A Guide to Formula 1

The Monaco Circuit
is a famous street circuit
that has hosted GPs since
1929

3 Types of circuits
Race, Street, and
Road Circuits.

As of 2021, there are
10 constructors in play.

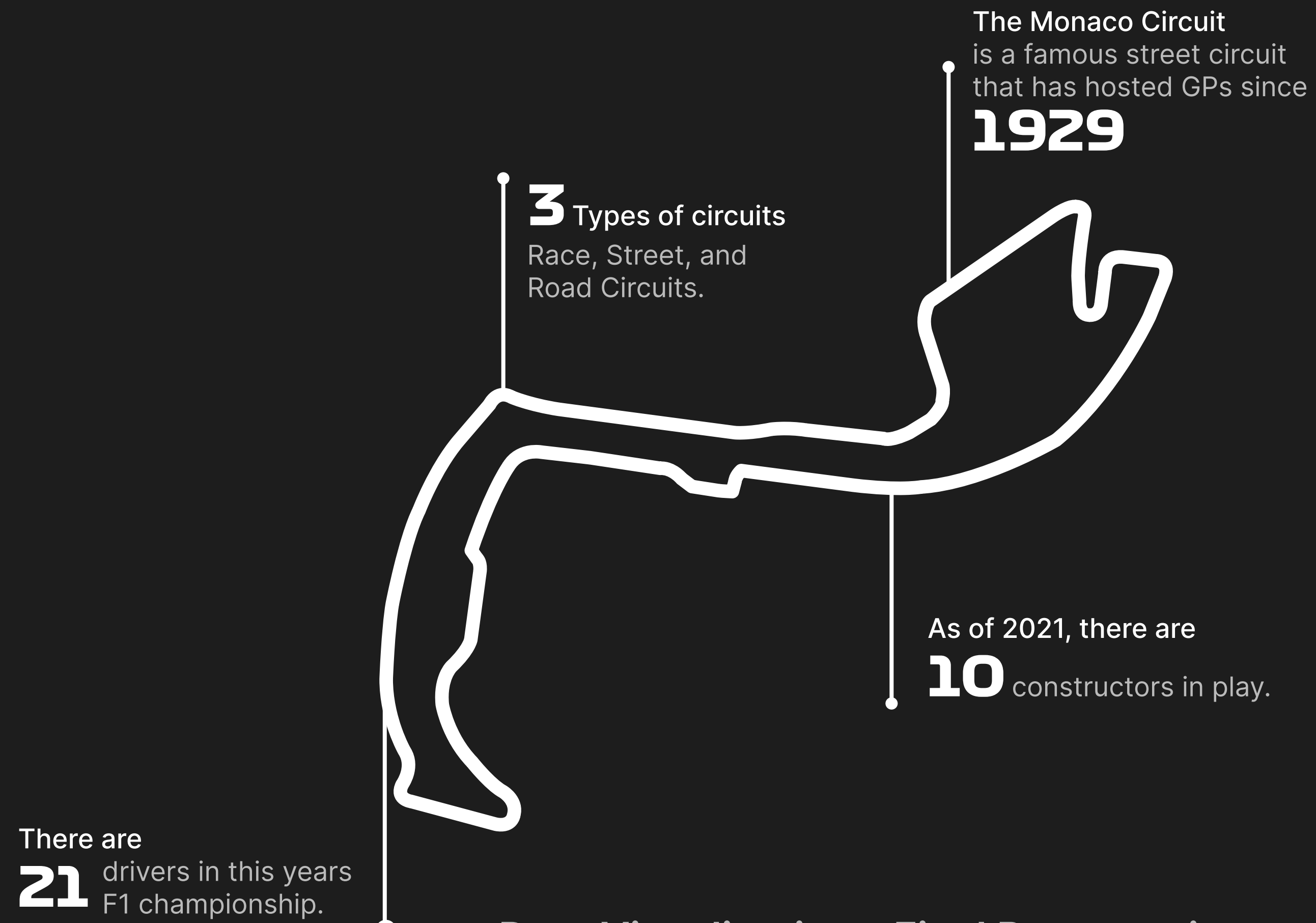There are
21 drivers in this years
F1 championship.

