

FORMULA ONE

Regression

Presented by:

Ahad Almutairi | Wafaa Alharbi



01

INTRO

02

TOOLS

03

METHODOLOGY

04

RESULTS

05

FLASK

06

**CONCLUSION &
FUTURE WORK**

FORMULA 1



- Single-seat auto racing competition
- Contains series of races
- 20 participants each race
- Winners will be granted points

TOOLS

JUPYTER

PANDAS

NUMPY

SEABORN

MATPLOT

FLASK

TOOLS

STATSMODELS

SCIPY

TABLEAU

SELENIUM

SKLEARN

BEAUTIFULSOUP



GOAL

Determine the amount of **points** players will take

Fastest Lap Avg Speed

Pit Stop Total

Qualifying Position

Starting Grid Position

Fastest Laps position

Practice 3 Time

FORMULA 1 GULF AIR BAHRAIN GRAND PRIX 2021 - QUALIFYING



26 - 28 Mar 2021 Bahrain International Circuit, Sakhir

RACE

RACE RESULT

POS	NO	DRIVER	CAR	Q1	Q2	Q3	LAPS
1	33	Max Verstappen	RED BULL RACING HONDA	1:30.499	1:30.318	1:28.997	15

FASTEST LAPS

2	44	Lewis Hamilton	MERCEDES	1:30.617	1:30.085	1:29.385	18
---	----	----------------	----------	----------	----------	----------	----

PIT STOP SUMMARY

3	77	Valtteri Bottas	MERCEDES	1:31.200	1:30.186	1:29.586	17
---	----	-----------------	----------	----------	----------	----------	----

Latest ▾ Video ▾ Schedule ▾ **Standings ▾** Drivers ▾ Teams ▾ Gaming ▾ Live Timing

RACE
RACE RESULT
FASTEST LAPS
PIT STOP SUMMARY
STARTING GRID
QUALIFYING
PRACTICE 3
PRACTICE 2
PRACTICE 1

POS	NO	DRIVER	CAR	LAPS	TIME/RETIRED	PTS
1	44	Lewis Hamilton	MERCEDES	56	1:32:03.897	25
2	33	Max Verstappen	RED BULL RACING HONDA	56	+0.745s	18
3	77	Valtteri Bottas	MERCEDES	56	+37.383s	16
4	4	Lando Norris	MCLAREN MERCEDES	56	+46.466s	12
5	11	Sergio Perez	RED BULL RACING HONDA	56	+52.047s	10
6	16	Charles Leclerc	FERRARI	56	+59.090s	8
7	3	Daniel Ricciardo	MCLAREN MERCEDES	56	+66.004s	6
8	55	Carlos Sainz	FERRARI	56	+67.100s	4
9	22	Yuki Tsunoda	ALPHATAURI HONDA	56	+85.692s	2

28 Columns
~9000 Rows

WEB SCRAPING

FORMULA 1 GULF AIR BAHRAIN GRAND PRIX 2021 - QUALIFYING



26 - 28 Mar 2021 Bahrain International Circuit, Sakhir

RACE	POS	NO	DRIVER	CAR	Q1	Q2	Q3	LAPS
RACE RESULT	1	33	Max Verstappen	RED BULL RACING HONDA	1:30.499	1:30.318	1:28.997	15
FASTEST LAPS	2	44	Lewis Hamilton	MERCEDES	1:30.617	1:30.085	1:29.385	18
PIT STOP SUMMARY	3	77	Valtteri Bottas	MERCEDES	1:31.200	1:30.186	1:29.586	17

28 Columns
~ Cleaning 9000 Rows

Latest ▾ Video ▾ Schedule ▾ **Standings ▾** Drivers ▾ Teams ▾ Gaming ▾ Live Timing

