

# SPRING SCHOOL 2021

## Data Science

### Team 6

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# Stakeholder Analysis



## Vision

A central database for  
Car Sport Racing over the world

## Goal



Source: <https://www.visolve.com>

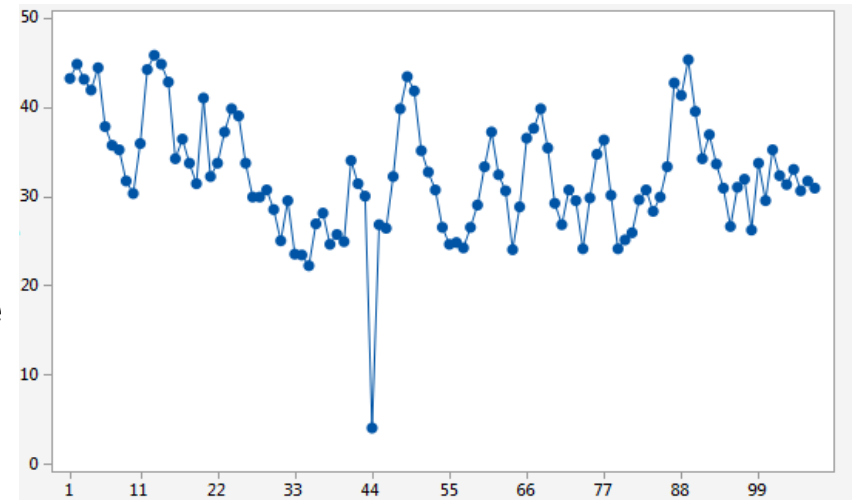
1. Create Database for real-time data taken from racing cars
2. Create Database for history data about car racing
3. API for media and press produce racing news
4. A platform where fans can find all information about car racing
5. An analytical system based on the current data

# Stakeholder Analysis



## Requirement

1. Create Database for real-time data taken from racing cars
- Database is optimized for time series including
    - sensors data from racing cars
    - the weather at the place where the racing is taking place
  - Visualize real-time data on dashboards



Source: <https://support.minitab.com>

# Stakeholder Analysis



## Requirement

### 2. Create Database for history data about car racing

- NonSQL Database is a combination of different data source
  - optimize for images, videos, news
- Relational database
  - Biography about the pilots, tournaments
  - Live update for racing events are taking place



Source: <https://www.differencebetween.info>

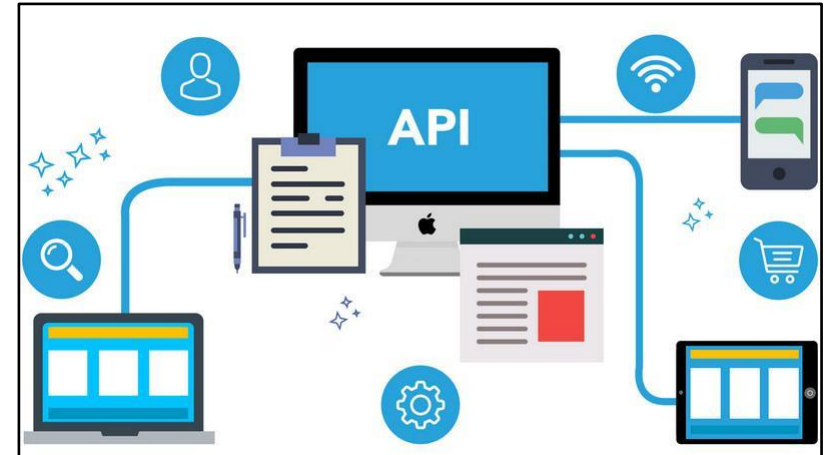
# Stakeholder Analysis



## Requirement

### 3. API for media and press produce racing news

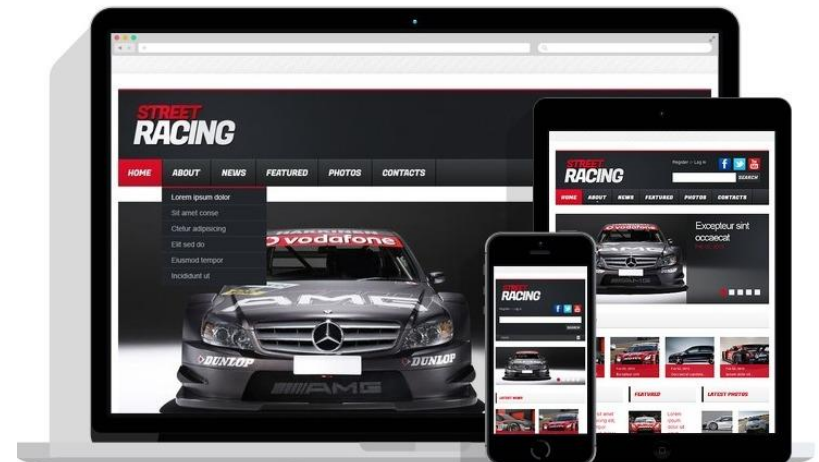
- Provide an API for privileged client get data and produce car racing news



