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# PREDICTING THE USED CAR PRICING

# INTRODUCTION

\* **Problem:**

- **Buying and selling a used car can be tricky**

\* **Goal:**

- **A web application provides a predicted used car value based on its features**



# DATA

\* Data from [Cars.com](#)

\* 75,253 listings of car information

Basics	
Exterior color	White
Interior color	Black
Drivetrain	Front-wheel Drive
MPG	54–50 ⓘ
Fuel type	Hybrid
Transmission	Automatic CVT
Engine	1.8L I4 16V MPFI DOHC Hybrid
VIN	JTDKARFU7J3055940
Stock #	055940
Mileage	28,246 mi.
Vehicle history	<a href="#">CARFAX Report ↗</a>

Features	
Convenience	Adaptive Cruise Control Heated Seats Keyless Start Navigation System
Entertainment	Bluetooth USB Port
Safety	Automatic Emergency Braking Backup Camera Brake Assist Lane Departure Warning Rear Cross Traffic Alert Stability Control



www.OurNextCar.com

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Used

2018 Toyota Prius Two

28,246 mi.

\$18,999

↑ Great Deal | \$2,863 under

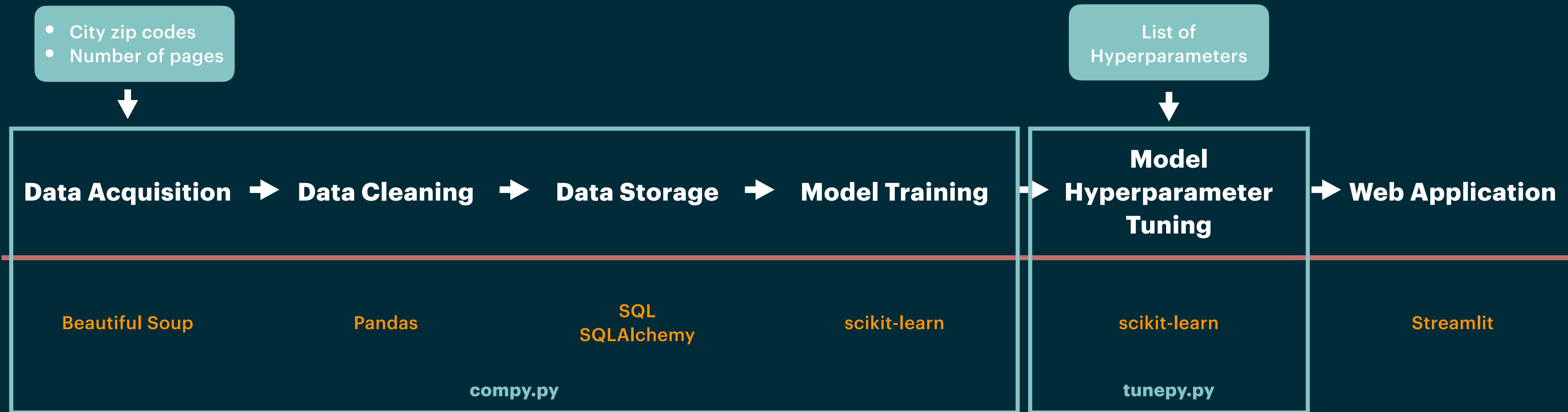
Virtual Appointments

Save

Video

The image shows a white Toyota Prius Two hybrid car parked in a parking lot. The car is shown from a front-three-quarter angle. Below the main image is a horizontal strip showing five smaller thumbnail images of the car from different angles, followed by a play button icon and the word "Video". To the right of the main image, there is descriptive text about the car's condition ("Used"), model ("2018 Toyota Prius Two"), mileage ("28,246 mi."), and price ("\$18,999"). At the bottom, there are two buttons: "Great Deal" with a note about the price being under \$2,863, and "Virtual Appointments".