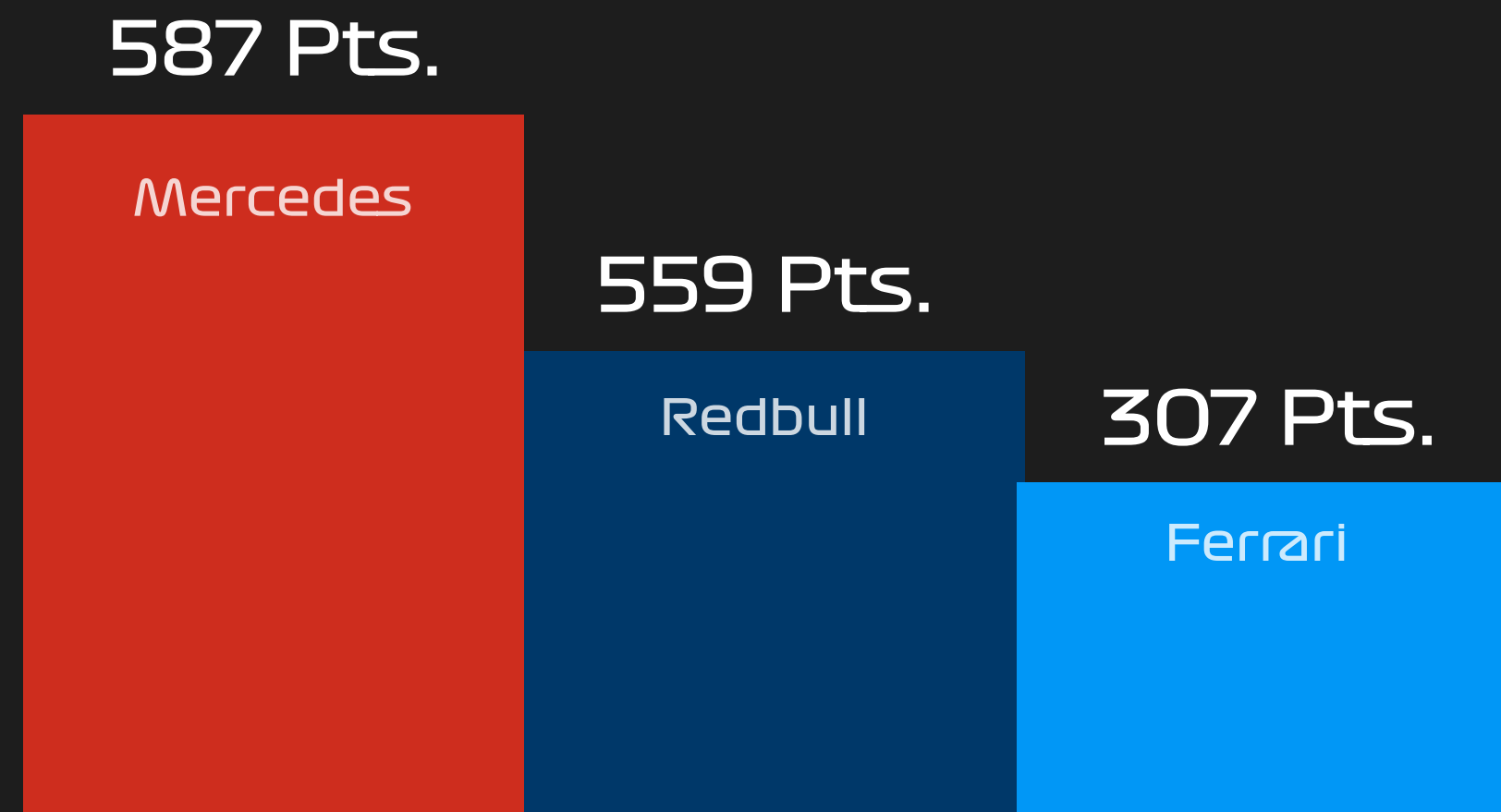**Data Visualization - Final Presentation**

Constructors

Constructors are teams that build the cars, and participate in the grand prix.

