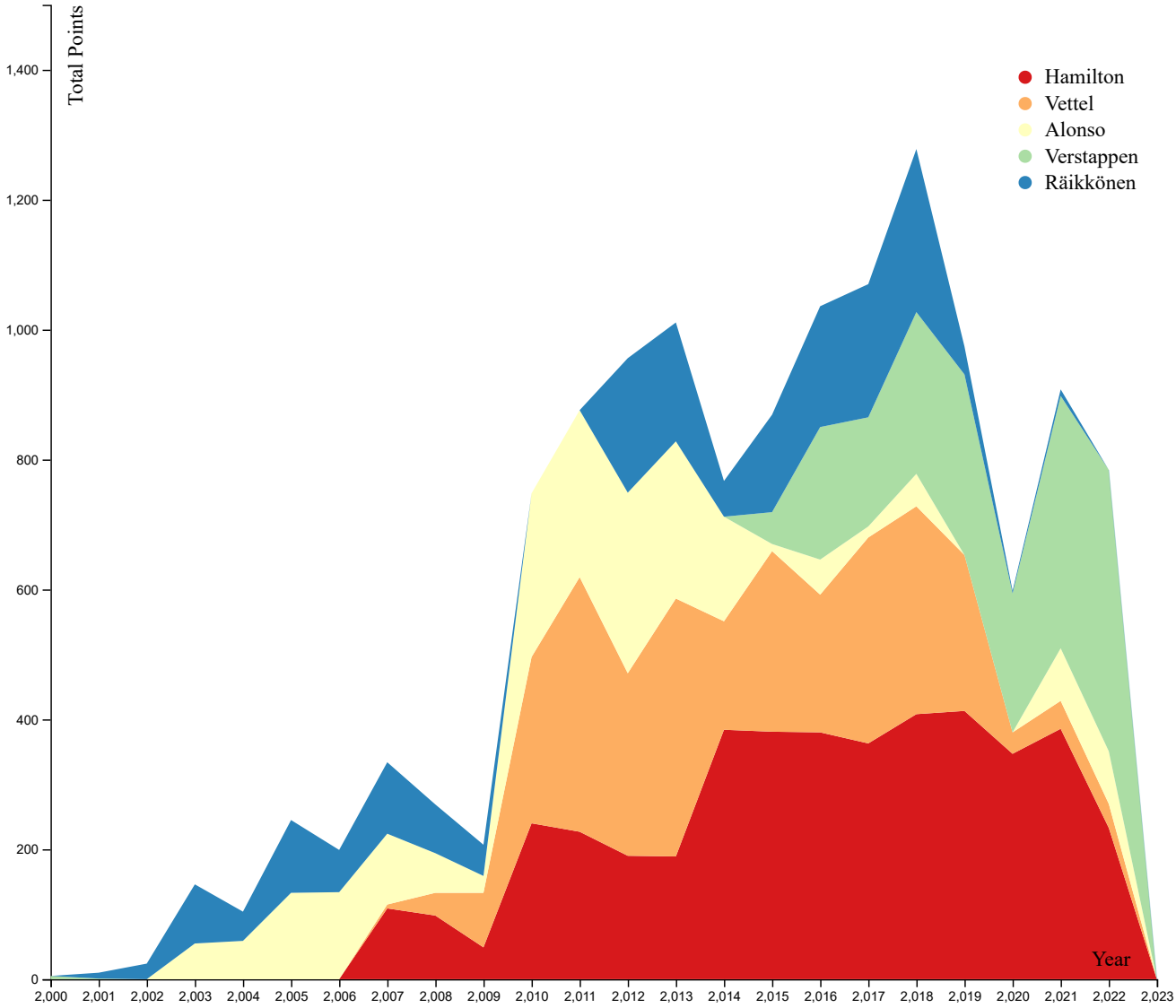
- Color scheme: Formula 1 Official Logo Color scheme
- Marks: area
- Channels: area(constructor's name size)

(Same word cloud format as Question 2-b, but this visualization is Constructor team which went on the podium many times.)
In this case, we can say Ferrari, Mercedes, McLaren, and Red Bull went of the podium many times in Formula 1 history, and they are the powerful constructor teams.

Question 3: Between Hamilton, Vettel, Verstappen, Alonso, and Räikkönen, who earned the most points in Grand Prix Championships from 2000 to 2022?

Plot:

Stacked streamgraph for Top 5 drivers from 2000 to 2022



- Color scheme: schemeSpectral[5] for 5 drivers
- Marks: area
- Channels: color, horizontal & vertical, area

A stacked streamgraph is a type of data visualization that displays the changes in data over time in a visually appealing way.
In this case, the stacked streamgraph contains information on the top 5 drivers, Hamilton, Vettel, Verstappen, Alonso, and Räikkönen, in terms of total points in Formula 1 Grand Prix Championships from 2000 to 2023.

