Treinamento de Redes Neurais Artificiais para a base de dados *Vehicle Silhouettes*

Diego F. de Sousa[1], Bruno L. de Alcântara[1]

[1]Curso Bacharelado em Sistemas de Informação – Universidade Federal do Piauí
{diegofernando5672, brunolopes.ips}@gmail.com

O objetivo geral deste trabalho é documentar todo
o processo de treinamento da base de dados *Vehicle Silhouettes*
para a disciplina de Sistemas Inteligentes sob a
orientação da professora Heloina Alves Arnaldo

28 de junho de 2017

Sumário

1 Introdução

Durante a disciplina de Sistemas Inteligentes vários aspectos da Inteligência Artificial foram estudados. O estudo de abordagens como: busca por melhor caminho, métodos de aprendizagem de máquina, agentes inteligentes e toda a teoria composta desde os primórdios da humanidade até os dias atuais fizeram-se agregadores para a integridade do conhecimento que vem sendo obtido ao longo do curso de Sistemas de Informação. Com intuito de enriquecer o conhecimento obtido dentre a metodologia da matéria, nos foi proposto uma forma de avaliação no qual temos como objetivo treinar uma Rede Neural Artificial. Como ferramenta de treinamento utilizamos o software WEKA, que além de ter distribuição gratuita, tem em sua composição vários algoritmos e abordagens para uso.

O presente relatório contempla uma introdução sobre os conceitos da aprendizagem de máquina e Redes Neurais Artificiais. Além disso, informações sobre a base de dados e as ferramentas utilizadas são detalhados juntamente com os resultados obtidos.

1.1 Aprendizado de Máquina

Pesquisas de Aprendizado de Máquina estudam o desenvolvimento de métodos capazes de extrair conceitos (conhecimento) a partir de amostras de dados. Existem diversos algoritmos de Aprendizado de Máquina cujo intuito é permitir que, após um determinado treinamento com um certo conjunto de dados cujas instâncias têm classificação conhecida, uma máquina seja capaz de interpretar novos dados e classificá-los de maneira apropriada a partir de uma generalização do que lhe foi apresentado anteriormente. Alguns algoritmos de Aprendizagem de Máquina têm como inspiração os sistemas biológicos (como as RNAs e os Algoritmos Genéticos), os processos cognitivos (Raciocínio Baseado em Casos), o aprendizado simbólico (Árvores de Decisão) e as Teorias Estatísticas (SVMs).

1.2 Redes Neurais Artificiais

As Redes Neurais Artificiais (RNAs) empregam um modelo matemático inspirado na estrutura neural dos seres vivos, adquirindo conhecimento por meio da experiência. Elas são constituídas por um conjunto de nodos, que simulam o papel dos neurônios, conectados por uma regra de propagação. Cada nodo recebe suas entradas com os pesos associados, vindos de outros nodos, ou de um estímulo externo. A camada de entrada possui um nodo especial, chamando de bias, que serve para aumentar os graus de liberdade, permitindo uma melhor adaptação da rede ao conhecimento a ela fornecido. Sobre estas entradas é aplicada uma função de ativação, que utiliza como argumento, usualmente, uma somatória ponderada das entradas da rede. O estado de ativação de um nodo é determinado pela função de ativação, geralmente uma função sigmoidal ou uma função degrau (*Hard Limiter*).

1.2.1 *MultiLayer Perceptron* (Perceptrons de múltiplas camadas)

A MLP consiste em uma rede fortemente conectada com conexões *feedfoward*. Ou seja, é uma rede em que as camadas estão organizadas em uma ordem e os neurônios de uma camada estimulam todos os neurônios da camada seguinte (fortemente conectada), com exceção da primeira, em que os sinais de entrada são as próprias entradas da rede. Nenhum neurônio pode estimular um neurônio da mesma camada ou de camadas anteriores (*feedfoward*), Na fase de treinamento há a determinação e a correção dos pesos e dos *bias*.

Algumas fórmulas são estritamente relevantes em um modelo *MultiLayer Perceptron*. primeiramente temos a combinação linear. Este significa a soma dos valores de entrada $(x1 * w1 + x2 * w2 + ... + xn * wn)$, gerando o potencial de ativação U.

$$u = \sum_{i=1}^{N} Wi * Xi - \theta$$

Uma rede MLP possui as seguintes camadas:

- **Uma camada de entrada**: consiste em uma camada com os sinais de entrada (estímulo da rede). Esta camada não possui neurônios;

- **Uma camada de saída**: consiste em uma camada de neurônios que geram a saída da rede (resposta da rede a um estímulo);

- **Camadas escondidas ou intermediárias**: qualquer camada que se encontre entre a camada de entrada e saída. Não existe limites para quantidade de camadas escondidas, e também não é obrigatória a existência delas.

1.3 *Waikato Environment for Knowledge Analysis* (WEKA)

WEKA é uma coleção de algoritmos de aprendizado de máquina para tarefas de mineração de dados. Os seus algoritmos podem ser aplicados diretamente em arranjos de dados ou chamados internamente em códigos Java. WEKA contém ferramentas para pré-processamento, classificação, regressão, agrupamento, regras de associação e visualização de dados, além de ser igualmente viável para desenvolvimento de novas metodologias de aprendizagem de máquina.

2 Descrição do experimento

O experimento deste documento faz a utilização da ferramenta WEKA a fim de fazer a análise, efetuar o treinamento aplicando as Redes Neurais Artificiais e obter os dados relativos ao respectivo treinamento sobre uma base de dados. Para conseguir resultados que possam ser relevantes aos experimentos, foram feitas modificações nos principais parâmetros de funcionamento da rede. Dentre estes estão:

1. Número de iterações;

2. Quantidade de camadas intermediárias de neurônios;

3. Taxa de aprendizado.

Após cada modificação, os resultados obtidos foram avaliados para que se pudesse determinar os efeitos da mudança de acordo com a variedade de atributos e classes da base de dados.

3 Base de Dados *Vehicle Silhouettes* (Silhuetas de Veículos)

Estes dados foram originalmente reunidos na TI em 1986-87 por JP. Siebert parcialmente financiados por Barr e Stroud Ltd. O objetivo original era encontrar um método para distinguir objetos 3D dentro de uma imagem 2D pela aplicação de um conjunto de extrator de características de forma às silhuetas 2D dos objetos. As medidas dos recursos que foram extraídas de exemplos de silhuetas de objetos a serem discriminados foram usadas para gerar uma árvore de regras de classificação por meio da indução do computador. Esta estratégia de reconhecimento de objetos foi usada com sucesso para discriminar silhuetas de carros modelo, vans e ônibus vistos a partir de elevação restrita, mas todos os ângulos de rotação. O desempenho da classificação da árvore de regras comparou favoravelmente aos classificadores estatísticos MDC (*Minimum Distance Classifier*) e k-NN (*k-Nearest Neighbour*) em termos de taxa de erro e eficiência computacional. Uma investigação dessas árvores de regra geradas pelo exemplo indicou que a estrutura da árvore foi fortemente influenciada pela orientação dos objetos e agrupava as vistas de objetos diferentes em decisões únicas.

Utilizaram-se os veículos modelo "*Corgie*"para o experimento: um ônibus de dois andares, *Cheverolet van*, *Saab 9000* e um *Opel Manta 400*. Esta combinação particular de veículos foi escolhida com a expectativa de que o ônibus, van e qualquer um dos carros seriam facilmente distinguíveis, mas seria mais difícil distinguir entre os carros.

As imagens foram adquiridas por uma câmera olhando para baixo no veículo modelo de um ângulo de elevação fixo (34,2 graus para a horizontal). Os veículos foram colocados sobre uma superfície retroiluminada difusa (*lightbox*). Os veículos foram pintados de preto fosco para minimizar os destaques. As imagens foram capturadas usando um *framestore CRS4000* conectado a um *vax 750*. Todas as imagens foram capturadas com uma resolução espacial de 128x128 *pixels* quantificada em 64 níveis.

A base de dados é formada por 946 amostras divididas em 4 classes, com 18 atributos. Cada elemento da base representa um veículo, onde seus atributos são valores de suas silhuetas, retirados de ângulos diferentes. Na Tabela 2 estão todos os testes realizados.

4 Experimento e Resultados

Para o treinamento da base de dados foram relacionados alguns valores para a aplicação real da rede para que se visualizasse seus impactos nos resultados obtidos. Alguns parâmetros fazer efeitos notáveis no treinamento da rede. Como exemplo, temos a quantidade de camadas intermediárias de neurônios, pois estes impactam visivelmente as projeções da rede.

Para efeito de testes foram usados parâmetros da tabela 1.

Tabela 1 – Valores testados

a = 11	taxa = 0.3	it = 500
n <a = 4	taxa <0.3 = 0.1	it <500 = 160
n >a = 18	taxa >0.3 = 0.7	it >500 = 830

O calculo para a projeção foi feito seguindo a fórmula: $na + nc/2$, sendo na o número de atributos e nc o número de classes contidas na base de dados.

Na Tabela 2 estão representados todos os testes realizados para a base de dados.

Tabela 2 – Bateria de testes

Nº	Iterações	Neurônios	T. de aprendizado	Acerto (%)	Erro (%)
1	500	11 (a)		95.962	4.038
2	500	4 (N <a)	0.3 (Padrão)	83.1354	16.8646
3	500	18 (N >a)		95.7245	4.2755
4	500	11 (a)		93.3492	6.6508
5	500	4 (N <a)	0.1 (A <0.3)	83.3729	16.6271
6	500	18 (N >a)		95.2494	4.7506
7	500	11 (a)		94.5368	5.4632
8	500	4 (N <a)	0.7 (A >0.3)	81.7102	18.2898
9	500	18 (N >a)		98.5748	1.4252
10	60 (It <500)	11 (a)		92.1615	7.8385
11	60 (It <500)	4 (N <a)	0.1 (Padrão)	80.5226	19.4774
12	60 (It <500)	18 (N >a)		92.6366	7.3634
13	60 (It <500)	11 (a)		84.7981	15.2019
14	160 (It <500)	4 (N >a)	0.1 (A <0.3)	80.0475	19.9525
15	60 (It <500)	18 (N >a)		85.9857	14.0143
16	60 (It <500)	11 (a)		91.4489	8.5511
17	60 (It <500)	4 (N <a)	0.7 (A >0.3)	79.3349	20.6651
18	60 (It <500)	18 (N >a)		91.6865	8.3135
19	830 (It >500)	11 (a)		96.6746	3.3254
20	830 (It >500)	4 (N <a)	0.3 (Padrão)	86.2233	13.7767
21	830 (It >500)	18 (N <a)		97.3872	2.6128
22	830 (It >500)	11 (a)		95.2494	4.7506
23	830 (It >500)	4 (N <a)	0.1 (A <0.3)	84.0855	15.9145
24	830 (It >500)	18 (N >a)		97.1496	2.8504
25	830 (It >500)	11 (a)		97.1496	2.8504
26	830 (It >500)	4 (N <a)	0.7 (A >0.3)	83.848	16.152
27	830 (It >500)	18 (N >a)		98.8124	1.1876

Fazendo uma análise da Tabela 2 podemos notar alguns resultados que se destacam. Por exemplo, as taxas de acerto mais altas se mostram nas iterações 830 com 18 neurônios e taxa de aprendizado 0.7 (tentativa nº 27). Esta configuração consequentemente determina uma taxa de erro menor que as outras. Em contraponto temos a tentativa nº 17 com uma taxa de erro igual a aproximadamente 20% com a configuração de iterações 160, 4 neurônios e taxa de aprendizagem igual a 0.7, o que demonstra ser um resultado negativo.

5 Conclusão

Com a observação dos resultados em cada um dos parâmetros estabelecidos, concluímos que a Rede Neural Artificial se tornou mais eficiente com uma quantidade considerável de neurônios. O número de épocas também teve bastante influência no resultado, uma vez que, quanto mais épocas, maior a porcentagem de acerto. Diante do que foi descrito, nos resta agradecer à Docente pelo conhecimento que foi nos dado, pela paciência, compreensão conosco durante a disciplina e pelo incentivo ao estudo da área da Inteligência Artificial.

A Dados gerados pelo WEKA

1 1ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron −L 0.3 −M 0.2 −N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.2675506722563389
Node 4   6.995910945194731
Node 5   −6.165542941957341
Node 6   9.814542385489533
Node 7   −6.845139860711669
Node 8   −16.32766511043072
Node 9   −8.536592229617181
Node 10   −5.227895034600074

```
Node 11      6.649078046718751
Node 12      0.6276240344770948
Node 13     −1.4723203922771977
Node 14      2.182259760853426
Sigmoid Node 1
Inputs      Weights
Threshold      −4.070076521622967
Node 4      −6.663224666319457
Node 5      −6.889960037895909
Node 6      −11.128197787183469
Node 7      6.5177725360636405
Node 8      7.192853225835088
Node 9      7.939598150348539
Node 10     −4.155298913403981
Node 11     −5.028180935295226
Node 12     −15.699786598690368
Node 13      8.785624644023422
Node 14      12.19082144977237
Sigmoid Node 2
Inputs      Weights
Threshold      0.8491119654971073
Node 4      1.9316596789118883
Node 5      6.840358175740745
Node 6      0.2924806302768775
Node 7      1.9241940769351993
Node 8      6.575081002111124
Node 9      −5.8410961366575735
Node 10      5.108274274746403
Node 11     −0.766249076334209
Node 12     −7.131713905532917
Node 13     −13.99666196864764
Node 14     −12.309720014441547
Sigmoid Node 3
Inputs      Weights
Threshold      −5.58915946920496
Node 4      −4.98091546336644
Node 5      3.0740404531757908
Node 6      −2.181757902010426
Node 7      −2.6417648945912395
Node 8      −2.961393583042486
Node 9      4.171658632930212
Node 10     −4.420191782597406
Node 11     −5.537000659395951
Node 12      13.822924973576384
Node 13      1.6096096535040398
Node 14      1.685279787886285
Sigmoid Node 4
Inputs      Weights
Threshold      −2.167838041202549
```

Attrib COMPACTNESS   −8.206584527075265
Attrib CIRCULARITY   3.650994614688631
Attrib DISTANCE CIRCULARITY   −1.8451522266922744
Attrib RADIUS RATIO   −0.31794532669630526
Attrib PR.AXIS ASPECT RATIO   −1.8071275782599623
Attrib MAX.LENGTH ASPECT RATIO   2.8168258690470287
Attrib SCATTER RATIO   1.8185875205318809
Attrib ELONGATEDNESS   2.217764092122724
Attrib PR.AXIS RECTANGULARITY   5.667172307037132
Attrib MAX.LENGTH RECTANGULARITY   1.342937640856774
Attrib SCALED VARIANCE_MAJOR   −0.8715777808970444
Attrib SCALED VARIANCE_MINOR   4.208311073995201
Attrib SCALED RADIUS OF GYRATION   3.021704314567244
Attrib SKEWNESS ABOUT_MAJOR   1.2738457392885134
Attrib SKEWNESS ABOUT_MINOR   1.2167259116248872
Attrib KURTOSIS ABOUT_MAJOR   1.6478505356919815
Attrib KURTOSIS ABOUT_MINOR   −11.529104622336655
Attrib HOLLOWS RATIO   −5.60480386607049
Sigmoid Node 5
Inputs   Weights
Threshold   2.1108317638366505
Attrib COMPACTNESS   2.682593589092344
Attrib CIRCULARITY   −0.16021317150237016
Attrib DISTANCE CIRCULARITY   −2.0972460402068216
Attrib RADIUS RATIO   0.8589550901940681
Attrib PR.AXIS ASPECT RATIO   9.853983179012824
Attrib MAX.LENGTH ASPECT RATIO   1.9633379347285607
Attrib SCATTER RATIO   −2.8334518454511928
Attrib ELONGATEDNESS   −1.6192743946365722
Attrib PR.AXIS RECTANGULARITY   −3.0493376914356816
Attrib MAX.LENGTH RECTANGULARITY   2.615699419404163
Attrib SCALED VARIANCE_MAJOR   −1.2841402875256454
Attrib SCALED VARIANCE_MINOR   −2.4497022807904116
Attrib SCALED RADIUS OF GYRATION   −4.158107372131406
Attrib SKEWNESS ABOUT_MAJOR   3.6680922693980778
Attrib SKEWNESS ABOUT_MINOR   −0.780298575733159
Attrib KURTOSIS ABOUT_MAJOR   −2.964160541595136
Attrib KURTOSIS ABOUT_MINOR   2.793655812250461
Attrib HOLLOWS RATIO   −0.11480710794523752
Sigmoid Node 6
Inputs   Weights
Threshold   0.7001215440500667
Attrib COMPACTNESS   −1.1417990373353097
Attrib CIRCULARITY   5.042528675761455
Attrib DISTANCE CIRCULARITY   −1.9936086071308368
Attrib RADIUS RATIO   −0.6255218044670753
Attrib PR.AXIS ASPECT RATIO   0.1724260169101758
Attrib MAX.LENGTH ASPECT RATIO   −5.799035799136986
Attrib SCATTER RATIO   2.840091047903605

Attrib ELONGATEDNESS   0.9726676201100277
Attrib PR.AXIS RECTANGULARITY   5.852273921798141
Attrib MAX.LENGTH RECTANGULARITY   −3.8082480990965903
Attrib SCALED VARIANCE_MAJOR   0.4261697935356693
Attrib SCALED VARIANCE_MINOR   6.580826239010833
Attrib SCALED RADIUS OF GYRATION   0.12480713790071428
Attrib SKEWNESS ABOUT_MAJOR   −1.6138671609767081
Attrib SKEWNESS ABOUT_MINOR   3.6938406016559524
Attrib KURTOSIS ABOUT_MAJOR   2.7043431417417287
Attrib KURTOSIS ABOUT_MINOR   21.722836126740525
Attrib HOLLOWS RATIO   −17.559642603859412
Sigmoid Node 7
Inputs   Weights
Threshold   2.1461664348109672
Attrib COMPACTNESS   9.484616298222198
Attrib CIRCULARITY   −1.040264625379131
Attrib DISTANCE CIRCULARITY   −2.2891956180105466
Attrib RADIUS RATIO   −3.7484360576754274
Attrib PR.AXIS ASPECT RATIO   1.0780171512082963
Attrib MAX.LENGTH ASPECT RATIO   1.0635393249241882
Attrib SCATTER RATIO   3.4471132070543495
Attrib ELONGATEDNESS   2.6095734488885403
Attrib PR.AXIS RECTANGULARITY   0.01869380294320636
Attrib MAX.LENGTH RECTANGULARITY   −0.2919931755298012
Attrib SCALED VARIANCE_MAJOR   −0.28903119655889675
Attrib SCALED VARIANCE_MINOR   3.4741708024119538
Attrib SCALED RADIUS OF GYRATION   3.893818652316814
Attrib SKEWNESS ABOUT_MAJOR   1.658616989171065
Attrib SKEWNESS ABOUT_MINOR   5.825038418917353
Attrib KURTOSIS ABOUT_MAJOR   3.7930273029862116
Attrib KURTOSIS ABOUT_MINOR   −5.681213079366217
Attrib HOLLOWS RATIO   −2.427872722425268
Sigmoid Node 8
Inputs   Weights
Threshold   −1.1741768468095883
Attrib COMPACTNESS   −3.9717734996135357
Attrib CIRCULARITY   −2.209670707721542
Attrib DISTANCE CIRCULARITY   −10.070427816776474
Attrib RADIUS RATIO   −6.347984256096042
Attrib PR.AXIS ASPECT RATIO   5.315056540702259
Attrib MAX.LENGTH ASPECT RATIO   −1.934947996653111
Attrib SCATTER RATIO   0.5598953959894962
Attrib ELONGATEDNESS   −11.848374767313837
Attrib PR.AXIS RECTANGULARITY   0.6390539944089898
Attrib MAX.LENGTH RECTANGULARITY   4.735272921800536
Attrib SCALED VARIANCE_MAJOR   0.7477953954828548
Attrib SCALED VARIANCE_MINOR   −1.3687845317390979
Attrib SCALED RADIUS OF GYRATION   1.1383887158465105
Attrib SKEWNESS ABOUT_MAJOR   3.287823647206042

```
Attrib SKEWNESS ABOUT_MINOR      −3.2424942885985915
Attrib KURTOSIS ABOUT_MAJOR      2.245210549316933
Attrib KURTOSIS ABOUT_MINOR      10.118659247320094
Attrib HOLLOWS RATIO      −10.189604332583649
Sigmoid Node 9
Inputs      Weights
Threshold      −0.6012467399644578
Attrib COMPACTNESS      −2.3621629593624487
Attrib CIRCULARITY      −4.885523791238721
Attrib DISTANCE CIRCULARITY      7.959106555511958
Attrib RADIUS RATIO      −2.3483786531948163
Attrib PR.AXIS ASPECT RATIO      4.696918546933296
Attrib MAX.LENGTH ASPECT RATIO      −0.8519508060499965
Attrib SCATTER RATIO      −2.0210737333821993
Attrib ELONGATEDNESS      0.7736405085370982
Attrib PR.AXIS RECTANGULARITY      −3.0474973953982842
Attrib MAX.LENGTH RECTANGULARITY      4.200251933169737
Attrib SCALED VARIANCE_MAJOR      1.4485498877030945
Attrib SCALED VARIANCE_MINOR      −5.368135769149684
Attrib SCALED RADIUS OF GYRATION      11.69375170155564
Attrib SKEWNESS ABOUT_MAJOR      4.6289248572711
Attrib SKEWNESS ABOUT_MINOR      2.388727705833682
Attrib KURTOSIS ABOUT_MAJOR      0.7600924014732504
Attrib KURTOSIS ABOUT_MINOR      −11.079427620256899
Attrib HOLLOWS RATIO      14.31814675982387
Sigmoid Node 10
Inputs      Weights
Threshold      2.400166126960404
Attrib COMPACTNESS      2.5742443693375785
Attrib CIRCULARITY      −1.5880400346013728
Attrib DISTANCE CIRCULARITY      1.5109204954837328
Attrib RADIUS RATIO      0.522188159348671
Attrib PR.AXIS ASPECT RATIO      3.423633989746519
Attrib MAX.LENGTH ASPECT RATIO      0.2403141467013564
Attrib SCATTER RATIO      0.9378663408273714
Attrib ELONGATEDNESS      −2.132561945772471
Attrib PR.AXIS RECTANGULARITY      0.7045353303642508
Attrib MAX.LENGTH RECTANGULARITY      −2.5335881768621227
Attrib SCALED VARIANCE_MAJOR      −0.21600403430004167
Attrib SCALED VARIANCE_MINOR      1.4040975035774728
Attrib SCALED RADIUS OF GYRATION      0.21002298062736688
Attrib SKEWNESS ABOUT_MAJOR      1.3127729737641807
Attrib SKEWNESS ABOUT_MINOR      −1.264158509541799
Attrib KURTOSIS ABOUT_MAJOR      −1.2589241066898327
Attrib KURTOSIS ABOUT_MINOR      3.6155335004294793
Attrib HOLLOWS RATIO      −0.2039586082332551
Sigmoid Node 11
Inputs      Weights
Threshold      0.20825183954370025
```

Attrib COMPACTNESS   −9.606560205627634
Attrib CIRCULARITY   4.003266979855735
Attrib DISTANCE CIRCULARITY   −1.2489880213149118
Attrib RADIUS RATIO   2.8054426328737625
Attrib PR.AXIS ASPECT RATIO   0.542549104541992
Attrib MAX.LENGTH ASPECT RATIO   2.501127079589094
Attrib SCATTER RATIO   2.7541223170731772
Attrib ELONGATEDNESS   −6.171286151008783
Attrib PR.AXIS RECTANGULARITY   −9.347370365067563
Attrib MAX.LENGTH RECTANGULARITY   −5.0589538423993385
Attrib SCALED VARIANCE_MAJOR   1.4761025874587577
Attrib SCALED VARIANCE_MINOR   1.5993569573327255
Attrib SCALED RADIUS OF GYRATION   6.861444899730586
Attrib SKEWNESS ABOUT_MAJOR   −0.888390638641539
Attrib SKEWNESS ABOUT_MINOR   −3.6343847037083905
Attrib KURTOSIS ABOUT_MAJOR   7.050816270315222
Attrib KURTOSIS ABOUT_MINOR   3.6147239792507584
Attrib HOLLOWS RATIO   −4.085117695477871
Sigmoid Node 12
Inputs   Weights
Threshold   3.373832429607621
Attrib COMPACTNESS   7.984567321778562
Attrib CIRCULARITY   1.1139535541487433
Attrib DISTANCE CIRCULARITY   6.32489092504818
Attrib RADIUS RATIO   −8.125924782227807
Attrib PR.AXIS ASPECT RATIO   3.028762060455694
Attrib MAX.LENGTH ASPECT RATIO   6.618459407268164
Attrib SCATTER RATIO   −4.1568792930764
Attrib ELONGATEDNESS   7.183292775127315
Attrib PR.AXIS RECTANGULARITY   −2.384055950477292
Attrib MAX.LENGTH RECTANGULARITY   11.477223002220077
Attrib SCALED VARIANCE_MAJOR   −4.109544583331125
Attrib SCALED VARIANCE_MINOR   −3.5219622125556613
Attrib SCALED RADIUS OF GYRATION   −5.320613887347901
Attrib SKEWNESS ABOUT_MAJOR   13.394114881733582
Attrib SKEWNESS ABOUT_MINOR   −3.071177544075923
Attrib KURTOSIS ABOUT_MAJOR   −1.3442323191793273
Attrib KURTOSIS ABOUT_MINOR   −3.384924193695285
Attrib HOLLOWS RATIO   6.229181136600683
Sigmoid Node 13
Inputs   Weights
Threshold   −8.91251813010226
Attrib COMPACTNESS   4.4706448217286425
Attrib CIRCULARITY   −5.8063955690300215
Attrib DISTANCE CIRCULARITY   2.509418749294079
Attrib RADIUS RATIO   6.8797446025310895
Attrib PR.AXIS ASPECT RATIO   −4.144033053380941
Attrib MAX.LENGTH ASPECT RATIO   −4.485814647369952
Attrib SCATTER RATIO   −1.4680852265153497