587 Pts.

Mercedes

559 Pts.

Redbull

307 Pts.

Ferrari

Drivers

We ran a head-to-head comparison of two former drivers with a good rivalry : Mika Hakinnen, and Michael Schumacher.

Mika Hakinnen   VS   Michael Schumacher

Data

We obtained data from http://ergast.com/mrd/

The data available from the api was extremely paginated so, to save time, we used a dump of the required data.

2021 Saudi Arabian Grand Prix

Lap Times		
Lap 1		
DriverId	Position	Time
hamilton	1	1:35.234
bottas	2	1:36.272
max_verstappen	3	1:36.916
leclerc	4	1:38.491
perez	5	1:39.056
norris	6	1:40.157
ocon		
gasly		
ricciardo		
giovinazzi		
alonso		
tsunoda		
sainz		
raikkonen		
vettel		
stroll		
russell		
mick_schumacher		
latifi		
mazepin		
Lap 2		

Ergast Developer API

Query Results

Query Details					
Series	Season	Round	DriverId	Lap	Results
f1	2012	2	alonso	1	1

Lap Tim	
Lap	
Driver	
alonso	

Ergast Developer API

Query Results

Query Details		
Series	Page	Results
f1	1 of 8	211

Constructor Table		
Constructor Name	Nationality	Information
Adams	American	Review
AFM	German	Review
AGS	French	Review
Alfa Romeo	Swiss	Review
AlphaTauri	Italian	Review
Alpine F1 Team	French	Review
Alta	British	Review
Amon	New Zealand	Review
Andrea Moda	Italian	Review
Apollon	Swiss	Review
Arrows	British	Review
Arzani–Volpini	Italian	Review
Aston Butterworth	British	Review
Aston Martin	British	Review