Source: <https://teks.co.in>

### 4. A platform where fans can find all information about car racing

- An mobile app and website for fans can find schedule of racing event all over the world



Source: <http://scr.templateMonster.com>

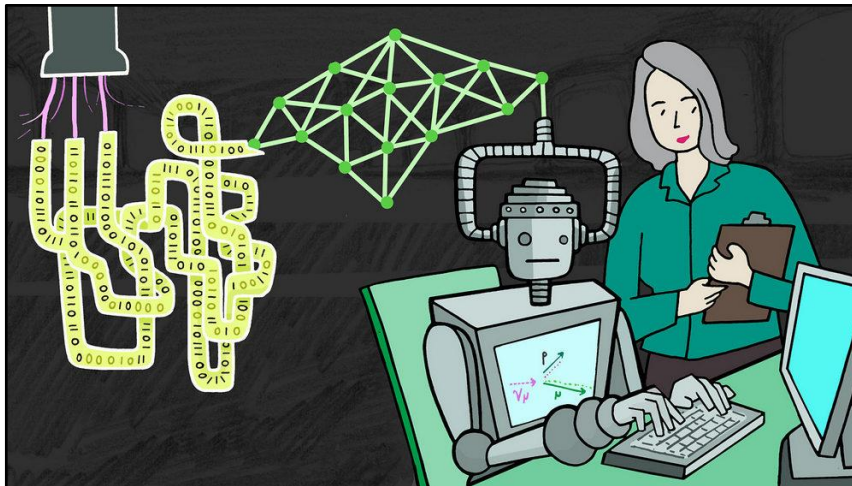
# Stakeholder Analysis



## Requirement

### 5. An analytical system based on the current data

- Using machine learning and data analysis to predict, classify data. These information should provide clients who want to use our data for their purpose



# Requirements Elicitation



From stakeholder analysis we lay down our proposals below:

