**INSTITUTO FEDERAL DO MARANHÃO-IFMA**

**CAMPUS SANTA INÊS**

**TURMA: ENG. DA COMPUTAÇÃO - 2022**

**DISCIPLINA: INTRO. À ENGENHARIA DA COMPUTAÇÃO**

**PROF. EMANUEL CLEYTON MACEDO LEMOS**

**ALUNO(A): FÁBIO DA SILVA ELOI JÚNIOR**

**RELATÓRIO DE DADOS – 1**

**WEKA: J48.**

**CONCLUSÕES**

**=== Run information ===**

**Scheme: weka.classifiers.trees.J48 -C 0.25 -M 2**

**Relation: car**

**Instances: 1728**

**Attributes: 7**

**buying**

**maint**

**doors**

**persons**

**lug\_boot**

**safety**

**class**

**Test mode: evaluate on training data**

**=== Classifier model (full training set) ===**

**J48 pruned tree**

**------------------**

**safety = low: unacc (576.0)**

**safety = med**

**| persons = 2: unacc (192.0)**

**| persons = 4**

**| | buying = vhigh**

**| | | maint = vhigh: unacc (12.0)**

**| | | maint = high: unacc (12.0)**

**| | | maint = med**

**| | | | lug\_boot = small: unacc (4.0)**

**| | | | lug\_boot = med: unacc (4.0/2.0)**

**| | | | lug\_boot = big: acc (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: unacc (4.0)**

**| | | | lug\_boot = med: unacc (4.0/2.0)**

**| | | | lug\_boot = big: acc (4.0)**

**| | buying = high**

**| | | lug\_boot = small: unacc (16.0)**

**| | | lug\_boot = med**

**| | | | doors = 2: unacc (4.0)**

**| | | | doors = 3: unacc (4.0)**

**| | | | doors = 4: acc (4.0/1.0)**

**| | | | doors = 5more: acc (4.0/1.0)**

**| | | lug\_boot = big**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: acc (4.0)**

**| | | | maint = med: acc (4.0)**

**| | | | maint = low: acc (4.0)**

**| | buying = med**

**| | | maint = vhigh**

**| | | | lug\_boot = small: unacc (4.0)**

**| | | | lug\_boot = med: unacc (4.0/2.0)**

**| | | | lug\_boot = big: acc (4.0)**

**| | | maint = high**

**| | | | lug\_boot = small: unacc (4.0)**

**| | | | lug\_boot = med: unacc (4.0/2.0)**

**| | | | lug\_boot = big: acc (4.0)**

**| | | maint = med: acc (12.0)**

**| | | maint = low**

**| | | | lug\_boot = small: acc (4.0)**

**| | | | lug\_boot = med: acc (4.0/2.0)**

**| | | | lug\_boot = big: good (4.0)**

**| | buying = low**

**| | | maint = vhigh**

**| | | | lug\_boot = small: unacc (4.0)**

**| | | | lug\_boot = med: unacc (4.0/2.0)**

**| | | | lug\_boot = big: acc (4.0)**

**| | | maint = high: acc (12.0)**

**| | | maint = med**

**| | | | lug\_boot = small: acc (4.0)**

**| | | | lug\_boot = med: acc (4.0/2.0)**

**| | | | lug\_boot = big: good (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: acc (4.0)**

**| | | | lug\_boot = med: acc (4.0/2.0)**

**| | | | lug\_boot = big: good (4.0)**

**| persons = more**

**| | lug\_boot = small**

**| | | buying = vhigh: unacc (16.0)**

**| | | buying = high: unacc (16.0)**

**| | | buying = med**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: unacc (4.0)**

**| | | | maint = med: acc (4.0/1.0)**

**| | | | maint = low: acc (4.0/1.0)**

**| | | buying = low**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: acc (4.0/1.0)**

**| | | | maint = med: acc (4.0/1.0)**

**| | | | maint = low: acc (4.0/1.0)**

**| | lug\_boot = med**

**| | | buying = vhigh**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: unacc (4.0)**

**| | | | maint = med: acc (4.0/1.0)**

**| | | | maint = low: acc (4.0/1.0)**

**| | | buying = high**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: acc (4.0/1.0)**

**| | | | maint = med: acc (4.0/1.0)**

**| | | | maint = low: acc (4.0/1.0)**

**| | | buying = med: acc (16.0/5.0)**

**| | | buying = low**

**| | | | maint = vhigh: acc (4.0/1.0)**

**| | | | maint = high: acc (4.0)**

**| | | | maint = med: good (4.0/1.0)**

**| | | | maint = low: good (4.0/1.0)**

**| | lug\_boot = big**

**| | | buying = vhigh**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: unacc (4.0)**

**| | | | maint = med: acc (4.0)**

**| | | | maint = low: acc (4.0)**

**| | | buying = high**

**| | | | maint = vhigh: unacc (4.0)**

**| | | | maint = high: acc (4.0)**

**| | | | maint = med: acc (4.0)**

**| | | | maint = low: acc (4.0)**

**| | | buying = med**

**| | | | maint = vhigh: acc (4.0)**

**| | | | maint = high: acc (4.0)**

**| | | | maint = med: acc (4.0)**

**| | | | maint = low: good (4.0)**

**| | | buying = low**

**| | | | maint = vhigh: acc (4.0)**

**| | | | maint = high: acc (4.0)**

**| | | | maint = med: good (4.0)**

**| | | | maint = low: good (4.0)**

**safety = high**

**| persons = 2: unacc (192.0)**

**| persons = 4**

**| | buying = vhigh**

**| | | maint = vhigh: unacc (12.0)**

**| | | maint = high: unacc (12.0)**

**| | | maint = med: acc (12.0)**

**| | | maint = low: acc (12.0)**

**| | buying = high**

**| | | maint = vhigh: unacc (12.0)**

**| | | maint = high: acc (12.0)**

**| | | maint = med: acc (12.0)**

**| | | maint = low: acc (12.0)**

**| | buying = med**

**| | | maint = vhigh: acc (12.0)**

**| | | maint = high: acc (12.0)**

**| | | maint = med**

**| | | | lug\_boot = small: acc (4.0)**

**| | | | lug\_boot = med: acc (4.0/2.