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| **Car Evaluation Data Set**  *Download*: [Data Folder](http://archive.ics.uci.edu/ml/machine-learning-databases/car/), [Data Set Description](http://archive.ics.uci.edu/ml/machine-learning-databases/car/car.names)  **Abstract**: Derived from simple hierarchical decision model, this database may be useful for testing constructive induction and structure discovery methods. | http://archive.ics.uci.edu/ml/assets/MLimages/Large19.jpg |

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| **Data Set Characteristics:** | Multivariate | **Number of Instances:** | 1728 | **Area:** | N/A |
| **Attribute Characteristics:** | Categorical | **Number of Attributes:** | 6 | **Date Donated** | 1997-06-01 |
| **Associated Tasks:** | Classification | **Missing Values?** | No | **Number of Web Hits:** | 524195 |

**Source:**

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**Data Set Information:**

Car Evaluation Database was derived from a simple hierarchical decision model originally developed for the demonstration of DEX, M. Bohanec, V. Rajkovic: Expert system for decision making. Sistemica 1(1), pp. 145-157, 1990.). The model evaluates cars according to the following concept structure:   
  
CAR car acceptability   
. PRICE overall price   
. . buying buying price   
. . maint price of the maintenance   
. TECH technical characteristics   
. . COMFORT comfort   
. . . doors number of doors   
. . . persons capacity in terms of persons to carry   
. . . lug\_boot the size of luggage boot   
. . safety estimated safety of the car   
  
Input attributes are printed in lowercase. Besides the target concept (CAR), the model includes three intermediate concepts: PRICE, TECH, COMFORT. Every concept is in the original model related to its lower level descendants by a set of examples (for these examples sets see [[Web Link]](http://www-ai.ijs.si/BlazZupan/car.html)).   
  
The Car Evaluation Database contains examples with the structural information removed, i.e., directly relates CAR to the six input attributes: buying, maint, doors, persons, lug\_boot, safety.   
  
Because of known underlying concept structure, this database may be particularly useful for testing constructive induction and structure discovery methods.

**Attribute Information:**

Class Values:   
  
unacc, acc, good, vgood   
  
Attributes:   
  
buying: vhigh, high, med, low.   
maint: vhigh, high, med, low.   
doors: 2, 3, 4, 5more.   
persons: 2, 4, more.   
lug\_boot: small, med, big.   
safety: low, med, high.

Class Values（分类依据）

unacc, acc, good, vgood

实验说明：

1 对原始数据进行必要的预处理，提交报告时，写明处理过程，及部分样本的示例结果

2 以car.data中数据为样本，以Class Values为分类依据，利用样本的前80%数据建立分类模型

3 求解分类规则

4 利用最后的20%作为最终实验数据为测试数据，对分类器进行评估，并求解以下数值

1) 准确率

2) 精度

3) 召回率

4) F 度量

设计要求：

1. 实验说明中1的预处理，写明处理过程或方法，及部分原始数据处理后的结果（可展示数据集的5%处理后结果）
2. 分类模型建立的算法伪代码和源代码（并标注主要过程或方法）
3. 展示20个数据对象的算法执行过程
4. 写出形成的分类规则的源代码（标注主要过程或方法），以及该分类模型形成的分类规则
5. 写出实验说明4）中对前50项测试数据进行测试的结果
6. 基于5）的结果，写出构建的混淆矩阵，并进行实验说明4）的评估，写出指标的求解过程
7. 写出实验说明4）所有测试数据集的指标值

**Relevant Papers:**

M. Bohanec and V. Rajkovic: Knowledge acquisition and explanation for multi-attribute decision making. In 8th Intl Workshop on Expert Systems and their Applications, Avignon, France. pages 59-78, 1988.   
[[Web Link]](http://rexa.info/paper/5e2ae6fa6748dfe24067bb2b59823f2df3f7ed73)   
  
B. Zupan, M. Bohanec, I. Bratko, J. Demsar: Machine learning by function decomposition. ICML-97, Nashville, TN. 1997 (to appear)   
[[Web Link]](http://rexa.info/paper/0f23f96c4a89bbb221a151f5db381924c17a6eaa)

**Papers That Cite This Data Set1:**

http://archive.ics.uci.edu/ml/assets/rexa.jpg

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Daniel J. Lizotte and Omid Madani and Russell Greiner. [Budgeted Learning of Naive-Bayes Classifiers](http://rexa.info/paper/f14d3edaeac2280dc4e49948d9d0fc1159bd05ca). UAI. 2003. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#f14d3edaeac2280dc4e49948d9d0fc1159bd05ca)].  
  
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Iztok Savnik and Peter A. Flach. [Discovery of multivalued dependencies from relations](http://rexa.info/paper/bc80295973a43d3806ff4dfe83e5724260301c33). Intell. Data Anal, 4. 2000. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#bc80295973a43d3806ff4dfe83e5724260301c33)].  
  
Marc Sebban and Richard Nock and Jean-Hugues Chauchat and Ricco Rakotomalala. [Impact of learning set quality and size on decision tree performances](http://rexa.info/paper/d2ad474fa4c9b346e9ac8f41900cea7d4917c7ac). Int. J. Comput. Syst. Signal, 1. 2000. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#d2ad474fa4c9b346e9ac8f41900cea7d4917c7ac)].  
  
Jie Cheng and Russell Greiner. [Comparing Bayesian Network Classifiers](http://rexa.info/paper/47354ca48da5014e0a8f5e4da7f3a7e9aaa6e9e5). UAI. 1999. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#47354ca48da5014e0a8f5e4da7f3a7e9aaa6e9e5)].  
  
Daniel J. Lizotte and Omid Madani and Russell Greiner. [Budgeted Learning, Part II: The Na#ve-Bayes Case](http://rexa.info/paper/7e787ada7263180d2a9bad6a3c490e7f8b0d4cd0). Department of Computing Science University of Alberta. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#7e787ada7263180d2a9bad6a3c490e7f8b0d4cd0)].  
  
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Zhiqiang Yang and Sheng Zhong and Rebecca N. Wright. [Privacy-Preserving Classification of Customer Data without Loss of Accuracy](http://rexa.info/paper/6aae20aa5fd96e903634bb73244782652cd4e947). Computer Science Department, Stevens Institute of Technology. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#6aae20aa5fd96e903634bb73244782652cd4e947)].  
  
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Daniel J. Lizotte. [Library Release Form Name of Author](http://rexa.info/paper/217beab6a7a7b64dc929c3c5fdb42e812f8b2431). Budgeted Learning of Naive Bayes Classifiers. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#217beab6a7a7b64dc929c3c5fdb42e812f8b2431)].  
  
Nikunj C. Oza and Stuart J. Russell. [Online Bagging and Boosting](http://rexa.info/paper/3e9ebff12a232c9f091156827e92c55d259b95f3). Computer Science Division University of California. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#3e9ebff12a232c9f091156827e92c55d259b95f3)].