The Process

We cleaned some of the more complex data using Python and Pandas, and merged multiple sources to form a better data source.

```
raceId,driverId,lap,position,time,milliseconds
900,3,1,1,"1:42.038",102038
900,3,2,1,"1:37.687",97687
900,3,3,1,"1:35.765",95765
900,3,4,1,"1:34.939",94939
900,3,5,1,"1:35.438",95438
900,3,6,1,"1:34.977",94977
900,3,7,1,"1:35.417",95417
900,3,8,1,"1:34.550",9455^
900,3,9,1,"1:34.217",9421
900,3,10,1,"1:34.364",943
900,3,11,1,"1:35.185",951
900,3,12,1,"2:14.269",134
900,3,13,1,"2:29.953",149
900,3,14,1,"2:21.208",141
900,3,15,1,"2:14.486",134
900,3,16,1,"1:33.976",939
900,3,17,1,"1:34.040",940
900,3,18,1,"1:33.195",931
900,3,19,1,"1:32.478",924
```
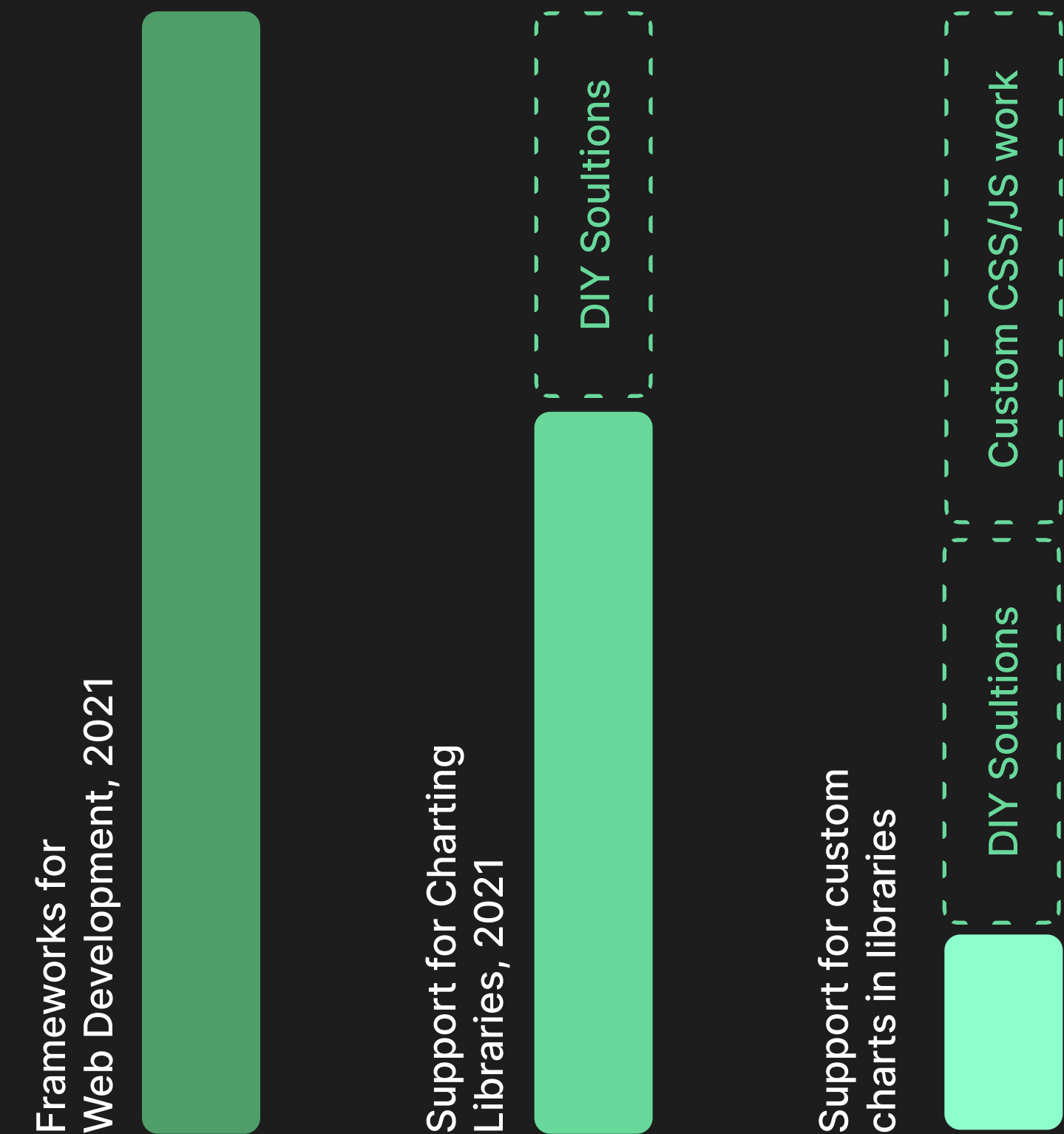
```
circuitId,circuitRef,name,location,country,lat,lng,alt,url
6,"monaco","Circuit de Monaco","Monte-
Carlo","Monaco",43.7347,7.42056,7,"http://en.wikipedia.org
/wiki/Circuit_de_Monaco"
13,"spa","Circuit de Spa-
Francorchamps","Spa","Belgium",50.4372,5.97139,401,"http:/
/en.wikipedia.org/wiki/Circuit_de_Spa-Francorchamps"
14,"monza","Autodromo Nazionale di
                                    .28111,162,"http://en.wiki
                                    le_Monza"
                           t Circuit","Marina
                        18,"http://en.wikipedia.or

                        197,14.7647,678,"http://en
                        g"
```

```
[
  {
    "driverId": 817,
    "driverRef": "ricciardo",
    "number": "3",
    "code": "RIC",
    "forename": "Daniel",
    "surname": "Ricciardo",
    "dob": "1989-07-01",
    "nationality": "Australian",
    "raceId": 1065,
    "lap": 53,
    "position": 1,
    "time_x": "1:24.812",
    "milliseconds": 84812,
    "year": 2021,
    "circuitId": 14,
    "name_x": "Italian Grand Prix",
    "date": "2021-09-12",
    "circuitRef": "monza",
    "name_y": "Autodromo Nazionale di Monza",
    "location": "Monza",
    "country": "Italy",
  }
]
```

```
driverId,driverRef,number,code,fore