- An interactive interface for the user to display, modify and update entries



- Real time update



- Different types of subscribers

→ Normal subscribers

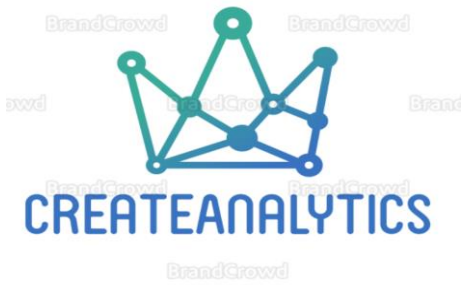
→ Commercial subscribers



- Scalable and integratable







# ***Requirements Elicitation***



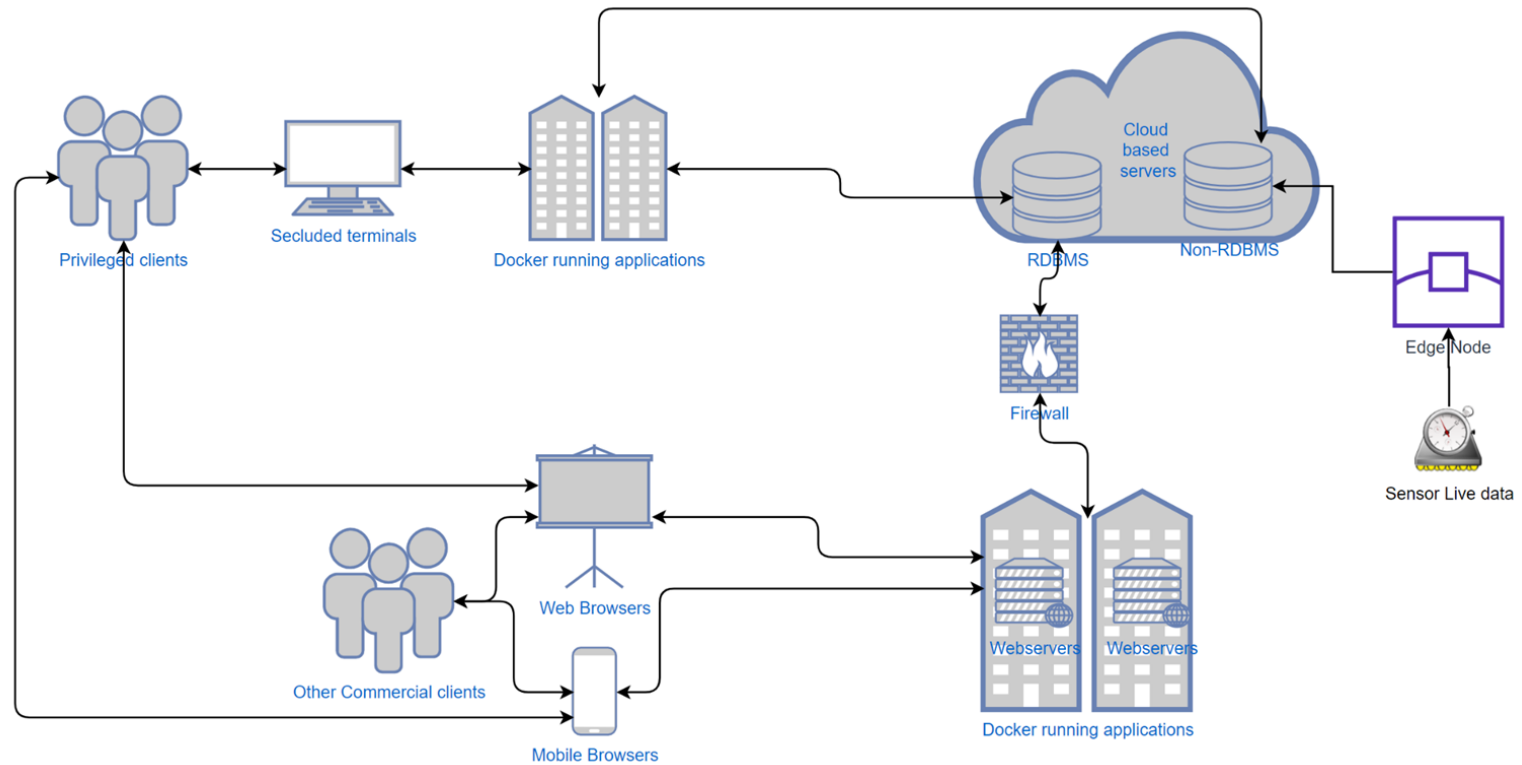
- Plausible data Analytics

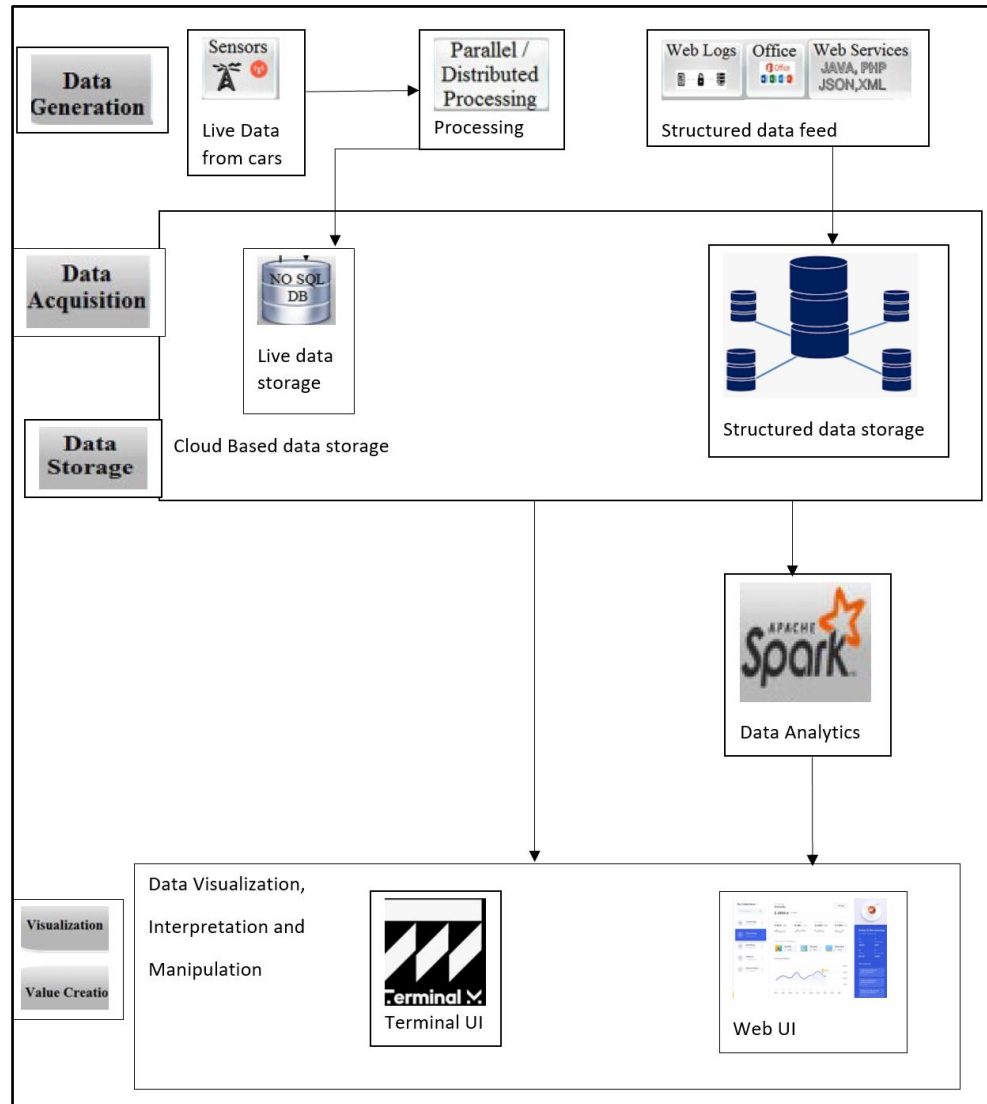


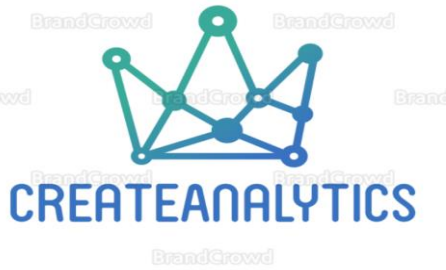
- Provision for data migration from different sources with accuracy











# ***Resource Analysis***



## Rationale behind choosing Relational database

- Large amounts of structured data
- Information from multiple files can be linked through “keys.”
- Client requirements on application requiring strong transactional functionality, data mining and complex reporting
- Data has a lot of relationships
- Predictability based on past data and report generation for the same

## Cloud Based infrastructure

- Scope for future expansion, scalable and flexible
- Support from major tech firms
- Less maintenance from the owners side
- Pay as used type of resource

Based on the above factors and analysis Amazon Relational Database Service is decided as the cloud based data base for system and application.