RACE	POS	NO	DRIVER	CAR	LAPS	TIME/RETIRED	PTS
RACE RESULT	1	44	Lewis Hamilton	MERCEDES	56	1:32:03.897	25
FASTEST LAPS	2	33	Max Verstappen	RED BULL RACING HONDA	56	+0.745s	18
PIT STOP SUMMARY	3	77	Valtteri Bottas	MERCEDES	56	+37.383s	16
STARTING GRID	4	4	Lando Norris	MCLAREN MERCEDES	56	+46.466s	12
QUALIFYING	5	11	Sergio Perez	RED BULL RACING HONDA	56	+52.047s	10
PRACTICE 3	6	16	Charles Leclerc	FERRARI	56	+59.090s	8
PRACTICE 2	7	3	Daniel Ricciardo	MCLAREN MERCEDES	56	+66.004s	6
PRACTICE 1	8	55	Carlos Sainz	FERRARI	56	+67.100s	4
	9	22	Yuki Tsunoda	ALPHATAURI HONDA	56	+85.692s	2

WEB SCRAPING

FORMULA 1 GULF AIR BAHRAIN GRAND PRIX 2021 - QUALIFYING



26 - 28 Mar 2021 Bahrain International Circuit, Sakhir

RACE	POS	NO	DRIVER	CAR	Q1	Q2	Q3	LAPS
RACE RESULT	1	33	Max Verstappen	RED BULL RACING HONDA	1:30.499	1:30.318	1:28.997	15
FASTEST LAPS	2	44	Lewis Hamilton	MERCEDES	1:30.617	1:30.085	1:29.385	18
PIT STOP SUMMARY	3	77	Valtteri Bottas	MERCEDES	1:31.200	1:30.186	1:29.586	17

27 Columns

~3000 Rows

Latest ▾ Video ▾ Schedule ▾ **Standings ▾** Drivers ▾ Teams ▾ Gaming ▾ Live Timing

RACE	POS	NO	DRIVER	CAR	LAPS	TIME/RETIRED	PTS
RACE RESULT	1	44	Lewis Hamilton	MERCEDES	56	1:32:03.897	25
FASTEST LAPS	2	33	Max Verstappen	RED BULL RACING HONDA	56	+0.745s	18
PIT STOP SUMMARY	3	77	Valtteri Bottas	MERCEDES	56	+37.383s	16
STARTING GRID	4	4	Lando Norris	MCLAREN MERCEDES	56	+46.466s	12
QUALIFYING	5	11	Sergio Perez	RED BULL RACING HONDA	56	+52.047s	10
PRACTICE 3	6	16	Charles Leclerc	FERRARI	56	+59.090s	8
PRACTICE 2	7	3	Daniel Ricciardo	MCLAREN MERCEDES	56	+66.004s	6
PRACTICE 1	8	55	Carlos Sainz	FERRARI	56	+67.100s	4
	9	22	Yuki Tsunoda	ALPHATAURI HONDA	56	+85.692s	2

