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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:**

Creator:   
  
Marko Bohanec   
  
Donors:   
  
1. Marko Bohanec (marko.bohanec **'@'** ijs.si)   
2. Blaz Zupan (blaz.zupan **'@'** ijs.si)

**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car.data中的原始数据进行必要的特征选择和预处理:

把各属性转换为数值型

2清除原数据中不干净的数据，包括去除噪音数据，填充缺省值

2 以car.data中数据为样本，以Class Values为分类依据，建立神经网络分类模型

3 对训练和测试样本按以下比例分别进行构建分类器：分类器1：(4:1)，分类器2：3:1, 分类器3：9:1

4 显示3中各分类器的参数

5 predict data

**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

Qingping Tao Ph. D. [MAKING EFFICIENT LEARNING ALGORITHMS WITH EXPONENTIALLY MANY FEATURES](http://rexa.info/paper/8e674b6eff0f726ba6fff46ef6eaff968dc89f39). Qingping Tao A DISSERTATION Faculty of The Graduate College University of Nebraska In Partial Fulfillment of Requirements. 2004. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#8e674b6eff0f726ba6fff46ef6eaff968dc89f39)].  
  
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)].  
  
Jianbin Tan and David L. Dowe. [MML Inference of Decision Graphs with Multi-way Joins and Dynamic Attributes](http://rexa.info/paper/14f025e969e3a0418fd852ee46e54039ab3f216a). Australian Conference on Artificial Intelligence. 2003. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#14f025e969e3a0418fd852ee46e54039ab3f216a)].  
  
Marc Sebban and Richard Nock and Stéphane Lallich. [Stopping Criterion for Boosting-Based Data Reduction Techniques: from Binary to Multiclass Problem](http://rexa.info/paper/1b77c2b6fd8a261af286cf411879f9f520824bd6). Journal of Machine Learning Research, 3. 2002. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#1b77c2b6fd8a261af286cf411879f9f520824bd6)].  
  
Nikunj C. Oza and Stuart J. Russell. [Experimental comparisons of online and batch versions of bagging and boosting](http://rexa.info/paper/5193dfc0a9d39b5f86fe360d6beff81aa9b7390e). KDD. 2001. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#5193dfc0a9d39b5f86fe360d6beff81aa9b7390e)].  
  
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)].  
  
Huan Liu. [A Family of Efficient Rule Generators](http://rexa.info/paper/8f5ae7219e74a85e3f722b58b3fedb30eab7a1d7). Department of Information Systems and Computer Science National University of Singapore. [[View Context](http://archive.ics.uci.edu/ml/support/Car+Evaluation#8f5ae7219e74a85e3f722b58b3fedb30eab7a1d7)].  
  
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)].