ality,url
1,"hamilton",44,"HAM","Lewis","Hami
07","British","http://en.wikipedia.
"
2,"heidfeld",\N,"HEI","Nick","Heidf
10","German","http://en.wikipedia.o
3,"rosberg",6,"ROS","Nico","Rosberg
27","German","http://en.wikipedia.o
4,"alonso",14,"ALO","Fernando","Alo
29","Spanish","http://en.wikipedia.
o"
5,"kovalainen",\N,"KOV","Heikki","K
19","Finnish","http://en.wikipedia.
nen"
6,"nakajima",\N,"NAK","Kazuki","Nakajima","1985-01-
11","Japanese","http://en.wikipedia.org/wiki/Kazuki_Nakaji
ma"
7,"bourdais",\N,"BOU","Sébastien","Bourdais","1979-02-
28","French","http://en.wikipedia.org/wiki/S%C3%A9bastien_
Bourdais"
8,"raikkonen",7,"RAI","Kimi","Räikkönen","1979-10-
17","Finnish","http://en.wikipedia.org/wiki/Kimi_R%C3%A4ik
k%C3%B6nen"
9,"kubica",88,"KUB","Robert","Kubica","1984-12-
07","Polish","http://en.wikipedia.org/wiki/Robert_Kubica"
10,"glock",\N,"GLO","Timo","Glock","1982-03-
18","German","http://en.wikipedia.org/wiki/Timo_Glock"
```

```
                      name,date,time,url
                     nd Prix","2014-03-
                    ikipedia.org/wiki/2014_Austral

                    d Prix","2014-03-
                    ikipedia.org/wiki/2014_Malaysi

                    Prix","2014-04-
                    ikipedia.org/wiki/2014_Bahrain_

                    Prix","2014-04-
                    ikipedia.org/wiki/2014_Chinese_

                    Prix","2014-05-
                    ikipedia.org/wiki/2014_Spanish_
                    Grand_Prix"
905,2014,6,6,"Monaco Grand Prix","2014-05-
25","12:00:00","http://en.wikipedia.org/wiki/2014_Monaco_G
rand_Prix"
906,2014,7,7,"Canadian Grand Prix","2014-06-
08","18:00:00","http://en.wikipedia.org/wiki/2014_Canadian
_Grand_Prix"
907,2014,8,70,"Austrian Grand Prix","2014-06-
22","12:00:00","http://en.wikipedia.org/wiki/2014_Austrian
_Grand_Prix"
908,2014,9,9,"British Grand Prix","2014-07-
06","12:00:00","http://en.wikipedia.org/wiki/2014_British_
Grand_Prix"
```

