Group 12

ASSESSING THE FINEST CAR AT HAYWARD HONDA

FINAL REPORT

Problem Statement

In today's rapidly evolving automotive market, selecting the perfect vehicle is both an exhilarating and challenging endeavor. With an array of options and the importance of making a sound investment, potential buyers frequently find themselves swamped by the sheer volume of decisions they face. Our project addresses this issue head-on by leveraging cutting-edge technologies like web scraping to amass a comprehensive database of pre-owned cars. By demystifying the complexities of car buying, we aim to transform it into a seamless, transparent, and enjoyable journey, fostering trust and satisfaction among consumers. This initiative marks a significant leap towards simplifying the automotive purchase process, ensuring that buyers are well-equipped with the knowledge they need to make informed decisions with confidence.

Data Collection

Utilize web scraping techniques to gather information from Hayward Honda's official website. Extract data pertaining to each car entity listed on the webpage and format it systematically for further analysis or presentation. The URL provided below directs to the relevant section:

Hayward Honda Used Cars (Page-1)
Hayward Honda Used Cars (Page-2)

Project Framework

Data is collected from the desired website using Beautiful Soup, a robust Python library, which facilitates the parsing of the website's HTML content to isolate and gather crucial details such as price, mileage, and color among other relevant attributes. After this collection phase, the data is systematically organized and refined, a process known as data wrangling, to make it conducive for detailed analysis.

The analytical journey kicks off with data visualization, laying the groundwork to unravel the complexities within the dataset. Crucial attributes like price and mileage are instrumental in gauging a car's durability and market worth. To further explore a vehicle's value and its cost-effectiveness, we delve into depreciation analysis, considering factors such as the car's age, mileage, and original price.

This thorough examination aids in pinpointing vehicles that present the best value, considering both cost-effectiveness and budgetary constraints. Further customization based on specific attributes, color preferences, and personal needs ensures the selection of the perfect car for each buyer. This detailed and customized approach streamlines the car buying process, making it more efficient and satisfying.

Methods and Implementation

The data collection process initiates with the aggregation of raw information, which is then methodically organized into an initial data frame. This step is crucial for validating the accuracy and reliability of the data by comparing it with the information presented on the source website. Following this verification, the data undergoes a series of enhancements, including meticulous cleaning and the transformation of data into suitable types, to facilitate more efficient analysis and interpretation.

To uphold the integrity of the dataset, any instances of incomplete data are rigorously identified and systematically substituted with null values. This approach ensures that the dataset remains coherent and comprehensive. Through these thorough and deliberate processes, a final, polished data frame is constructed with great care, guaranteeing that every piece of data is impeccably clean and precise.

The culminating step involves exporting this carefully processed data into a CSV file, which stands as a crucial asset for further detailed analysis or storage, offering profound insights into the dataset of cars. Below is an illustrative depiction of the completed data frame, showcasing the attributes of various cars in an organized, structured, and visually appealing manner.