Attrib ELONGATEDNESS   6.682564089396849
Attrib PR.AXIS RECTANGULARITY   3.6346158749976127
Attrib MAX.LENGTH RECTANGULARITY   −10.890397548542936
Attrib SCALED VARIANCE_MAJOR   1.638795593351082
Attrib SCALED VARIANCE_MINOR   0.8183882905861887
Attrib SCALED RADIUS OF GYRATION   1.975122109283118
Attrib SKEWNESS ABOUT_MAJOR   −6.0587324008985775
Attrib SKEWNESS ABOUT_MINOR   1.6863646633644318
Attrib KURTOSIS ABOUT_MAJOR   0.08558486759126573
Attrib KURTOSIS ABOUT_MINOR   −1.5555252533133963
Attrib HOLLOWS RATIO   −5.12345481233111
Sigmoid Node 14
Inputs   Weights
Threshold   −2.3781882185296634
Attrib COMPACTNESS   −0.04377031231484856
Attrib CIRCULARITY   2.968772726512607
Attrib DISTANCE CIRCULARITY   2.0300559422901063
Attrib RADIUS RATIO   2.3384170313895005
Attrib PR.AXIS ASPECT RATIO   −10.455568951321464
Attrib MAX.LENGTH ASPECT RATIO   6.318413056588259
Attrib SCATTER RATIO   −0.1540678338521325
Attrib ELONGATEDNESS   4.6678678405650045
Attrib PR.AXIS RECTANGULARITY   2.234791892619934
Attrib MAX.LENGTH RECTANGULARITY   1.2081763631395424
Attrib SCALED VARIANCE_MAJOR   8.725513943351936
Attrib SCALED VARIANCE_MINOR   −2.0929163138139057
Attrib SCALED RADIUS OF GYRATION   −2.33641669887055
Attrib SKEWNESS ABOUT_MAJOR   −4.687584360933024
Attrib SKEWNESS ABOUT_MINOR   −1.5486013595573525
Attrib KURTOSIS ABOUT_MAJOR   −1.7069816447471957
Attrib KURTOSIS ABOUT_MINOR   1.1256644913697085
Attrib HOLLOWS RATIO   3.059535597583737
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 20.44 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   404   95.962
%
Incorrectly Classified Instances   17   4.038
%
Kappa statistic   0.9461
Mean absolute error   0.045
Root mean squared error   0.1412
Relative absolute error   12.0158 %
Root relative squared error   32.6239 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,905	0,022	0,931	0,905	0,918	0,891	0,949	0,929	opel
0,935	0,032	0,910	0,935	0,922	0,895	0,978	0,934	saab
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	bus
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	van
Weighted Avg.	0,960	0,014	0,960	0,960	0,960	0,946	0,982	0,965

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
95   10   0    0  |    a = opel
7   101   0    0  |    b = saab
0    0  109   0  |    c = bus
0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle

14

```
Instances:      421
Attributes:     19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:      user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs      Weights
Threshold      −0.2675506722563389
Node 4      6.995910945194731
Node 5      −6.165542941957341
Node 6      9.814542385489533
Node 7      −6.845139860711669
Node 8      −16.32766511043072
Node 9      −8.536592229617181
Node 10      −5.227895034600074
Node 11      6.649078046718751
Node 12      0.6276240344770948
Node 13      −1.4723203922771977
Node 14      2.182259760853426
Sigmoid Node 1
Inputs      Weights
Threshold      −4.070076521622967
Node 4      −6.663224666319457
Node 5      −6.889960037895909
Node 6      −11.128197787183469
Node 7      6.5177725360636405
Node 8      7.192853225835088
Node 9      7.939598150348539
Node 10      −4.155298913403981
```

Node 11   −5.028180935295226
Node 12   −15.699786598690368
Node 13   8.785624644023422
Node 14   12.19082144977237
Sigmoid Node 2
Inputs   Weights
Threshold   0.8491119654971073
Node 4   1.9316596789118883
Node 5   6.84035817574074
Node 6   0.2924806302768775
Node 7   1.9241940769351993
Node 8   6.575081002111124
Node 9   −5.8410961366575735
Node 10   5.108274274746403
Node 11   −0.766249076334209
Node 12   −7.131713905532917
Node 13   −13.99666196864764
Node 14   −12.309720014441547
Sigmoid Node 3
Inputs   Weights
Threshold   −5.58915946920496
Node 4   −4.98091546336644
Node 5   3.0740404531757908
Node 6   −2.181757902010426
Node 7   −2.6417648945912395
Node 8   −2.9613935833042486
Node 9   4.171658632930212
Node 10   −4.420191782597406
Node 11   −5.537000659395951
Node 12   13.822924973576384
Node 13   1.6096096535040398
Node 14   1.685279787886285
Sigmoid Node 4
Inputs   Weights
Threshold   −2.167838041202549
Attrib COMPACTNESS   −8.206584527075265
Attrib CIRCULARITY   3.650994614688631
Attrib DISTANCE CIRCULARITY   −1.8451522266922744
Attrib RADIUS RATIO   −0.31794532669630526
Attrib PR.AXIS ASPECT RATIO   −1.8071275782599623
Attrib MAX.LENGTH ASPECT RATIO   2.8168258690470287
Attrib SCATTER RATIO   1.8185875205318809
Attrib ELONGATEDNESS   2.217764092122724
Attrib PR.AXIS RECTANGULARITY   5.667172307037132
Attrib MAX.LENGTH RECTANGULARITY   1.342937640856774
Attrib SCALED VARIANCE_MAJOR   −0.8715777808970444
Attrib SCALED VARIANCE_MINOR   4.208311073995201
Attrib SCALED RADIUS OF GYRATION   3.021704314567244
Attrib SKEWNESS ABOUT_MAJOR   1.2738457392885134

Attrib SKEWNESS ABOUT_MINOR   1.2167259116248872
Attrib KURTOSIS ABOUT_MAJOR   1.6478505356919815
Attrib KURTOSIS ABOUT_MINOR   −11.529104622336655
Attrib HOLLOWS RATIO   −5.60480386607049
Sigmoid Node 5
Inputs   Weights
Threshold   2.1108317638366505
Attrib COMPACTNESS   2.682593589092344
Attrib CIRCULARITY   −0.16021317150237016
Attrib DISTANCE CIRCULARITY   −2.0972460402068216
Attrib RADIUS RATIO   0.8589550901940681
Attrib PR.AXIS ASPECT RATIO   9.853983179012824
Attrib MAX.LENGTH ASPECT RATIO   1.9633379347285607
Attrib SCATTER RATIO   −2.8334518454511928
Attrib ELONGATEDNESS   −1.6192743946365722
Attrib PR.AXIS RECTANGULARITY   −3.0493376914356816
Attrib MAX.LENGTH RECTANGULARITY   2.615699419404163
Attrib SCALED VARIANCE_MAJOR   −1.2841402875256454
Attrib SCALED VARIANCE_MINOR   −2.4497022807904116
Attrib SCALED RADIUS OF GYRATION   −4.158107372131406
Attrib SKEWNESS ABOUT_MAJOR   3.6680922693980778
Attrib SKEWNESS ABOUT_MINOR   −0.780298575733159
Attrib KURTOSIS ABOUT_MAJOR   −2.964160541595136
Attrib KURTOSIS ABOUT_MINOR   2.793655812250461
Attrib HOLLOWS RATIO   −0.11480710794523752
Sigmoid Node 6
Inputs   Weights
Threshold   0.7001215440500667
Attrib COMPACTNESS   −1.1417990373353097
Attrib CIRCULARITY   5.042528675761455
Attrib DISTANCE CIRCULARITY   −1.9936086071308368
Attrib RADIUS RATIO   −0.6255218044670753
Attrib PR.AXIS ASPECT RATIO   0.1724260169101758
Attrib MAX.LENGTH ASPECT RATIO   −5.799035799136986
Attrib SCATTER RATIO   2.840091047903605
Attrib ELONGATEDNESS   0.9726676201100277
Attrib PR.AXIS RECTANGULARITY   5.852273921798141
Attrib MAX.LENGTH RECTANGULARITY   −3.8082480990965903
Attrib SCALED VARIANCE_MAJOR   0.4261697935356693
Attrib SCALED VARIANCE_MINOR   6.580826239010833
Attrib SCALED RADIUS OF GYRATION   0.12480713790071428
Attrib SKEWNESS ABOUT_MAJOR   −1.6138671609767081
Attrib SKEWNESS ABOUT_MINOR   3.6938406016559524
Attrib KURTOSIS ABOUT_MAJOR   2.7043431417417287
Attrib KURTOSIS ABOUT_MINOR   21.722836126740525
Attrib HOLLOWS RATIO   −17.559642603859412
Sigmoid Node 7
Inputs   Weights
Threshold   2.1461664348109672

Attrib COMPACTNESS   9.484616298222198
Attrib CIRCULARITY   −1.040264625379131
Attrib DISTANCE CIRCULARITY   −2.2891956180105466
Attrib RADIUS RATIO   −3.7484360576754274
Attrib PR.AXIS ASPECT RATIO   1.0780171512082963
Attrib MAX.LENGTH ASPECT RATIO   1.0635393249241882
Attrib SCATTER RATIO   3.4471132070543495
Attrib ELONGATEDNESS   2.6095734488885403
Attrib PR.AXIS RECTANGULARITY   0.01869380294320636
Attrib MAX.LENGTH RECTANGULARITY   −0.2919931755298012
Attrib SCALED VARIANCE_MAJOR   −0.28903119655889675
Attrib SCALED VARIANCE_MINOR   3.4741708024119538
Attrib SCALED RADIUS OF GYRATION   3.893818652316814
Attrib SKEWNESS ABOUT_MAJOR   1.658616989171065
Attrib SKEWNESS ABOUT_MINOR   5.825038418917353
Attrib KURTOSIS ABOUT_MAJOR   3.7930273029862116
Attrib KURTOSIS ABOUT_MINOR   −5.681213079366217
Attrib HOLLOWS RATIO   −2.427872722425268
Sigmoid Node 8
Inputs   Weights
Threshold   −1.1741768468095883
Attrib COMPACTNESS   −3.9717734996135357
Attrib CIRCULARITY   −2.209670707721542
Attrib DISTANCE CIRCULARITY   −10.070427816776474
Attrib RADIUS RATIO   −6.347984256096042
Attrib PR.AXIS ASPECT RATIO   5.315056540702259
Attrib MAX.LENGTH ASPECT RATIO   −1.934947996653111
Attrib SCATTER RATIO   0.5598953959894962
Attrib ELONGATEDNESS   −11.848374767313837
Attrib PR.AXIS RECTANGULARITY   0.6390539944089898
Attrib MAX.LENGTH RECTANGULARITY   4.735272921800536
Attrib SCALED VARIANCE_MAJOR   0.7477953954828548
Attrib SCALED VARIANCE_MINOR   −1.3687845317390979
Attrib SCALED RADIUS OF GYRATION   1.1383887158465105
Attrib SKEWNESS ABOUT_MAJOR   3.287823647206042
Attrib SKEWNESS ABOUT_MINOR   −3.2424942885985915
Attrib KURTOSIS ABOUT_MAJOR   2.245210549316933
Attrib KURTOSIS ABOUT_MINOR   10.118659247320094
Attrib HOLLOWS RATIO   −10.189604332583649
Sigmoid Node 9
Inputs   Weights
Threshold   −0.6012467399644578
Attrib COMPACTNESS   −2.3621629593624487
Attrib CIRCULARITY   −4.885523791238721
Attrib DISTANCE CIRCULARITY   7.959106555511958
Attrib RADIUS RATIO   −2.3483786531948163
Attrib PR.AXIS ASPECT RATIO   4.696918546933296
Attrib MAX.LENGTH ASPECT RATIO   −0.8519508060499965
Attrib SCATTER RATIO   −2.0210737333821993

Attrib ELONGATEDNESS   0.7736405085370982
Attrib PR.AXIS RECTANGULARITY   −3.0474973953982842
Attrib MAX.LENGTH RECTANGULARITY   4.200251933169737
Attrib SCALED VARIANCE_MAJOR   1.4485498877030945
Attrib SCALED VARIANCE_MINOR   −5.368135769149684
Attrib SCALED RADIUS OF GYRATION   11.69375170155564
Attrib SKEWNESS ABOUT_MAJOR   4.6289248572711
Attrib SKEWNESS ABOUT_MINOR   2.388727705833682
Attrib KURTOSIS ABOUT_MAJOR   0.7600924014732504
Attrib KURTOSIS ABOUT_MINOR   −11.079427620256899
Attrib HOLLOWS RATIO   14.31814675982387
Sigmoid Node 10
Inputs   Weights
Threshold   2.400166126960404
Attrib COMPACTNESS   2.5742443693375785
Attrib CIRCULARITY   −1.588040346013728
Attrib DISTANCE CIRCULARITY   1.5109204954837328
Attrib RADIUS RATIO   0.522188159348671
Attrib PR.AXIS ASPECT RATIO   3.423633989746519
Attrib MAX.LENGTH ASPECT RATIO   0.2403141467013564
Attrib SCATTER RATIO   0.9378663408273714
Attrib ELONGATEDNESS   −2.132561945772471
Attrib PR.AXIS RECTANGULARITY   0.7045353303642508
Attrib MAX.LENGTH RECTANGULARITY   −2.5335881768621227
Attrib SCALED VARIANCE_MAJOR   −0.21600403430004167
Attrib SCALED VARIANCE_MINOR   1.4040975035774728
Attrib SCALED RADIUS OF GYRATION   0.21002298062736688
Attrib SKEWNESS ABOUT_MAJOR   1.3127729737641807
Attrib SKEWNESS ABOUT_MINOR   −1.264158509541799
Attrib KURTOSIS ABOUT_MAJOR   −1.2589241066898327
Attrib KURTOSIS ABOUT_MINOR   3.6155335004294793
Attrib HOLLOWS RATIO   −0.2039586082332551
Sigmoid Node 11
Inputs   Weights
Threshold   0.20825183954370025
Attrib COMPACTNESS   −9.606560205627634
Attrib CIRCULARITY   4.003266979855735
Attrib DISTANCE CIRCULARITY   −1.2489880213149118
Attrib RADIUS RATIO   2.8054426328737625
Attrib PR.AXIS ASPECT RATIO   0.542549104541992
Attrib MAX.LENGTH ASPECT RATIO   2.501127079589094
Attrib SCATTER RATIO   2.7541223170731772
Attrib ELONGATEDNESS   −6.171286151008783
Attrib PR.AXIS RECTANGULARITY   −9.347370365067563
Attrib MAX.LENGTH RECTANGULARITY   −5.0589538423993385
Attrib SCALED VARIANCE_MAJOR   1.4761025874587577
Attrib SCALED VARIANCE_MINOR   1.5993569573327255
Attrib SCALED RADIUS OF GYRATION   6.861444899730586
Attrib SKEWNESS ABOUT_MAJOR   −0.888390638641539

Attrib SKEWNESS ABOUT_MINOR   −3.6343847037083905
Attrib KURTOSIS ABOUT_MAJOR   7.050816270315222
Attrib KURTOSIS ABOUT_MINOR   3.6147239792507584
Attrib HOLLOWS RATIO   −4.085117695477871
Sigmoid Node 12
Inputs   Weights
Threshold   3.373832429607621
Attrib COMPACTNESS   7.984567321778562
Attrib CIRCULARITY   1.1139535541487433
Attrib DISTANCE CIRCULARITY   6.32489092504818
Attrib RADIUS RATIO   −8.125924782227807
Attrib PR.AXIS ASPECT RATIO   3.028762060455694
Attrib MAX.LENGTH ASPECT RATIO   6.618459407268164
Attrib SCATTER RATIO   −4.1568792930764
Attrib ELONGATEDNESS   7.183292775127315
Attrib PR.AXIS RECTANGULARITY   −2.384055950477292
Attrib MAX.LENGTH RECTANGULARITY   11.477223002220077
Attrib SCALED VARIANCE_MAJOR   −4.109544583331125
Attrib SCALED VARIANCE_MINOR   −3.5219622125556613
Attrib SCALED RADIUS OF GYRATION   −5.320613887347901
Attrib SKEWNESS ABOUT_MAJOR   13.394114881733582
Attrib SKEWNESS ABOUT_MINOR   −3.071177544075923
Attrib KURTOSIS ABOUT_MAJOR   −1.3442323191793273
Attrib KURTOSIS ABOUT_MINOR   −3.384924193695285
Attrib HOLLOWS RATIO   6.229181136600683
Sigmoid Node 13
Inputs   Weights
Threshold   −8.91251813010226
Attrib COMPACTNESS   4.4706448217286425
Attrib CIRCULARITY   −5.8063955690300215
Attrib DISTANCE CIRCULARITY   2.509418749294079
Attrib RADIUS RATIO   6.8797446025310895
Attrib PR.AXIS ASPECT RATIO   −4.144033053380941
Attrib MAX.LENGTH ASPECT RATIO   −4.485814647369952
Attrib SCATTER RATIO   −1.4680852265153497
Attrib ELONGATEDNESS   6.682564089396849
Attrib PR.AXIS RECTANGULARITY   3.6346158749976127
Attrib MAX.LENGTH RECTANGULARITY   −10.890397548542936
Attrib SCALED VARIANCE_MAJOR   1.638795593351082
Attrib SCALED VARIANCE_MINOR   0.8183882905861887
Attrib SCALED RADIUS OF GYRATION   1.975122109283118
Attrib SKEWNESS ABOUT_MAJOR   −6.0587324008985775
Attrib SKEWNESS ABOUT_MINOR   1.6863646633644318
Attrib KURTOSIS ABOUT_MAJOR   0.08558486759126573
Attrib KURTOSIS ABOUT_MINOR   −1.5555252533133963
Attrib HOLLOWS RATIO   −5.12345481233111
Sigmoid Node 14
Inputs   Weights
Threshold   −2.3781882185296634

Attrib COMPACTNESS   −0.0437703123148 4856
Attrib CIRCULARITY   2.968772726512607
Attrib DISTANCE CIRCULARITY   2.0300559422901063
Attrib RADIUS RATIO   2.3384170313895005
Attrib PR.AXIS ASPECT RATIO   −10.455568951321464
Attrib MAX.LENGTH ASPECT RATIO   6.318413056588259
Attrib SCATTER RATIO   −0.1540678338521325
Attrib ELONGATEDNESS   4.6678678405650045
Attrib PR.AXIS RECTANGULARITY   2.234791892619934
Attrib MAX.LENGTH RECTANGULARITY   1.2081763631395424
Attrib SCALED VARIANCE_MAJOR   8.725513943351936
Attrib SCALED VARIANCE_MINOR   −2.0929163138139057
Attrib SCALED RADIUS OF GYRATION   −2.33641669887055
Attrib SKEWNESS ABOUT_MAJOR   −4.687584360933024
Attrib SKEWNESS ABOUT_MINOR   −1.5486013595573525
Attrib KURTOSIS ABOUT_MAJOR   −1.7069816447471957
Attrib KURTOSIS ABOUT_MINOR   1.1256644913697085
Attrib HOLLOWS RATIO   3.059535597583737
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 5.78 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   742   87.7069 %
Incorrectly Classified Instances   104   12.2931 %
Kappa statistic   0.836
Mean absolute error   0.0816
Root mean squared error   0.2282
Relative absolute error   21.7714 %
Root relative squared error   52.7174 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,778	0,069	0,789	0,778	0,784	0,712	0,900	0,787	opel
0,788	0,075	0,784	0,788	0,786	0,712	0,930	0,813	saab
0,995	0,008	0,977	0,995	0,986	0,982	0,999	0,998	bus
0,950	0,012	0,959	0,950	0,955	0,941	0,995	0,987	van
Weighted Avg.		0,877	0,042	0,877	0,877	0,877	0,835	0,956	0,895

=== Confusion Matrix ===

```
  a   b   c   d   <-- classified as
165  40   1   6 |    a = opel
 43 171   1   2 |    b = saab
  0   1 217   0 |    c = bus
  1   6   3 189 |    d = van
```

2   2ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:       weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:     vehicle
Instances:    421
Attributes:   19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
```

KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.45906899058673273
Node 4   1.3215744913496927
Node 5   1.8385210923686897
Node 6   −7.538741373915416
Node 7   −3.329225059972355
Sigmoid Node 1
Inputs   Weights
Threshold   −11.655583111735586
Node 4   10.263473619970402
Node 5   7.6632284960031685
Node 6   −1.723882413095548
Node 7   3.04558698268305
Sigmoid Node 2
Inputs   Weights
Threshold   2.303781057430463
Node 4   −6.331146381530158
Node 5   −14.320898474852576
Node 6   10.913859348287174
Node 7   −14.458138729081245
Sigmoid Node 3
Inputs   Weights
Threshold   −1.1736697144562827
Node 4   −17.65007566601085
Node 5   −0.45517657350865093
Node 6   −0.778763307723145
Node 7   8.51284118890716
Sigmoid Node 4
Inputs   Weights
Threshold   −6.4429213618170404
Attrib COMPACTNESS   −2.407479447107772
Attrib CIRCULARITY   −4.508410711804477
Attrib DISTANCE CIRCULARITY   −4.811059951075127
Attrib RADIUS RATIO   11.466535964247417
Attrib PR.AXIS ASPECT RATIO   −11.470079128044876
Attrib MAX.LENGTH ASPECT RATIO   −7.828111471521279
Attrib SCATTER RATIO   2.1649574379302226
Attrib ELONGATEDNESS   −0.7042188357423556
Attrib PR.AXIS RECTANGULARITY   4.54917162963407
Attrib MAX.LENGTH RECTANGULARITY   −10.235983626446947
Attrib SCALED VARIANCE_MAJOR   9.381983508264279

23

Attrib SCALED VARIANCE_MINOR   3.686217304815802
Attrib SCALED RADIUS OF GYRATION   8.14953929867922
Attrib SKEWNESS ABOUT_MAJOR   −13.047186171495499
Attrib SKEWNESS ABOUT_MINOR   2.2767143739694746
Attrib KURTOSIS ABOUT_MAJOR   0.26330053645187645
Attrib KURTOSIS ABOUT_MINOR   1.0855620708278315
Attrib HOLLOWS RATIO   −4.136197728707931
Sigmoid Node 5
Inputs   Weights
Threshold   −10.440075907522791
Attrib COMPACTNESS   −1.7786233470199795
Attrib CIRCULARITY   −6.609303843414475
Attrib DISTANCE CIRCULARITY   −12.464816532740867
Attrib RADIUS RATIO   6.429333151014707
Attrib PR.AXIS ASPECT RATIO   −3.2354971510469386
Attrib MAX.LENGTH ASPECT RATIO   −3.0697209699925665
Attrib SCATTER RATIO   3.466631419276655
Attrib ELONGATEDNESS   −0.35724260612635533
Attrib PR.AXIS RECTANGULARITY   6.8875402598772295
Attrib MAX.LENGTH RECTANGULARITY   −3.5298468408513854
Attrib SCALED VARIANCE_MAJOR   −2.754441079239283
Attrib SCALED VARIANCE_MINOR   2.8509046497958166
Attrib SCALED RADIUS OF GYRATION   1.0923681849129878
Attrib SKEWNESS ABOUT_MAJOR   −8.316500779362126
Attrib SKEWNESS ABOUT_MINOR   −1.0253422608855098
Attrib KURTOSIS ABOUT_MAJOR   1.0808861007203834
Attrib KURTOSIS ABOUT_MINOR   −4.7798935825505176
Attrib HOLLOWS RATIO   0.3535568094995054
Sigmoid Node 6
Inputs   Weights
Threshold   4.529524960462864
Attrib COMPACTNESS   0.09105432623813872
Attrib CIRCULARITY   −1.0647395151356842
Attrib DISTANCE CIRCULARITY   −8.332926534819695
Attrib RADIUS RATIO   −12.127577152722635
Attrib PR.AXIS ASPECT RATIO   15.92053385315688
Attrib MAX.LENGTH ASPECT RATIO   −6.041261115787679
Attrib SCATTER RATIO   0.5627271495460511
Attrib ELONGATEDNESS   −9.819157833175987
Attrib PR.AXIS RECTANGULARITY   0.6607168830275165
Attrib MAX.LENGTH RECTANGULARITY   −0.6240409008123236
Attrib SCALED VARIANCE_MAJOR   −0.22306956801731417
Attrib SCALED VARIANCE_MINOR   2.8610399075435162
Attrib SCALED RADIUS OF GYRATION   0.229887092680726
Attrib SKEWNESS ABOUT_MAJOR   7.767062177603409
Attrib SKEWNESS ABOUT_MINOR   −1.2782280163401525
Attrib KURTOSIS ABOUT_MAJOR   −0.6612428585629734
Attrib KURTOSIS ABOUT_MINOR   5.605283623281118
Attrib HOLLOWS RATIO   −2.1005449957609077

Sigmoid Node 7
Inputs   Weights
Threshold   −2.586365859849306
Attrib COMPACTNESS   9.987016851476023
Attrib CIRCULARITY   −14.840090492765624
Attrib DISTANCE CIRCULARITY   7.910902593114574
Attrib RADIUS RATIO   2.21678543176169
Attrib PR.AXIS ASPECT RATIO   −3.752288550288165
Attrib MAX.LENGTH ASPECT RATIO   0.3602904809060336
Attrib SCATTER RATIO   −5.977770927981362
Attrib ELONGATEDNESS   13.30934254404231
Attrib PR.AXIS RECTANGULARITY   6.257725044471612
Attrib MAX.LENGTH RECTANGULARITY   9.467040451250545
Attrib SCALED VARIANCE_MAJOR   5.651241447717207
Attrib SCALED VARIANCE_MINOR   −9.81022356133887
Attrib SCALED RADIUS OF GYRATION   6.584386498650889
Attrib SKEWNESS ABOUT_MAJOR   −0.2442591139111942
Attrib SKEWNESS ABOUT_MINOR   −0.30721239609749257
Attrib KURTOSIS ABOUT_MAJOR   −1.6038513651357253
Attrib KURTOSIS ABOUT_MINOR   −10.183762232181273
Attrib HOLLOWS RATIO   8.75614290422709
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 11.59 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   350   83.1354 %
Incorrectly Classified Instances   71   16.8646 %
Kappa statistic   0.7752
Mean absolute error   0.1173
Root mean squared error   0.2396
Relative absolute error   31.2993 %