# THE PIPELINE



# COMPY.PY

## Dataframe Information

### Data From Web Scraping

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 78868 entries, 0 to 78867
Data columns (total 10 columns):
 #   Column           Non-Null Count  Dtype  
---  --  
 0   Unnamed: 0        78867 non-null   object 
 1   price            78369 non-null   float64
 2   mpg              71419 non-null   float64
 3   mileage          78862 non-null   float64
 4   drivetrain       78867 non-null   object 
 5   fuel_type         78867 non-null   object 
 6   transmission     78867 non-null   object 
 7   engine            78867 non-null   object 
 8   num_of_entertainment 75149 non-null   float64
 9   num_of_safety    69820 non-null   float64
dtypes: float64(5), object(5)
memory usage: 6.0+ MB
```

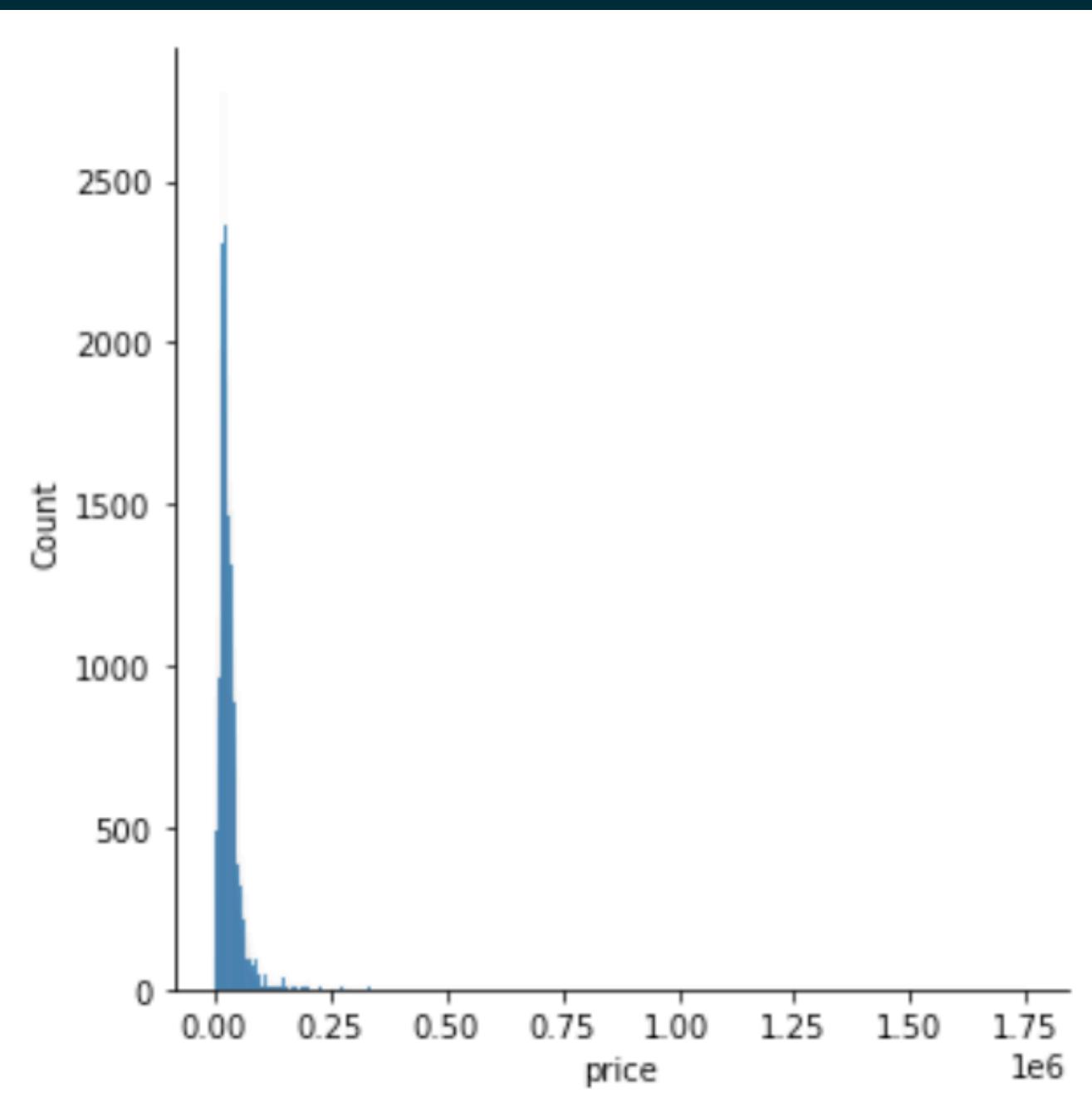
### Cleaned Data in SQL

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 75253 entries, 0 to 75252
Data columns (total 13 columns):
 #   Column           Non-Null Count  Dtype  
---  --  
 0   name             75253 non-null   object 
 1   price            75253 non-null   int64  
 2   mpg              75253 non-null   int64  
 3   mileage          75253 non-null   int64  
 4   num_of_entertainment 75253 non-null   int64  
 5   num_of_safety    75253 non-null   int64  
 6   year              75253 non-null   int64  
 7   drivetrain       75253 non-null   object 
 8   fuel_type         75253 non-null   object 
 9   transmission     75253 non-null   object 
 10  engine            75253 non-null   object 
 11  make              75253 non-null   object 
 12  model             75253 non-null   object 
dtypes: int64(6), object(7)
memory usage: 7.5+ MB
```