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: good (4.0)**

**| | | | lug\_boot = med: good (4.0/2.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | buying = low**

**| | | maint = vhigh: acc (12.0)**

**| | | maint = high**

**| | | | lug\_boot = small: acc (4.0)**

**| | | | lug\_boot = med: acc (4.0/2.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = med**

**| | | | lug\_boot = small: good (4.0)**

**| | | | lug\_boot = med: good (4.0/2.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: good (4.0)**

**| | | | lug\_boot = med: good (4.0/2.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| persons = more**

**| | buying = vhigh**

**| | | maint = vhigh: unacc (12.0)**

**| | | maint = high: unacc (12.0)**

**| | | maint = med: acc (12.0/1.0)**

**| | | maint = low: acc (12.0/1.0)**

**| | buying = high**

**| | | maint = vhigh: unacc (12.0)**

**| | | maint = high: acc (12.0/1.0)**

**| | | maint = med: acc (12.0/1.0)**

**| | | maint = low: acc (12.0/1.0)**

**| | buying = med**

**| | | maint = vhigh: acc (12.0/1.0)**

**| | | maint = high: acc (12.0/1.0)**

**| | | maint = med**

**| | | | lug\_boot = small: acc (4.0/1.0)**

**| | | | lug\_boot = med: vgood (4.0/1.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: good (4.0/1.0)**

**| | | | lug\_boot = med: vgood (4.0/1.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | buying = low**

**| | | maint = vhigh: acc (12.0/1.0)**

**| | | maint = high**

**| | | | lug\_boot = small: acc (4.0/1.0)**

**| | | | lug\_boot = med: vgood (4.0/1.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = med**

**| | | | lug\_boot = small: good (4.0/1.0)**

**| | | | lug\_boot = med: vgood (4.0/1.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**| | | maint = low**

**| | | | lug\_boot = small: good (4.0/1.0)**

**| | | | lug\_boot = med: vgood (4.0/1.0)**

**| | | | lug\_boot = big: vgood (4.0)**

**Number of Leaves : 131**

**Size of the tree : 182**

**Time taken to build model: 0.01 seconds**

**=== Evaluation on training set ===**

**Time taken to test model on training data: 0.01 seconds**

**=== Summary ===**

**Correctly Classified Instances 1664 96.2963 %**

**Incorrectly Classified Instances 64 3.7037 %**

**Kappa statistic 0.9198**

**Mean absolute error 0.0248**

**Root mean squared error 0.1114**

**Relative absolute error 10.8411 %**

**Root relative squared error 32.9501 %**

**Total Number of Instances 1728**

**=== Detailed Accuracy By Class ===**

**TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class**

**0,977 0,019 0,992 0,977 0,984 0,948 0,997 0,998 unacc**

**0,964 0,028 0,907 0,964 0,934 0,916 0,996 0,978 acc**

**0,826 0,007 0,838 0,826 0,832 0,825 0,997 0,916 good**

**0,846 0,003 0,917 0,846 0,880 0,876 0,999 0,952 vgood**

**Weighted Avg. 0,963 0,020 0,964 0,963 0,963 0,933 0,997 0,989**

**=== Confusion Matrix ===**

**a b c d <-- classified as**

**1182 25 3 0 | a = unacc**

**10 370 2 2 | b = acc**

**0 9 57 3 | c = good**

**0 4 6 55 | d = vgood**

**CONCLUSÕES**

Após o resultado gerado pelo software pode-se analisar que na mineração escolhida houveram 1728 instâncias, classificadas em 7 tipos de atributos: buying, maint, doors, persons, lug\_boot, safety, class. O modo de teste efetuado para avaliar os dados foi de o “evaluate on training data”.

A árvore podada trouxe a análise dos dados apresentados, variando de acordo os caminhos existentes que cada decisão pode ser tomada, trazendo atributos do seu topo para a base. A parte principal é a safety, que está no topo árvore, onde ela é dividida em low, med e high. O número de instâncias classificadas corretamente foi de 1664, representando 96.2963% do total, e trouxe 64 classificações incorretas, sendo 3.7037%. Também foi apresentado o nível de confiabilidade entre as avaliações, onde obteve a porcentagem de 0.9198. A precisão nas classes também foi mostrada, e ao final a matriz de confusão, que apresentou os resultados nas variáveis possíveis. A unacc obteve 1182 corretas, a acc 370, good 57 e vgood 55, totalizando as 1664 instâncias classificadas corretamente.