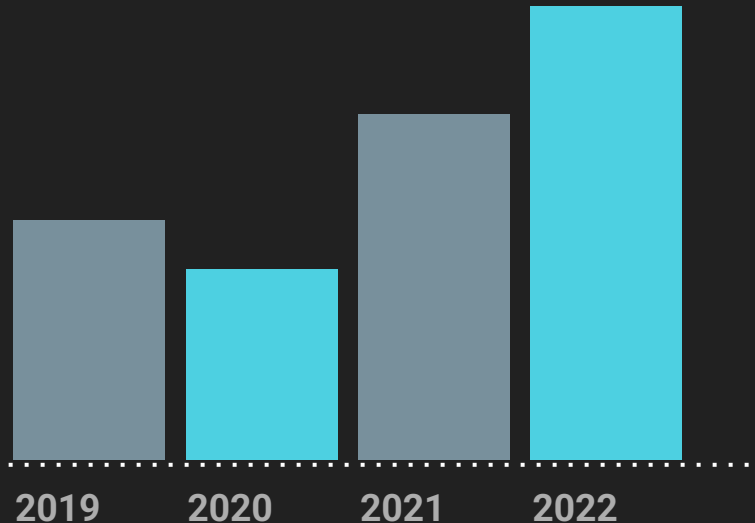


ALT

A Pessimistic Car Recommender

Car Price Skyrocketing, Wallet Shrinking...

- Many buyers (like myself) can no longer afford their favorite cars.
- **ALT (short for "alternative")** aims to help potential buyers efficiently find alternative options by recommending cars similar to the dream car they've always wanted yet could no longer get.
- Countless hours and even days could be saved.



A close-up photograph of a person's hand holding a pen, pointing at a document. The background is blurred, showing some bokeh lights. The text 'Link to App' is overlaid in white.

Link to App

<http://msia423-1925432727.us-east-1.elb.amazonaws.com/>

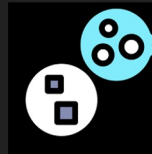
Data & Storage

- Car advertisement data. Each row is a listing with the specifications and price of the listed car.
- **Aggregated** the raw data by 4 key attributes and summarized the rest by taking means or modes.
- Clustered the cars using K-means and stored the **labeled data on RDS**.
- Flask App uses the **labeled data** from RDS to make predictions.

Aggregated Data (Local)



Maker	Model	Year	Body Type	...
Audi	X5	2016	SUV	...
Infiniti	Q50	2016	Saloon	...
...



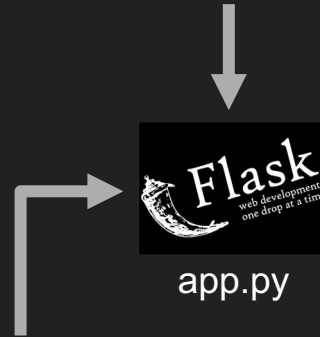
K-means

Labeled Data (RDS)



Maker	Model	Year	Body Type	...	Cluster
Audi	X5	2016	SUV	...	1
Infiniti	Q50	2016	Saloon	...	2
...

User Input: (Maker, Model, Year, Body Type)



Modeling

- Clustering algorithm: **K-means**
 - Features: engine size, seat number, door number, gearbox
 - Number of clusters: 50
- Recommendation strategy
 - **Recommend cars in the same cluster** as the input
- Offline model
 - Labels saved to RDS before deployment
- Success Criteria
 - Model Metric: Silhouette > 0.5
 - Business Metric: Day 1 Retention Rate > 0.1%

Offline
Model

match

User Input: (maker, model, year, bodytype)

Maker	Model	Year	Body Type	...	Cluster
...
maker	model	year	bodytype	...	K
...