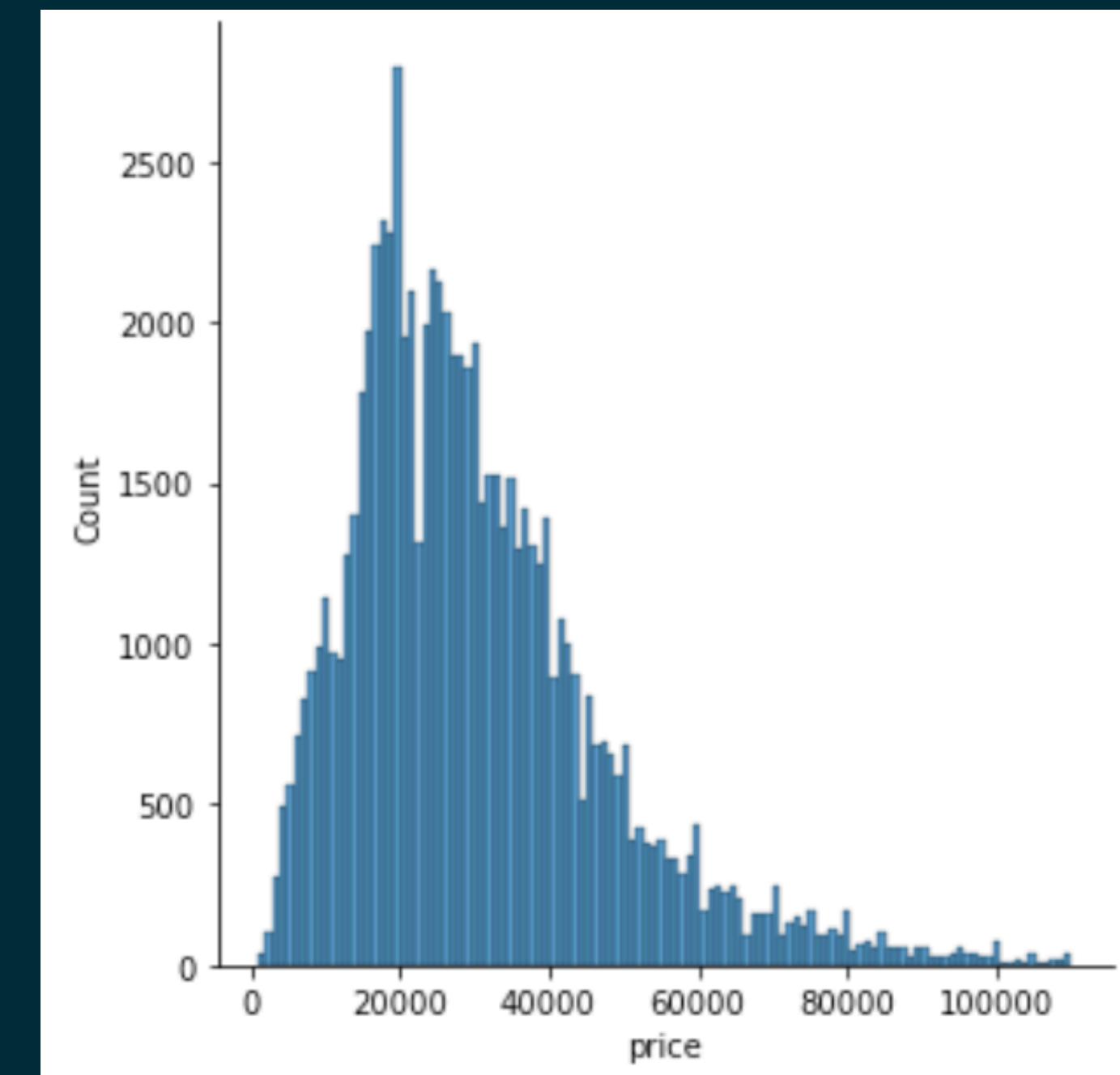
# COMPY.PY

## Distribution Plots

Price Distribution Before Outlier Removal

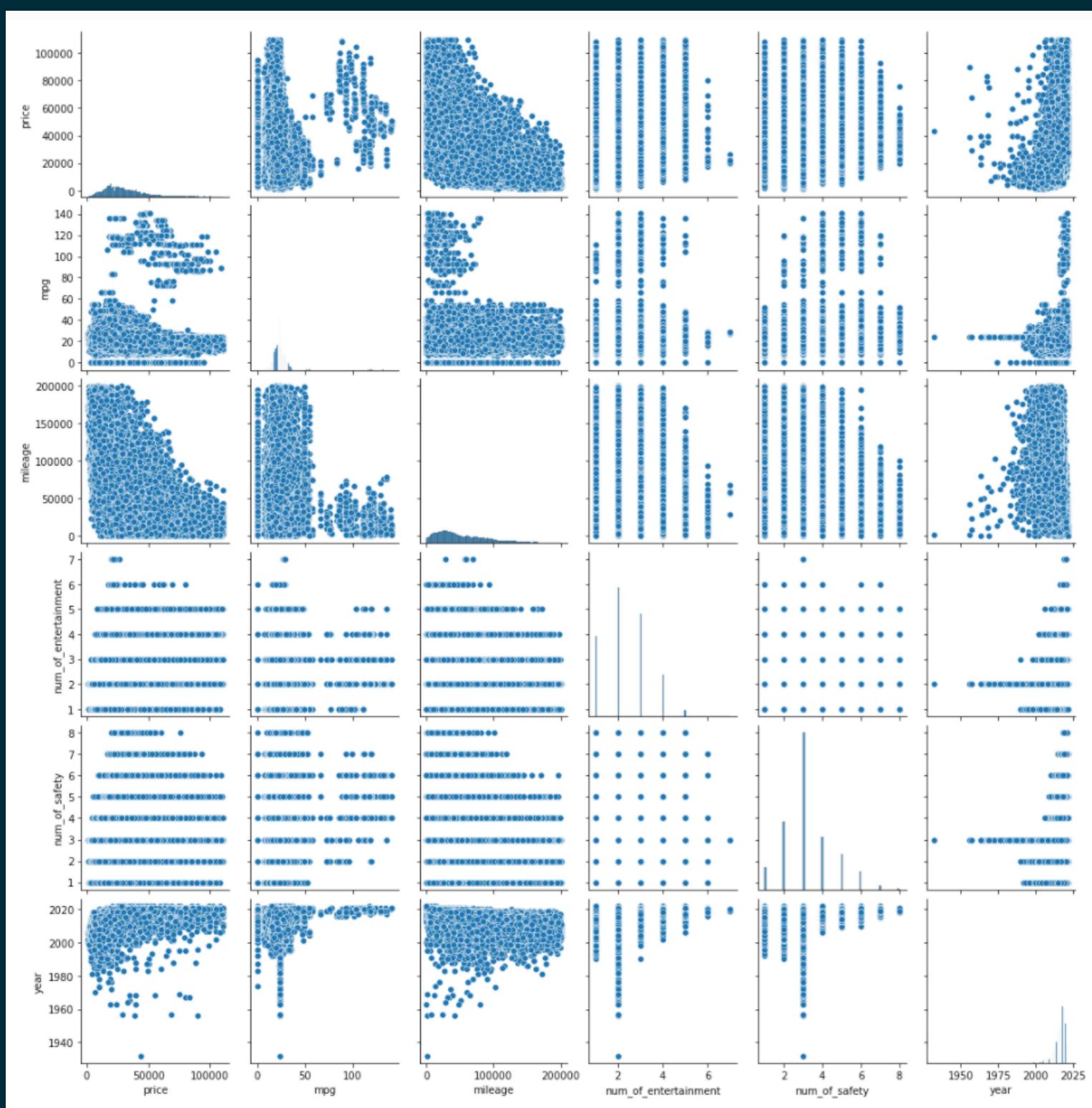


Price Distribution After Outlier Removal

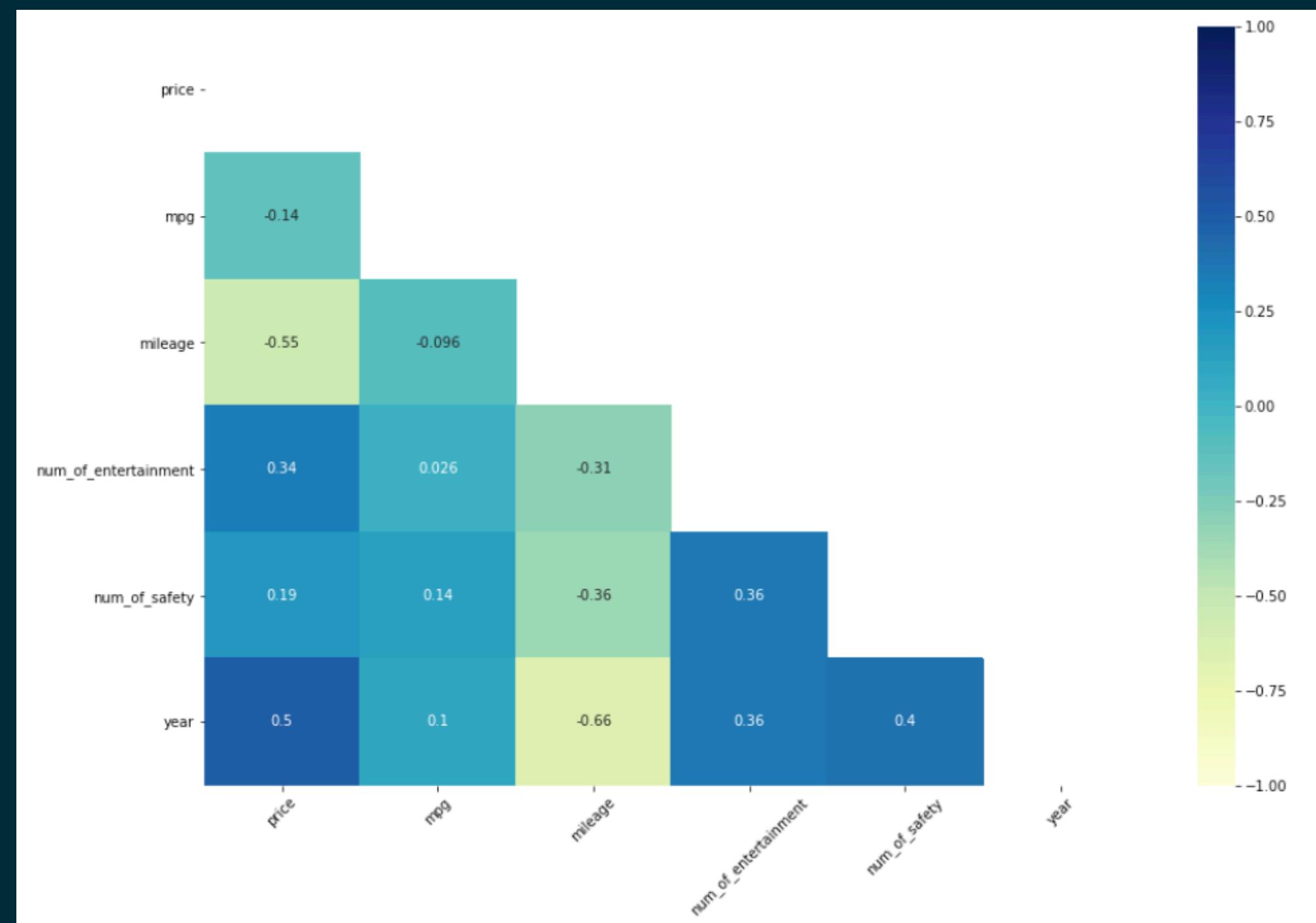


# COMPY.PY

Pair Plot



Correlation Plot



# THE APPLICATION

**Find Out The Sale Price of Your Car**

Miles per Gallon  
18 - +

Mileage of the Car  
26704 - +

Number of Entertainment Features  
2 - +

Number of Safety Features  
3 - +

Year The Car Was Made  