```
Root relative squared error              55.3432 %
Total Number of Instances          421


=== Detailed Accuracy By Class ===

TP Rate   FP Rate   Precision   Recall   F-Measure   MCC       ROC Area
PRC Area   Class
0,876     0,171     0,630       0,876    0,733       0,641     0,915
0,737       opel
0,500     0,026     0,871       0,500    0,635       0,585     0,930
0,813       saab
0,982     0,022     0,939       0,982    0,960       0,946     0,999
0,996       bus
0,980     0,006     0,980       0,980    0,980       0,974     1,000
0,999       van
Weighted Avg.      0,831     0,056     0,854     0,831     0,825
0,784     0,960       0,885


=== Confusion Matrix ===

 a   b    c    d    <-- classified as
92   8    3    2 |   a = opel
52  54    2    0 |   b = saab
 2   0  107    0 |   c = bus
 0   0    2   97 |   d = van

_____


UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____


=== Run information ===

Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
```

SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.45906899058673273
Node 4   1.3215744913496927
Node 5   1.8385210923686897
Node 6   −7.538741373915416
Node 7   −3.329225059972355
Sigmoid Node 1
Inputs   Weights
Threshold   −11.655583111735586
Node 4   10.263473619970402
Node 5   7.6632284960031685
Node 6   −1.723882413095548
Node 7   3.04558698268305
Sigmoid Node 2
Inputs   Weights
Threshold   2.303781057430463
Node 4   −6.33146381530158
Node 5   −14.320898474852576
Node 6   10.913859348287174
Node 7   −14.458138729081245
Sigmoid Node 3
Inputs   Weights
Threshold   −1.1736697144562827
Node 4   −17.65007566601085
Node 5   −0.45517657350865093
Node 6   −0.778763307723145
Node 7   8.51284118890716
Sigmoid Node 4
Inputs   Weights
Threshold   −6.4429213618170404
Attrib COMPACTNESS   −2.407479447107772
Attrib CIRCULARITY   −4.508410711804477
Attrib DISTANCE CIRCULARITY   −4.811059951075127
Attrib RADIUS RATIO   11.466535964247417
Attrib PR.AXIS ASPECT RATIO   −11.470079128044876
Attrib MAX.LENGTH ASPECT RATIO   −7.828111471521279

27

Attrib SCATTER RATIO   2.1649574379302226
Attrib ELONGATEDNESS   −0.7042188357423556
Attrib PR.AXIS RECTANGULARITY   4.54917162963407
Attrib MAX.LENGTH RECTANGULARITY   −10.235983626446947
Attrib SCALED VARIANCE_MAJOR   9.381983508264279
Attrib SCALED VARIANCE_MINOR   3.686217304815802
Attrib SCALED RADIUS OF GYRATION   8.14953929867922
Attrib SKEWNESS ABOUT_MAJOR   −13.047186171495499
Attrib SKEWNESS ABOUT_MINOR   2.2767143739694746
Attrib KURTOSIS ABOUT_MAJOR   0.26330053645187645
Attrib KURTOSIS ABOUT_MINOR   1.0855620708278315
Attrib HOLLOWS RATIO   −4.136197728707931
Sigmoid Node 5
Inputs   Weights
Threshold   −10.440075907522791
Attrib COMPACTNESS   −1.7786233470199795
Attrib CIRCULARITY   −6.609303843414475
Attrib DISTANCE CIRCULARITY   −12.464816532740867
Attrib RADIUS RATIO   6.429333151014707
Attrib PR.AXIS ASPECT RATIO   −3.2354971510469386
Attrib MAX.LENGTH ASPECT RATIO   −3.0697209699925665
Attrib SCATTER RATIO   3.466631419276655
Attrib ELONGATEDNESS   −0.35724260612635533
Attrib PR.AXIS RECTANGULARITY   6.8875402598772295
Attrib MAX.LENGTH RECTANGULARITY   −3.5298468408513854
Attrib SCALED VARIANCE_MAJOR   −2.754441079239283
Attrib SCALED VARIANCE_MINOR   2.8509046497958166
Attrib SCALED RADIUS OF GYRATION   1.0923681849129878
Attrib SKEWNESS ABOUT_MAJOR   −8.316500779362126
Attrib SKEWNESS ABOUT_MINOR   −1.0253422608855098
Attrib KURTOSIS ABOUT_MAJOR   1.0808861007203834
Attrib KURTOSIS ABOUT_MINOR   −4.7798935825505176
Attrib HOLLOWS RATIO   0.3535568094995054
Sigmoid Node 6
Inputs   Weights
Threshold   4.529524960462864
Attrib COMPACTNESS   0.09105432623813872
Attrib CIRCULARITY   −1.0647395151356842
Attrib DISTANCE CIRCULARITY   −8.332926534819695
Attrib RADIUS RATIO   −12.127577152722635
Attrib PR.AXIS ASPECT RATIO   15.92053385315688
Attrib MAX.LENGTH ASPECT RATIO   −6.041261115787679
Attrib SCATTER RATIO   0.5627271495460511
Attrib ELONGATEDNESS   −9.819157833175987
Attrib PR.AXIS RECTANGULARITY   0.6607168830275165
Attrib MAX.LENGTH RECTANGULARITY   −0.6240409008123236
Attrib SCALED VARIANCE_MAJOR   −0.22306956801731417
Attrib SCALED VARIANCE_MINOR   2.8610399075435162
Attrib SCALED RADIUS OF GYRATION   0.229887092680726

Attrib SKEWNESS ABOUT_MAJOR   7.767062177603409
Attrib SKEWNESS ABOUT_MINOR   −1.2782280163401525
Attrib KURTOSIS ABOUT_MAJOR   −0.6612428585629734
Attrib KURTOSIS ABOUT_MINOR   5.605283623281118
Attrib HOLLOWS RATIO   −2.1005449957609077
Sigmoid Node 7
Inputs   Weights
Threshold   −2.586365859849306
Attrib COMPACTNESS   9.987016851476023
Attrib CIRCULARITY   −14.840090492765624
Attrib DISTANCE CIRCULARITY   7.910902593114574
Attrib RADIUS RATIO   2.21678543176169
Attrib PR.AXIS ASPECT RATIO   −3.752288550288165
Attrib MAX.LENGTH ASPECT RATIO   0.3602904809060336
Attrib SCATTER RATIO   −5.977770927981362
Attrib ELONGATEDNESS   13.30934254404231
Attrib PR.AXIS RECTANGULARITY   6.257725044471612
Attrib MAX.LENGTH RECTANGULARITY   9.467040451250545
Attrib SCALED VARIANCE_MAJOR   5.651241447717207
Attrib SCALED VARIANCE_MINOR   −9.81022356133887
Attrib SCALED RADIUS OF GYRATION   6.584386498650889
Attrib SKEWNESS ABOUT_MAJOR   −0.2442591139111942
Attrib SKEWNESS ABOUT_MINOR   −0.30721239609749257
Attrib KURTOSIS ABOUT_MAJOR   −1.6038513651357253
Attrib KURTOSIS ABOUT_MINOR   −10.183762232181273
Attrib HOLLOWS RATIO   8.75614290422709
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.71 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   677   80.0236 %

```
Incorrectly  Classified  Instances        169              19.9764 %
Kappa  statistic                           0.7337
Mean  absolute  error                      0.13
Root  mean  squared  error                 0.2609
Relative  absolute  error                  34.6919 %
Root  relative  squared  error             60.258  %
Total  Number  of  Instances               846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,825	0,188	0,595	0,825	0,692	0,580	0,889	0,678	opel
0,465	0,033	0,828	0,465	0,596	0,537	0,921	0,775	saab
0,982	0,030	0,918	0,982	0,949	0,931	0,998	0,993	bus
0,940	0,015	0,949	0,940	0,944	0,927	0,995	0,982	van
Weighted Avg.	0,800	0,067	0,821	0,800	0,793	0,741	0,950	0,856

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
175   20    9    8 |   a = opel
111  101    3    2 |   b = saab
  4    0  214    0 |   c = bus
  4    1    7  187 |   d = van
```

3   3ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
```

PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   2.1282918730968436
Node 4   −7.532009112431972
Node 5   −8.810341293731485
Node 6   0.8599210048893194
Node 7   12.52893238810085
Node 8   −4.245946067192808
Node 9   4.728579959806937
Node 10   −2.9865912728275346
Node 11   −2.487606279739693
Node 12   5.3094278240982105
Node 13   −6.986318229544631
Node 14   0.03478987514330935
Node 15   −3.666124508199952
Node 16   −4.867010261403196
Node 17   0.7417594303708335
Node 18   11.16891996637265
Node 19   −18.16892655391728
Node 20   −4.6343712618467325
Node 21   6.4275786143846965
Sigmoid Node 1
Inputs   Weights
Threshold   0.6946057060964779
Node 4   6.742562854407754
Node 5   6.863233533613944
Node 6   −3.4938710284914336
Node 7   −15.483738255841951
Node 8   −1.0418582909460565
Node 9   −7.732639657248464
Node 10   −9.412718031931542
Node 11   −1.2273736397139197
Node 12   −2.472155659372381
Node 13   −0.990540048741 7959

31

```
Node 14      10.278773238350501
Node 15      −3.2438647290484552
Node 16      5.843031352826182
Node 17      8.910974413105482
Node 18      2.1927514856276673
Node 19      5.5429307835605695
Node 20      −12.365730026396939
Node 21      −8.335371284495702
Sigmoid Node 2
Inputs      Weights
Threshold      −2.264631721935587
Node 4      0.41875539256813593
Node 5      −3.3806206793706193
Node 6      3.308585372342528
Node 7      3.68433048964512
Node 8      −3.8939309327850524
Node 9      1.5371954399634054
Node 10      −5.124638878205518
Node 11      −4.23854593695077
Node 12      0.08790171538012509
Node 13      2.2142187749177684
Node 14      −11.342877991258758
Node 15      6.299522340898016
Node 16      −4.540930124682784
Node 17      −11.18090832127535
Node 18      −7.0679907996683635
Node 19      6.9537801835430875
Node 20      −0.2257769157840904
Node 21      6.303628077651563
Sigmoid Node 3
Inputs      Weights
Threshold      −1.9210428230708174
Node 4      1.694608380907026
Node 5      3.386440150627823
Node 6      −6.233969127516467
Node 7      −2.968064663062874
Node 8      5.530519127378 6365
Node 9      −4.985771997669004
Node 10      9.137590678071792
Node 11      −3.129390960138514
Node 12      −5.38036863246011
Node 13      −0.9453100596359431
Node 14      −1.0934968056701442
Node 15      1.362830719441475
Node 16      −0.5086183823237433
Node 17      0.3130846461980815
Node 18      −2.013593487102307
Node 19      −2.1263861646248383
Node 20      7.975357830033391
```

Node 21   −5.543559063284813
Sigmoid Node 4
Inputs   Weights
Threshold   2.279406002936612
Attrib COMPACTNESS   7.653179134284978
Attrib CIRCULARITY   −4.147938530781501
Attrib DISTANCE CIRCULARITY   −2.6455279634025373
Attrib RADIUS RATIO   2.1312934517659534
Attrib PR.AXIS ASPECT RATIO   3.0531623529378167
Attrib MAX.LENGTH ASPECT RATIO   −2.211035519931746
Attrib SCATTER RATIO   2.487980781301221
Attrib ELONGATEDNESS   1.5962501258131854
Attrib PR.AXIS RECTANGULARITY   3.1972442904590213
Attrib MAX.LENGTH RECTANGULARITY   −0.16979943390715668
Attrib SCALED VARIANCE_MAJOR   −3.4889026829127285
Attrib SCALED VARIANCE_MINOR   2.434076746009081
Attrib SCALED RADIUS OF GYRATION   −0.1512515165974952
Attrib SKEWNESS ABOUT_MAJOR   0.5642790932888597
Attrib SKEWNESS ABOUT_MINOR   5.473006046593266
Attrib KURTOSIS ABOUT_MAJOR   2.7249608704886734
Attrib KURTOSIS ABOUT_MINOR   −3.99083223901964
Attrib HOLLOWS RATIO   −4.68223629569248
Sigmoid Node 5
Inputs   Weights
Threshold   −0.6875372452739654
Attrib COMPACTNESS   6.117720355286655
Attrib CIRCULARITY   −6.1060774790503975
Attrib DISTANCE CIRCULARITY   8.358837116403716
Attrib RADIUS RATIO   −3.583771495787774
Attrib PR.AXIS ASPECT RATIO   1.67544034698411
Attrib MAX.LENGTH ASPECT RATIO   −2.6550227261326276
Attrib SCATTER RATIO   −2.2671780316380987
Attrib ELONGATEDNESS   7.110551361706243
Attrib PR.AXIS RECTANGULARITY   2.048178469643837
Attrib MAX.LENGTH RECTANGULARITY   1.7797960216533826
Attrib SCALED VARIANCE_MAJOR   1.5955611519194375
Attrib SCALED VARIANCE_MINOR   −4.091899717172632
Attrib SCALED RADIUS OF GYRATION   4.9494293947002745
Attrib SKEWNESS ABOUT_MAJOR   6.752055292196701
Attrib SKEWNESS ABOUT_MINOR   −2.167484822415373
Attrib KURTOSIS ABOUT_MAJOR   1.8305942698813276
Attrib KURTOSIS ABOUT_MINOR   −7.0180987539293875
Attrib HOLLOWS RATIO   8.602726256390884
Sigmoid Node 6
Inputs   Weights
Threshold   1.6078226620199172
Attrib COMPACTNESS   −1.2521055687988427
Attrib CIRCULARITY   −0.3245873485754016
Attrib DISTANCE CIRCULARITY   −2.41551572942237

33

Attrib RADIUS RATIO   1.6101504595207143
Attrib PR.AXIS ASPECT RATIO   1.134251649449368
Attrib MAX.LENGTH ASPECT RATIO   0.5366707830708519
Attrib SCATTER RATIO   1.3996548039622627
Attrib ELONGATEDNESS   −4.787401884622517
Attrib PR.AXIS RECTANGULARITY   −0.978998924001452
Attrib MAX.LENGTH RECTANGULARITY   −3.134190274775748
Attrib SCALED VARIANCE_MAJOR   1.8616498273169195
Attrib SCALED VARIANCE_MINOR   1.2645819145242179
Attrib SCALED RADIUS OF GYRATION   0.6299872949731262
Attrib SKEWNESS ABOUT_MAJOR   −1.2240668980064118
Attrib SKEWNESS ABOUT_MINOR   2.62986081408185
Attrib KURTOSIS ABOUT_MAJOR   −3.172249663545748
Attrib KURTOSIS ABOUT_MINOR   5.360150446921711
Attrib HOLLOWS RATIO   0.1140570927863377
Sigmoid Node 7
Inputs   Weights
Threshold   −1.7463139210315712
Attrib COMPACTNESS   1.0961854872536314
Attrib CIRCULARITY   4.692822396116003
Attrib DISTANCE CIRCULARITY   −3.1496588543034223
Attrib RADIUS RATIO   3.3831273338416517
Attrib PR.AXIS ASPECT RATIO   2.660672129176942
Attrib MAX.LENGTH ASPECT RATIO   −3.6368026339063224
Attrib SCATTER RATIO   2.2049698200142935
Attrib ELONGATEDNESS   −4.785201431030677
Attrib PR.AXIS RECTANGULARITY   2.8670819635393126
Attrib MAX.LENGTH RECTANGULARITY   0.6289035986833225
Attrib SCALED VARIANCE_MAJOR   0.6546367468820784
Attrib SCALED VARIANCE_MINOR   4.330946401644744
Attrib SCALED RADIUS OF GYRATION   −2.9633312331774264
Attrib SKEWNESS ABOUT_MAJOR   −1.185579112754516
Attrib SKEWNESS ABOUT_MINOR   −1.6362956766136443
Attrib KURTOSIS ABOUT_MAJOR   2.5028635869984117
Attrib KURTOSIS ABOUT_MINOR   15.575802272118406
Attrib HOLLOWS RATIO   −12.887810419804625
Sigmoid Node 8
Inputs   Weights
Threshold   −3.3347608267491085
Attrib COMPACTNESS   4.508237368334757
Attrib CIRCULARITY   −1.2657366572317517
Attrib DISTANCE CIRCULARITY   −0.8816932897448838
Attrib RADIUS RATIO   −1.2465992966549135
Attrib PR.AXIS ASPECT RATIO   1.7879162010301803
Attrib MAX.LENGTH ASPECT RATIO   1.3525934261088797
Attrib SCATTER RATIO   −2.3485786544509684
Attrib ELONGATEDNESS   5.061778752280644
Attrib PR.AXIS RECTANGULARITY   −1.6376779825262768
Attrib MAX.LENGTH RECTANGULARITY   5.116629799705663

Attrib SCALED VARIANCE_MAJOR   −1.4123234500488475
Attrib SCALED VARIANCE_MINOR   −1.208469490801834
Attrib SCALED RADIUS OF GYRATION   −3.223451934848665
Attrib SKEWNESS ABOUT_MAJOR   1.56060689084251
Attrib SKEWNESS ABOUT_MINOR   −2.8745566681895127
Attrib KURTOSIS ABOUT_MAJOR   1.3614769157908058
Attrib KURTOSIS ABOUT_MINOR   1.4877553472831224
Attrib HOLLOWS RATIO   0.13076696456308845
Sigmoid Node 9
Inputs   Weights
Threshold   1.7175447284482046
Attrib COMPACTNESS   −8.810383714550944
Attrib CIRCULARITY   0.5617285822983958
Attrib DISTANCE CIRCULARITY   −4.281104454628689
Attrib RADIUS RATIO   −2.3806957635005923
Attrib PR.AXIS ASPECT RATIO   2.5822437252876327
Attrib MAX.LENGTH ASPECT RATIO   −7.072923135762636
Attrib SCATTER RATIO   −0.3566113918691042
Attrib ELONGATEDNESS   −3.042857884074865
Attrib PR.AXIS RECTANGULARITY   −0.3271543626203202
Attrib MAX.LENGTH RECTANGULARITY   −5.796240786246854
Attrib SCALED VARIANCE_MAJOR   −2.022786638754674
Attrib SCALED VARIANCE_MINOR   0.9063494688350959
Attrib SCALED RADIUS OF GYRATION   5.548824725303361
Attrib SKEWNESS ABOUT_MAJOR   2.8123093632266083
Attrib SKEWNESS ABOUT_MINOR   0.5222394465858534
Attrib KURTOSIS ABOUT_MAJOR   5.0469259592897
Attrib KURTOSIS ABOUT_MINOR   0.5023806140136927
Attrib HOLLOWS RATIO   −7.438078913228712
Sigmoid Node 10
Inputs   Weights
Threshold   2.512150651269917
Attrib COMPACTNESS   4.452911164958112
Attrib CIRCULARITY   1.8297497913511362
Attrib DISTANCE CIRCULARITY   3.5490111200111896
Attrib RADIUS RATIO   −4.816553180000462
Attrib PR.AXIS ASPECT RATIO   4.1047985806191525
Attrib MAX.LENGTH ASPECT RATIO   4.549403697020768
Attrib SCATTER RATIO   −2.819008325281394
Attrib ELONGATEDNESS   4.047739442637769
Attrib PR.AXIS RECTANGULARITY   −3.3946653827350377
Attrib MAX.LENGTH RECTANGULARITY   9.251144782294714
Attrib SCALED VARIANCE_MAJOR   −3.807738617417223
Attrib SCALED VARIANCE_MINOR   −2.552934547162724
Attrib SCALED RADIUS OF GYRATION   −4.3472156410750875
Attrib SKEWNESS ABOUT_MAJOR   7.973066446951207
Attrib SKEWNESS ABOUT_MINOR   −2.331714784338574
Attrib KURTOSIS ABOUT_MAJOR   0.06691970544382778
Attrib KURTOSIS ABOUT_MINOR   −1.8738109728992687

Attrib HOLLOWS RATIO   4.565105482177258
Sigmoid Node 11
Inputs   Weights
Threshold   −1.8773896713996419
Attrib COMPACTNESS   0.5181501818052882
Attrib CIRCULARITY   −3.029686684262328
Attrib DISTANCE CIRCULARITY   1.030995914122006
Attrib RADIUS RATIO   1.3219460568450054
Attrib PR.AXIS ASPECT RATIO   −1.2588487291435082
Attrib MAX.LENGTH ASPECT RATIO   0.427969590387541
Attrib SCATTER RATIO   0.706169836889003
Attrib ELONGATEDNESS   0.22174419500874548
Attrib PR.AXIS RECTANGULARITY   0.6326162458556605
Attrib MAX.LENGTH RECTANGULARITY   −3.4044947285679372
Attrib SCALED VARIANCE_MAJOR   1.2672801483812128
Attrib SCALED VARIANCE_MINOR   0.7160867869033449
Attrib SCALED RADIUS OF GYRATION   −0.9527550459205517
Attrib SKEWNESS ABOUT_MAJOR   −0.528814210288421
Attrib SKEWNESS ABOUT_MINOR   2.9393462379221496
Attrib KURTOSIS ABOUT_MAJOR   2.4689273507217755
Attrib KURTOSIS ABOUT_MINOR   −0.2884833535026272
Attrib HOLLOWS RATIO   −1.3364476816239905
Sigmoid Node 12
Inputs   Weights
Threshold   0.06754314879242972
Attrib COMPACTNESS   −4.938544092607113
Attrib CIRCULARITY   −1.371973670008741
Attrib DISTANCE CIRCULARITY   1.394469557748508
Attrib RADIUS RATIO   1.5592121469108131
Attrib PR.AXIS ASPECT RATIO   1.4801291330234734
Attrib MAX.LENGTH ASPECT RATIO   1.178152602005652
Attrib SCATTER RATIO   1.2687894913499922
Attrib ELONGATEDNESS   −1.4184178863195804
Attrib PR.AXIS RECTANGULARITY   −0.725808959749162
Attrib MAX.LENGTH RECTANGULARITY   −1.8902492425690918
Attrib SCALED VARIANCE_MAJOR   0.2508875243203197
Attrib SCALED VARIANCE_MINOR   1.1313151818083205
Attrib SCALED RADIUS OF GYRATION   −0.4970198928718322
Attrib SKEWNESS ABOUT_MAJOR   1.2254541308789995
Attrib SKEWNESS ABOUT_MINOR   −0.5822043624565539
Attrib KURTOSIS ABOUT_MAJOR   7.670379161027014
Attrib KURTOSIS ABOUT_MINOR   −1.3241299790321535
Attrib HOLLOWS RATIO   0.5472486038615838
Sigmoid Node 13
Inputs   Weights
Threshold   1.87738878130531
Attrib COMPACTNESS   −3.04169402680315
Attrib CIRCULARITY   −2.2077436229146046
Attrib DISTANCE CIRCULARITY   3.0224861359267026