Data Visualization - Final Presentation

The Struggles

Building a set of visualizations on the web is still very lacking. We found D3 and other libraries to be very tough for building custom visualizations.

We ended up using SVGs for the custom visuals, and Charts.js for the other ones.

Frameworks for Web Development, 2021

Support for Charting Libraries, 2021

DIY Soultions

Support for custom charts in libraries

DIY Soultions

Custom CSS/JS work
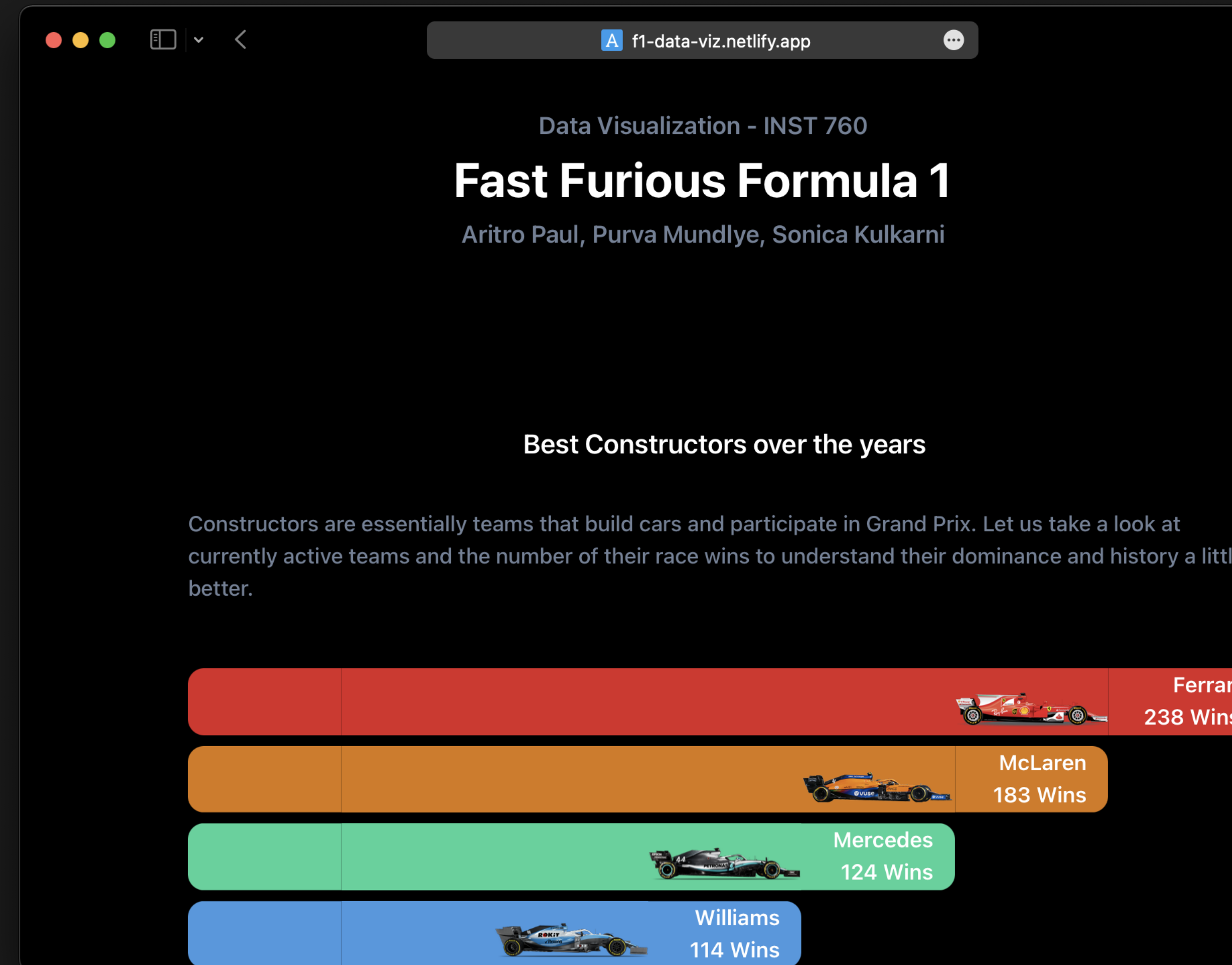
Data Visualization - Final Presentation

The Website

Our end product is a website containing the visualizations on the basis of the data that we selected from ergast.

