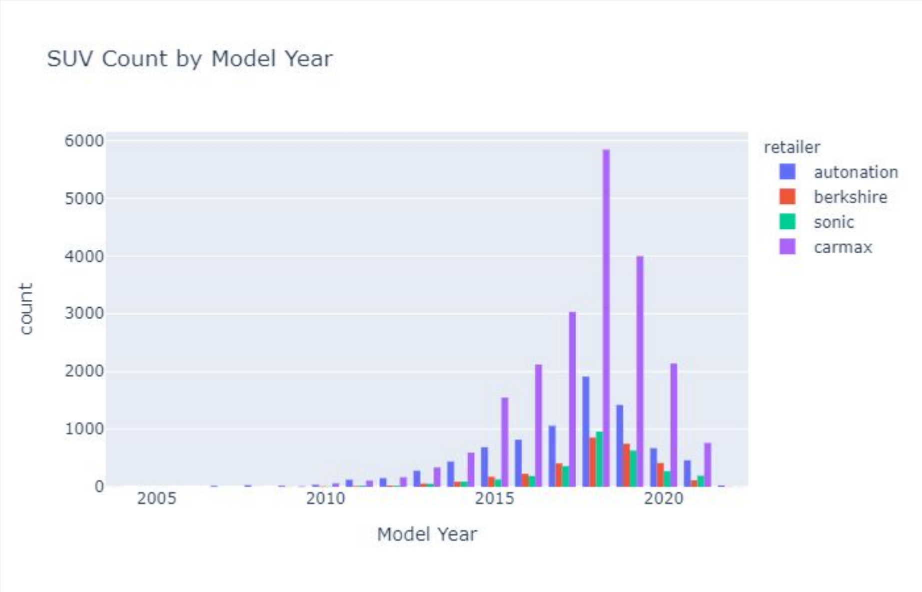
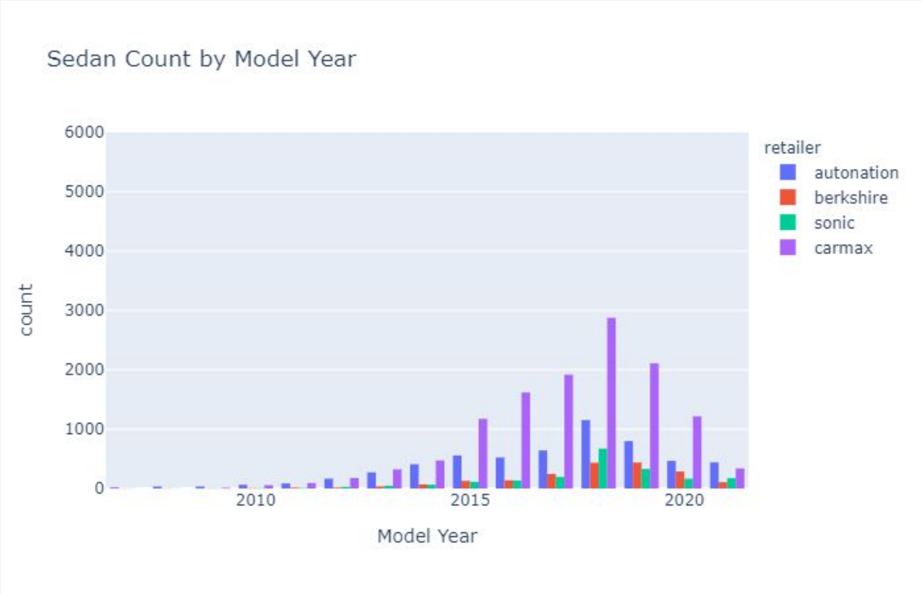
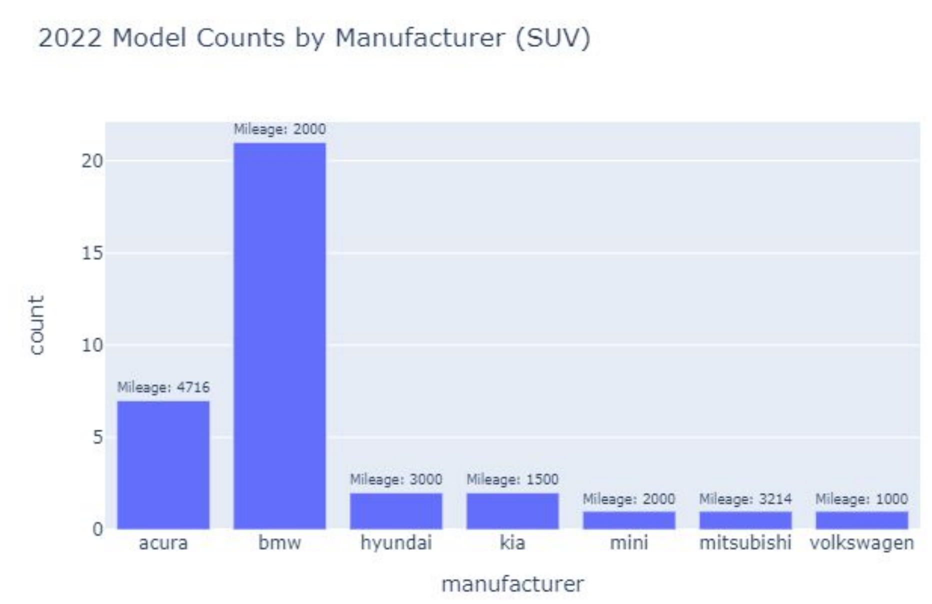
Exhibit 1 - Inventory Distribution by Model Year Between Retailers