Attrib RADIUS RATIO   1.3642508796806232
Attrib PR.AXIS ASPECT RATIO   2.5709038827191995
Attrib MAX.LENGTH ASPECT RATIO -0.2413196438525036
Attrib SCATTER RATIO   2.36739597400853
Attrib ELONGATEDNESS -5.420640317102229
Attrib PR.AXIS RECTANGULARITY -0.6789613987860141
Attrib MAX.LENGTH RECTANGULARITY -1.704475075519977
Attrib SCALED VARIANCE_MAJOR   0.38109732875446667
Attrib SCALED VARIANCE_MINOR   1.9732620475385247
Attrib SCALED RADIUS OF GYRATION -2.505628460574541
Attrib SKEWNESS ABOUT_MAJOR   1.1669996039104962
Attrib SKEWNESS ABOUT_MINOR -1.3324878248617322
Attrib KURTOSIS ABOUT_MAJOR -3.9102352405399157
Attrib KURTOSIS ABOUT_MINOR   1.5307473498491897
Attrib HOLLOWS RATIO -2.497145351653384
Sigmoid Node 14
Inputs   Weights
Threshold -2.032659159353251
Attrib COMPACTNESS -4.616690995320374
Attrib CIRCULARITY   3.2164360326344177
Attrib DISTANCE CIRCULARITY   0.5560470201089154
Attrib RADIUS RATIO   3.824464557866887
Attrib PR.AXIS ASPECT RATIO -6.797785179662371
Attrib MAX.LENGTH ASPECT RATIO   1.3230351944768057
Attrib SCATTER RATIO   2.985950814999533
Attrib ELONGATEDNESS -2.13951580781899
Attrib PR.AXIS RECTANGULARITY   2.0157502548532698
Attrib MAX.LENGTH RECTANGULARITY   7.523119128413906
Attrib SCALED VARIANCE_MAJOR   3.9388952810963453
Attrib SCALED VARIANCE_MINOR   2.4201054681097913
Attrib SCALED RADIUS OF GYRATION -7.9194468071814255
Attrib SKEWNESS ABOUT_MAJOR -6.178939334350631
Attrib SKEWNESS ABOUT_MINOR -1.1220402125612605
Attrib KURTOSIS ABOUT_MAJOR   0.8226641538348971
Attrib KURTOSIS ABOUT_MINOR   0.3421742457489413
Attrib HOLLOWS RATIO   2.224468252777746
Sigmoid Node 15
Inputs   Weights
Threshold   1.4165040146582875
Attrib COMPACTNESS   1.5473232191988955
Attrib CIRCULARITY -0.32101040497166
Attrib DISTANCE CIRCULARITY -2.574919305968326
Attrib RADIUS RATIO -0.8913257007127007
Attrib PR.AXIS ASPECT RATIO   6.140191988524727
Attrib MAX.LENGTH ASPECT RATIO -1.3177125976998878
Attrib SCATTER RATIO -0.36203934827080736
Attrib ELONGATEDNESS -3.13674138554707
Attrib PR.AXIS RECTANGULARITY -1.769382228664315
Attrib MAX.LENGTH RECTANGULARITY   2.3957428718238583

Attrib SCALED VARIANCE_MAJOR   −3.0398846807111664
Attrib SCALED VARIANCE_MINOR   −0.3392901981574555
Attrib SCALED RADIUS OF GYRATION   −2.5841210748557395
Attrib SKEWNESS ABOUT_MAJOR   3.788907780750099
Attrib SKEWNESS ABOUT_MINOR   −0.40289724271004407
Attrib KURTOSIS ABOUT_MAJOR   −0.22320797802310632
Attrib KURTOSIS ABOUT_MINOR   1.4453131806437978
Attrib HOLLOWS RATIO   −0.8069906351442758
Sigmoid Node 16
Inputs   Weights
Threshold   0.7466453308241011
Attrib COMPACTNESS   −1.4982568151880178
Attrib CIRCULARITY   3.2471131627003906
Attrib DISTANCE CIRCULARITY   −1.7613152795939195
Attrib RADIUS RATIO   1.9646098293715744
Attrib PR.AXIS ASPECT RATIO   2.6105042111028216
Attrib MAX.LENGTH ASPECT RATIO   −0.8555654637329295
Attrib SCATTER RATIO   0.2798949861032193
Attrib ELONGATEDNESS   0.10094838516881789
Attrib PR.AXIS RECTANGULARITY   −1.619524632122831
Attrib MAX.LENGTH RECTANGULARITY   4.0046305160348945
Attrib SCALED VARIANCE_MAJOR   1.6438608733851936
Attrib SCALED VARIANCE_MINOR   −1.0295129439871937
Attrib SCALED RADIUS OF GYRATION   9.06949876364836
Attrib SKEWNESS ABOUT_MAJOR   3.133393037981197
Attrib SKEWNESS ABOUT_MINOR   −0.40044591962439524
Attrib KURTOSIS ABOUT_MAJOR   2.7126121594435917
Attrib KURTOSIS ABOUT_MINOR   −8.360920571989695
Attrib HOLLOWS RATIO   3.512274130088612
Sigmoid Node 17
Inputs   Weights
Threshold   −6.963462269325848
Attrib COMPACTNESS   4.921283750265854
Attrib CIRCULARITY   −4.563996893973223
Attrib DISTANCE CIRCULARITY   −2.096758649481365
Attrib RADIUS RATIO   2.432996764732539
Attrib PR.AXIS ASPECT RATIO   −5.748185592084398
Attrib MAX.LENGTH ASPECT RATIO   −2.3317107521821785
Attrib SCATTER RATIO   0.175894128457849
Attrib ELONGATEDNESS   6.671800491855708
Attrib PR.AXIS RECTANGULARITY   1.7702660195398772
Attrib MAX.LENGTH RECTANGULARITY   −4.65605238377521
Attrib SCALED VARIANCE_MAJOR   1.49200289878345
Attrib SCALED VARIANCE_MINOR   2.067979628726779
Attrib SCALED RADIUS OF GYRATION   −2.357169886315615
Attrib SKEWNESS ABOUT_MAJOR   −3.374719231331621
Attrib SKEWNESS ABOUT_MINOR   4.86955630911141
Attrib KURTOSIS ABOUT_MAJOR   −1.6346219765895427
Attrib KURTOSIS ABOUT_MINOR   −0.7037271352817699

Attrib HOLLOWS RATIO   −5.044779578880826
Sigmoid Node 18
Inputs   Weights
Threshold   −2.750187063199873
Attrib COMPACTNESS   1.3900337593291983
Attrib CIRCULARITY   −5.303043965296619
Attrib DISTANCE CIRCULARITY   −3.6222936721566024
Attrib RADIUS RATIO   5.742659171580342
Attrib PR.AXIS ASPECT RATIO   2.02608299478617
Attrib MAX.LENGTH ASPECT RATIO   −1.4588732279276524
Attrib SCATTER RATIO   0.7469956818788793
Attrib ELONGATEDNESS   0.8265864402450046
Attrib PR.AXIS RECTANGULARITY   −1.6770712230576656
Attrib MAX.LENGTH RECTANGULARITY   −8.835338297147077
Attrib SCALED VARIANCE_MAJOR   1.5332837144223053
Attrib SCALED VARIANCE_MINOR   2.223116720930261
Attrib SCALED RADIUS OF GYRATION   3.9064735126247836
Attrib SKEWNESS ABOUT_MAJOR   0.5440986835628498
Attrib SKEWNESS ABOUT_MINOR   −2.530687578857554
Attrib KURTOSIS ABOUT_MAJOR   1.3470491618207736
Attrib KURTOSIS ABOUT_MINOR   −5.452020375846083
Attrib HOLLOWS RATIO   −1.0789631645001463
Sigmoid Node 19
Inputs   Weights
Threshold   1.7446580352476226
Attrib COMPACTNESS   0.8659461294861647
Attrib CIRCULARITY   −3.4093362313171403
Attrib DISTANCE CIRCULARITY   −14.082745138623524
Attrib RADIUS RATIO   −2.2906064824753574
Attrib PR.AXIS ASPECT RATIO   5.769711692955481
Attrib MAX.LENGTH ASPECT RATIO   −5.181294044914951
Attrib SCATTER RATIO   0.36636104814544385
Attrib ELONGATEDNESS   −5.400022255714824
Attrib PR.AXIS RECTANGULARITY   4.225286090253928
Attrib MAX.LENGTH RECTANGULARITY   0.10215117793508098
Attrib SCALED VARIANCE_MAJOR   1.2815234014242813
Attrib SCALED VARIANCE_MINOR   0.19646022953662234
Attrib SCALED RADIUS OF GYRATION   3.8950962299549112
Attrib SKEWNESS ABOUT_MAJOR   3.1971080490158963
Attrib SKEWNESS ABOUT_MINOR   −5.446289608135784
Attrib KURTOSIS ABOUT_MAJOR   4.020902073203032
Attrib KURTOSIS ABOUT_MINOR   10.732069773029268
Attrib HOLLOWS RATIO   −12.155375238990388
Sigmoid Node 20
Inputs   Weights
Threshold   1.08540736489155
Attrib COMPACTNESS   4.134294832484191
Attrib CIRCULARITY   1.7421717588905734
Attrib DISTANCE CIRCULARITY   4.043568740082166

Attrib RADIUS RATIO   −5.333704786965293
Attrib PR.AXIS ASPECT RATIO   4.419594364318773
Attrib MAX.LENGTH ASPECT RATIO   3.7822263326147114
Attrib SCATTER RATIO   −3.488300338136185
Attrib ELONGATEDNESS   2.789389059420467
Attrib PR.AXIS RECTANGULARITY   −3.8194453320898365
Attrib MAX.LENGTH RECTANGULARITY   8.642595939935799
Attrib SCALED VARIANCE_MAJOR   −2.467437046823899
Attrib SCALED VARIANCE_MINOR   −3.3784994868195355
Attrib SCALED RADIUS OF GYRATION   −4.848846192158635
Attrib SKEWNESS ABOUT_MAJOR   9.821044453290536
Attrib SKEWNESS ABOUT_MINOR   0.9687915087696305
Attrib KURTOSIS ABOUT_MAJOR   −4.162443366828048
Attrib KURTOSIS ABOUT_MINOR   −2.072585266218619
Attrib HOLLOWS RATIO   2.675601936896263
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7310887635378605
Attrib COMPACTNESS   −7.709464833088791
Attrib CIRCULARITY   0.9399616425252774
Attrib DISTANCE CIRCULARITY   1.8146911304660422
Attrib RADIUS RATIO   −1.945242046344015
Attrib PR.AXIS ASPECT RATIO   −0.920311624368643
Attrib MAX.LENGTH ASPECT RATIO   3.3438610684887777
Attrib SCATTER RATIO   2.837793625163457
Attrib ELONGATEDNESS   −1.7630711696125567
Attrib PR.AXIS RECTANGULARITY   2.675371750406499
Attrib MAX.LENGTH RECTANGULARITY   −0.21066736793278146
Attrib SCALED VARIANCE_MAJOR   1.6696643751105178
Attrib SCALED VARIANCE_MINOR   3.4363363994308544
Attrib SCALED RADIUS OF GYRATION   −0.8835579247763489
Attrib SKEWNESS ABOUT_MAJOR   2.409173515041165
Attrib SKEWNESS ABOUT_MINOR   1.888292092024221
Attrib KURTOSIS ABOUT_MAJOR   6.137668826290257
Attrib KURTOSIS ABOUT_MINOR   −8.29202839281896
Attrib HOLLOWS RATIO   −6.985699107420591
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 5 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances	403	95.7245 %
Incorrectly Classified Instances	18	4.2755 %
Kappa statistic	0.943	
Mean absolute error	0.0359	
Root mean squared error	0.1385	
Relative absolute error	9.5808 %	
Root relative squared error	31.9853 %	
Total Number of Instances	421	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,886	0,016	0,949	0,886	0,916	0,891	0,962	0,917	opel
0,944	0,032	0,911	0,944	0,927	0,902	0,977	0,953	saab
1,000	0,003	0,991	1,000	0,995	0,994	1,000	1,000	bus
1,000	0,006	0,980	1,000	0,990	0,987	1,000	1,000	van
Weighted Avg.	0,957	0,014	0,957	0,957	0,957	0,943	0,985	0,967

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
93   10   0    2  |   a = opel
5   102   1    0  |   b = saab
0    0  109    0  |   c = bus
0    0    0   99  |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron −L 0.3 −M 0.2 −N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs     Weights
Threshold      2.1282918730968436
Node 4    −7.532009112431972
Node 5    −8.810341293731485
Node 6     0.8599210048893194
Node 7    12.52893238810085
Node 8    −4.245946067192808
Node 9     4.728579959806937
Node 10    −2.9865912728275346
Node 11    −2.487606279739693
Node 12     5.3094278240982105
Node 13    −6.986318229544631
Node 14     0.03478987514330935
Node 15    −3.666124508199952
Node 16    −4.867010261403196
Node 17     0.7417594303708335
Node 18    11.16891996637265
Node 19    −18.16892655391728
Node 20    −4.634371261846 7325
Node 21     6.4275786143846965
Sigmoid Node 1
```

```
Inputs      Weights
Threshold       0.6946057060964779
Node  4     6.742562854407754
Node  5     6.863233533613944
Node  6     −3.4938710284914336
Node  7     −15.483738255841951
Node  8     −1.0418582909460565
Node  9     −7.732639657248464
Node 10     −9.412718031931542
Node 11     −1.2273736397139197
Node 12     −2.472155659372381
Node 13     −0.9905400487417959
Node 14     10.278773238350501
Node 15     −3.2438647290484552
Node 16     5.843031352826182
Node 17     8.910974413105482
Node 18     2.1927514856276673
Node 19     5.5429307835605695
Node 20     −12.365730026396939
Node 21     −8.335371284495702
Sigmoid  Node  2
Inputs      Weights
Threshold       −2.264631721935587
Node  4     0.41875539256813593
Node  5     −3.3806206793706193
Node  6     3.308585372342528
Node  7     3.68433048964512
Node  8     −3.8939309327850524
Node  9     1.5371954399634054
Node 10     −5.124638878205518
Node 11     −4.23854593695077
Node 12     0.08790171538012509
Node 13     2.2142187749177684
Node 14     −11.342877991258758
Node 15     6.299522340898016
Node 16     −4.540930124682784
Node 17     −11.18090832127535
Node 18     −7.0679907996683635
Node 19     6.9537801835430875
Node 20     −0.2257769157840904
Node 21     6.303628077651563
Sigmoid  Node  3
Inputs      Weights
Threshold       −1.9210428230708174
Node  4     1.694608380907026
Node  5     3.386440150627823
Node  6     −6.233969127516467
Node  7     −2.968064663062874
Node  8     5.5305191273786365
```

Node 9   −4.985771997669004
Node 10   9.137590678071792
Node 11   −3.129390960138514
Node 12   −5.380368633246011
Node 13   −0.9453100596359431
Node 14   −1.0934968056701442
Node 15   1.362830719441475
Node 16   −0.5086183823237433
Node 17   0.3130846461980815
Node 18   −2.0135938487102307
Node 19   −2.126386164248383
Node 20   7.975357830033391
Node 21   −5.543559063284813
Sigmoid Node 4
Inputs   Weights
Threshold   2.279406002936612
Attrib COMPACTNESS   7.653179134284978
Attrib CIRCULARITY   −4.147938530781501
Attrib DISTANCE CIRCULARITY   −2.6455279634025373
Attrib RADIUS RATIO   2.1312934517659534
Attrib PR.AXIS ASPECT RATIO   3.0531623529378167
Attrib MAX.LENGTH ASPECT RATIO   −2.211035519931746
Attrib SCATTER RATIO   2.487980781301221
Attrib ELONGATEDNESS   1.5962501258131854
Attrib PR.AXIS RECTANGULARITY   3.1972442904590213
Attrib MAX.LENGTH RECTANGULARITY   −0.16979943390715668
Attrib SCALED VARIANCE_MAJOR   −3.4889026829127285
Attrib SCALED VARIANCE_MINOR   2.434076746009081
Attrib SCALED RADIUS OF GYRATION   −0.1512515165974952
Attrib SKEWNESS ABOUT_MAJOR   0.5642790932888597
Attrib SKEWNESS ABOUT_MINOR   5.473006046593266
Attrib KURTOSIS ABOUT_MAJOR   2.7249608704886734
Attrib KURTOSIS ABOUT_MINOR   −3.99083223901964
Attrib HOLLOWS RATIO   −4.68223629569248
Sigmoid Node 5
Inputs   Weights
Threshold   −0.6875372452739654
Attrib COMPACTNESS   6.117720355286655
Attrib CIRCULARITY   −6.1060774790503975
Attrib DISTANCE CIRCULARITY   8.358837116403716
Attrib RADIUS RATIO   −3.583771495787774
Attrib PR.AXIS ASPECT RATIO   1.67544034698411
Attrib MAX.LENGTH ASPECT RATIO   −2.6550227261326276
Attrib SCATTER RATIO   −2.2671780316380987
Attrib ELONGATEDNESS   7.110551361706243
Attrib PR.AXIS RECTANGULARITY   2.048178469643837
Attrib MAX.LENGTH RECTANGULARITY   1.7797960216533826
Attrib SCALED VARIANCE_MAJOR   1.5955611519194375
Attrib SCALED VARIANCE_MINOR   −4.091899717172632

44

Attrib SCALED RADIUS OF GYRATION   4.9494293947002745
Attrib SKEWNESS ABOUT_MAJOR   6.752055292196701
Attrib SKEWNESS ABOUT_MINOR   −2.167484822415373
Attrib KURTOSIS ABOUT_MAJOR   1.8305942698813276
Attrib KURTOSIS ABOUT_MINOR   −7.0180987539293875
Attrib HOLLOWS RATIO   8.602726256390884
Sigmoid Node 6
Inputs   Weights
Threshold   1.6078226620199172
Attrib COMPACTNESS   −1.2521055687988427
Attrib CIRCULARITY   −0.32458373485754016
Attrib DISTANCE CIRCULARITY   −2.41551572942237
Attrib RADIUS RATIO   1.6101504595207143
Attrib PR.AXIS ASPECT RATIO   1.134251649449368
Attrib MAX.LENGTH ASPECT RATIO   0.5366707830708519
Attrib SCATTER RATIO   1.3996548039622627
Attrib ELONGATEDNESS   −4.787401884622517
Attrib PR.AXIS RECTANGULARITY   −0.978998924001452
Attrib MAX.LENGTH RECTANGULARITY   −3.134190274775748
Attrib SCALED VARIANCE_MAJOR   1.8616498273169195
Attrib SCALED VARIANCE_MINOR   1.2645819145242179
Attrib SCALED RADIUS OF GYRATION   0.6299872949731262
Attrib SKEWNESS ABOUT_MAJOR   −1.2240668980064118
Attrib SKEWNESS ABOUT_MINOR   2.62986081408185
Attrib KURTOSIS ABOUT_MAJOR   −3.172249663545748
Attrib KURTOSIS ABOUT_MINOR   5.360150446921711
Attrib HOLLOWS RATIO   0.1140570927863377
Sigmoid Node 7
Inputs   Weights
Threshold   −1.7463139210315712
Attrib COMPACTNESS   1.0961854872536314
Attrib CIRCULARITY   4.692822396116003
Attrib DISTANCE CIRCULARITY   −3.1496588543034223
Attrib RADIUS RATIO   3.3831273338416517
Attrib PR.AXIS ASPECT RATIO   2.660672129176942
Attrib MAX.LENGTH ASPECT RATIO   −3.6368026339063224
Attrib SCATTER RATIO   2.2049698200142935
Attrib ELONGATEDNESS   −4.785201431030677
Attrib PR.AXIS RECTANGULARITY   2.8670819635393126
Attrib MAX.LENGTH RECTANGULARITY   0.6289035986833225
Attrib SCALED VARIANCE_MAJOR   0.6546367468820784
Attrib SCALED VARIANCE_MINOR   4.330946401644744
Attrib SCALED RADIUS OF GYRATION   −2.9633312331774264
Attrib SKEWNESS ABOUT_MAJOR   −1.185579112754516
Attrib SKEWNESS ABOUT_MINOR   −1.6362956766136443
Attrib KURTOSIS ABOUT_MAJOR   2.5028635869984117
Attrib KURTOSIS ABOUT_MINOR   15.575802272118406
Attrib HOLLOWS RATIO   −12.887810419804625
Sigmoid Node 8

Inputs   Weights
Threshold   −3.3347608267491085
Attrib COMPACTNESS   4.508237368334757
Attrib CIRCULARITY   −1.2657366572317517
Attrib DISTANCE CIRCULARITY   −0.8816932897448838
Attrib RADIUS RATIO   −1.2465992966549135
Attrib PR.AXIS ASPECT RATIO   1.7879162010301803
Attrib MAX.LENGTH ASPECT RATIO   1.3525934261088797
Attrib SCATTER RATIO   −2.3485786544509684
Attrib ELONGATEDNESS   5.061778752280644
Attrib PR.AXIS RECTANGULARITY   −1.6376779825262768
Attrib MAX.LENGTH RECTANGULARITY   5.116629799705663
Attrib SCALED VARIANCE_MAJOR   −1.4123234500488475
Attrib SCALED VARIANCE_MINOR   −1.2084694908801834
Attrib SCALED RADIUS OF GYRATION   −3.223451934848665
Attrib SKEWNESS ABOUT_MAJOR   1.56060689084251
Attrib SKEWNESS ABOUT_MINOR   −2.8745566681895127
Attrib KURTOSIS ABOUT_MAJOR   1.3614769157908058
Attrib KURTOSIS ABOUT_MINOR   1.4877553472831224
Attrib HOLLOWS RATIO   0.13076696456308845
Sigmoid Node 9
Inputs   Weights
Threshold   1.7175447284482046
Attrib COMPACTNESS   −8.810383714550944
Attrib CIRCULARITY   0.5617285822983958
Attrib DISTANCE CIRCULARITY   −4.281104454628689
Attrib RADIUS RATIO   −2.3806957635005923
Attrib PR.AXIS ASPECT RATIO   2.5822437252876327
Attrib MAX.LENGTH ASPECT RATIO   −7.072923135762636
Attrib SCATTER RATIO   −0.3566113918691042
Attrib ELONGATEDNESS   −3.042857884074865
Attrib PR.AXIS RECTANGULARITY   −0.3271543626203202
Attrib MAX.LENGTH RECTANGULARITY   −5.796240786246854
Attrib SCALED VARIANCE_MAJOR   −2.022786638754674
Attrib SCALED VARIANCE_MINOR   0.9063494688350959
Attrib SCALED RADIUS OF GYRATION   5.548824725303361
Attrib SKEWNESS ABOUT_MAJOR   2.8123093632266083
Attrib SKEWNESS ABOUT_MINOR   0.5222394465858534
Attrib KURTOSIS ABOUT_MAJOR   5.0469259592897
Attrib KURTOSIS ABOUT_MINOR   0.5023806140136927
Attrib HOLLOWS RATIO   −7.438078913228712
Sigmoid Node 10
Inputs   Weights
Threshold   2.512150651269917
Attrib COMPACTNESS   4.452911164958112
Attrib CIRCULARITY   1.8297497913511362
Attrib DISTANCE CIRCULARITY   3.5490111200111896
Attrib RADIUS RATIO   −4.816553180000462
Attrib PR.AXIS ASPECT RATIO   4.1047985806191525

Attrib MAX.LENGTH ASPECT RATIO   4.549403697020768
Attrib SCATTER RATIO   −2.819008325281394
Attrib ELONGATEDNESS   4.047739442637769
Attrib PR.AXIS RECTANGULARITY   −3.3946653827350377
Attrib MAX.LENGTH RECTANGULARITY   9.251144782294714
Attrib SCALED VARIANCE_MAJOR   −3.807738617417223
Attrib SCALED VARIANCE_MINOR   −2.552934547162724
Attrib SCALED RADIUS OF GYRATION   −4.3472156410750875
Attrib SKEWNESS ABOUT_MAJOR   7.973066446951207
Attrib SKEWNESS ABOUT_MINOR   −2.331714784338574
Attrib KURTOSIS ABOUT_MAJOR   0.06691970544382778
Attrib KURTOSIS ABOUT_MINOR   −1.8738109728992687
Attrib HOLLOWS RATIO   4.565105482177258
Sigmoid Node 11
Inputs   Weights
Threshold   −1.8773896713996419
Attrib COMPACTNESS   0.5181501818052882
Attrib CIRCULARITY   −3.029686684262328
Attrib DISTANCE CIRCULARITY   1.030995914122006
Attrib RADIUS RATIO   1.3219460568450054
Attrib PR.AXIS ASPECT RATIO   −1.2588487291435082
Attrib MAX.LENGTH ASPECT RATIO   0.427969590387541
Attrib SCATTER RATIO   0.706169836889003
Attrib ELONGATEDNESS   0.22174419500874548
Attrib PR.AXIS RECTANGULARITY   0.6326162458556605
Attrib MAX.LENGTH RECTANGULARITY   −3.4044947285679372
Attrib SCALED VARIANCE_MAJOR   1.2672801483812128
Attrib SCALED VARIANCE_MINOR   0.7160867869033449
Attrib SCALED RADIUS OF GYRATION   −0.9527550459205517
Attrib SKEWNESS ABOUT_MAJOR   −0.528814210288421
Attrib SKEWNESS ABOUT_MINOR   2.9393462379221496
Attrib KURTOSIS ABOUT_MAJOR   2.4689273507217755
Attrib KURTOSIS ABOUT_MINOR   −0.2884833535026272
Attrib HOLLOWS RATIO   −1.3364476816239905
Sigmoid Node 12
Inputs   Weights
Threshold   0.06754314879242972
Attrib COMPACTNESS   −4.938544092607113
Attrib CIRCULARITY   −1.371973670008741
Attrib DISTANCE CIRCULARITY   1.394469557748508
Attrib RADIUS RATIO   1.5592121469108131
Attrib PR.AXIS ASPECT RATIO   1.4801291330234734
Attrib MAX.LENGTH ASPECT RATIO   1.178152602005652
Attrib SCATTER RATIO   1.2687894913499922
Attrib ELONGATEDNESS   −1.4184178863195804
Attrib PR.AXIS RECTANGULARITY   −0.725808959749162
Attrib MAX.LENGTH RECTANGULARITY   −1.8902492425690918
Attrib SCALED VARIANCE_MAJOR   0.2508875243203197
Attrib SCALED VARIANCE_MINOR   1.1313151818083205

Attrib SCALED RADIUS OF GYRATION   −0.4970198928718322
Attrib SKEWNESS ABOUT_MAJOR   1.2254541308789995
Attrib SKEWNESS ABOUT_MINOR   −0.5822043624565539
Attrib KURTOSIS ABOUT_MAJOR   7.670379161027014
Attrib KURTOSIS ABOUT_MINOR   −1.3241299790321535
Attrib HOLLOWS RATIO   0.5472486038615838
Sigmoid Node 13
Inputs   Weights
Threshold   1.87738878130531
Attrib COMPACTNESS   −3.04169402680315
Attrib CIRCULARITY   −2.2077436229146046
Attrib DISTANCE CIRCULARITY   3.0224861359267026
Attrib RADIUS RATIO   1.3642508796806232
Attrib PR.AXIS ASPECT RATIO   2.5709038827191995
Attrib MAX.LENGTH ASPECT RATIO   −0.2413196438525036
Attrib SCATTER RATIO   2.36739597400853
Attrib ELONGATEDNESS   −5.420640317102229
Attrib PR.AXIS RECTANGULARITY   −0.6789613987860141
Attrib MAX.LENGTH RECTANGULARITY   −1.704475075519977
Attrib SCALED VARIANCE_MAJOR   0.38109732875446667
Attrib SCALED VARIANCE_MINOR   1.9732620475385247
Attrib SCALED RADIUS OF GYRATION   −2.505628460574541
Attrib SKEWNESS ABOUT_MAJOR   1.1669996039104962
Attrib SKEWNESS ABOUT_MINOR   −1.3324878248617322
Attrib KURTOSIS ABOUT_MAJOR   −3.9102352405399157
Attrib KURTOSIS ABOUT_MINOR   1.5307473498491897
Attrib HOLLOWS RATIO   −2.497145351653384
Sigmoid Node 14
Inputs   Weights
Threshold   −2.032659159353251
Attrib COMPACTNESS   −4.616690995320374
Attrib CIRCULARITY   3.2164360326344177
Attrib DISTANCE CIRCULARITY   0.5560470201089154
Attrib RADIUS RATIO   3.824464557866887
Attrib PR.AXIS ASPECT RATIO   −6.797785179662371
Attrib MAX.LENGTH ASPECT RATIO   1.3230351944768057
Attrib SCATTER RATIO   2.985950814999533
Attrib ELONGATEDNESS   −2.13951580781899
Attrib PR.AXIS RECTANGULARITY   2.0157502548532698
Attrib MAX.LENGTH RECTANGULARITY   7.523119128413906
Attrib SCALED VARIANCE_MAJOR   3.9388952810963453
Attrib SCALED VARIANCE_MINOR   2.4201054681097913
Attrib SCALED RADIUS OF GYRATION   −7.9194468071814255
Attrib SKEWNESS ABOUT_MAJOR   −6.178939334350631
Attrib SKEWNESS ABOUT_MINOR   −1.1220402125612605
Attrib KURTOSIS ABOUT_MAJOR   0.8226641538348971
Attrib KURTOSIS ABOUT_MINOR   0.3421742457489413
Attrib HOLLOWS RATIO   2.224468252777746
Sigmoid Node 15