You can check out the website right now and interact with the data, and maybe learn a little about Formula 1 today!

bit.ly/760formula1 ↗

Data Visualization - Final Presentation
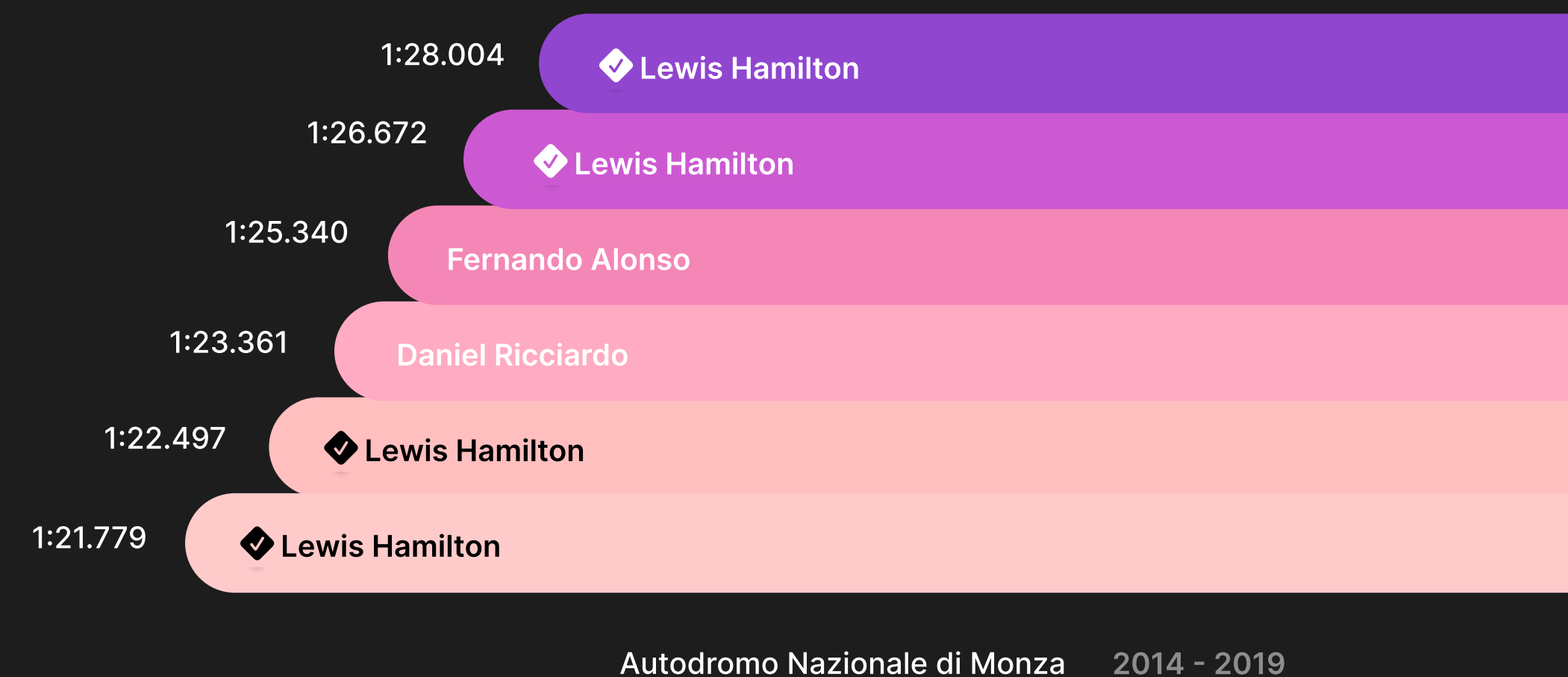
Main Takeaways