- CarMax has the largest inventory of SUVs/sedans, with AutoNation a distant second. Berkshire/Sonic have similar inventory sizes
- Retailers have more SUVs than sedans
- The majority model years range from the time period: 2015 - 2020
- There are a number of 2022 SUVs for sale, but none for sedan

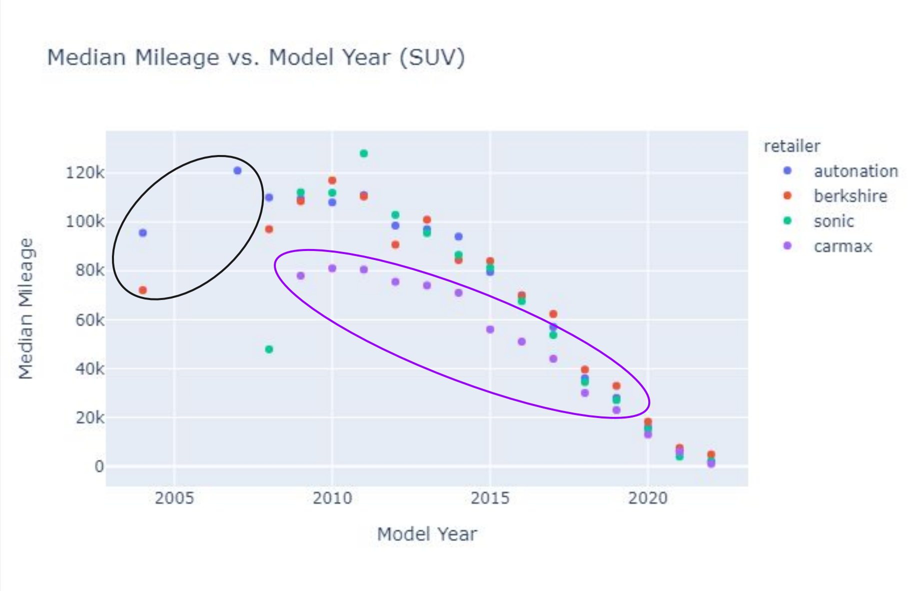
Exhibit 2 - 2022 SUV Counts by Manufacturer



Median mileage shown

- There is a disproportionate amount of BMWs

Exhibit 3 - Mileage and Price vs. Model Year - SUV



- CarMax SUVs have the least mileage from 2009 - 2020 and tend to be more expensive
- Albeit a tiny inventory, only AutoNation and Berkshire offer a selection of old and cheap SUVs (2004, 2007)

Exhibit 4 - Mileage and Price vs. Model Year - Sedan

- CarMax offers the lowest mileage sedans from 2010 - 2020, while pricing is the highest from 2010 - 2016
- CarMax’s 2018 sedan collection provides the best value (lowest mileage, lowest price)