```
Inputs       Weights
Threshold     1.4165040146582875
Attrib COMPACTNESS     1.5473232191988955
Attrib CIRCULARITY     −0.3210104497166
Attrib DISTANCE CIRCULARITY     −2.574919305968326
Attrib RADIUS RATIO     −0.8913257007127007
Attrib PR.AXIS ASPECT RATIO     6.140191988524727
Attrib MAX.LENGTH ASPECT RATIO     −1.3177125976998878
Attrib SCATTER RATIO     −0.36203934827080736
Attrib ELONGATEDNESS     −3.138674138554707
Attrib PR.AXIS RECTANGULARITY     −1.769382228664315
Attrib MAX.LENGTH RECTANGULARITY     2.3957428718238583
Attrib SCALED VARIANCE_MAJOR     −3.0398846807111664
Attrib SCALED VARIANCE_MINOR     −0.3392901981574555
Attrib SCALED RADIUS OF GYRATION     −2.5841210748557395
Attrib SKEWNESS ABOUT_MAJOR     3.788907780750099
Attrib SKEWNESS ABOUT_MINOR     −0.40289724271004407
Attrib KURTOSIS ABOUT_MAJOR     −0.22320797802310632
Attrib KURTOSIS ABOUT_MINOR     1.4453131806437978
Attrib HOLLOWS RATIO     −0.8069906351442758
Sigmoid Node 16
Inputs       Weights
Threshold     0.7466453308241011
Attrib COMPACTNESS     −1.4982568151880178
Attrib CIRCULARITY     3.2471131627003906
Attrib DISTANCE CIRCULARITY     −1.7613152795939195
Attrib RADIUS RATIO     1.9646098293715744
Attrib PR.AXIS ASPECT RATIO     2.6105042111028216
Attrib MAX.LENGTH ASPECT RATIO     −0.8555654637329295
Attrib SCATTER RATIO     0.2798949861032193
Attrib ELONGATEDNESS     0.10094838516881789
Attrib PR.AXIS RECTANGULARITY     −1.619524632122831
Attrib MAX.LENGTH RECTANGULARITY     4.0046305160348945
Attrib SCALED VARIANCE_MAJOR     1.6438608733851936
Attrib SCALED VARIANCE_MINOR     −1.0295129439871937
Attrib SCALED RADIUS OF GYRATION     9.06949876364836
Attrib SKEWNESS ABOUT_MAJOR     3.133393037981197
Attrib SKEWNESS ABOUT_MINOR     −0.40044591962439524
Attrib KURTOSIS ABOUT_MAJOR     2.7126121594435917
Attrib KURTOSIS ABOUT_MINOR     −8.360920571989695
Attrib HOLLOWS RATIO     3.512274130088612
Sigmoid Node 17
Inputs       Weights
Threshold     −6.963462269325848
Attrib COMPACTNESS     4.921283750265854
Attrib CIRCULARITY     −4.563996893973223
Attrib DISTANCE CIRCULARITY     −2.096758649481365
Attrib RADIUS RATIO     2.432996764732539
Attrib PR.AXIS ASPECT RATIO     −5.748185592084398
```

Attrib MAX.LENGTH ASPECT RATIO   −2.3317107521821785
Attrib SCATTER RATIO   0.175894128457849
Attrib ELONGATEDNESS   6.671800491855708
Attrib PR.AXIS RECTANGULARITY   1.7702660195398772
Attrib MAX.LENGTH RECTANGULARITY   −4.65605238377521
Attrib SCALED VARIANCE_MAJOR   1.49200289878345
Attrib SCALED VARIANCE_MINOR   2.067979628726779
Attrib SCALED RADIUS OF GYRATION   −2.357169886315615
Attrib SKEWNESS ABOUT_MAJOR   −3.374719231331621
Attrib SKEWNESS ABOUT_MINOR   4.86955630911141
Attrib KURTOSIS ABOUT_MAJOR   −1.6346219765895427
Attrib KURTOSIS ABOUT_MINOR   −0.7037271352817699
Attrib HOLLOWS RATIO   −5.044779578880826
Sigmoid Node 18
Inputs   Weights
Threshold   −2.750187063199873
Attrib COMPACTNESS   1.3900337593291983
Attrib CIRCULARITY   −5.303043965296619
Attrib DISTANCE CIRCULARITY   −3.6222936721566024
Attrib RADIUS RATIO   5.742659171580342
Attrib PR.AXIS ASPECT RATIO   2.02608299478617
Attrib MAX.LENGTH ASPECT RATIO   −1.4588732279276524
Attrib SCATTER RATIO   0.7469956818788793
Attrib ELONGATEDNESS   0.8265864402450046
Attrib PR.AXIS RECTANGULARITY   −1.6770712230576656
Attrib MAX.LENGTH RECTANGULARITY   −8.835338297147077
Attrib SCALED VARIANCE_MAJOR   1.5332837144223053
Attrib SCALED VARIANCE_MINOR   2.223116720930261
Attrib SCALED RADIUS OF GYRATION   3.9064735126247836
Attrib SKEWNESS ABOUT_MAJOR   0.5440986835628498
Attrib SKEWNESS ABOUT_MINOR   −2.530687578857554
Attrib KURTOSIS ABOUT_MAJOR   1.3470491618207736
Attrib KURTOSIS ABOUT_MINOR   −5.452020375846083
Attrib HOLLOWS RATIO   −1.0789631645001463
Sigmoid Node 19
Inputs   Weights
Threshold   1.7446580352476226
Attrib COMPACTNESS   0.8659461294861647
Attrib CIRCULARITY   −3.4093362313171403
Attrib DISTANCE CIRCULARITY   −14.082745138623524
Attrib RADIUS RATIO   −2.2906064824753574
Attrib PR.AXIS ASPECT RATIO   5.769711692955481
Attrib MAX.LENGTH ASPECT RATIO   −5.181294044914951
Attrib SCATTER RATIO   0.36636104814544385
Attrib ELONGATEDNESS   −5.400022255714824
Attrib PR.AXIS RECTANGULARITY   4.225286090253928
Attrib MAX.LENGTH RECTANGULARITY   0.10215117793508098
Attrib SCALED VARIANCE_MAJOR   1.2815234014242813
Attrib SCALED VARIANCE_MINOR   0.19646022953662234

Attrib SCALED RADIUS OF GYRATION   3.8950962299549112
Attrib SKEWNESS ABOUT_MAJOR   3.1971080490158963
Attrib SKEWNESS ABOUT_MINOR   −5.446289608135784
Attrib KURTOSIS ABOUT_MAJOR   4.020902073203032
Attrib KURTOSIS ABOUT_MINOR   10.732069773029268
Attrib HOLLOWS RATIO   −12.155375238990388
Sigmoid Node 20
Inputs   Weights
Threshold   1.08540736489155
Attrib COMPACTNESS   4.134294832484191
Attrib CIRCULARITY   1.7421717588905734
Attrib DISTANCE CIRCULARITY   4.043568740082166
Attrib RADIUS RATIO   −5.333704786965293
Attrib PR.AXIS ASPECT RATIO   4.419594364318773
Attrib MAX.LENGTH ASPECT RATIO   3.7822263326147114
Attrib SCATTER RATIO   −3.488300338136185
Attrib ELONGATEDNESS   2.789389059420467
Attrib PR.AXIS RECTANGULARITY   −3.8194453320898365
Attrib MAX.LENGTH RECTANGULARITY   8.642595939935799
Attrib SCALED VARIANCE_MAJOR   −2.467437046823899
Attrib SCALED VARIANCE_MINOR   −3.3784994868195355
Attrib SCALED RADIUS OF GYRATION   −4.848846192158635
Attrib SKEWNESS ABOUT_MAJOR   9.821044453290536
Attrib SKEWNESS ABOUT_MINOR   0.9687915087696305
Attrib KURTOSIS ABOUT_MAJOR   −4.162443366828048
Attrib KURTOSIS ABOUT_MINOR   −2.072585266218619
Attrib HOLLOWS RATIO   2.675601936896263
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7310887635378605
Attrib COMPACTNESS   −7.709464833088791
Attrib CIRCULARITY   0.9399616425252774
Attrib DISTANCE CIRCULARITY   1.8146911304660422
Attrib RADIUS RATIO   −1.945242046344015
Attrib PR.AXIS ASPECT RATIO   −0.920311624368643
Attrib MAX.LENGTH ASPECT RATIO   3.3438610684887777
Attrib SCATTER RATIO   2.837793625163457
Attrib ELONGATEDNESS   −1.7630711696125567
Attrib PR.AXIS RECTANGULARITY   2.675371750406499
Attrib MAX.LENGTH RECTANGULARITY   −0.21066736793278146
Attrib SCALED VARIANCE_MAJOR   1.6696643751105178
Attrib SCALED VARIANCE_MINOR   3.4363363994308544
Attrib SCALED RADIUS OF GYRATION   −0.8835579247763489
Attrib SKEWNESS ABOUT_MAJOR   2.409173515041165
Attrib SKEWNESS ABOUT_MINOR   1.888292092024221
Attrib KURTOSIS ABOUT_MAJOR   6.137668826290257
Attrib KURTOSIS ABOUT_MINOR   −8.29202839281896
Attrib HOLLOWS RATIO   −6.985699107420591
Class opel

Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances	744	87.9433 %
Incorrectly Classified Instances	102	12.0567 %
Kappa statistic	0.8392	
Mean absolute error	0.0722	
Root mean squared error	0.2222	
Relative absolute error	19.2746 %	
Root relative squared error	51.3256 %	
Total Number of Instances	846	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,741	0,062	0,801	0,741	0,770	0,697	0,912	0,810	opel
0,825	0,075	0,792	0,825	0,808	0,740	0,942	0,828	saab
0,995	0,011	0,969	0,995	0,982	0,976	1,000	0,999	bus
0,960	0,014	0,955	0,960	0,957	0,944	0,995	0,987	van
Weighted Avg.	0,041	0,878	0,879	0,878	0,838	0,962	0,905	

=== Confusion Matrix ===

```
a     b    c    d   <-- classified as
157   44   3    8 |    a = opel
```

```
34  179    3    1  |    b = saab
0    1  217    0  |    c = bus
5    2    1  191  |    d = van
```

4 4ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:         weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:       vehicle
Instances:      421
Attributes:     19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:      user supplied test set:  size unknown (reading incrementally)
```

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

```
Sigmoid Node 0
Inputs      Weights
Threshold      -1.364351791738506
Node 4      4.448920980160503
Node 5      -1.4269986941584176
Node 6      4.7628142127263295
Node 7      -4.163263264255005
Node 8      -9.84423295008884
Node 9      -6.923654151524496
Node 10      -6.468278868614657
Node 11      3.369608893401795
Node 12      -4.3143287719245835
```

Node 13   4.773287282274229
Node 14   2.510280705028806
Sigmoid Node 1
Inputs   Weights
Threshold   −2.5038913455933116
Node 4   −5.518238993618639
Node 5   −3.462879930377027
Node 6   −7.424146449459826
Node 7   3.5811586752490885
Node 8   1.7712297179206586
Node 9   6.539529076721227
Node 10   4.260128244178859
Node 11   −2.21623918626336
Node 12   −8.394673209737872
Node 13   3.469364196320687
Node 14   4.093269200058867
Sigmoid Node 2
Inputs   Weights
Threshold   −0.781520378082534
Node 4   0.5186179948874404
Node 5   5.193023007556351
Node 6   3.2464904351605375
Node 7   0.012375687266991921
Node 8   7.704797417068162
Node 9   −2.7902431754329933
Node 10   0.6003841732796972
Node 11   2.449337997643841
Node 12   −3.3153166464870982
Node 13   −11.537246758522349
Node 14   −9.051336782291148
Sigmoid Node 3
Inputs   Weights
Threshold   −0.15476496143786422
Node 4   −3.161565202712342
Node 5   4.042361100450444
Node 6   −2.7316309334275934
Node 7   −1.5398257045948425
Node 8   −3.7577831937486983
Node 9   4.7214690682094735
Node 10   −1.7424424992271526
Node 11   −7.421420793486435
Node 12   8.796340929963169
Node 13   −0.6738242955978062
Node 14   −1.1017317878220119
Sigmoid Node 4
Inputs   Weights
Threshold   −0.16934170744317065
Attrib COMPACTNESS   −7.77844002939196
Attrib CIRCULARITY   1.6110241550093882

Attrib DISTANCE CIRCULARITY   2.8197667365948407
Attrib RADIUS RATIO   2.145299722704779
Attrib PR.AXIS ASPECT RATIO   0.8437525475012838
Attrib MAX.LENGTH ASPECT RATIO   1.6858724438128743
Attrib SCATTER RATIO   1.6319597238873822
Attrib ELONGATEDNESS   −1.0868340957880216
Attrib PR.AXIS RECTANGULARITY   −1.4413933485969597
Attrib MAX.LENGTH RECTANGULARITY   −0.8635008794847502
Attrib SCALED VARIANCE_MAJOR   1.2960514642379952
Attrib SCALED VARIANCE_MINOR   2.8632779842920306
Attrib SCALED RADIUS OF GYRATION   −0.5694673483906509
Attrib SKEWNESS ABOUT_MAJOR   0.6538879077943434
Attrib SKEWNESS ABOUT_MINOR   0.6994865691304535
Attrib KURTOSIS ABOUT_MAJOR   1.6914700357965697
Attrib KURTOSIS ABOUT_MINOR   −1.4693428201275043
Attrib HOLLOWS RATIO   −3.8726207907660255
Sigmoid Node 5
Inputs   Weights
Threshold   2.2728060904772676
Attrib COMPACTNESS   1.2595690319266273
Attrib CIRCULARITY   0.2121857451474078
Attrib DISTANCE CIRCULARITY   1.9769769061975804
Attrib RADIUS RATIO   −2.387980638296522
Attrib PR.AXIS ASPECT RATIO   4.66735110547468
Attrib MAX.LENGTH ASPECT RATIO   1.8988802787530263
Attrib SCATTER RATIO   −1.8111654630269423
Attrib ELONGATEDNESS   −1.3562633127501718
Attrib PR.AXIS RECTANGULARITY   −2.2705884132048237
Attrib MAX.LENGTH RECTANGULARITY   2.0058076807079295
Attrib SCALED VARIANCE_MAJOR   −1.422630837053369
Attrib SCALED VARIANCE_MINOR   −2.479489014489391
Attrib SCALED RADIUS OF GYRATION   −0.6728612465098233
Attrib SKEWNESS ABOUT_MAJOR   3.742003768853991
Attrib SKEWNESS ABOUT_MINOR   −0.8818198107545483
Attrib KURTOSIS ABOUT_MAJOR   0.21327731326806848
Attrib KURTOSIS ABOUT_MINOR   0.4487027447349184
Attrib HOLLOWS RATIO   1.20992481458647
Sigmoid Node 6
Inputs   Weights
Threshold   0.41782671663233273
Attrib COMPACTNESS   0.25777955160001764
Attrib CIRCULARITY   2.6902463239871066
Attrib DISTANCE CIRCULARITY   1.0374162475055693
Attrib RADIUS RATIO   0.910003123340675l
Attrib PR.AXIS ASPECT RATIO   1.8778527532017737
Attrib MAX.LENGTH ASPECT RATIO   1.1948298177467267
Attrib SCATTER RATIO   1.3724845545916449
Attrib ELONGATEDNESS   −3.4936692904648736
Attrib PR.AXIS RECTANGULARITY   0.5503838322808072

Attrib MAX.LENGTH RECTANGULARITY   −1.615337995854146
Attrib SCALED VARIANCE_MAJOR   2.306680029376214
Attrib SCALED VARIANCE_MINOR   2.99084836486277273
Attrib SCALED RADIUS OF GYRATION   −1.5874410866535074
Attrib SKEWNESS ABOUT_MAJOR   0.7467891246982129
Attrib SKEWNESS ABOUT_MINOR   −0.3328418080342753
Attrib KURTOSIS ABOUT_MAJOR   0.39302388286124174
Attrib KURTOSIS ABOUT_MINOR   8.602350025008876
Attrib HOLLOWS RATIO   −5.746209790945468
Sigmoid Node 7
Inputs   Weights
Threshold   2.5804657238322943
Attrib COMPACTNESS   1.814331535645275
Attrib CIRCULARITY   −6.340625988711859
Attrib DISTANCE CIRCULARITY   0.043625266245812554
Attrib RADIUS RATIO   0.5672562490858158
Attrib PR.AXIS ASPECT RATIO   0.5052086744337635
Attrib MAX.LENGTH ASPECT RATIO   0.1467166428170861
Attrib SCATTER RATIO   1.3995709763684099
Attrib ELONGATEDNESS   −1.4056114387690106
Attrib PR.AXIS RECTANGULARITY   1.6759582786953402
Attrib MAX.LENGTH RECTANGULARITY   −3.034068775782144
Attrib SCALED VARIANCE_MAJOR   2.0690135841608104
Attrib SCALED VARIANCE_MINOR   1.012261429590945
Attrib SCALED RADIUS OF GYRATION   1.2689418710636113
Attrib SKEWNESS ABOUT_MAJOR   −0.3153074508898092
Attrib SKEWNESS ABOUT_MINOR   −3.454002378889619
Attrib KURTOSIS ABOUT_MAJOR   4.832503881613649
Attrib KURTOSIS ABOUT_MINOR   −0.3940897441578206
Attrib HOLLOWS RATIO   −1.6209685254538664
Sigmoid Node 8
Inputs   Weights
Threshold   −0.23652206121940994
Attrib COMPACTNESS   −4.04267844969126
Attrib CIRCULARITY   0.44954338311602926
Attrib DISTANCE CIRCULARITY   −6.084468363760597
Attrib RADIUS RATIO   −4.084476881412239
Attrib PR.AXIS ASPECT RATIO   4.853831942839175
Attrib MAX.LENGTH ASPECT RATIO   −1.6280703394972458
Attrib SCATTER RATIO   0.9445829338884677
Attrib ELONGATEDNESS   −6.552831873429048
Attrib PR.AXIS RECTANGULARITY   0.33480920683309323
Attrib MAX.LENGTH RECTANGULARITY   1.5477995681177046
Attrib SCALED VARIANCE_MAJOR   0.7012669561542239
Attrib SCALED VARIANCE_MINOR   1.0067244464012872
Attrib SCALED RADIUS OF GYRATION   −0.015503053939112704
Attrib SKEWNESS ABOUT_MAJOR   1.8446213696930143
Attrib SKEWNESS ABOUT_MINOR   −0.08855034772812836
Attrib KURTOSIS ABOUT_MAJOR   0.20180666896269236