	VehicleName	Price($)	Mileage(Miles)	Engine	Transmission	DriveTrain	VIN	Stock	Interior
0	2020 Hyundai Elantra SEL	15451	60935	Regular Unleaded I-4 2.0 L/122	CVT	FWD	5NPD84LF2LH578383	402090R	Gray
1	2016 Honda Civic Sedan 4dr CVT LX	15991	81639	Regular Unleaded I-4 2.0 L/122	CVT	FWD	19XFC2F53GE213896	402073	Black/Ivory
2	2020 Hyundai Santa Fe SE w/SULEV	17551	65993	Regular Unleaded I-4 2.4 L/144	Automatic	FWD	5NMS23AD8LH262777	402035	Black/Black
3	2021 Nissan Versa SR	17551	33548	Regular Unleaded I-4 1.6 L/98	CVT	FWD	3N1CN8FV0ML924370	402111	Sport Interior
4	2021 Nissan Rogue Sport S	17551	67221	Regular Unleaded I-4 2.0 L/122	CVT	AWD	JN1BJ1AW6MW662556	402135R	Charcoal
5	2019 Honda Civic Hatchback Sport CVT	17881	90155	Intercooled Turbo Premium Unleaded I-4 1.5 L/91	CVT	FWD	SHHFK7H40KU420879	402053	Black
6	2020 Nissan Kicks SR	17991	41821	Regular Unleaded I-4 1.6 L/98	CVT	FWD	3N1CP5DV0LL536016	402112	Charcoal
7	2020 Honda Fit EX CVT	17991	85713	Regular Unleaded I-4 1.5 L/91	CVT	FWD	3HGGK5H84LM705905	402051	Black
8	2020 Kia Forte GT-Line	17991	61286	Regular Unleaded I-4 2.0 L/122	CVT	FWD	3KPF34AD2LE228779	402107	Black
9	2016 Honda Civic Sedan 4dr CVT EX-T	18451	67387	Intercooled Turbo Regular Unleaded I-4 1.5 L/91	CVT	FWD	19XFC1F39GE204645	402089	Black
10	2018 MAZDA MAZDA3 4-Door Touring	18551	53728	Regular Unleaded I-4 2.5 L/152	Automatic	FWD	3MZBN1V33JM182985	402088	Black
11	2021 Toyota Corolla LE	18551	68257	Regular Unleaded I-4 1.8 L/110	CVT	FWD	5YFEPMAE9MP264574	402126R	Black
12	2019 Honda Civic Hatchback EX CVT	18741	102444	Intercooled Turbo Regular Unleaded I-4 1.5 L/91	CVT	FWD	SHHFK7H65KU402427	402099	Black
13	2020 Toyota Corolla SE	19991	60043	Regular Unleaded I-4 2.0 L/121	CVT	FWD	5YFS4RCE5LP045647	402110	Ivory
14	2019 Honda CR-V LX 2WD	19991	81811	Regular Unleaded I-4 2.4	CVT	FWD	2HKRW5H31KH422513	402121	Graphite

Exploratory Analysis

The key factors in choosing the ideal car largely hinge on its price and the miles it has traveled. These elements are crucial in forming a transparent view for selecting the right car. To depict the relationship between these essential factors, a bar chart is used to place the price and mileage side by side. This visual display not only brings to light the individual metrics but also clarifies how the car's price relates to its level of use, providing a deeper insight into their interplay. Such an examination is invaluable for prospective buyers, enabling them to weigh the car's cost against its usage, indicated by the mileage. This method facilitates a more refined decision-making process, allowing purchasers to gauge each car's worth against these key indicators.