2019 - +

Type of Drivetrain  
4WD

Type of Fuel Used  
Gasoline

Type of Transmission  
Automatic

Type of Engine  
4.0L

Brand of the Car  
Toyota

Model of the Car  
4Runner

Predicted Sale Price of the Car: \$44896.43

# THE APPLICATION

## Find Out The Sale Price of Your Car

Miles per Gallon

18

- +

Mileage of the Car

26704

- +

Number of Entertainment Features

2

- +

# THE APPLICATION

Number of Safety Features

3

- +

Year The Car Was Made

2019

- +

Type of Drivetrain

4WD

Type of Fuel Used

Gasoline

# THE APPLICATION

Type of Transmission	Automatic
Type of Engine	4.0L
Brand of the Car	Toyota
Model of the Car	4Runner
Predicted Sale Price of the Car:	\$44896.43

# PREDICTION



2019 Toyota 4Runner TRD Off Road

mpg	18
Mileage	26,704
Entertainment	2
Safety	3
Drivetrain	4WD
Fuel	Gasoline
Transmission	Automatic
Engine	4.0L

**Actual: \$ 44,995**

**Predicted: \$ 44,896.43**

# PREDICTION



2017 Jeep Cherokee Latitude

mpg	25
Mileage	85,600
Entertainment	1
Safety	3
Drivetrain	FWD
Fuel	Gasoline
Transmission	Automatic
Engine	2.4L

**Actual: \$ 18,990**

**Predicted: \$ 18,493.65**

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# FUTURE WORK

- \* **Change some application features to drop box with options**
  - \* **Automate compy.py with Cron**
  - \* **Deploy application with Heroku**
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**THANK YOU!**

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# APPENDIX

Final Model:  
Random Forest Regressor

Train R2	0.99
Test R2	0.94
MAE	2671.65

# APPENDIX