Exhibit 5 - Linear Regression - Industry

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_{10} x_{10}$$

Adj. R-squared = 30.5% 1

Features		Coefficients		p-value 2	95% CI
		$\beta_0 =$	23.36	0.000	[22.76, 23.96]
$x_1 =$	*mileage*	$\beta_1 =$	3 -0.10	0.000	[-0.11, -0.10]
$x_2 =$	*car_type* is SUV	$\beta_2 =$	5.92	0.000	[5.76, 6.09]
$x_3 =$	*model_year* is 2014	$\beta_3 =$	1.22	0.000	[0.59, 1.85]
...		...			
$x_{10} =$	*model_year* is 2021	$\beta_{10} =$	16.68	0.000	[16.00, 17.36]

Full regression results can be viewed in the Jupyter Notebook

1. Mileage, car type and model year explain 30.5% of the variation in industry pricing

2. There is statistical significance for all sample coefficients, meaning there is evidence of differences in price

3. On average, every additional 1,000 miles driven is associated with a $100 decrease in price
On average, there is a $5,920 increase in mean price for SUVs compared to sedans
On average, there is a $1,220 increase in mean price for 2014 models compared to 2013 models

Exhibit 5 - Linear Regression - CarMax

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_{10} x_{10}$$

Adj. R-squared = 27.4% [1]

Features		Coefficients		p-value	95% CI	Industry CI
		$\beta_0 =$	23.31	0.000	[22.52, 24.10]	[22.76, 23.96]
$x_1 =$	*mileage*	$\beta_1 =$	-0.09	0.000	[-0.096, -0.08]	[-0.11, -0.098] [2]
$x_2 =$	*car_type* is SUV	$\beta_2 =$	6.06	0.000	[5.86, 6.26]	[5.76, 6.09]
$x_3 =$	*model_year* is 2014	$\beta_3 =$	0.70	0.108 [3]	[-0.15, 1.56]	[0.59, 1.85]
...		...				
$x_{10} =$	*model_year* is 2021	$\beta_{10} =$	14.67	0.000	[13.75, 15.60]	[16.00, 17.36] [4]

Full regression results can be viewed in the Jupyter Notebook

1. Mileage, car type and model year explain 27.4% of the variation in CarMax's pricing

2. This interval is higher than industry, suggesting CarMax's pricing decreases less than industry average for additional mileage

3. Non-significance for this coefficient indicates no observed difference between mean price for CarMax's 2014 and 2013 models
   - Healthy number of instances (not due to low sample size): 1,065 cars for 2014 and 658 cars for 2013

4. The increase in mean price is lower than the industry, suggesting that the difference between mean price for CarMax's 2021 models compared to their other models is lower than industry

Exhibit 5 - Linear Regression - AutoNation

$$Y = \beta_0+\beta_1 x_1+\beta_2 x_2+\beta_3 x_3 + \dots +\beta_{10} x_{10}$$

Adj. R-squared = 37.8% 1

Features		Coefficients		p-value	95% CI	Industry CI
		$\beta_0 =$	24.47	0.000	[23.34, 25.60]	[22.76, 23.96]
$x_1 =$	*mileage*	$\beta_1 =$	-0.12	0.000	[-0.13, -0.113]	[-0.106, -0.10] 2
$x_2 =$	*car_type* is SUV	$\beta_2 =$	5.89	0.000	[5.53, 6.24]	[5.76, 6.09]
$x_3 =$	*model_year* is 2014	$\beta_3 =$	1.96	0.000	[0.88, 3.05]	[0.59, 1.85]
...		...				
$x_{10} =$	*model_year* is 2021	$\beta_{10} =$	17.85	0.000	[16.57, 19.13]	[16.00, 17.36]

Full regression results can be viewed in the Jupyter Notebook

1. Mileage, car type and model year explain 37.8% of the variation in AutoNation's pricing
2. This interval is lower than industry, suggesting AutoNation's pricing decreases more than industry average for additional mileage

Exhibit 5 - Linear Regression - Berkshire

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_{10} x_{10}$$

Adj. R-squared = 32.3% [1]