# Resource Analysis



## Need for Dockerized containers

- To support continuous build, deploy, run, update of data in the databas.
- Full control on the database.
- **Continuous integration** and **continuous delivery** of data into the database
- Traffic free routing of changes into the database.
- Real-time update

## Analytics - Apache Spark (Compared among, Spart, Hadoop and Flink)

- Easy-to-use APIs
- One of the best for iterative algorithms
- Being a more mature framework and superior in terms of market share and community.
- Includes a richer set of operations and a wide range of tools
- Better performance in terms of time and resources with variations in configurable parameters like clusters, number of nodes, parallelism etc
- Runs Everywhere

# Demo

Adding a new Entry →

localhost:81/new\_driver

### New Driver

DriverRef :

Number :

Code :

Forename :

Surname :

DOB :

Nationality :

URL :

Example for a homepage display  
for driver details table



localhost:81

### HOME Page

Display the existing data

localhost:81/display

driverId	driverRef	number	code	forename	surname	dob	nationality	
1	hamilton	44	HAM	Lewis	Hamilton	07/01/1985	British	<a href="http://en.wikipedia.org/wiki/Lewis_Hamilton">http://en.wikipedia.org/wiki/Lewis_Hamilton</a>
2	heidfeld	N	HEI	Nick	Heidfeld	10/05/1977	German	<a href="http://en.wikipedia.org/wiki/Nick_Heidfeld">http://en.wikipedia.org/wiki/Nick_Heidfeld</a>
3	rosberg	6	ROS	Nico	Rosberg	27/06/1985	German	<a href="http://en.wikipedia.org/wiki/Nico_Rosberg">http://en.wikipedia.org/wiki/Nico_Rosberg</a>
4	alonso	14	ALO	Fernando	Alonso	29/07/1981	Spanish	<a href="http://en.wikipedia.org/wiki/Fernando_Alonso">http://en.wikipedia.org/wiki/Fernando_Alonso</a>
5	kovalainen	N	KOV	Heikki	Kovalainen	19/10/1981	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>
6	nakajima	N	NAK	Kazuki	Nakajima	11/01/1985	Japanese	<a href="http://en.wikipedia.org/wiki/Kazuki_Nakajima">http://en.wikipedia.org/wiki/Kazuki_Nakajima</a>
7	bourdais	N	BOU	Sébastien	Bourdais	28/02/1979	French	<a href="http://en.wikipedia.org/wiki/S%C3%A9bastien_Bourdais">http://en.wikipedia.org/wiki/S%C3%A9bastien_Bourdais</a>