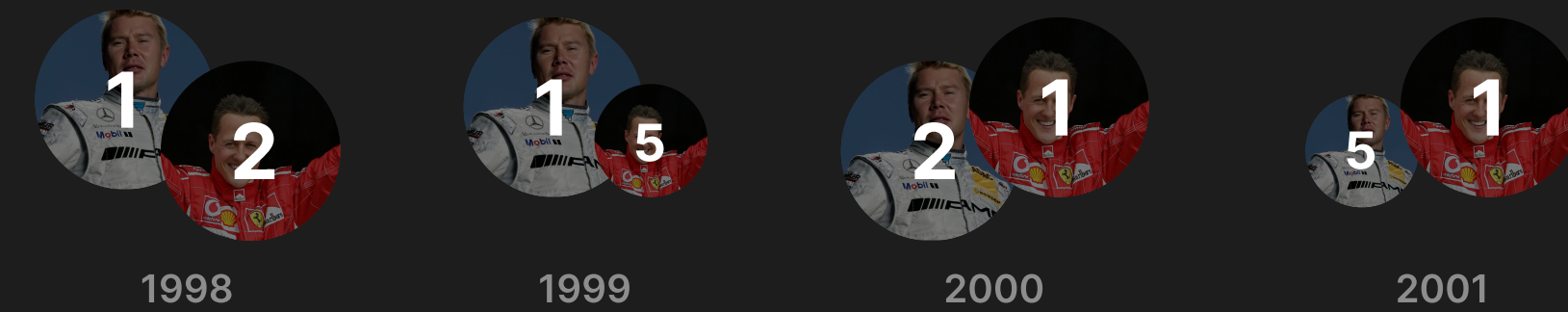⏱ Every year cars improve so the best lap times keep reducing.

1:28.004 ◆ Lewis Hamilton

1:26.672 ◆ Lewis Hamilton

1:25.340 Fernando Alonso

1:23.361 Daniel Ricciardo

01 The dominant, top racers are in a completely different league of their own. They usually remain at the top, for most part.
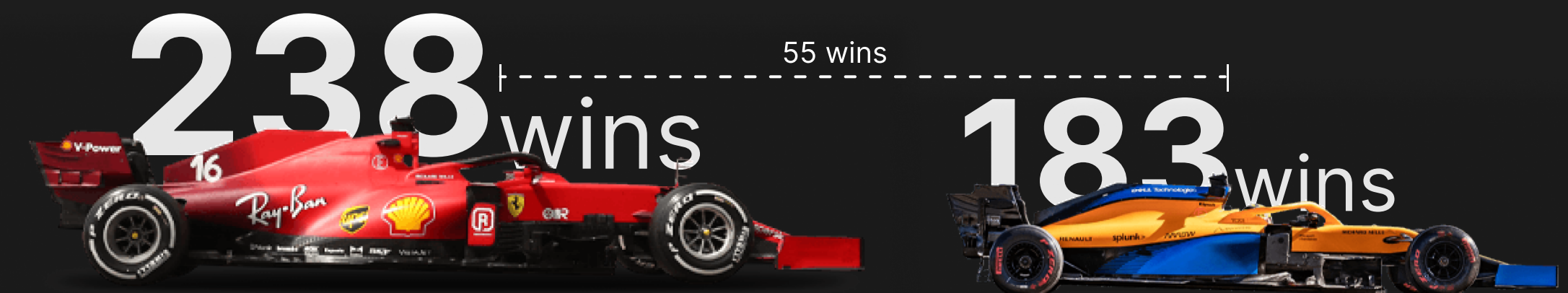
1:22.497 ◆ Lewis Hamilton

1:21.779 ◆ Lewis Hamilton

Autodromo Nazionale di Monza   2014 - 2019

Data Visualization - Final Presentation

Main Takeaways

👑 Even though Schumacher dominated Hakinnen over the 1991-2001 period, they had a intense battle between 1998-2000

1998   1999   2000   2001

🚗 Ferrari and McLaren dominate the constructor leaderboard with a good lead (~50 wins)

238 wins

55 wins

183 wins

Data Visualization - Final Presentation

Thank You

We are open to questions!

Aritro Paul, Purva Mundlye, Sonica Kulkarni