Features		Coefficients		p-value	95% CI	Industry CI
		$\beta_0 =$	22.28	0.000	[20.10, 24.45]	[22.76, 23.96]
$x_1 =$	*mileage*	$\beta_1 =$	-0.11	0.000	[-0.12, -0.10]	[-0.11, -0.10]
$x_2 =$	*car_type* is SUV	$\beta_2 =$	7.28	0.000	[6.77, 7.78] [2]	[5.76, 6.09]
$x_3 =$	*model_year* is 2014	$\beta_3 =$	0.25	0.831 [3]	[-2.03, 2.53]	[0.59, 1.85]
...		...				
$x_{10} =$	*model_year* is 2021	$\beta_{10} =$	13.17	0.000	[10.77, 15.57] [4]	[16.00, 17.36]

Full regression results can be viewed in the Jupyter Notebook

1. Mileage, car type and model year explain 32.3% of the variation in Berkshire's pricing

2. The increase in mean price for SUV versus sedan is higher than industry, suggesting Berkshire's pricing between SUVs and sedans is further apart than industry

3. Non-significance for this coefficient indicates no observed difference between mean price for Berkshire's 2014 and 2013 models
   - Healthy number of instances (not due to low sample size): 155 cars for 2014 and 90 cars for 2013

4. The increase in mean price is lower than the industry, suggesting that the difference between mean price for Berkshire's 2021 compared to their other models is lower than industry

Exhibit 5 - Linear Regression - Sonic

$Y = \beta_0+\beta_1 x_1+\beta_2 x_2+\beta_3 x_3 + \ldots+\beta_{10} x_{10}$

Adj. R-squared = 30.1% 1

Features		Coefficients		p-value	95% CI	Industry CI
		$\beta_0 =$	23.32	0.000	[20.66, 25.98]	[22.76, 23.96]
$x_1 =$	*mileage*	$\beta_1 =$	-0.11	0.000	[-0.13, -0.09]	[-0.11, -0.10] 2
$x_2 =$	*car_type* is SUV	$\beta_2 =$	4.71	0.000	[4.08, 5.34]	[5.76, 6.09]
$x_3 =$	*model_year* is 2014	$\beta_3 =$	1.01	0.466 3	[-1.71, 3.74]	[0.59, 1.85]
...		...				
$x_{10} =$	*model_year* is 2021	$\beta_{10} =$	20.11	0.000	[17.28, 22.95]	[16.00, 17.36]

Full regression results can be viewed in the Jupyter Notebook

1. Mileage, car type and model year explain 30.1% of the variation in Sonic's pricing

2. The increase in mean price for SUV versus sedan is lower than industry, suggesting Sonic's pricing between SUVs and sedans is closer together than industry

3. Non-significance for this coefficient indicates no observed difference between mean price for 2014 models versus 2013 models for Sonic
    - Healthy number of instances (not due to low sample size): 152 cars for 2014 and 99 cars for 2013

Exhibit 5 - Summary of Linear Regression Findings

Variation in Pricing

- Mileage, car type and model year explain the most variation in AutoNation's pricing (37.8%)
- Mileage, car type and model year explain the most least variation in CarMax's pricing (27.4%)

Mileage

- For increases in mileage, CarMax decreases pricing less than the industry average, while AutoNation increases pricing more
  - Industry average: every 1,000 increase in mileage is associated with a $100 decrease in price
    - For CarMax, this associated price decrease is $90
    - For AutoNation, this associated price decrease is $120

Car Type

- Berkshire's SUV and sedan pricing is further apart, while Sonic's SUV and sedan pricing is closer together

Model Year

- Industry pricing decreases sharply for newer models and tails-off for older models

Features		Coefficients	
x_3 =	*model_year* is 2014	β_3 =	1.22
x_4 =	*model_year* is 2015	β_4 =	2.82
x_5 =	*model_year* is 2016	β_5 =	3.34
x_6 =	*model_year* is 2017	β_6 =	4.60
x_7 =	*model_year* is 2018	β_7 =	6.29
x_8 =	*model_year* is 2019	β_8 =	6.73
x_9 =	*model_year* is 2020	β_9 =	9.82
x_{10} =	*model_year* is 2021	β_{10} =	16.68