Attrib KURTOSIS ABOUT_MINOR   6.552051252971805
Attrib HOLLOWS RATIO   −5.579677527619801
Sigmoid Node 9
Inputs   Weights
Threshold   −1.604301638522832
Attrib COMPACTNESS   0.13643322002260197
Attrib CIRCULARITY   −3.730675637752896
Attrib DISTANCE CIRCULARITY   3.5241508897573603
Attrib RADIUS RATIO   −0.13567183768051738
Attrib PR.AXIS ASPECT RATIO   1.7810666928281165
Attrib MAX.LENGTH ASPECT RATIO   0.6751455485835185
Attrib SCATTER RATIO   −0.20427788183317971
Attrib ELONGATEDNESS   0.32384992930065193
Attrib PR.AXIS RECTANGULARITY   0.327652563722267954
Attrib MAX.LENGTH RECTANGULARITY   3.59507201049582
Attrib SCALED VARIANCE_MAJOR   −0.026216478723984988
Attrib SCALED VARIANCE_MINOR   −2.827758500438175
Attrib SCALED RADIUS OF GYRATION   3.926325102987925
Attrib SKEWNESS ABOUT_MAJOR   1.0854945752966887
Attrib SKEWNESS ABOUT_MINOR   0.7075042691664271
Attrib KURTOSIS ABOUT_MAJOR   −2.8690775829505366
Attrib KURTOSIS ABOUT_MINOR   −7.519037879099976
Attrib HOLLOWS RATIO   10.198013492277227
Sigmoid Node 10
Inputs   Weights
Threshold   1.228732967781298
Attrib COMPACTNESS   4.151850296151583
Attrib CIRCULARITY   −1.8468041081018562
Attrib DISTANCE CIRCULARITY   0.09279022287807426
Attrib RADIUS RATIO   0.6328907987673674
Attrib PR.AXIS ASPECT RATIO   2.4344308572044966
Attrib MAX.LENGTH ASPECT RATIO   0.15463711502246502
Attrib SCATTER RATIO   0.6198872719903574
Attrib ELONGATEDNESS   1.4794645701995721
Attrib PR.AXIS RECTANGULARITY   1.797560320642153
Attrib MAX.LENGTH RECTANGULARITY   −2.238968763716234
Attrib SCALED VARIANCE_MAJOR   −1.1883849446688568
Attrib SCALED VARIANCE_MINOR   0.9179539737791361
Attrib SCALED RADIUS OF GYRATION   1.075931439723995
Attrib SKEWNESS ABOUT_MAJOR   0.11646911845376737
Attrib SKEWNESS ABOUT_MINOR   4.016958481605919
Attrib KURTOSIS ABOUT_MAJOR   0.8823902582384398
Attrib KURTOSIS ABOUT_MINOR   −1.306648821125643
Attrib HOLLOWS RATIO   −4.040462922099923
Sigmoid Node 11
Inputs   Weights
Threshold   3.147179819873625
Attrib COMPACTNESS   −4.536320688058332
Attrib CIRCULARITY   2.7454912062972068

Attrib DISTANCE CIRCULARITY   −1.0427362205000643
Attrib RADIUS RATIO   1.9759585743324926
Attrib PR.AXIS ASPECT RATIO   −0.46954390156368353
Attrib MAX.LENGTH ASPECT RATIO   −0.8735386363758375
Attrib SCATTER RATIO   2.328908529663945
Attrib ELONGATEDNESS   −5.049191149116406
Attrib PR.AXIS RECTANGULARITY   −0.7593400725920775
Attrib MAX.LENGTH RECTANGULARITY   −5.331817195419368
Attrib SCALED VARIANCE_MAJOR   0.6198518936440561
Attrib SCALED VARIANCE_MINOR   1.5321614921352689
Attrib SCALED RADIUS OF GYRATION   2.08759315267965
Attrib SKEWNESS ABOUT_MAJOR   −1.6304374579863763
Attrib SKEWNESS ABOUT_MINOR   1.5834120718626963
Attrib KURTOSIS ABOUT_MAJOR   0.7266328956927633
Attrib KURTOSIS ABOUT_MINOR   −0.6854984404784307
Attrib HOLLOWS RATIO   −0.08377691805464432
Sigmoid Node 12
Inputs   Weights
Threshold   −0.15051699072276392
Attrib COMPACTNESS   5.479230585286235
Attrib CIRCULARITY   −0.6336413168197483
Attrib DISTANCE CIRCULARITY   4.447726328170966
Attrib RADIUS RATIO   −4.950746796650293
Attrib PR.AXIS ASPECT RATIO   2.419494846346821
Attrib MAX.LENGTH ASPECT RATIO   4.444000369712833
Attrib SCATTER RATIO   −3.2963987650318427
Attrib ELONGATEDNESS   3.9504169443304993
Attrib PR.AXIS RECTANGULARITY   −2.614389093828463
Attrib MAX.LENGTH RECTANGULARITY   6.802009437133947
Attrib SCALED VARIANCE_MAJOR   −1.78049186540273
Attrib SCALED VARIANCE_MINOR   −3.1691518643551753
Attrib SCALED RADIUS OF GYRATION   −2.412570407553334
Attrib SKEWNESS ABOUT_MAJOR   5.77251548947999
Attrib SKEWNESS ABOUT_MINOR   −0.4419300858547633
Attrib KURTOSIS ABOUT_MAJOR   −1.3039811615088315
Attrib KURTOSIS ABOUT_MINOR   −2.8933200334695623
Attrib HOLLOWS RATIO   3.023422815987648
Sigmoid Node 13
Inputs   Weights
Threshold   −4.308668017233631
Attrib COMPACTNESS   0.7794280023454263
Attrib CIRCULARITY   −4.3761929534465125
Attrib DISTANCE CIRCULARITY   0.11988283391158343
Attrib RADIUS RATIO   4.947983281731122
Attrib PR.AXIS ASPECT RATIO   −0.9209447543795732
Attrib MAX.LENGTH ASPECT RATIO   −1.7441585874842567
Attrib SCATTER RATIO   −0.6457624189841669
Attrib ELONGATEDNESS   4.220292096977099
Attrib PR.AXIS RECTANGULARITY   −0.19095269353103245

Attrib MAX.LENGTH RECTANGULARITY   −5.688934103659625
Attrib SCALED VARIANCE_MAJOR   1.77405940649504
Attrib SCALED VARIANCE_MINOR   0.481388059361392
Attrib SCALED RADIUS OF GYRATION   0.375065794380855
Attrib SKEWNESS ABOUT_MAJOR   −1.135133996813354
Attrib SKEWNESS ABOUT_MINOR   1.5685116553910667
Attrib KURTOSIS ABOUT_MAJOR   −0.4100379074571479
Attrib KURTOSIS ABOUT_MINOR   −1.7533447175495358
Attrib HOLLOWS RATIO   −2.9987876796137627
Sigmoid Node 14
Inputs   Weights
Threshold   −0.588678501489853
Attrib COMPACTNESS   −0.20230108386521545
Attrib CIRCULARITY   2.5296664811359335
Attrib DISTANCE CIRCULARITY   2.49625721345109
Attrib RADIUS RATIO   0.764267892990903
Attrib PR.AXIS ASPECT RATIO   −6.391111370029644
Attrib MAX.LENGTH ASPECT RATIO   3.1305851442123047
Attrib SCATTER RATIO   −0.5621362679999335
Attrib ELONGATEDNESS   2.2716688181269062
Attrib PR.AXIS RECTANGULARITY   −0.7712531411134309
Attrib MAX.LENGTH RECTANGULARITY   3.581215409404805
Attrib SCALED VARIANCE_MAJOR   4.998344826325551
Attrib SCALED VARIANCE_MINOR   −1.0334838272656885
Attrib SCALED RADIUS OF GYRATION   −0.19062129350289447
Attrib SKEWNESS ABOUT_MAJOR   −2.342149773630115
Attrib SKEWNESS ABOUT_MINOR   −0.9135051720180072
Attrib KURTOSIS ABOUT_MAJOR   1.1066597267424556
Attrib KURTOSIS ABOUT_MINOR   1.0731892048634812
Attrib HOLLOWS RATIO   1.4732475814910084
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.49 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   393   93.3492 %
Incorrectly Classified Instances   28   6.6508 %
Kappa statistic   0.9113
Mean absolute error   0.0802
Root mean squared error   0.1717
Relative absolute error   21.3986 %
Root relative squared error   39.6631 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,867	0,044	0,867	0,867	0,867	0,822	0,978	0,941	opel
0,870	0,045	0,870	0,870	0,870	0,826	0,969	0,938	saab
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	bus
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	van
Weighted Avg.	0,933	0,023	0,933	0,933	0,933	0,911	0,986	0,969

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
91   14   0    0  |   a = opel
14   94   0    0  |   b = saab
0    0  109    0  |   c = bus
0    0    0   99  |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY

DISTANCE CIRCULARITY
RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −1.364351791738506
Node 4   4.448920980160503
Node 5   −1.4269986941584176
Node 6   4.7628142127263295
Node 7   −4.163263264255005
Node 8   −9.84423295008884
Node 9   −6.923654151524496
Node 10   −6.468278868614657
Node 11   3.369608893401795
Node 12   −4.3143287719245835
Node 13   4.773287282274229
Node 14   2.510280705028806
Sigmoid Node 1
Inputs   Weights
Threshold   −2.5038913455933116
Node 4   −5.518238993618639
Node 5   −3.462879930377027
Node 6   −7.424146449459826
Node 7   3.5811586752490885
Node 8   1.7712297179206586
Node 9   6.539529076721227
Node 10   4.260128244178859
Node 11   −2.21623918626336
Node 12   −8.394673209737872
Node 13   3.469364196320687
Node 14   4.093269200058867

Sigmoid Node 2
Inputs   Weights
Threshold   −0.781520378082534
Node 4   0.5186179948874404
Node 5   5.193023007556351
Node 6   3.2464904351605375
Node 7   0.012375687266991921
Node 8   7.704797417068162
Node 9   −2.7902431754329933
Node 10   0.6003841732796972
Node 11   2.449337997643841
Node 12   −3.3153166464870982
Node 13   −11.537246758522349
Node 14   −9.051336782291148
Sigmoid Node 3
Inputs   Weights
Threshold   −0.15476496143786422
Node 4   −3.161565202712342
Node 5   4.042361100450444
Node 6   −2.7316309334275934
Node 7   −1.5398257045948425
Node 8   −3.7577831937486983
Node 9   4.7214690682094735
Node 10   −1.7424424992271526
Node 11   −7.421420793486435
Node 12   8.796340929963169
Node 13   −0.6738242955978062
Node 14   −1.1017317878220119
Sigmoid Node 4
Inputs   Weights
Threshold   −0.16934170744317065
Attrib COMPACTNESS   −7.77844002939196
Attrib CIRCULARITY   1.6110241550093882
Attrib DISTANCE CIRCULARITY   2.8197667365948407
Attrib RADIUS RATIO   2.145299722704779
Attrib PR.AXIS ASPECT RATIO   0.8437525475012838
Attrib MAX.LENGTH ASPECT RATIO   1.6858724438128743
Attrib SCATTER RATIO   1.6319597238873822
Attrib ELONGATEDNESS   −1.0868340957880216
Attrib PR.AXIS RECTANGULARITY   −1.4413933485969597
Attrib MAX.LENGTH RECTANGULARITY   −0.8635008794847502
Attrib SCALED VARIANCE_MAJOR   1.2960514642379952
Attrib SCALED VARIANCE_MINOR   2.8632779842920306
Attrib SCALED RADIUS OF GYRATION   −0.5694673483906509
Attrib SKEWNESS ABOUT_MAJOR   0.6538879077943434
Attrib SKEWNESS ABOUT_MINOR   0.6994865691304535
Attrib KURTOSIS ABOUT_MAJOR   1.6914700357965697
Attrib KURTOSIS ABOUT_MINOR   −1.4693428201275043
Attrib HOLLOWS RATIO   −3.8726207907660255

Sigmoid Node 5
Inputs   Weights
Threshold   2.2728060904772676
Attrib COMPACTNESS   1.2595690319266273
Attrib CIRCULARITY   0.2121857451474078
Attrib DISTANCE CIRCULARITY   1.9769769061975804
Attrib RADIUS RATIO   −2.387980638296522
Attrib PR.AXIS ASPECT RATIO   4.66735110547468
Attrib MAX.LENGTH ASPECT RATIO   1.8988802787530263
Attrib SCATTER RATIO   −1.8111654630269423
Attrib ELONGATEDNESS   −1.3562633127501718
Attrib PR.AXIS RECTANGULARITY   −2.2705884132048237
Attrib MAX.LENGTH RECTANGULARITY   2.0058076807079295
Attrib SCALED VARIANCE_MAJOR   −1.422630837053369
Attrib SCALED VARIANCE_MINOR   −2.479489014489391
Attrib SCALED RADIUS OF GYRATION   −0.6728612465098233
Attrib SKEWNESS ABOUT_MAJOR   3.742003768853991
Attrib SKEWNESS ABOUT_MINOR   −0.8818198107545483
Attrib KURTOSIS ABOUT_MAJOR   0.21327731326806848
Attrib KURTOSIS ABOUT_MINOR   0.4487027447349184
Attrib HOLLOWS RATIO   1.20992481458647
Sigmoid Node 6
Inputs   Weights
Threshold   0.41782671663233273
Attrib COMPACTNESS   0.25777955160001764
Attrib CIRCULARITY   2.6902463239871066
Attrib DISTANCE CIRCULARITY   1.0374162475055693
Attrib RADIUS RATIO   0.9100031233406751
Attrib PR.AXIS ASPECT RATIO   1.8778527532017737
Attrib MAX.LENGTH ASPECT RATIO   1.1948298177467267
Attrib SCATTER RATIO   1.3724845545916449
Attrib ELONGATEDNESS   −3.4936692904648736
Attrib PR.AXIS RECTANGULARITY   0.5503838322808072
Attrib MAX.LENGTH RECTANGULARITY   −1.615337995854146
Attrib SCALED VARIANCE_MAJOR   2.306680029376214
Attrib SCALED VARIANCE_MINOR   2.9908483648627273
Attrib SCALED RADIUS OF GYRATION   −1.5874410866535074
Attrib SKEWNESS ABOUT_MAJOR   0.7467891246982129
Attrib SKEWNESS ABOUT_MINOR   −0.3328418080342753
Attrib KURTOSIS ABOUT_MAJOR   0.39302388286124174
Attrib KURTOSIS ABOUT_MINOR   8.602350025008876
Attrib HOLLOWS RATIO   −5.746209790945468
Sigmoid Node 7
Inputs   Weights
Threshold   2.5804657238322943
Attrib COMPACTNESS   1.814331535645275
Attrib CIRCULARITY   −6.34062598871 l859
Attrib DISTANCE CIRCULARITY   0.043625266245812554
Attrib RADIUS RATIO   0.5672562490858158

Attrib PR.AXIS ASPECT RATIO   0.5052086744337635
Attrib MAX.LENGTH ASPECT RATIO   0.1467166428170861
Attrib SCATTER RATIO   1.3995709763684099
Attrib ELONGATEDNESS   −1.405611438769010
Attrib PR.AXIS RECTANGULARITY   1.6759582786953402
Attrib MAX.LENGTH RECTANGULARITY   −3.034068775782144
Attrib SCALED VARIANCE_MAJOR   2.0690135841608104
Attrib SCALED VARIANCE_MINOR   1.012261429590945
Attrib SCALED RADIUS OF GYRATION   1.2689418710636113
Attrib SKEWNESS ABOUT_MAJOR   −0.3153074508898092
Attrib SKEWNESS ABOUT_MINOR   −3.454002378889619
Attrib KURTOSIS ABOUT_MAJOR   4.832503881613649
Attrib KURTOSIS ABOUT_MINOR   −0.3940897441578206
Attrib HOLLOWS RATIO   −1.6209685254538664
Sigmoid Node 8
Inputs   Weights
Threshold   −0.23652206121940994
Attrib COMPACTNESS   −4.04267844969126
Attrib CIRCULARITY   0.44954338311602926
Attrib DISTANCE CIRCULARITY   −6.084468363760597
Attrib RADIUS RATIO   −4.084476881412239
Attrib PR.AXIS ASPECT RATIO   4.853831942839175
Attrib MAX.LENGTH ASPECT RATIO   −1.6280703394972458
Attrib SCATTER RATIO   0.9445829338884677
Attrib ELONGATEDNESS   −6.552831873429048
Attrib PR.AXIS RECTANGULARITY   0.33480920683309323
Attrib MAX.LENGTH RECTANGULARITY   1.5477995681177046
Attrib SCALED VARIANCE_MAJOR   0.7012669561542239
Attrib SCALED VARIANCE_MINOR   1.0067244464012872
Attrib SCALED RADIUS OF GYRATION   −0.015503053939112704
Attrib SKEWNESS ABOUT_MAJOR   1.8446213696930143
Attrib SKEWNESS ABOUT_MINOR   −0.08855034772812836
Attrib KURTOSIS ABOUT_MAJOR   0.20180666896269236
Attrib KURTOSIS ABOUT_MINOR   6.552051252971805
Attrib HOLLOWS RATIO   −5.579677527619801
Sigmoid Node 9
Inputs   Weights
Threshold   −1.604301638522832
Attrib COMPACTNESS   0.13643322002260197
Attrib CIRCULARITY   −3.730675637752896
Attrib DISTANCE CIRCULARITY   3.5241508897573603
Attrib RADIUS RATIO   −0.13567183768051738
Attrib PR.AXIS ASPECT RATIO   1.7810666928281165
Attrib MAX.LENGTH ASPECT RATIO   0.6751455485835185
Attrib SCATTER RATIO   −0.20427788183317971
Attrib ELONGATEDNESS   0.32384992930065193
Attrib PR.AXIS RECTANGULARITY   0.32765256372267954
Attrib MAX.LENGTH RECTANGULARITY   3.59507201049582
Attrib SCALED VARIANCE_MAJOR   −0.026216478723984988

Attrib SCALED VARIANCE_MINOR   −2.827758500438175
Attrib SCALED RADIUS OF GYRATION   3.926325102987925
Attrib SKEWNESS ABOUT_MAJOR   1.0854945752966887
Attrib SKEWNESS ABOUT_MINOR   0.7075042691664271
Attrib KURTOSIS ABOUT_MAJOR   −2.8690775829505366
Attrib KURTOSIS ABOUT_MINOR   −7.519037879099976
Attrib HOLLOWS RATIO   10.198013492277227
Sigmoid Node 10
Inputs   Weights
Threshold   1.228732967781298
Attrib COMPACTNESS   4.151850296151583
Attrib CIRCULARITY   −1.8468041081018562
Attrib DISTANCE CIRCULARITY   0.09279022287807426
Attrib RADIUS RATIO   0.6328907987673674
Attrib PR.AXIS ASPECT RATIO   2.4344308572044966
Attrib MAX.LENGTH ASPECT RATIO   0.15463711502246502
Attrib SCATTER RATIO   0.6198872719903574
Attrib ELONGATEDNESS   1.4794645701995721
Attrib PR.AXIS RECTANGULARITY   1.797560320642153
Attrib MAX.LENGTH RECTANGULARITY   −2.238968763716234
Attrib SCALED VARIANCE_MAJOR   −1.1883849446688568
Attrib SCALED VARIANCE_MINOR   0.9179539737791361
Attrib SCALED RADIUS OF GYRATION   1.075931439723995
Attrib SKEWNESS ABOUT_MAJOR   0.11646911845376737
Attrib SKEWNESS ABOUT_MINOR   4.016958481605919
Attrib KURTOSIS ABOUT_MAJOR   0.8823902582384398
Attrib KURTOSIS ABOUT_MINOR   −1.306648821125643
Attrib HOLLOWS RATIO   −4.040462922099923
Sigmoid Node 11
Inputs   Weights
Threshold   3.147179819873625
Attrib COMPACTNESS   −4.53620688058332
Attrib CIRCULARITY   2.7454912062972068
Attrib DISTANCE CIRCULARITY   −1.0427362205000643
Attrib RADIUS RATIO   1.9759585743324926
Attrib PR.AXIS ASPECT RATIO   −0.46954390156368353
Attrib MAX.LENGTH ASPECT RATIO   −0.8735386363758375
Attrib SCATTER RATIO   2.328908529663945
Attrib ELONGATEDNESS   −5.049191149116406
Attrib PR.AXIS RECTANGULARITY   −0.7593400725920775
Attrib MAX.LENGTH RECTANGULARITY   −5.331817195419368
Attrib SCALED VARIANCE_MAJOR   0.6198518936440561
Attrib SCALED VARIANCE_MINOR   1.5321614921352689
Attrib SCALED RADIUS OF GYRATION   2.08759315267965
Attrib SKEWNESS ABOUT_MAJOR   −1.6304374579863763
Attrib SKEWNESS ABOUT_MINOR   1.5834120718626963
Attrib KURTOSIS ABOUT_MAJOR   0.7266328956927633
Attrib KURTOSIS ABOUT_MINOR   −0.6854984404784307
Attrib HOLLOWS RATIO   −0.08377691805464432

Sigmoid Node 12
Inputs   Weights
Threshold   −0.15051699072276392
Attrib COMPACTNESS   5.479230585286235
Attrib CIRCULARITY   −0.6336413168197483
Attrib DISTANCE CIRCULARITY   4.447726328170966
Attrib RADIUS RATIO   −4.950746796650293
Attrib PR.AXIS ASPECT RATIO   2.419494846346821
Attrib MAX.LENGTH ASPECT RATIO   4.444000369712833
Attrib SCATTER RATIO   −3.2963987650318427
Attrib ELONGATEDNESS   3.9504169443304993
Attrib PR.AXIS RECTANGULARITY   −2.614389093828463
Attrib MAX.LENGTH RECTANGULARITY   6.802009437133947
Attrib SCALED VARIANCE_MAJOR   −1.78049186540273
Attrib SCALED VARIANCE_MINOR   −3.1691518643551753
Attrib SCALED RADIUS OF GYRATION   −2.412570407553334
Attrib SKEWNESS ABOUT_MAJOR   5.77251548947999
Attrib SKEWNESS ABOUT_MINOR   −0.4419300858547633
Attrib KURTOSIS ABOUT_MAJOR   −1.3039811615088315
Attrib KURTOSIS ABOUT_MINOR   −2.8933200334695623
Attrib HOLLOWS RATIO   3.023422815987648
Sigmoid Node 13
Inputs   Weights
Threshold   −4.308668017233631
Attrib COMPACTNESS   0.7794280023454263
Attrib CIRCULARITY   −4.3761929534465125
Attrib DISTANCE CIRCULARITY   0.11988283391158343
Attrib RADIUS RATIO   4.947983281731122
Attrib PR.AXIS ASPECT RATIO   −0.9209447543795732
Attrib MAX.LENGTH ASPECT RATIO   −1.7441585874842567
Attrib SCATTER RATIO   −0.6457624189841669
Attrib ELONGATEDNESS   4.220292096977099
Attrib PR.AXIS RECTANGULARITY   −0.19095269353103245
Attrib MAX.LENGTH RECTANGULARITY   −5.688934103659625
Attrib SCALED VARIANCE_MAJOR   1.77405940649504
Attrib SCALED VARIANCE_MINOR   0.481388059361392
Attrib SCALED RADIUS OF GYRATION   0.375065794380855
Attrib SKEWNESS ABOUT_MAJOR   −1.135133968133354
Attrib SKEWNESS ABOUT_MINOR   1.5685116553910667
Attrib KURTOSIS ABOUT_MAJOR   −0.4100379074571479
Attrib KURTOSIS ABOUT_MINOR   −1.7533447175495358
Attrib HOLLOWS RATIO   −2.9987876796137627
Sigmoid Node 14
Inputs   Weights
Threshold   −0.588678501489853
Attrib COMPACTNESS   −0.20230108386521545
Attrib CIRCULARITY   2.5296664811359335
Attrib DISTANCE CIRCULARITY   2.49625721345109
Attrib RADIUS RATIO   0.764267892990903

Attrib PR.AXIS ASPECT RATIO   −6.391111370029644
Attrib MAX.LENGTH ASPECT RATIO   3.1305851442123047
Attrib SCATTER RATIO   −0.5621362679999335
Attrib ELONGATEDNESS   2.2716688181269062
Attrib PR.AXIS RECTANGULARITY   −0.7712531411134309
Attrib MAX.LENGTH RECTANGULARITY   3.581215409404805
Attrib SCALED VARIANCE_MAJOR   4.998344826325551
Attrib SCALED VARIANCE_MINOR   −1.034838272656885
Attrib SCALED RADIUS OF GYRATION   −0.19062129350289447
Attrib SKEWNESS ABOUT_MAJOR   −2.342149773630115
Attrib SKEWNESS ABOUT_MINOR   −0.9135051720180072
Attrib KURTOSIS ABOUT_MAJOR   1.1066597267424556
Attrib KURTOSIS ABOUT_MINOR   1.0731892048634812
Attrib HOLLOWS RATIO   1.4732475814910084
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.06 seconds

═══ Evaluation on test set ═══

Time taken to test model on supplied test set: 0.01 seconds

═══ Summary ═══

Correctly Classified Instances   746   88.1797 %
Incorrectly Classified Instances   100   11.8203 %
Kappa statistic   0.8423
Mean absolute error   0.1009
Root mean squared error   0.2191
Relative absolute error   26.9144 %
Root relative squared error   50.6105 %
Total Number of Instances   846

═══ Detailed Accuracy By Class ═══

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

0,783	0,071	0,787	0,783	0,785	0,713	0,936
0,825	opel					
0,783	0,065	0,806	0,783	0,794	0,725	0,939
0,852	saab					
1,000	0,008	0,978	1,000	0,989	0,985	1,000
0,999	bus					
0,965	0,014	0,955	0,965	0,960	0,948	0,997
0,992	van					
Weighted Avg.		0,882	0,040	0,880	0,882	0,881
0,841	0,968	0,916				