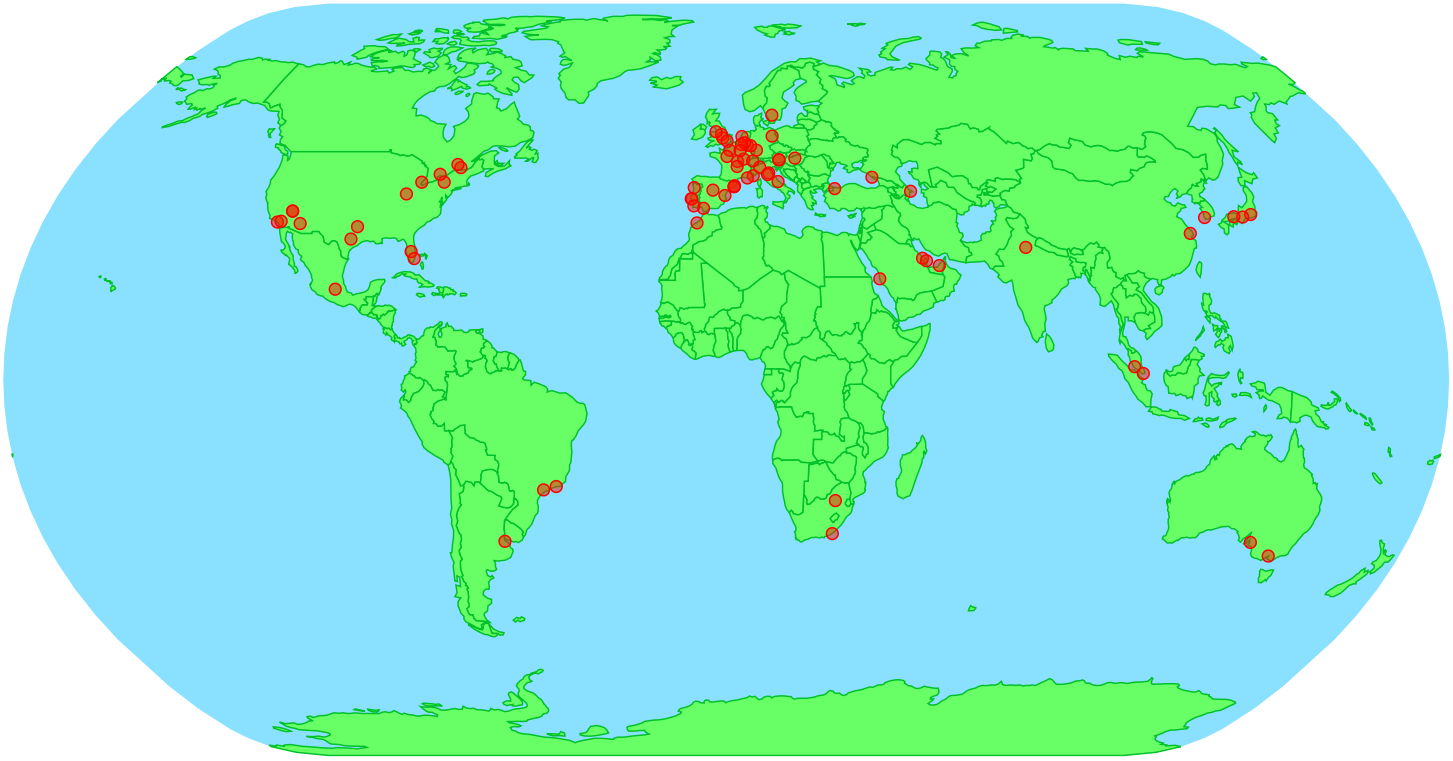
The stacked streamgraph represents the total points of each driver as a stacked area, with each driver's stack colored differently for easy differentiation. The x-axis represents time, with each year displayed as a segment on the graph, while the y-axis represents the total points scored by the drivers.

If we look at the Hamilton's total points (in Red), we can get following information from the graph:
- Started to earn points since 2006
- Earned points constantly until 2019
- Earned the most points on 2019 overall everyone

Question 4: Map of Formula One circuits

Plot:

World Map of Formula One Circuits



- Color scheme: Formula 1 Official Logo Color scheme
- Marks: points, area
- Channels: color(ocean, land, location)