Remove entity

# Demo

## HOME Page

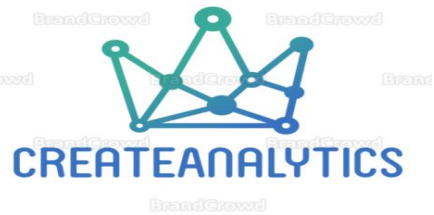
Display Details

New Entry

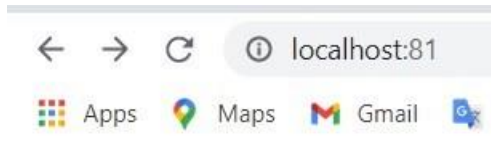
Remove Entry

	driverId	driverRef	number	code	forename	surname	dob	nationality	
0	2	heidfeld	\N	HEI	Nick	Heidfeld	1977-05-10	German	<a href="http://en.wikipedia.org/wiki/Nick_Heidfeld">http://en.wikipedia.org/wiki/Nick_Heidfeld</a>
1	3	rosberg	6	ROS	Nico	Rosberg	1985-06-27	German	<a href="http://en.wikipedia.org/wiki/Nico_Rosberg">http://en.wikipedia.org/wiki/Nico_Rosberg</a>
2	4	alonso	14	ALO	Fernando	Alonso	1981-07-29	Spanish	<a href="http://en.wikipedia.org/wiki/Fernando_Alonso">http://en.wikipedia.org/wiki/Fernando_Alonso</a>
3	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>
4	6	nakajima	\N	NAK	Kazuki	Nakajima	1985-01-11	Japanese	<a href="http://en.wikipedia.org/wiki/Kazuki_Nakajima">http://en.wikipedia.org/wiki/Kazuki_Nakajima</a>
5	7	bourdais	\N	BOU	Sébastien	Bourdais	1979-02-28	French	<a href="http://en.wikipedia.org/wiki/S%C3%A9bastien_Bourdais">http://en.wikipedia.org/wiki/S%C3%A9bastien_Bourdais</a>
6	8	raikkonen	7	RAI	Kimi	Räikkönen	1979-10-17	Finnish	<a href="http://en.wikipedia.org/wiki/Kimi_R%C3%A4ikk%C3%B6nen">http://en.wikipedia.org/wiki/Kimi_R%C3%A4ikk%C3%B6nen</a>
7	9	kubica	88	KUB	Robert	Kubica	1984-12-07	Polish	<a href="http://en.wikipedia.org/wiki/Robert_Kubica">http://en.wikipedia.org/wiki/Robert_Kubica</a>
8	10	glock	\N	GLO	Timo	Glock	1982-03-18	German	<a href="http://en.wikipedia.org/wiki/Timo_Glock">http://en.wikipedia.org/wiki/Timo_Glock</a>
9	11	sato	\N	SAT	Takuma	Sato	1977-01-28	Japanese	<a href="http://en.wikipedia.org/wiki/Takuma_Sato">http://en.wikipedia.org/wiki/Takuma_Sato</a>
10	12	piquet_jr	\N	PIQ	Nelson	Piquet Jr.	1985-07-25	Brazilian	<a href="http://en.wikipedia.org/wiki/Nelson_Piquet,_Jr.">http://en.wikipedia.org/wiki/Nelson_Piquet,_Jr.</a>
11	13	massa	19	MAS	Felipe	Massa	1981-04-	Brazilian	<a href="http://en.wikipedia.org/wiki/Felipe_Massa">http://en.wikipedia.org/wiki/Felipe_Massa</a>

Display driver info



# Demo

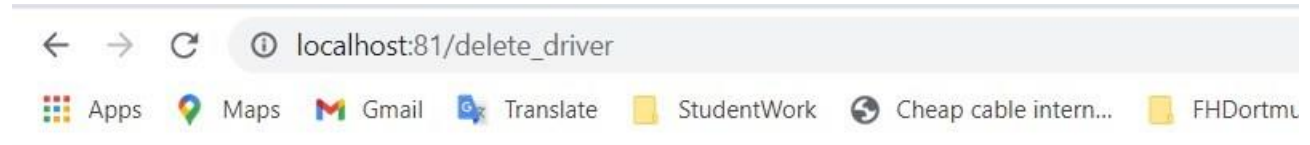


## HOME Page

Display Details

New Entry

Remove Entry



## Driver details will be deleted based on the driver ID provided

DriverId :

Submit

Delete driver info



# Demo

## HOME Page

Display Details

New Entry

Remove Entry

localhost:81/display

Before

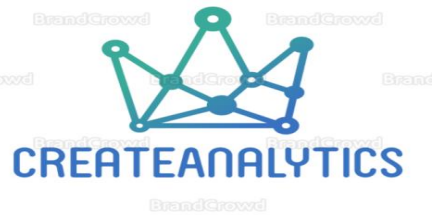
	driverId	driverRef	number	code	forename	surname	dob	nationality	
0	2	heidfeld	N	HEI	Nick	Heidfeld	1977-05-10	German	<a href="http://en.wikipedia.org/wiki/Nick_Heidfeld">http://en.wikipedia.org/wiki/Nick_Heidfeld</a>
1	3	rosberg	6	ROS	Nico	Rosberg	1985-06-27	German	<a href="http://en.wikipedia.org/wiki/Nico_Rosberg">http://en.wikipedia.org/wiki/Nico_Rosberg</a>
2	4	alonso	14	ALO	Fernando	Alonso	1981-07-29	Spanish	<a href="http://en.wikipedia.org/wiki/Fernando_Alonso">http://en.wikipedia.org/wiki/Fernando_Alonso</a>
3	5	kovalainen	N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>
4	6	nakajima	N	NAK	Kazuki	Nakajima	1985-01-11	Japanese	<a href="http://en.wikipedia.org/wiki/Kazuki_Nakajima">http://en.wikipedia.org/wiki/Kazuki_Nakajima</a>

localhost:81/display

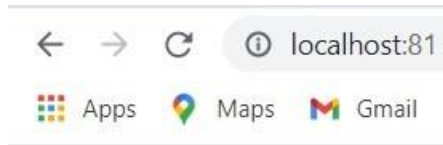
After Deleting Driver id 2

	driverId	driverRef	number	code	forename	surname	dob	nationality	
0	3	rosberg	6	ROS	Nico	Rosberg	1985-06-27	German	<a href="http://en.wikipedia.org/wiki/Nico_Rosberg">http://en.wikipedia.org/wiki/Nico_Rosberg</a>
1	4	alonso	14	ALO	Fernando	Alonso	1981-07-29	Spanish	<a href="http://en.wikipedia.org/wiki/Fernando_Alonso">http://en.wikipedia.org/wiki/Fernando_Alonso</a>
2	5	kovalainen	N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>
3	6	nakajima	N	NAK	Kazuki	Nakajima	1985-01-11	Japanese	<a href="http://en.wikipedia.org/wiki/Kazuki_Nakajima">http://en.wikipedia.org/wiki/Kazuki_Nakajima</a>
4	7	bourdais	N	BOU	Sébastien	Bourdais	1979-02-28	French	<a href="http://en.wikipedia.org/wiki/Sébastien_Bourdais">http://en.wikipedia.org/wiki/Sébastien_Bourdais</a>