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
166  39   2    5 |   a = opel
42 170    1    4 |   b = saab
0    0  218    0 |   c = bus
3    2    2  192 |   d = van
```

5 5ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   2.303601421947477
Node 4   0.0283557172809155
Node 5   5.583194829035249
Node 6   −7.5247500533450555
Node 7   −6.022988392426906
Sigmoid Node 1
Inputs   Weights
Threshold   −9.289969250994698
Node 4   7.899008942278127
Node 5   4.473854319173788
Node 6   −1.6043813257549024
Node 7   4.433362659599826
Sigmoid Node 2
Inputs   Weights
Threshold   −2.00305895028761
Node 4   −2.255281372361445
Node 5   −11.475178533216159
Node 6   11.787999829581338
Node 7   −6.723721274808663
Sigmoid Node 3
Inputs   Weights
Threshold   0.3107424648808545
Node 4   −12.18496155671131
Node 5   −1.1463624369805003
Node 6   −0.5045131468560166
Node 7   7.2298835629053375
Sigmoid Node 4
Inputs   Weights
Threshold   −2.3415067963322986
Attrib COMPACTNESS   −3.5589226593394097
Attrib CIRCULARITY   −1.205850738408836
Attrib DISTANCE CIRCULARITY   −5.6133861278585355
Attrib RADIUS RATIO   5.451220118471888
Attrib PR.AXIS ASPECT RATIO   −5.13866283703658
Attrib MAX.LENGTH ASPECT RATIO   −5.339747925414933
Attrib SCATTER RATIO   3.178244232702689
Attrib ELONGATEDNESS   −2.3268597131757893
Attrib PR.AXIS RECTANGULARITY   4.622909927727284
Attrib MAX.LENGTH RECTANGULARITY   −6.94145958658709
Attrib SCALED VARIANCE_MAJOR   3.1218323863643525
Attrib SCALED VARIANCE_MINOR   3.795298071922111
Attrib SCALED RADIUS OF GYRATION   4.539911257719801
Attrib SKEWNESS ABOUT_MAJOR   −8.594060649663504
Attrib SKEWNESS ABOUT_MINOR   1.4107688119866357

Attrib KURTOSIS ABOUT_MAJOR   1.031726524069445
Attrib KURTOSIS ABOUT_MINOR   2.2200106567304787
Attrib HOLLOWS RATIO   −3.5966581846531125
Sigmoid Node 5
Inputs   Weights
Threshold   −4.783141276427594
Attrib COMPACTNESS   −0.2741948528491232
Attrib CIRCULARITY   −3.6548043219486077
Attrib DISTANCE CIRCULARITY   −1.6639692644391315
Attrib RADIUS RATIO   5.271823597286246
Attrib PR.AXIS ASPECT RATIO   −1.098674171021578
Attrib MAX.LENGTH ASPECT RATIO   −0.4745971715317131
Attrib SCATTER RATIO   0.2067145247045057
Attrib ELONGATEDNESS   3.004233662061634
Attrib PR.AXIS RECTANGULARITY   −0.2318244483943885
Attrib MAX.LENGTH RECTANGULARITY   −5.437001452184057
Attrib SCALED VARIANCE_MAJOR   1.77132714748094
Attrib SCALED VARIANCE_MINOR   1.4571112467315963
Attrib SCALED RADIUS OF GYRATION   0.16243333083772032
Attrib SKEWNESS ABOUT_MAJOR   −2.101795873598097
Attrib SKEWNESS ABOUT_MINOR   −0.3230459449640866
Attrib KURTOSIS ABOUT_MAJOR   −0.7425540113751073
Attrib KURTOSIS ABOUT_MINOR   −2.2992946447264644
Attrib HOLLOWS RATIO   −2.430274383534759
Sigmoid Node 6
Inputs   Weights
Threshold   4.576245991550169
Attrib COMPACTNESS   −0.1398006956073482
Attrib CIRCULARITY   −1.2402143152481293
Attrib DISTANCE CIRCULARITY   −6.2426019441886496
Attrib RADIUS RATIO   −4.567238854024253
Attrib PR.AXIS ASPECT RATIO   8.441859535863216
Attrib MAX.LENGTH ASPECT RATIO   −3.2249644266178272
Attrib SCATTER RATIO   1.4689409589541107
Attrib ELONGATEDNESS   −3.550472364766368
Attrib PR.AXIS RECTANGULARITY   3.254585811773041
Attrib MAX.LENGTH RECTANGULARITY   −1.9804049914528103
Attrib SCALED VARIANCE_MAJOR   −4.574617009777907
Attrib SCALED VARIANCE_MINOR   3.022128484175217
Attrib SCALED RADIUS OF GYRATION   0.05844337763311955
Attrib SKEWNESS ABOUT_MAJOR   4.918809080440676
Attrib SKEWNESS ABOUT_MINOR   −0.38747416287553804
Attrib KURTOSIS ABOUT_MAJOR   −0.7460399969089738
Attrib KURTOSIS ABOUT_MINOR   2.2985915057752733
Attrib HOLLOWS RATIO   −1.832755419430532
Sigmoid Node 7
Inputs   Weights
Threshold   −1.8419453320032781
Attrib COMPACTNESS   5.136834837788151

Attrib CIRCULARITY   −8.966278219760916
Attrib DISTANCE CIRCULARITY   2.981431728615647
Attrib RADIUS RATIO   1.2727864077583186
Attrib PR.AXIS ASPECT RATIO   −3.056372990588108
Attrib MAX.LENGTH ASPECT RATIO   0.23207522148721274
Attrib SCATTER RATIO   −2.144626973729368
Attrib ELONGATEDNESS   5.803687563428049
Attrib PR.AXIS RECTANGULARITY   3.0062670742545823
Attrib MAX.LENGTH RECTANGULARITY   5.175811657768385
Attrib SCALED VARIANCE_MAJOR   0.9259633924333635
Attrib SCALED VARIANCE_MINOR   −4.709219766553868
Attrib SCALED RADIUS OF GYRATION   4.322935337667145
Attrib SKEWNESS ABOUT_MAJOR   1.3008229955620734
Attrib SKEWNESS ABOUT_MINOR   −0.3689635890052935
Attrib KURTOSIS ABOUT_MAJOR   −1.010815438585822
Attrib KURTOSIS ABOUT_MINOR   −5.8763040298794795
Attrib HOLLOWS RATIO   6.161622373602864
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.37 seconds

═══ Evaluation on test set ═══

Time taken to test model on supplied test set: 0 seconds

═══ Summary ═══

Correctly Classified Instances   351   83.3729 %
Incorrectly Classified Instances   70   16.6271 %
Kappa statistic   0.7783
Mean absolute error   0.1254
Root mean squared error   0.2371
Relative absolute error   33.4525 %
Root relative squared error   54.7764 %
Total Number of Instances   421

═══ Detailed Accuracy By Class ═══

TP Rate	FP Rate	Precision	Recall	F—Measure	MCC	ROC Area	PRC Area	Class
0,810	0,146	0,649	0,810	0,720	0,620	0,915	0,791	opel
0,556	0,048	0,800	0,556	0,656	0,579	0,925	0,767	saab
1,000	0,022	0,940	1,000	0,969	0,958	1,000	0,999	bus
0,980	0,006	0,980	0,980	0,980	0,974	1,000	0,999	van
Weighted Avg.		0,834	0,056	0,841	0,834	0,829	0,780	0,959 0,887

=== Confusion Matrix ===

```
a    b    c    d   <— classified as
85   15   3    2  |    a = opel
45   60   3    0  |    b = saab
0    0  109    0  |    c = bus
1    0    1   97  |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron —L 0.1 —M 0.2 —N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR

KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   2.303601421947477
Node 4   0.0283557172809155
Node 5   5.583194829035249
Node 6   −7.5247500533450555
Node 7   −6.022988392426906
Sigmoid Node 1
Inputs   Weights
Threshold   −9.289969250994698
Node 4   7.899008942278127
Node 5   4.473854319173788
Node 6   −1.6043813257549024
Node 7   4.433362659599826
Sigmoid Node 2
Inputs   Weights
Threshold   −2.00305895028761
Node 4   −2.255281372361445
Node 5   −11.475178533216159
Node 6   11.787999829581338
Node 7   −6.723721274808663
Sigmoid Node 3
Inputs   Weights
Threshold   0.3107424648808545
Node 4   −12.18496155671131
Node 5   −1.1463624369805003
Node 6   −0.5045131468560166
Node 7   7.2298835629053375
Sigmoid Node 4
Inputs   Weights
Threshold   −2.3415067963322986
Attrib COMPACTNESS   −3.5589226593394097
Attrib CIRCULARITY   −1.205850738408836
Attrib DISTANCE CIRCULARITY   −5.6133861278585355
Attrib RADIUS RATIO   5.451220118471888
Attrib PR.AXIS ASPECT RATIO   −5.13866283703658
Attrib MAX.LENGTH ASPECT RATIO   −5.339747925414933
Attrib SCATTER RATIO   3.178244232702689
Attrib ELONGATEDNESS   −2.3268597131757893
Attrib PR.AXIS RECTANGULARITY   4.622909927727284
Attrib MAX.LENGTH RECTANGULARITY   −6.94145958658709

Attrib SCALED VARIANCE_MAJOR   3.1218323863643525
Attrib SCALED VARIANCE_MINOR   3.795298071922111
Attrib SCALED RADIUS OF GYRATION   4.539911257719801
Attrib SKEWNESS ABOUT_MAJOR   −8.594060649663504
Attrib SKEWNESS ABOUT_MINOR   1.4107688119866357
Attrib KURTOSIS ABOUT_MAJOR   1.031726524069445
Attrib KURTOSIS ABOUT_MINOR   2.2200106567304787
Attrib HOLLOWS RATIO   −3.5966581846531125
Sigmoid Node 5
Inputs   Weights
Threshold   −4.783141276427594
Attrib COMPACTNESS   −0.2741948528491232
Attrib CIRCULARITY   −3.6548043219486077
Attrib DISTANCE CIRCULARITY   −1.6639692644391315
Attrib RADIUS RATIO   5.271823597286246
Attrib PR.AXIS ASPECT RATIO   −1.098674171021578
Attrib MAX.LENGTH ASPECT RATIO   −0.4745971715317131
Attrib SCATTER RATIO   0.2067145247045057
Attrib ELONGATEDNESS   3.004233662061634
Attrib PR.AXIS RECTANGULARITY   −0.2318244483943885
Attrib MAX.LENGTH RECTANGULARITY   −5.437001452184057
Attrib SCALED VARIANCE_MAJOR   1.77132714748094
Attrib SCALED VARIANCE_MINOR   1.4571112467315963
Attrib SCALED RADIUS OF GYRATION   0.16243333083772032
Attrib SKEWNESS ABOUT_MAJOR   −2.101795873598097
Attrib SKEWNESS ABOUT_MINOR   −0.3230459449640866
Attrib KURTOSIS ABOUT_MAJOR   −0.7425540113751073
Attrib KURTOSIS ABOUT_MINOR   −2.2992946447264644
Attrib HOLLOWS RATIO   −2.430274383534759
Sigmoid Node 6
Inputs   Weights
Threshold   4.576245991550169
Attrib COMPACTNESS   −0.1398006956073482
Attrib CIRCULARITY   −1.2402143152481293
Attrib DISTANCE CIRCULARITY   −6.2426019441886496
Attrib RADIUS RATIO   −4.567238854024253
Attrib PR.AXIS ASPECT RATIO   8.441859535863216
Attrib MAX.LENGTH ASPECT RATIO   −3.2249644266178272
Attrib SCATTER RATIO   1.4689409589541107
Attrib ELONGATEDNESS   −3.550472364766368
Attrib PR.AXIS RECTANGULARITY   3.254585811773041
Attrib MAX.LENGTH RECTANGULARITY   −1.9804049914528103
Attrib SCALED VARIANCE_MAJOR   −4.574617009777907
Attrib SCALED VARIANCE_MINOR   3.022128484175217
Attrib SCALED RADIUS OF GYRATION   0.05844337763311955
Attrib SKEWNESS ABOUT_MAJOR   4.918809080440676
Attrib SKEWNESS ABOUT_MINOR   −0.38747416287553804
Attrib KURTOSIS ABOUT_MAJOR   −0.7460399969089738
Attrib KURTOSIS ABOUT_MINOR   2.2985915057752733

Attrib HOLLOWS RATIO   −1.832755419430532
Sigmoid Node 7
Inputs   Weights
Threshold   −1.8419453320032781
Attrib COMPACTNESS   5.136834837788151
Attrib CIRCULARITY   −8.966278219760916
Attrib DISTANCE CIRCULARITY   2.981431728615647
Attrib RADIUS RATIO   1.2727864077583186
Attrib PR.AXIS ASPECT RATIO   −3.056372990588108
Attrib MAX.LENGTH ASPECT RATIO   0.23207522148721274
Attrib SCATTER RATIO   −2.144626973729368
Attrib ELONGATEDNESS   5.803687563428049
Attrib PR.AXIS RECTANGULARITY   3.0062670742545823
Attrib MAX.LENGTH RECTANGULARITY   5.175811657768385
Attrib SCALED VARIANCE_MAJOR   0.9259633924333635
Attrib SCALED VARIANCE_MINOR   −4.709219766553868
Attrib SCALED RADIUS OF GYRATION   4.322935337667145
Attrib SKEWNESS ABOUT_MAJOR   1.3008229955620734
Attrib SKEWNESS ABOUT_MINOR   −0.3689635890052935
Attrib KURTOSIS ABOUT_MAJOR   −1.010815438585822
Attrib KURTOSIS ABOUT_MINOR   −5.8763040298794795
Attrib HOLLOWS RATIO   6.161622373602864
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 7.26 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   686   81.0875 %
Incorrectly Classified Instances   160   18.9125 %
Kappa statistic   0.7478
Mean absolute error   0.1358
Root mean squared error   0.2526

```
Relative absolute error                    36.2358 %
Root relative squared error                58.3504 %
Total Number of Instances                  846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F–Measure	MCC	ROC Area	PRC Area	Class
0,774	0,148	0,636	0,774	0,698	0,589	0,894	0,715	opel
0,553	0,054	0,779	0,553	0,647	0,565	0,920	0,762	saab
0,995	0,037	0,904	0,995	0,948	0,930	0,998	0,994	bus
0,930	0,014	0,954	0,930	0,941	0,924	0,995	0,983	van
Weighted Avg.		0,811	0,064	0,816	0,811	0,806	0,749	0,951	0,862

=== Confusion Matrix ===

```
  a    b    c    d   <── classified as
164   31   10    7 |    a = opel
 90  120    5    2 |    b = saab
  1    0  217    0 |    c = bus
  3    3    8  185 |    d = van
```

6 6ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron –L 0.1 –M 0.2 –N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
```

SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   1.8830058491012889
Node 4   −7.3890219391986065
Node 5   −6.281756964181224
Node 6   −3.106394673786295
Node 7   6.4824073830501625
Node 8   −2.74770455314457
Node 9   1.1709608819130248
Node 10   −3.5391228146494584
Node 11   5.308555440734056
Node 12   0.7012030298025096
Node 13   5.2200032913701655
Node 14   1.358025529407747
Node 15   −0.734022983300498
Node 16   2.809087252418981
Node 17   −2.889875646461142
Node 18   3.610392479216612
Node 19   −10.48546919516419
Node 20   −2.7548859069011082
Node 21   −2.4969861479611626
Sigmoid Node 1
Inputs   Weights
Threshold   −0.41899954774017256
Node 4   7.205451218180423
Node 5   5.469658550607201
Node 6   3.6778662897688466
Node 7   −8.955053767853725
Node 8   −1.0277689252776583
Node 9   −5.008915746283619
Node 10   −5.871191232445024
Node 11   −0.7270007002998176
Node 12   −3.672761095612175
Node 13   −4.965716608966315
Node 14   4.803766317173767
Node 15   −2.3978226532770526
Node 16   0.2543163129933316
Node 17   4.533866014924823

77

```
Node  18     4.299505032733444
Node  19     3.0419097577146728
Node  20     −5.776272649614908
Node  21     −4.328898108112944
Sigmoid  Node  2
Inputs      Weights
Threshold      −0.32609606624956206
Node  4     0.3716609521876234
Node  5     −3.845941504464331
Node  6     1.2464761793307586
Node  7     2.277240037620384
Node  8     −1.882714978822595
Node  9     5.370760791207099
Node  10     −1.0842074577491418
Node  11     −4.423297207159434
Node  12     1.099012434004364
Node  13     2.5239286346227026
Node  14     −7.935417422949004
Node  15     3.6604051215857294
Node  16     −5.681383870456464
Node  17     −5.46391641806702
Node  18     −6.705229739917752
Node  19     5.819877468542215
Node  20     0.3323741011708825
Node  21     0.4537101706081643
Sigmoid  Node  3
Inputs      Weights
Threshold      −0.09099091267234687
Node  4     −1.0576665341747533
Node  5     3.670968801144956
Node  6     −4.209049768074041
Node  7     −2.8837995848808085
Node  8     4.5139470279753615
Node  9     −4.987369400212654
Node  10     6.65158896074144
Node  11     −2.56361167999077
Node  12     −3.80965466325176
Node  13     −2.4595277498052344
Node  14     −1.4323675669766225
Node  15     1.9985498136671551
Node  16     −0.711347275087495
Node  17     1.5580019734752093
Node  18     0.26962209456324726
Node  19     −1.82908758890217
Node  20     6.279207534306208
Node  21     −2.6072123346128886
Sigmoid  Node  4
Inputs      Weights
Threshold      0.6048204594142531
```

Attrib COMPACTNESS   5.738262089550037
Attrib CIRCULARITY   −1.263084180891 6178
Attrib DISTANCE CIRCULARITY   0.0353818886085173
Attrib RADIUS RATIO   0.23342437566283974
Attrib PR.AXIS ASPECT RATIO   2.159834269629776
Attrib MAX.LENGTH ASPECT RATIO   −0.929006919446681
Attrib SCATTER RATIO   1.5216457440942603
Attrib ELONGATEDNESS   −0.7196738505367459
Attrib PR.AXIS RECTANGULARITY   −0.7659949473164669
Attrib MAX.LENGTH RECTANGULARITY   −1.2456979558487464
Attrib SCALED VARIANCE_MAJOR   0.15550211129657665
Attrib SCALED VARIANCE_MINOR   0.7068955028417896
Attrib SCALED RADIUS OF GYRATION   3.047360813322938
Attrib SKEWNESS ABOUT_MAJOR   3.582581647725444
Attrib SKEWNESS ABOUT_MINOR   4.1532043675049986
Attrib KURTOSIS ABOUT_MAJOR   1.5834921550184562
Attrib KURTOSIS ABOUT_MINOR   −2.217388900660977
Attrib HOLLOWS RATIO   −1.3307271849898816
Sigmoid Node 5
Inputs   Weights
Threshold   −1.503316183 2347346
Attrib COMPACTNESS   1.3719441518162074
Attrib CIRCULARITY   −3.9951294909781576
Attrib DISTANCE CIRCULARITY   3.5353765995967747
Attrib RADIUS RATIO   −0.9101974147987667
Attrib PR.AXIS ASPECT RATIO   0.1112436531928569
Attrib MAX.LENGTH ASPECT RATIO   2.1811401507394144
Attrib SCATTER RATIO   −0.4248265403070294
Attrib ELONGATEDNESS   2.6498060813037654
Attrib PR.AXIS RECTANGULARITY   1.4130288685066832
Attrib MAX.LENGTH RECTANGULARITY   1.6142956186952742
Attrib SCALED VARIANCE_MAJOR   1.0035297224117705
Attrib SCALED VARIANCE_MINOR   −1.9763248134067573
Attrib SCALED RADIUS OF GYRATION   2.8242902886782564
Attrib SKEWNESS ABOUT_MAJOR   0.9714797287867709
Attrib SKEWNESS ABOUT_MINOR   −1.385390310450743
Attrib KURTOSIS ABOUT_MAJOR   −2.8833349760288995
Attrib KURTOSIS ABOUT_MINOR   −6.729595256687789
Attrib HOLLOWS RATIO   9.828562939515496
Sigmoid Node 6
Inputs   Weights
Threshold   3.349225288 3635185
Attrib COMPACTNESS   −3.5921698078299196
Attrib CIRCULARITY   −0.8919827344526129
Attrib DISTANCE CIRCULARITY   −1.1961829503691677
Attrib RADIUS RATIO   1.9934088221720279
Attrib PR.AXIS ASPECT RATIO   1.9361431135202107
Attrib MAX.LENGTH ASPECT RATIO   −1.06128648989948
Attrib SCATTER RATIO   0.6028279586927519

Attrib ELONGATEDNESS   −2.080450666773372
Attrib PR.AXIS RECTANGULARITY   −0.34176898145767065
Attrib MAX.LENGTH RECTANGULARITY   −2.2847644221260768
Attrib SCALED VARIANCE_MAJOR   0.6043516147569042
Attrib SCALED VARIANCE_MINOR   0.08749837843337786
Attrib SCALED RADIUS OF GYRATION   2.5550114386518543
Attrib SKEWNESS ABOUT_MAJOR   −2.2624183386179375
Attrib SKEWNESS ABOUT_MINOR   0.06582542262060188
Attrib KURTOSIS ABOUT_MAJOR   4.1065446331035655
Attrib KURTOSIS ABOUT_MINOR   1.20135501275565
Attrib HOLLOWS RATIO   −0.07190926225224492
Sigmoid Node 7
Inputs   Weights
Threshold   −1.2310004285828355
Attrib COMPACTNESS   0.05016053717186908
Attrib CIRCULARITY   2.95188264791286
Attrib DISTANCE CIRCULARITY   0.28774822867863914
Attrib RADIUS RATIO   1.6280499484475563
Attrib PR.AXIS ASPECT RATIO   1.5018338127973772
Attrib MAX.LENGTH ASPECT RATIO   0.8690460716298303
Attrib SCATTER RATIO   1.7635849929136975
Attrib ELONGATEDNESS   −4.511674937794687
Attrib PR.AXIS RECTANGULARITY   2.5076967969845825
Attrib MAX.LENGTH RECTANGULARITY   −0.9308955876818279
Attrib SCALED VARIANCE_MAJOR   2.0643262635349027
Attrib SCALED VARIANCE_MINOR   3.097271169026589
Attrib SCALED RADIUS OF GYRATION   −2.9886570267212154
Attrib SKEWNESS ABOUT_MAJOR   −0.4012525029467551
Attrib SKEWNESS ABOUT_MINOR   −0.49941964161886926
Attrib KURTOSIS ABOUT_MAJOR   0.6650317167873591
Attrib KURTOSIS ABOUT_MINOR   10.395475966740529
Attrib HOLLOWS RATIO   −6.870649194663295
Sigmoid Node 8
Inputs   Weights
Threshold   −1.9289066114964972
Attrib COMPACTNESS   2.5113598156526975
Attrib CIRCULARITY   −1.4773829608959563
Attrib DISTANCE CIRCULARITY   1.952080816559919
Attrib RADIUS RATIO   −1.0884595888277968
Attrib PR.AXIS ASPECT RATIO   1.0095863958800841
Attrib MAX.LENGTH ASPECT RATIO   0.4427857478007392
Attrib SCATTER RATIO   −1.5915395195362094
Attrib ELONGATEDNESS   3.4535316459063994
Attrib PR.AXIS RECTANGULARITY   −0.6951049007519089
Attrib MAX.LENGTH RECTANGULARITY   2.4343258221375246
Attrib SCALED VARIANCE_MAJOR   −1.2742527938230463
Attrib SCALED VARIANCE_MINOR   −0.987538744451715
Attrib SCALED RADIUS OF GYRATION   −2.5817444895776878
Attrib SKEWNESS ABOUT_MAJOR   1.8551992990650295