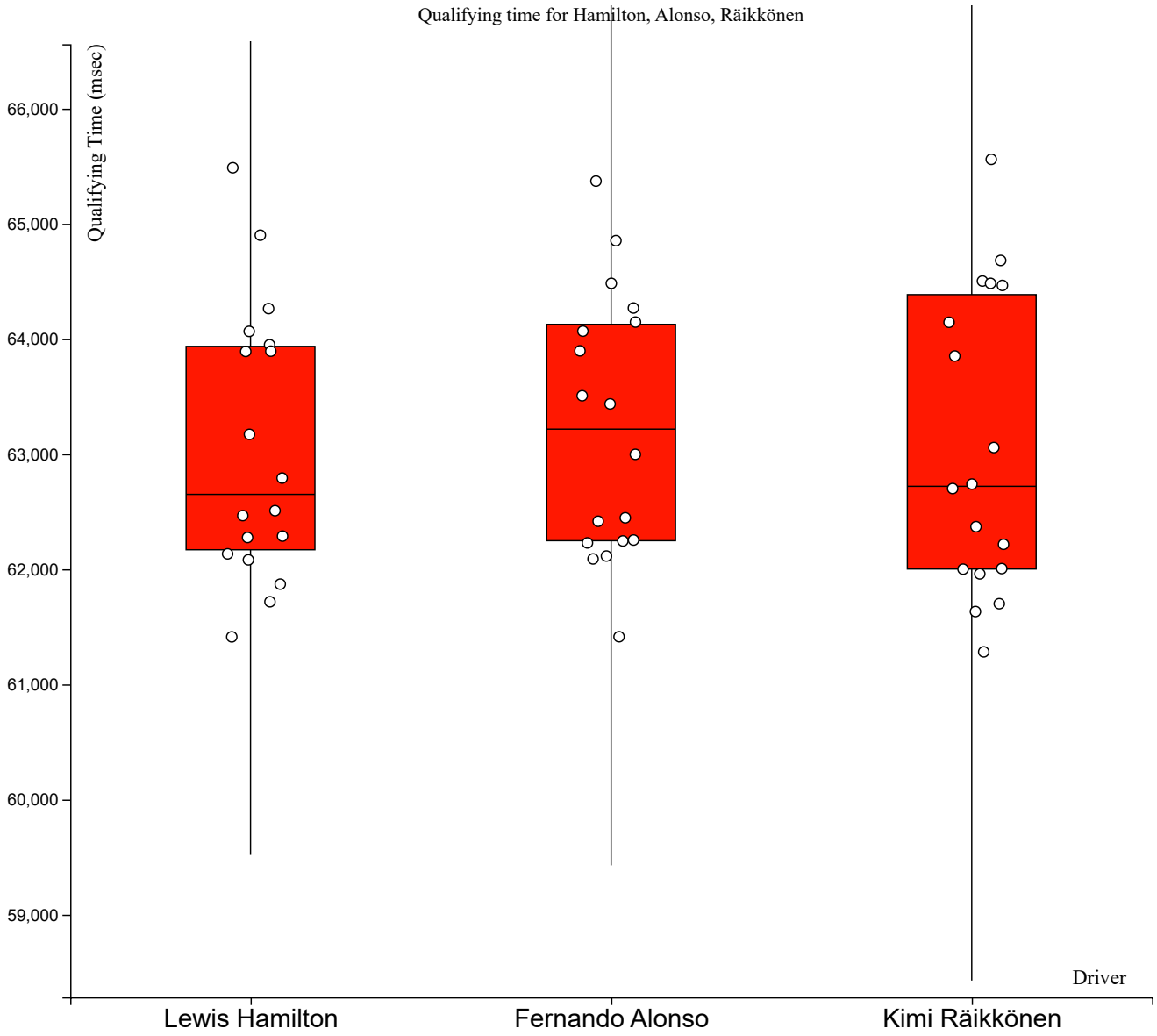
The map provides a visual representation of the various locations where F1 circuits are located across the world.
The circuits are marked on the map using red circles with stroke, showing the location of the circuits.

While the official F1 calendar only includes a select number of circuits each year, this map includes many more circuits than the ones typically used.
Even though F1 is a global sport, many circuits are located in Europe as tradition, compare to other continents.
The 2023 Formula One World Championships will be held in 23 different circuits around the world.

Question 5: Qualifying time distribution for Lewis Hamilton, Fernando Alonso, and Kimi Räikkönen

◉ 2008 ○ 2012 ○ 2016

Plot:



- Color scheme: Formula 1 Official Logo Color scheme
- Marks: points, line, areas(box - q1 to q3)
- Channels: vertical, area, length

A box plot is a type of data visualization that displays the distribution of data based on five key values: minimum, maximum, median, and the first and third quartiles.
In this case, the box plot displays the qualifying time distribution of three of the most successful Formula 1 drivers of all time: Lewis Hamilton, Fernando Alonso, and Kimi Räikkönen.

The box plot is interactive, with radio buttons that allow users to view data from different years: 2008, 2012, and 2016.

By looking at the box plot, we can gain insights into each driver's qualifying performance over the years.
If a box is shorter, it indicates that the qualifying times are clustered, while a taller box indicates that qualifying times are spread out.
If a box is shifted towards the lower end, it indicates that the driver has shorter qualifying time that will lead to front position on the starting grid, while a box shifted towards the higher end indicates that the driver has longer qualifying time and lead to later starting grid in the race.
Additionally, the dots are the exact qualifying times for each driver in several championships.