Delete driver info



# Demo

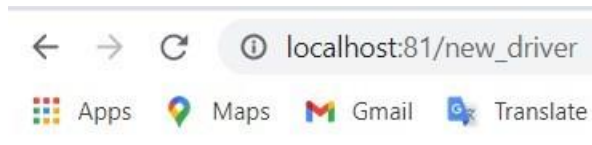


## HOME Page

Display Details

New Entry

Remove Entry



## New Driver

DriverRef : shalok

Number : 502521

Code : 560029

Forename : Shankar

Surname : Lokeshwara

DOB : 21/02/1992

Nationality : German

URL : www.shankarlokeshwara.c

Submit

Add driver info

# Demo

## HOME Page

- Display Details
- New Entry
- Remove Entry

Before New Entry

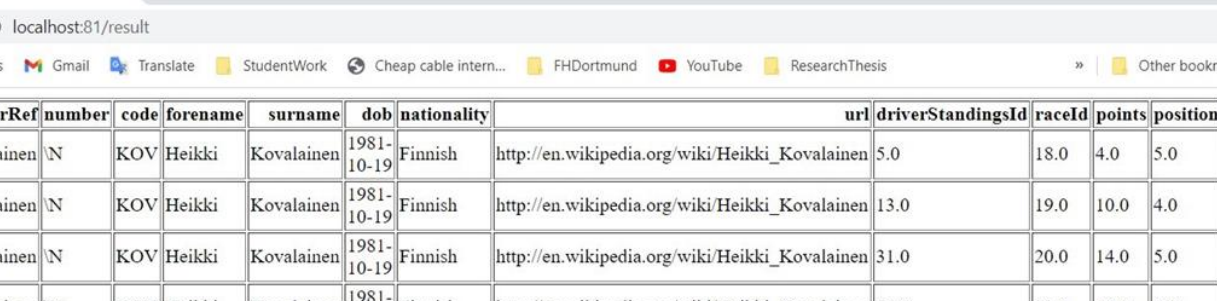
846	854	mick_schumacher	47	MSC	Mick	Schumacher	1999-03-22	German	<a href="http://en.wikipedia.org/wiki/Mick_Schumacher">http://en.wikipedia.org/wiki/Mick_Schumacher</a>
847	855	abc	123	001366	vignesh	sundar	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>
848	856	abc	123	001366	vignesh	sundar	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>
849	857	xyz	456	001366	vignesh	lokes	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>

After Entering New Driver Details

844	849	latifi	6	LAT	Nicholas	Latifi	1995-06-29	Canadian	<a href="http://en.wikipedia.org/wiki/Nicholas_Latifi">http://en.wikipedia.org/wiki/Nicholas_Latifi</a>
845	850	pietro_fittipaldi	51	FIT	Pietro	Fittipaldi	1996-06-25	Brazilian	<a href="http://en.wikipedia.org/wiki/Pietro_Fittipaldi">http://en.wikipedia.org/wiki/Pietro_Fittipaldi</a>
846	854	mick_schumacher	47	MSC	Mick	Schumacher	1999-03-22	German	<a href="http://en.wikipedia.org/wiki/Mick_Schumacher">http://en.wikipedia.org/wiki/Mick_Schumacher</a>
847	855	abc	123	001366	vignesh	sundar	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>
848	856	abc	123	001366	vignesh	sundar	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>
849	857	xyz	456	001366	vignesh	lokes	23/07/1993	indian	<a href="http://www.viky.com">www.viky.com</a>
850	858	shalok	502521	560029	Shankar	Lokeshwara	21/02/1992	German	<a href="http://www.shankarlokeswara.com">www.shankarlokeswara.com</a>