Labeled Data (RDS)

Cluster Assignment
of Input Car

filter

Maker	Model	Year	Body Type	...	Cluster
...	K
...	K
...	K

Recommendations

Observation - Cars in the Same Cluster Have Similar Prices

Price was not used to create clusters

Your Impossible Dream Car

Maker	Model	Year	Body Type	Gearbox	Engine Size	Fuel Type	Seat Number	Door Number	Price Estimate
Ferrari	458	2016	Coupe	Automatic	4.5	Petrol	2.0	2.0	189970.0

Maybe These Would Work?

Maker	Model	Year	Body Type	Gearbox	Engine Size	Fuel Type	Seat Number	Door Number	Price Estimate
Audi	R8	2017	Convertible	Automatic	5.2	Petrol	2.0	2.0	84995.0
Audi	R8	2021	Coupe	Automatic	5.2	Petrol	2.0	2.0	112962.0
Audi	R8	2021	Convertible	Automatic	5.2	Petrol	2.0	2.0	109950.0
Jaguar	F-Type	2018	Convertible	Automatic	5.0	Petrol	2.0	2.0	51386.7
Lamborghini	Gallardo	2014	Convertible	Automatic	5.0	Petrol	2.0	2.0	72989.0
Lamborghini	Gallardo	2016	Convertible	Automatic	5.2	Petrol	2.0	2.0	109992.0
Lamborghini	Gallardo	2017	Convertible	Automatic	5.0	Petrol	2.0	2.0	108925.0
Lamborghini	Gallardo	2018	Convertible	Automatic	5.2	Petrol	2.0	2.0	104978.0
Lamborghini	Gallardo	2018	Coupe	Automatic	5.2	Petrol	2.0	2.0	98379.7
Lamborghini	Huracan	2016	Coupe	Automatic	5.2	Petrol	2.0	2.0	169989.0
Lamborghini	Huracan	2017	Coupe	Automatic	5.2	Petrol	2.0	2.0	155322.0
Lamborghini	Huracan	2018	Convertible	Automatic	5.2	Petrol	2.0	2.0	238668.0
Lamborghini	Huracan	2018	Coupe	Automatic	5.2	Petrol	2.0	2.0	202943.0

Your Impossible Dream Car

Maker	Model	Year	Body Type	Gearbox	Engine Size	Fuel Type	Seat Number	Door Number	Price Estimate
Toyota	Corolla	2016	Hatchback	Manual	1.6	Petrol	5.0	3.0	1295.0

Maybe These Would Work?

Maker	Model	Year	Body Type	Gearbox	Engine Size	Fuel Type	Seat Number	Door Number	Price Estimate
Audi	A4	2018	Estate	Manual	2.0	Diesel	5.0	3.0	9592.5
BMW	1 Series	2017	Hatchback	Manual	1.6	Petrol	5.0	3.0	7758.67
BMW	3 Series	2018	Hatchback	Manual	2.5	Petrol	5.0	3.0	986.4
Citroen	C4	2017	Coupe	Manual	1.6	Diesel	5.0	3.0	1669.75
Citroen	C4	2018	Coupe	Manual	1.6	Diesel	5.0	3.0	1518.14
Citroen	DS3	2017	Hatchback	Manual	1.6	Petrol	5.0	3.0	6712.56
Citroen	DS3	2018	Hatchback	Manual	1.6	Petrol	5.0	3.0	6128.27
Citroen	DS4	2015	Hatchback	Manual	2.0	Diesel	5.0	3.0	9995.0
Daihatsu	Fourtrak	2018	SUV	Manual	2.8	Diesel	7.0	3.0	4950.0
DS	3	2017	Hatchback	Manual	1.6	Diesel	5.0	3.0	11425.9
Honda	Civic	2015	Hatchback	Manual	1.6	Petrol	5.0	3.0	2000.0
Infiniti	Q50	2018	Hatchback	Manual	2.0	Diesel	5.0	3.0	18900.0
Kia	'Pro_Cee'd'	2018	Hatchback	Manual	1.6	Diesel	5.0	3.0	9770.36

Thank you!



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