

CS 180 Project: Car Evaluation Based on the Car Attributes and Personal Opinion

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Introduction:

“A good reputation for quality vehicles is essential if one is thinking of selling used cars”

Do you want to sell your car?



Introduction:

“A good reputation for quality vehicles is essential if one is thinking of selling used cars”

If yes, Is it worth selling?



Introduction:

“A good reputation for quality vehicles is essential if one is thinking of selling used cars”

Our project aims to help and motivate the owner/seller of the car decide whether the car can still be sold at a reasonable price or if the car isn't suited for selling at all based on its current condition and specifications.



Review on Related Literatures

Consumer Acceptability as defined, results from determining the feasibility of whether a product or service will be acceptable to the consumer requires tests, surveys, pretests and even prototypes[1]



Methodology:

>Data Set

UCI Machine Learning Repository


Car Evaluation:

Car Evaluation Data Set (1728 instances)

- 4 Classes (unacc, acc, good, vgood)
- 6 Attributes (buying price, maintaining price, no. of doors, persons capacity, size of luggage, safeness)

Sentiment Analysis on Owner's Review/Opinion:

Sentiment Labelled Sentences Data Set (3000 instances)



Methodology:

>Machine Learning Technique

Decision Trees

- Model of decisions and their possible consequences.
- includes chance event outcomes



Methodology:

>Machine Learning Technique

Multinomial Naive Bayes

- explicitly models the word counts and adjusts the underlying calculations to deal with in
- normally requires integer feature counts



Methodology:

>Machine Learning Technique

Training Set Parameters

- Training set: 60%
- Testing set: 40%



Methodology:

>Machine Learning Technique

Training Set Parameters

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Methodology:

> Machine Learning Technique

- PreProcessing of dataset



Methodology:

> Performance Measure (Decision Tree)

- Accuracy: (96.68%)

		Prediction			
Actual		Unacceptable	Acceptable	Good	Very Good
	Unacceptable	478	2	0	0
	Acceptable	1	143	9	3
	Good	0	0	26	3
	Very Good	0	3	2	22



Methodology:

> Performance Measure (Multinomial Naive Bayes)

- Accuracy: (82.08%)

		Prediction	
		Negative	Positive
Actual	Negative	504	113
	Positive	102	481



Methodology:

> Performance Measure (Car Evaluation)

Variables	Accuracy
safety+Persons	0.7616
all	0.941
all except doors	0.9213
all	0.9757
buying+maint+safety+persons	0.8692



Results and Discussion:
>Sample Run

RUN THE PROGRAM



Results and Discussion:

> Limitations of the Project

- No input validation
- Attributes are generalized
- Limited to only 6 attributes
- No neutral (limited to only positive or negative)
- Depends on choice of the owner's choice of words



Conclusion:

- All attributes contribute a certain factor to the customer's acceptability
- Overall Safety and Seating Capacity both have a great impact to the result
- Number of doors are the least important variable in deciding the class value of the car.



Conclusion:

- The owner's positive comment does not guarantee to a customer's acceptability in a car and vice versa



References:

Data Set: <https://archive.ics.uci.edu/ml/machine-learning-databases/00331/>

<https://archive.ics.uci.edu/ml/datasets/car+evaluation>

<https://archive.ics.uci.edu/ml/datasets/Sentiment+Labelled+Sentences>



References:

Consumer Acceptability:

[1]<https://bizfluent.com/facts-7196986-consumer-acceptability-.html>

[2]https://books.google.com.ph/books?id=r-iMSOgr-pwC&pg=PA1548&lpg=PA1548&dq=consumer+acceptability+car+e+valuation&source=bl&ots=x2kXESp_aO&sig=TQUMv7EfZgFgnfoNGqq0ghweC6U&hl=en&sa=X&ved=0ahUKEwi07Jzj7KrbAhXBxbwKHShuDpkQ6AEINzAB#v=onepage&q=consumer%20acceptability%20car%20evaluation&f=false



References:

Sentiment Analysis:

[3]<https://www.brandwatch.com/blog/understanding-sentiment-analysis/>

[4]<https://towardsdatascience.com/sentiment-analysis-concept-analysis-and-applications-6c94d6f58c17>



References:

Decision Tree:

[5]https://en.wikipedia.org/wiki/Decision_tree

[6]<https://towardsdatascience.com/decision-trees-in-machine-learning-641b9c4e8052>

Other Sources:

[7]<https://www.sectorsdonut.co.uk/sectors/automotive/used-car-dealer/overview>



THANK YOU!!