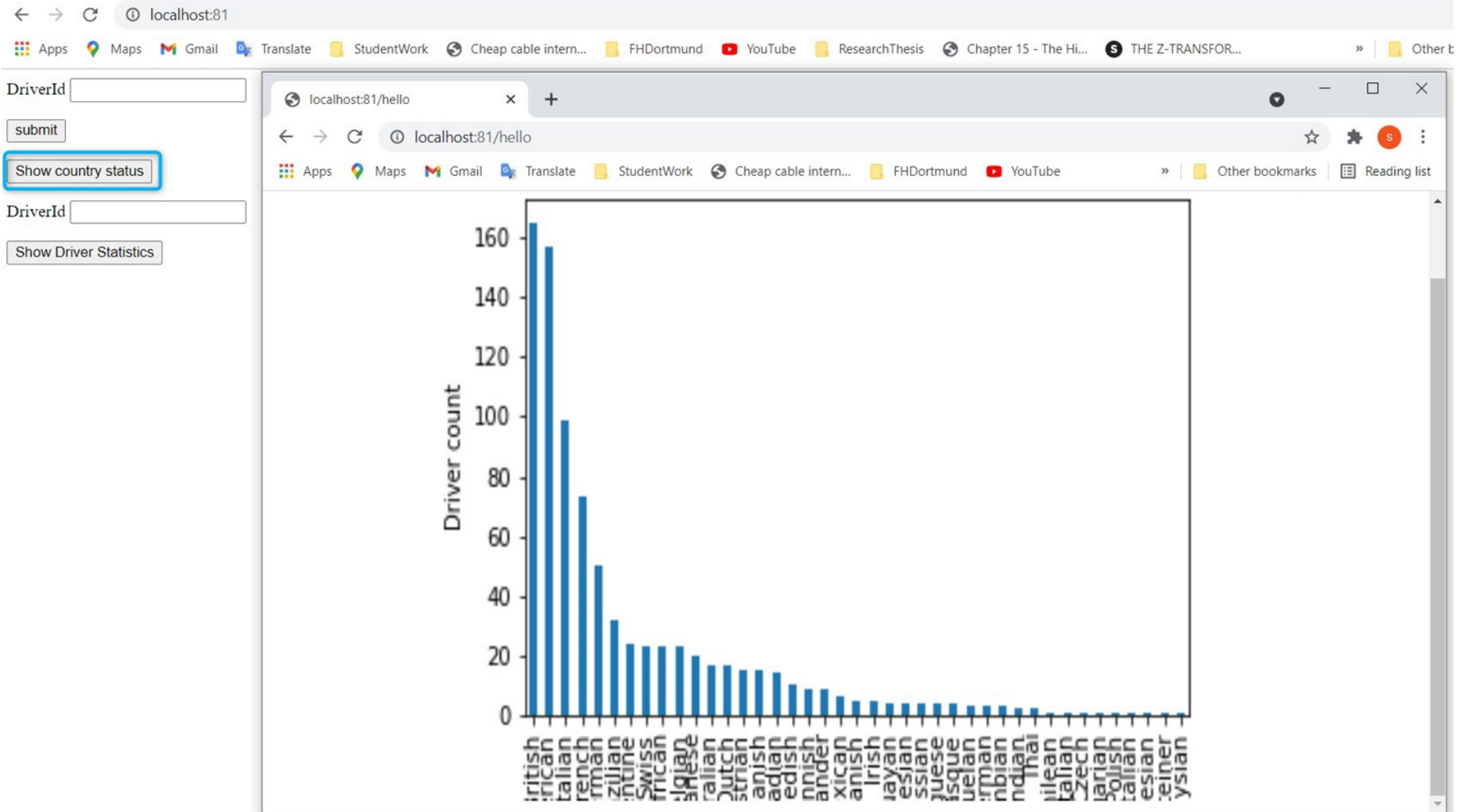
Add driver info





The screenshot shows a web browser window with the address bar displaying 'localhost:81/result'. The browser's address bar and tabs are visible at the top. Below the browser window, a table of driver data is displayed. The table has 16 columns: driverId, driverRef, number, code, forename, surname, dob, nationality, url, driverStandingsId, raceId, points, position, positionText, and wins. The data rows show Heikki Kovalainen's performance across 10 races (driverId 91 to 100). He consistently finished in 5th or 6th position, with points ranging from 4.0 to 43.0. The table is presented in a clean, white background with black text and thin black borders around the cells.

	driverId	driverRef	number	code	forename	surname	dob	nationality	url	driverStandingsId	raceId	points	position	positionText	wins
91	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	5.0	18.0	4.0	5.0	5	0.0
92	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	13.0	19.0	10.0	4.0	4	0.0
93	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	31.0	20.0	14.0	5.0	5	0.0
94	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	52.0	21.0	14.0	6.0	6	0.0
95	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	73.0	22.0	14.0	6.0	6	0.0
96	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	95.0	23.0	15.0	6.0	6	0.0
97	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	117.0	24.0	15.0	6.0	6	0.0
98	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	139.0	25.0	20.0	6.0	6	0.0
99	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	161.0	26.0	24.0	6.0	6	0.0
100	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	183.0	27.0	28.0	6.0	6	0.0
101	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	205.0	28.0	38.0	6.0	6	1.0
102	5	kovalainen	\N	KOV	Heikki	Kovalainen	1981-10-19	Finnish	<a href="http://en.wikipedia.org/wiki/Heikki_Kovalainen">http://en.wikipedia.org/wiki/Heikki_Kovalainen</a>	227.0	29.0	43.0	5.0	5	1.0