Car Price and Mileage

Depreciation of Vehicles Based on Miles Driven

Price vs. Depreciation
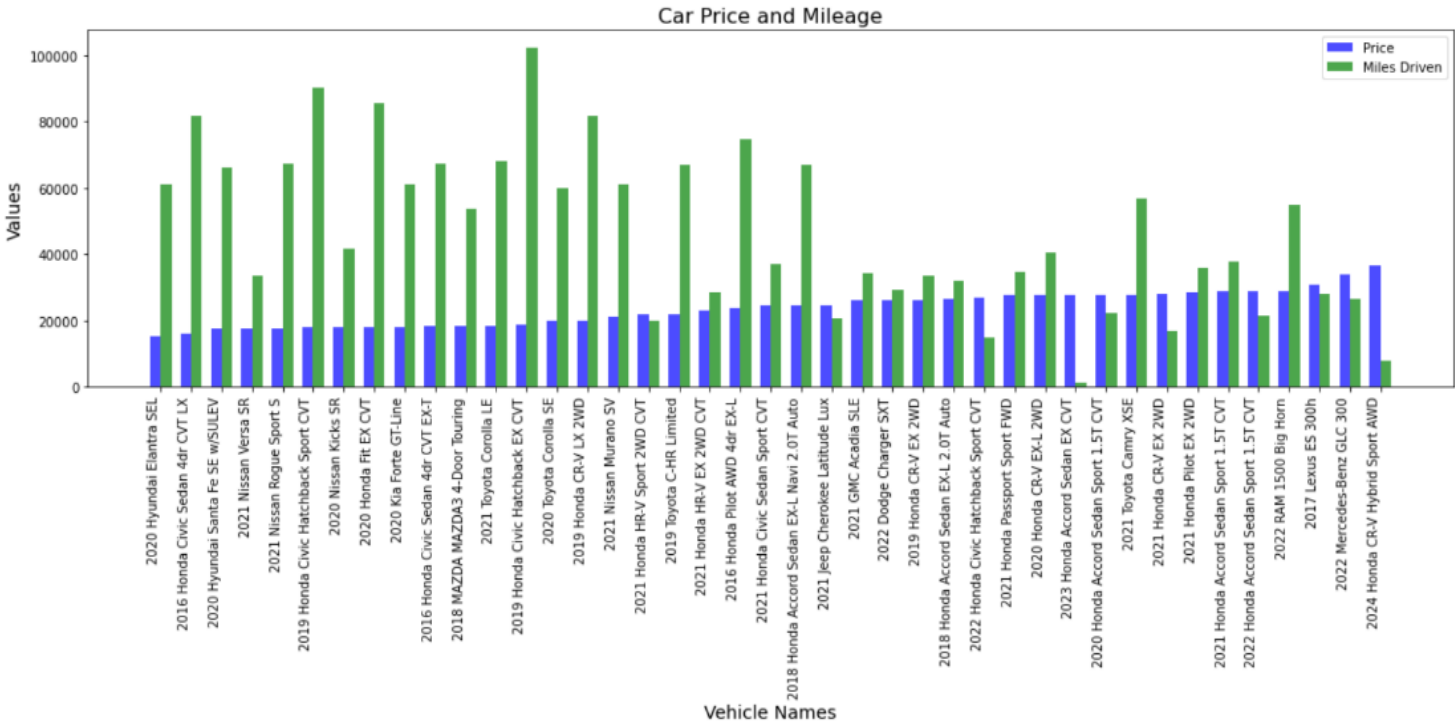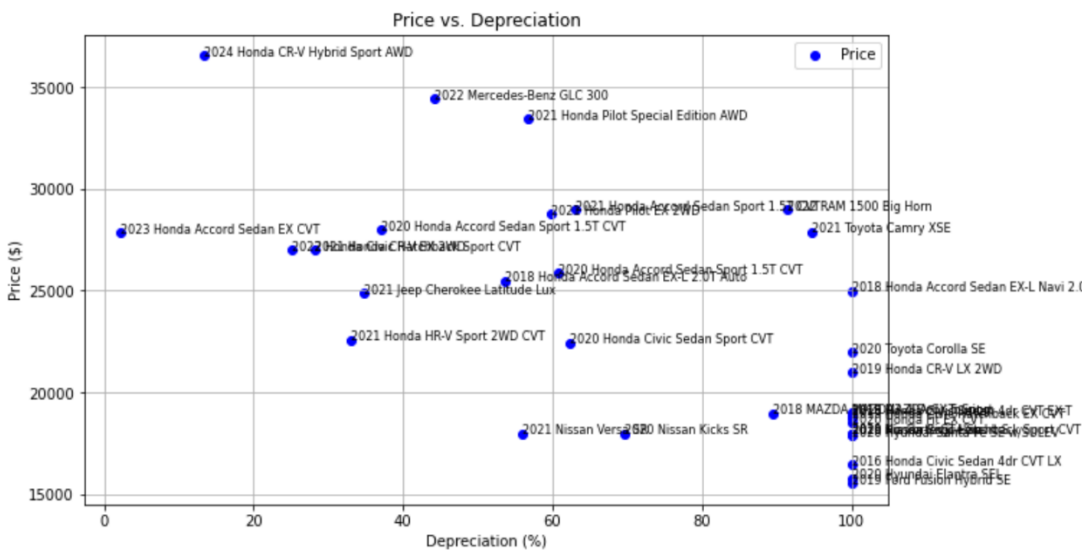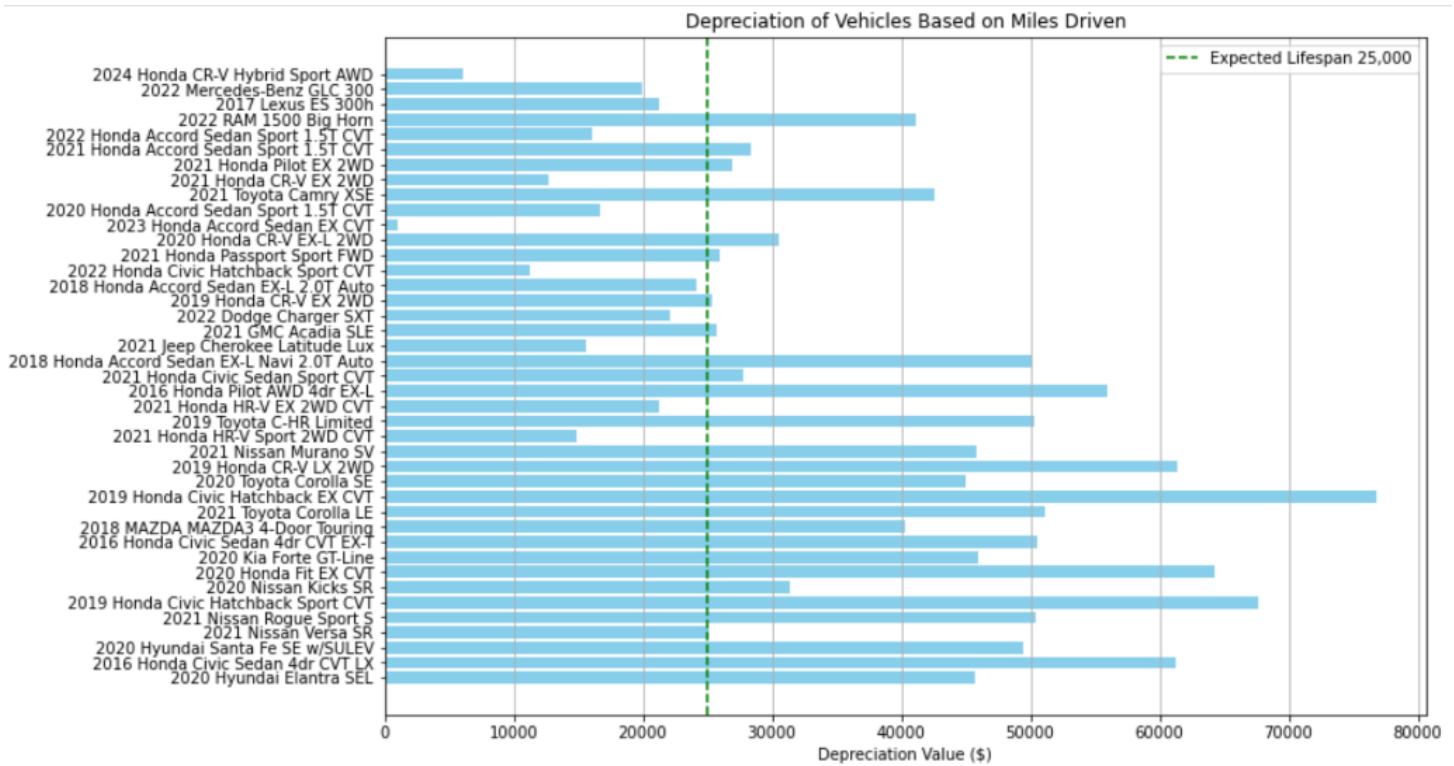
Assessing the depreciation of the car can significantly reveal its current status and value. To conduct this assessment, it's necessary to assume that the average lifespan of a car is about 60,000 miles, and the average initial purchase price of a car is approximately $45,000. With these assumptions in place, the calculation for depreciation can be determined by dividing the miles driven by the car by its assumed average lifespan, and then multiplying this ratio by the initial cost. This formula yields a depreciation value that provides a clearer picture of the car's worth over time. Understanding depreciation in this manner is crucial as it helps in comprehensively evaluating the financial aspect of car ownership, offering potential buyers a more informed perspective on the economic depreciation of the vehicle relative to its usage and initial value.

Conclusion

Following this detailed and systematic approach enables individuals to make an informed decision when selecting the ideal car. The final choice is further influenced by other crucial aspects, including the technological advancements integrated within the car and its aesthetic appeal, as determined by its color. Employing this methodological framework not only simplifies the car selection process but also ensures that the chosen vehicle aligns perfectly with personal preferences and requirements, thereby facilitating the acquisition of an optimal car that meets all desired criteria.