WEB SCRAPING

Model Building

TRAIN & VALIDATION

OLS

0.723

LINEAR

TRAIN: 0.58

VALIDATE: 0.56

PLOYNOMIAL DEGREE=2

TRAIN: 0.77

VALIDATE: 0.64

PLOYNOMIAL DEGREE = 3

TRAIN: 1

VALIDATE: -11613.5

TRAIN & VALIDATION

BERNOULLI

TRAIN: 0.482
VALIDATE: 0.461

GUASSIAN

TRAIN: 0.490
VALIDATE: 0.43

DECISION TREE

TRAIN: 1
VALIDATE: 0.40

RANDOM FOREST

TRAIN: 0.72
VALIDATE: 0.64

GRADIENT BOOSTING

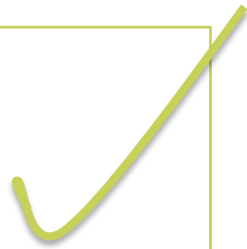
TRAIN: 0.78

VALIDATE: 0.67

GRADIENT BOOSTING

TRAIN: 0.78

VALIDATE: 0.67



LASSO

SCALING

**DUMMY
VARIABLES
FOR CARS**

**CROSS
VALIDATION**

GB: 0.71

LR: 0.59

POLY: 0.59

BRN: -0.28

GSN: 0.53

DTREE: 0.42

RF: 0.68

LASSO: 0.58

RIDGE: 0.59

1

TRAIN R^2

0.80

3

VALIDATE R^2

0.70

5

MAE

2.27

**R^2 ALL
DATASET**

0.78

6

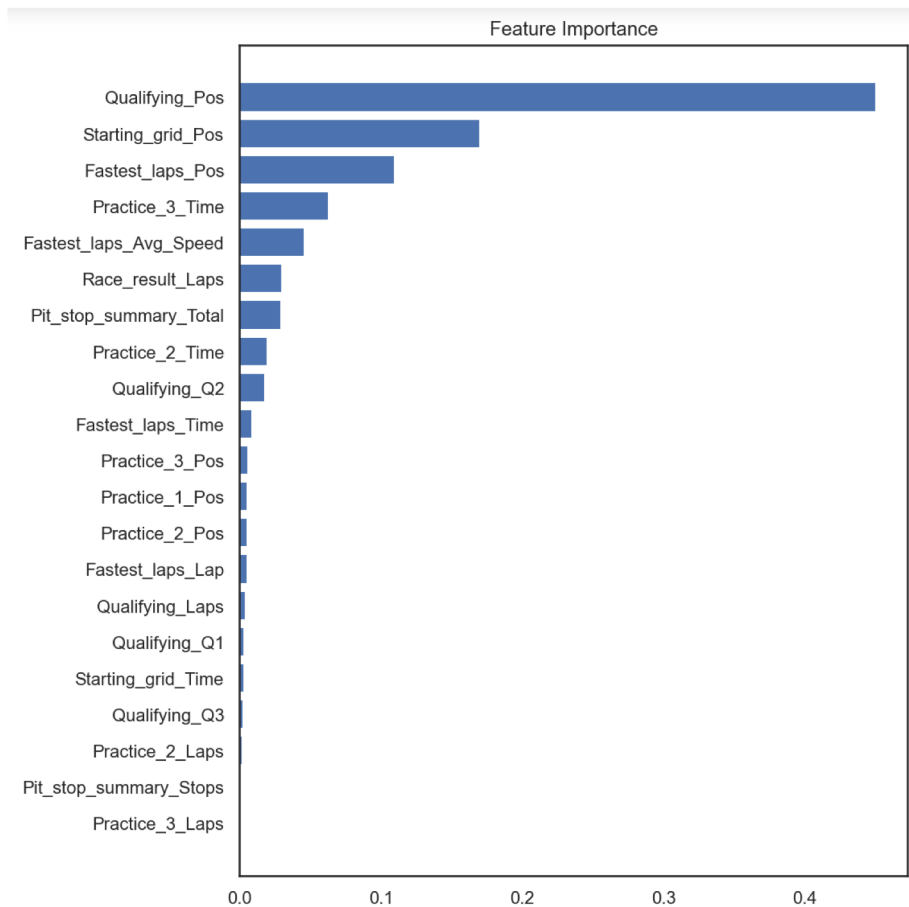
TEST R^2

0.72



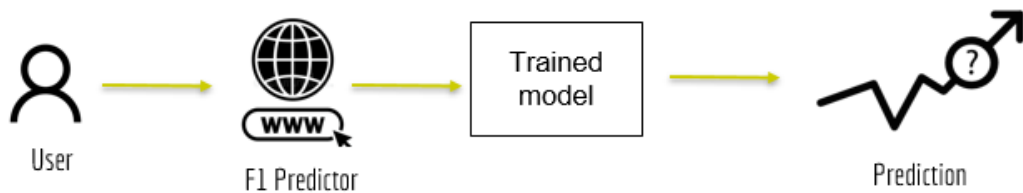
RESULTS

FEATURE IMPORTANCE





F1 Prediction cloud environment



CONCLUSION

CONCLUSION

CONCLUSION



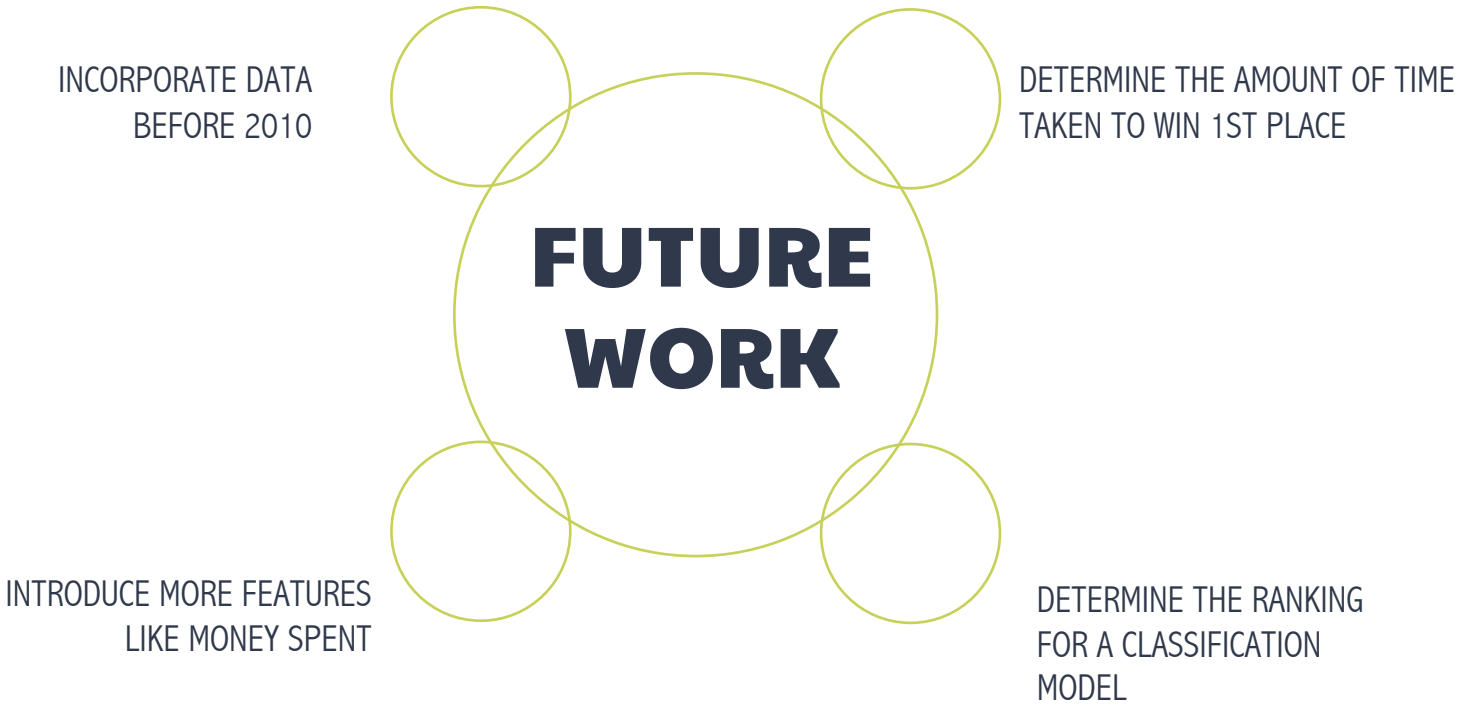
Predicting the number of points a racer will have.



Pumping up R^2 value to 80 with feature engineering



Build a prediction website



THANKS

Does anyone have any questions?