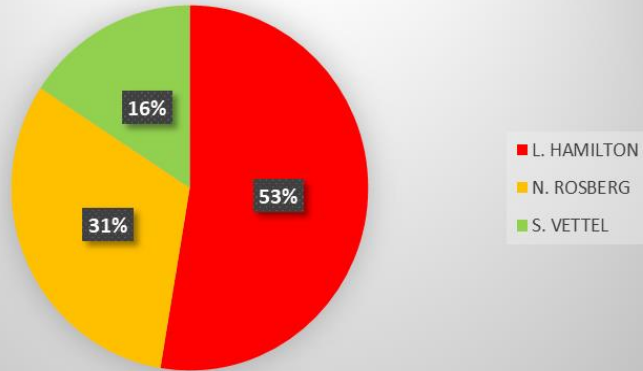




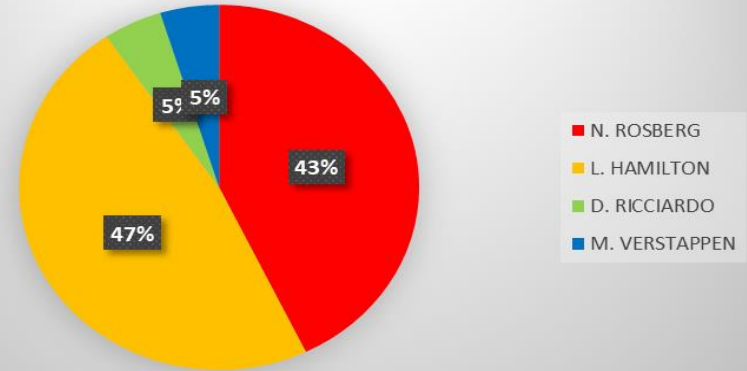
Show Driver Statistics

# Proposal

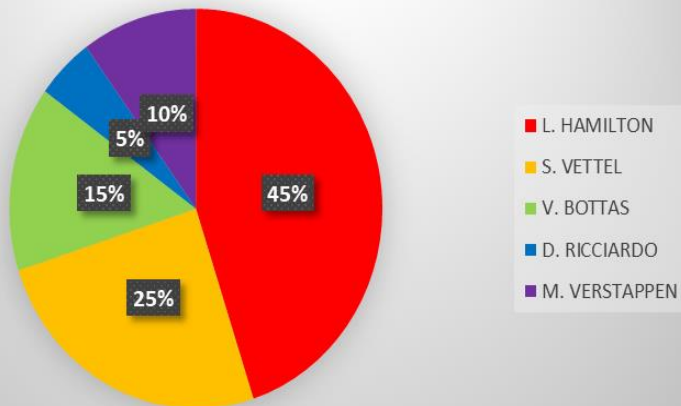
2015 Season



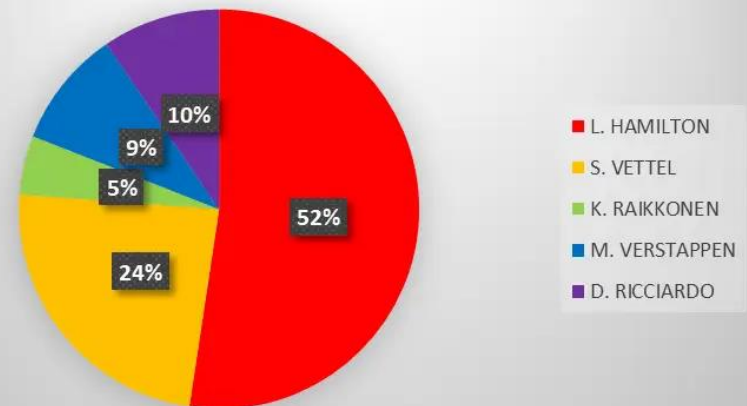
2016 Season



2017 Season



2018 Season





# Proposal

Pos.	Driver	AU1	AU2	HUN	GB1	GB2	SPA	BEL	ITA	RUS	BH1	BH2	ABU	Pts
1	Lewis Hamilton	5	6	2	1	1	3	3	1	1	1	2	2	231
2	Sebastian Vettel	7	2	1	6	4	2	1	3	2	2	1	7	195
3	Max Verstappen	1	10	4	2	2	1	6	2	3	4	4	1	192
4	Alex Albon	4	1	3	4	7	4	19	4	5	10	8	3	125
5	Kimi Raikkonen	10	14	5	3	3	5	4	6	4	9	3	5	110
6	Romain Grosjean	8	5	6	5	9	7	2	10	12	12	6	4	80
7	Valtteri Bottas	3	7	12	7	5	11	9	13	7	3	7	6	74
8	Charles Leclerc	2	11	15	14	6	6	12	7	6	6	5	13	66
9	Sergio Perez	11	4	7	9	11	20	7	11	8	8	10	18	35
10	Lance Stroll	14	3	14	20	20	10	18	15	9	18	15	11	19
11	George Russell	17	8	9	8	14	9	8	9	10	15	13	12	19
12	Kevin Magnussen	9	19	17	12	8	15	13	5	18	11	18	9	18
13	Daniil Kvyat	13	12	20	15	13	12	14	16	14	5	14	8	15
14	Lando Norris	20	17	8	10	10	8	10	19	11	20	20	10	12
15	Esteban Ocon	6	18	10	17	15	19	16	12	16	16	9	17	11
16	Carlos Sainz Jr	19	15	11	18	18	17	5	20	13	19	17	15	10
17	Daniel Ricciardo	16	16	16	11	17	14	20	8	20	7	12	14	10
18	Nicholas Latifi	18	9	19	19	16	16	15	14	15	14	19	20	2
19	Pierre Gasly	12	20	13	13	12	13	11	18	17	13	11	19	0
20	Antonio Giovinazzi	15	13	18	16	19	18	17	17	19	17	16	16	0

# References



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