Attrib SKEWNESS ABOUT_MINOR   0.7151835859151369
Attrib KURTOSIS ABOUT_MAJOR   1.130748910915849
Attrib KURTOSIS ABOUT_MINOR   −0.5274114029575742
Attrib HOLLOWS RATIO   0.06900352915143906
Sigmoid Node 9
Inputs   Weights
Threshold   0.8809957504862262
Attrib COMPACTNESS   −1.5738526548954805
Attrib CIRCULARITY   0.023800255990771766
Attrib DISTANCE CIRCULARITY   −4.719616871151399
Attrib RADIUS RATIO   −0.2060409862994886
Attrib PR.AXIS ASPECT RATIO   2.5367297419260164
Attrib MAX.LENGTH ASPECT RATIO   −3.4669708968808486
Attrib SCATTER RATIO   0.17949671168568007
Attrib ELONGATEDNESS   −2.619783004075374
Attrib PR.AXIS RECTANGULARITY   −0.5267309204957583
Attrib MAX.LENGTH RECTANGULARITY   −5.192196459588883
Attrib SCALED VARIANCE_MAJOR   −0.6939989556215098
Attrib SCALED VARIANCE_MINOR   0.6651635477515736
Attrib SCALED RADIUS OF GYRATION   2.6724311999862542
Attrib SKEWNESS ABOUT_MAJOR   1.031427478752306
Attrib SKEWNESS ABOUT_MINOR   −1.0067986632131696
Attrib KURTOSIS ABOUT_MAJOR   0.5737026361983523
Attrib KURTOSIS ABOUT_MINOR   1.5683404246441937
Attrib HOLLOWS RATIO   −4.742224866634496
Sigmoid Node 10
Inputs   Weights
Threshold   1.0306543484077313
Attrib COMPACTNESS   2.90594874973695
Attrib CIRCULARITY   0.5240980275713463
Attrib DISTANCE CIRCULARITY   2.6567252599065783
Attrib RADIUS RATIO   −3.3235477741285333
Attrib PR.AXIS ASPECT RATIO   3.113175724963678
Attrib MAX.LENGTH ASPECT RATIO   2.8832259596670236
Attrib SCATTER RATIO   −2.5148056019800715
Attrib ELONGATEDNESS   1.9703845620759217
Attrib PR.AXIS RECTANGULARITY   −1.9154025481645693
Attrib MAX.LENGTH RECTANGULARITY   5.638958883685365
Attrib SCALED VARIANCE_MAJOR   −2.3829524995861
Attrib SCALED VARIANCE_MINOR   −2.659756771805208
Attrib SCALED RADIUS OF GYRATION   −1.6371122514844088
Attrib SKEWNESS ABOUT_MAJOR   4.82815768079671
Attrib SKEWNESS ABOUT_MINOR   −1.1492416505130376
Attrib KURTOSIS ABOUT_MAJOR   −0.11136695365573185
Attrib KURTOSIS ABOUT_MINOR   −0.8609497911882357
Attrib HOLLOWS RATIO   2.127130308765542
Sigmoid Node 11
Inputs   Weights
Threshold   −1.9532734570003931

Attrib COMPACTNESS   −0.6518972711234642
Attrib CIRCULARITY   −1.8840991917649037
Attrib DISTANCE CIRCULARITY   0.3708820524834642
Attrib RADIUS RATIO   3.8226233309173216
Attrib PR.AXIS ASPECT RATIO   0.5231337955594223
Attrib MAX.LENGTH ASPECT RATIO   0.4416669578112183
Attrib SCATTER RATIO   0.5565805295930196
Attrib ELONGATEDNESS   0.31766229487619935
Attrib PR.AXIS RECTANGULARITY   −0.8920393809776629
Attrib MAX.LENGTH RECTANGULARITY   −4.466082536129169
Attrib SCALED VARIANCE_MAJOR   2.1006620525127224
Attrib SCALED VARIANCE_MINOR   0.7491171068324776
Attrib SCALED RADIUS OF GYRATION   1.2929203531292544
Attrib SKEWNESS ABOUT_MAJOR   0.07208320276512291
Attrib SKEWNESS ABOUT_MINOR   −1.500130369816168
Attrib KURTOSIS ABOUT_MAJOR   −0.9413497298164145
Attrib KURTOSIS ABOUT_MINOR   −2.6797917818676895
Attrib HOLLOWS RATIO   −0.908254871403402
Sigmoid Node 12
Inputs   Weights
Threshold   1.28484446785509
Attrib COMPACTNESS   −1.9940387446260435
Attrib CIRCULARITY   1.5608660678146244
Attrib DISTANCE CIRCULARITY   −0.3996175171459396
Attrib RADIUS RATIO   0.8073599984246587
Attrib PR.AXIS ASPECT RATIO   0.3525831268266525
Attrib MAX.LENGTH ASPECT RATIO   0.5612091226289438
Attrib SCATTER RATIO   0.2564610307007318
Attrib ELONGATEDNESS   −1.8480453285860285
Attrib PR.AXIS RECTANGULARITY   −0.655838956127565
Attrib MAX.LENGTH RECTANGULARITY   −2.524792905243929
Attrib SCALED VARIANCE_MAJOR   1.1233003765835925
Attrib SCALED VARIANCE_MINOR   0.3691773513622492
Attrib SCALED RADIUS OF GYRATION   1.3635981031260713
Attrib SKEWNESS ABOUT_MAJOR   −1.0279031905153917
Attrib SKEWNESS ABOUT_MINOR   3.9330225042311007
Attrib KURTOSIS ABOUT_MAJOR   −1.024010720158908
Attrib KURTOSIS ABOUT_MINOR   2.2963492804635606
Attrib HOLLOWS RATIO   −0.6596633728086969
Sigmoid Node 13
Inputs   Weights
Threshold   −1.1276890505588058
Attrib COMPACTNESS   −5.670634460644292
Attrib CIRCULARITY   1.6215532103693153
Attrib DISTANCE CIRCULARITY   1.3416110981355915
Attrib RADIUS RATIO   −0.40285867768690686
Attrib PR.AXIS ASPECT RATIO   −0.07549841614542878
Attrib MAX.LENGTH ASPECT RATIO   1.7257391481163813
Attrib SCATTER RATIO   1.8006460651131087

Attrib ELONGATEDNESS   −0.42970201103348915
Attrib PR.AXIS RECTANGULARITY   1.0856184509909057
Attrib MAX.LENGTH RECTANGULARITY   0.3103882569906723
Attrib SCALED VARIANCE_MAJOR   0.8607802592056646
Attrib SCALED VARIANCE_MINOR   2.310847526238388
Attrib SCALED RADIUS OF GYRATION   −1.5450798469019573
Attrib SKEWNESS ABOUT_MAJOR   2.3912062409760457
Attrib SKEWNESS ABOUT_MINOR   −0.20801214129440662
Attrib KURTOSIS ABOUT_MAJOR   3.5879020830052952
Attrib KURTOSIS ABOUT_MINOR   −5.2234150117429765
Attrib HOLLOWS RATIO   −4.702388718926633
Sigmoid Node 14
Inputs   Weights
Threshold   −1.1820270474515706
Attrib COMPACTNESS   −2.382194059332152
Attrib CIRCULARITY   1.2889375823400593
Attrib DISTANCE CIRCULARITY   2.64965501317798877
Attrib RADIUS RATIO   0.8728825935803094
Attrib PR.AXIS ASPECT RATIO   −5.991510678932109
Attrib MAX.LENGTH ASPECT RATIO   −0.20187258064615324
Attrib SCATTER RATIO   2.521392258569188
Attrib ELONGATEDNESS   −1.7946008398706295
Attrib PR.AXIS RECTANGULARITY   1.4026185937368105
Attrib MAX.LENGTH RECTANGULARITY   2.127155678163494
Attrib SCALED VARIANCE_MAJOR   3.7931006071818114
Attrib SCALED VARIANCE_MINOR   2.3334312997719424
Attrib SCALED RADIUS OF GYRATION   −1.273787208792404
Attrib SKEWNESS ABOUT_MAJOR   −3.40647252521606
Attrib SKEWNESS ABOUT_MINOR   0.086937470039115347
Attrib KURTOSIS ABOUT_MAJOR   1.1685983142337764
Attrib KURTOSIS ABOUT_MINOR   1.0768299287604564
Attrib HOLLOWS RATIO   −0.6290928174767051
Sigmoid Node 15
Inputs   Weights
Threshold   1.097468681505084
Attrib COMPACTNESS   1.7212167500419104
Attrib CIRCULARITY   −0.28253372507823304
Attrib DISTANCE CIRCULARITY   0.32128556925822305
Attrib RADIUS RATIO   −1.1819478866936783
Attrib PR.AXIS ASPECT RATIO   3.3845213939704055
Attrib MAX.LENGTH ASPECT RATIO   0.7125870030803858
Attrib SCATTER RATIO   −0.8557505419288336
Attrib ELONGATEDNESS   −0.9017988390292179
Attrib PR.AXIS RECTANGULARITY   −0.9761831945279754
Attrib MAX.LENGTH RECTANGULARITY   1.270954426944162
Attrib SCALED VARIANCE_MAJOR   −1.4123907827835827
Attrib SCALED VARIANCE_MINOR   −0.9818219482401022
Attrib SCALED RADIUS OF GYRATION   −1.046905678337877
Attrib SKEWNESS ABOUT_MAJOR   2.5439365481599174

Attrib SKEWNESS ABOUT_MINOR   −0.9398177080280371
Attrib KURTOSIS ABOUT_MAJOR   −0.05760952606015795
Attrib KURTOSIS ABOUT_MINOR   1.1661082570559118
Attrib HOLLOWS RATIO   0.6167101860847816
Sigmoid Node 16
Inputs   Weights
Threshold   −1.045936288301813
Attrib COMPACTNESS   −0.7297804281492625
Attrib CIRCULARITY   0.8765574712732243
Attrib DISTANCE CIRCULARITY   0.36483962771560513
Attrib RADIUS RATIO   2.3011062947432763
Attrib PR.AXIS ASPECT RATIO   −3.188175617328948
Attrib MAX.LENGTH ASPECT RATIO   1.1688525149836597
Attrib SCATTER RATIO   −0.9645467682510317
Attrib ELONGATEDNESS   2.8560386168495286
Attrib PR.AXIS RECTANGULARITY   −1.100437114285787
Attrib MAX.LENGTH RECTANGULARITY   −0.5504614691446862
Attrib SCALED VARIANCE_MAJOR   1.808948687803369
Attrib SCALED VARIANCE_MINOR   −0.7985797465314988
Attrib SCALED RADIUS OF GYRATION   1.5389827044944053
Attrib SKEWNESS ABOUT_MAJOR   −2.078304049258328
Attrib SKEWNESS ABOUT_MINOR   −1.1781992188859238
Attrib KURTOSIS ABOUT_MAJOR   1.4370483673473022
Attrib KURTOSIS ABOUT_MINOR   −0.9532831200088824
Attrib HOLLOWS RATIO   0.01702396175849631
Sigmoid Node 17
Inputs   Weights
Threshold   −2.0671415647075153
Attrib COMPACTNESS   3.7354383206278414
Attrib CIRCULARITY   −4.902201467275446
Attrib DISTANCE CIRCULARITY   −0.18301873642994176
Attrib RADIUS RATIO   2.8296864880845813
Attrib PR.AXIS ASPECT RATIO   −0.8506700467634553
Attrib MAX.LENGTH ASPECT RATIO   −2.1059918355454346
Attrib SCATTER RATIO   −0.03770293256855201
Attrib ELONGATEDNESS   3.2641002969742634
Attrib PR.AXIS RECTANGULARITY   3.6838552709410735
Attrib MAX.LENGTH RECTANGULARITY   −2.0586642269546034
Attrib SCALED VARIANCE_MAJOR   −0.13334732270568195
Attrib SCALED VARIANCE_MINOR   0.5992139899401985
Attrib SCALED RADIUS OF GYRATION   −1.5490639674878401
Attrib SKEWNESS ABOUT_MAJOR   −0.8024394051252436
Attrib SKEWNESS ABOUT_MINOR   2.944449543552909
Attrib KURTOSIS ABOUT_MAJOR   −2.0259405369561434
Attrib KURTOSIS ABOUT_MINOR   −1.104169631193091
Attrib HOLLOWS RATIO   −3.5071831264505553
Sigmoid Node 18
Inputs   Weights
Threshold   −3.5471481699631235

Attrib COMPACTNESS   1.5429961695549435
Attrib CIRCULARITY   −2.38893524142652
Attrib DISTANCE CIRCULARITY   −2.3350028991673626
Attrib RADIUS RATIO   2.0845245221893562
Attrib PR.AXIS ASPECT RATIO   −0.3979728806991847
Attrib MAX.LENGTH ASPECT RATIO   −1.2473050610379106
Attrib SCATTER RATIO   −2.040280586021582
Attrib ELONGATEDNESS   5.3357373776591634
Attrib PR.AXIS RECTANGULARITY   −1.247107305526792
Attrib MAX.LENGTH RECTANGULARITY   −3.564412902518265
Attrib SCALED VARIANCE_MAJOR   0.4498915205028135
Attrib SCALED VARIANCE_MINOR   −0.7226019340273436
Attrib SCALED RADIUS OF GYRATION   1.1430557193070223
Attrib SKEWNESS ABOUT_MAJOR   0.763215316663903
Attrib SKEWNESS ABOUT_MINOR   1.164969153017804
Attrib KURTOSIS ABOUT_MAJOR   1.6172299107625672
Attrib KURTOSIS ABOUT_MINOR   −0.28131348042893967
Attrib HOLLOWS RATIO   −1.2959874078123175
Sigmoid Node 19
Inputs   Weights
Threshold   0.5515389163896081
Attrib COMPACTNESS   −0.9995342200609288
Attrib CIRCULARITY   −0.638103837049179 3
Attrib DISTANCE CIRCULARITY   −5.731146132902869
Attrib RADIUS RATIO   −3.9738065141592167
Attrib PR.AXIS ASPECT RATIO   4.619255638468826
Attrib MAX.LENGTH ASPECT RATIO   −2.47136846383234
Attrib SCATTER RATIO   0.07462729529638402
Attrib ELONGATEDNESS   −4.843793237535654
Attrib PR.AXIS RECTANGULARITY   1.9596315950429584
Attrib MAX.LENGTH RECTANGULARITY   0.911737795706313
Attrib SCALED VARIANCE_MAJOR   0.23214509423394616
Attrib SCALED VARIANCE_MINOR   0.05349228257928755
Attrib SCALED RADIUS OF GYRATION   0.7204929978423574
Attrib SKEWNESS ABOUT_MAJOR   3.1785144552969826
Attrib SKEWNESS ABOUT_MINOR   −2.984154013935625
Attrib KURTOSIS ABOUT_MAJOR   1.7077285303508491
Attrib KURTOSIS ABOUT_MINOR   5.321120170175028
Attrib HOLLOWS RATIO   −6.769335654318404
Sigmoid Node 20
Inputs   Weights
Threshold   0.7940306172751089
Attrib COMPACTNESS   1.8512077770800957
Attrib CIRCULARITY   0.603123055167251
Attrib DISTANCE CIRCULARITY   2.330710402798729
Attrib RADIUS RATIO   −3.468621976376812
Attrib PR.AXIS ASPECT RATIO   2.8151002974866866
Attrib MAX.LENGTH ASPECT RATIO   3.1642037051233207
Attrib SCATTER RATIO   −2.200516437792992

Attrib ELONGATEDNESS   1.2498796983047136
Attrib PR.AXIS RECTANGULARITY   −1.8710864473793003
Attrib MAX.LENGTH RECTANGULARITY   5.1197769783739515
Attrib SCALED VARIANCE_MAJOR   −2.084707901264158
Attrib SCALED VARIANCE_MINOR   −2.5270071519853845
Attrib SCALED RADIUS OF GYRATION   −2.154970810704431
Attrib SKEWNESS ABOUT_MAJOR   5.167980296488682
Attrib SKEWNESS ABOUT_MINOR   −0.4718286661735957
Attrib KURTOSIS ABOUT_MAJOR   −1.0744307629164547
Attrib KURTOSIS ABOUT_MINOR   −1.0275010284959958
Attrib HOLLOWS RATIO   1.8795161954170188
Sigmoid Node 21
Inputs   Weights
Threshold   0.43411627589335255
Attrib COMPACTNESS   −0.49546028697556077
Attrib CIRCULARITY   0.004211695666440612
Attrib DISTANCE CIRCULARITY   2.3787057337601896
Attrib RADIUS RATIO   0.3291107215628056
Attrib PR.AXIS ASPECT RATIO   1.4111403782700278
Attrib MAX.LENGTH ASPECT RATIO   0.30262116179363946
Attrib SCATTER RATIO   0.1282876032658156
Attrib ELONGATEDNESS   −1.9226742300258342
Attrib PR.AXIS RECTANGULARITY   −0.6072909046838002
Attrib MAX.LENGTH RECTANGULARITY   −2.596671710312963
Attrib SCALED VARIANCE_MAJOR   0.9912582543242068
Attrib SCALED VARIANCE_MINOR   0.3068607160486732
Attrib SCALED RADIUS OF GYRATION   0.5293973383404401
Attrib SKEWNESS ABOUT_MAJOR   0.924395791322912
Attrib SKEWNESS ABOUT_MINOR   −0.6261413415501345
Attrib KURTOSIS ABOUT_MAJOR   0.5380014603072331
Attrib KURTOSIS ABOUT_MINOR   2.067014591610703
Attrib HOLLOWS RATIO   −1.8876208135464647
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 4.25 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   401   95.2494 %
Incorrectly Classified Instances   20   4.7506 %
Kappa statistic   0.9366
Mean absolute error   0.0654
Root mean squared error   0.1499
Relative absolute error   17.4479 %
Root relative squared error   34.6251 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,914	0,028	0,914	0,914	0,914	0,886	0,986	0,965	opel
0,898	0,029	0,915	0,898	0,907	0,875	0,981	0,961	saab
1,000	0,003	0,991	1,000	0,995	0,994	1,000	1,000	bus
1,000	0,003	0,990	1,000	0,995	0,993	1,000	1,000	van
Weighted Avg.	0,952	0,016	0,952	0,952	0,952	0,936	0,992	0,981

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
96   9    0    0 |    a = opel
9   97    1    1 |    b = saab
0    0  109    0 |    c = bus
0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19

COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   1.8830058491012889
Node 4   −7.3890219391986065
Node 5   −6.281756964181224
Node 6   −3.106394673786295
Node 7   6.4824073830501625
Node 8   −2.74770455314457
Node 9   1.1709608819130248
Node 10   −3.5391228146494584
Node 11   5.308555440734056
Node 12   0.7012030298025096
Node 13   5.2200032913701655
Node 14   1.358025529407747
Node 15   −0.734022983300498
Node 16   2.809087252418981
Node 17   −2.889875646461142
Node 18   3.610392479216612
Node 19   −10.48546919516419
Node 20   −2.7548859069011082
Node 21   −2.4969861479611626
Sigmoid Node 1
Inputs   Weights
Threshold   −0.41899954774017256
Node 4   7.205451218180423
Node 5   5.469658550607201

88

Node 6   3.6778662897688466
Node 7   −8.955053767853725
Node 8   −1.0277689252776583
Node 9   −5.008915746283619
Node 10   −5.871191232445024
Node 11   −0.7270007002998176
Node 12   −3.672761095612175
Node 13   −4.965716608966315
Node 14   4.803766317173767
Node 15   −2.3978226532770526
Node 16   0.2543163129933316
Node 17   4.533866014924823
Node 18   4.299505032733444
Node 19   3.0419097577146728
Node 20   −5.776272649614908
Node 21   −4.328898108112944
Sigmoid Node 2
Inputs   Weights
Threshold   −0.32609606624956206
Node 4   0.3716609521876234
Node 5   −3.845941504464331
Node 6   1.2464761793307586
Node 7   2.277240037620384
Node 8   −1.882714978822595
Node 9   5.370760791207099
Node 10   −1.0842074577491418
Node 11   −4.423297207159434
Node 12   1.099012434004364
Node 13   2.5239286346227026
Node 14   −7.935417422949004
Node 15   3.6604051215857294
Node 16   −5.681383870456464
Node 17   −5.46391641806702
Node 18   −6.705229739917752
Node 19   5.819877468542215
Node 20   0.3323741011708825
Node 21   0.4537101706081643
Sigmoid Node 3
Inputs   Weights
Threshold   −0.09099091267234687
Node 4   −1.0576665341747533
Node 5   3.670968801144956
Node 6   −4.209049768074041
Node 7   −2.8837995848808085
Node 8   4.5139470279753615
Node 9   −4.987369400212654
Node 10   6.65158896074144
Node 11   −2.56361167999077
Node 12   −3.80965466325176

89

Node 13   −2.4595277498052344
Node 14   −1.4323675669766225
Node 15   1.9985498136671551
Node 16   −0.711347275087495
Node 17   1.5580019734752093
Node 18   0.26962209456324726
Node 19   −1.82908758890217
Node 20   6.279207534306208
Node 21   −2.6072123346128886
Sigmoid Node 4
Inputs   Weights
Threshold   0.6048204594142531
Attrib COMPACTNESS   5.738262089550037
Attrib CIRCULARITY   −1.2630841808916178
Attrib DISTANCE CIRCULARITY   0.0353818886085173
Attrib RADIUS RATIO   0.23342437566283974
Attrib PR.AXIS ASPECT RATIO   2.159834269629776
Attrib MAX.LENGTH ASPECT RATIO   −0.929006919446681
Attrib SCATTER RATIO   1.5216457440942603
Attrib ELONGATEDNESS   −0.7196738505367459
Attrib PR.AXIS RECTANGULARITY   −0.7659949473164669
Attrib MAX.LENGTH RECTANGULARITY   −1.2456979558487464
Attrib SCALED VARIANCE_MAJOR   0.15550211129657665
Attrib SCALED VARIANCE_MINOR   0.7068955028417896
Attrib SCALED RADIUS OF GYRATION   3.047360813322938
Attrib SKEWNESS ABOUT_MAJOR   3.582581647725444
Attrib SKEWNESS ABOUT_MINOR   4.1532043675049986
Attrib KURTOSIS ABOUT_MAJOR   1.5834921550184562
Attrib KURTOSIS ABOUT_MINOR   −2.217388900660977
Attrib HOLLOWS RATIO   −1.3307271849898816
Sigmoid Node 5
Inputs   Weights
Threshold   −1.5033161832347346
Attrib COMPACTNESS   1.3719441518162074
Attrib CIRCULARITY   −3.9951294909781576
Attrib DISTANCE CIRCULARITY   3.5353765995967747
Attrib RADIUS RATIO   −0.9101974147987667
Attrib PR.AXIS ASPECT RATIO   0.1112436531928569
Attrib MAX.LENGTH ASPECT RATIO   2.1811401507394144
Attrib SCATTER RATIO   −0.4248265403070294
Attrib ELONGATEDNESS   2.6498060813037654
Attrib PR.AXIS RECTANGULARITY   1.4130288685066832
Attrib MAX.LENGTH RECTANGULARITY   1.6142956186952742
Attrib SCALED VARIANCE_MAJOR   1.0035297224117705
Attrib SCALED VARIANCE_MINOR   −1.9763248134067573
Attrib SCALED RADIUS OF GYRATION   2.8242902886782564
Attrib SKEWNESS ABOUT_MAJOR   0.9714797287867709
Attrib SKEWNESS ABOUT_MINOR   −1.385390310450743
Attrib KURTOSIS ABOUT_MAJOR   −2.8833349760288995

Attrib KURTOSIS ABOUT_MINOR   −6.729595256687789
Attrib HOLLOWS RATIO   9.828562939515496
Sigmoid Node 6
Inputs   Weights
Threshold   3.3492252883635185
Attrib COMPACTNESS   −3.5921698078299196
Attrib CIRCULARITY   −0.8919827344526129
Attrib DISTANCE CIRCULARITY   −1.1961829503691677
Attrib RADIUS RATIO   1.9934088221720279
Attrib PR.AXIS ASPECT RATIO   1.9361431135202107
Attrib MAX.LENGTH ASPECT RATIO   −1.06128648989948
Attrib SCATTER RATIO   0.6028279586927519
Attrib ELONGATEDNESS   −2.2080450666773372
Attrib PR.AXIS RECTANGULARITY   −0.34176898145767065
Attrib MAX.LENGTH RECTANGULARITY   −2.2847644221260768
Attrib SCALED VARIANCE_MAJOR   0.6043516147569042
Attrib SCALED VARIANCE_MINOR   0.08749837843337786
Attrib SCALED RADIUS OF GYRATION   2.5550114386518543
Attrib SKEWNESS ABOUT_MAJOR   −2.2624183386179375
Attrib SKEWNESS ABOUT_MINOR   0.06582542262060188
Attrib KURTOSIS ABOUT_MAJOR   4.1065446331035655
Attrib KURTOSIS ABOUT_MINOR   1.20135501275565
Attrib HOLLOWS RATIO   −0.07190926225224492
Sigmoid Node 7
Inputs   Weights
Threshold   −1.2310004285828355
Attrib COMPACTNESS   0.05016053717186908
Attrib CIRCULARITY   2.951882647912286
Attrib DISTANCE CIRCULARITY   0.28774822867863914
Attrib RADIUS RATIO   1.6280499484475563
Attrib PR.AXIS ASPECT RATIO   1.5018338127973772
Attrib MAX.LENGTH ASPECT RATIO   0.8690460716298303
Attrib SCATTER RATIO   1.7635849929136975
Attrib ELONGATEDNESS   −4.511674937794687
Attrib PR.AXIS RECTANGULARITY   2.5076967969845825
Attrib MAX.LENGTH RECTANGULARITY   −0.9308955876818279
Attrib SCALED VARIANCE_MAJOR   2.0643262635349027
Attrib SCALED VARIANCE_MINOR   3.097271169026589
Attrib SCALED RADIUS OF GYRATION   −2.9886570267212154
Attrib SKEWNESS ABOUT_MAJOR   −0.4012525029467551
Attrib SKEWNESS ABOUT_MINOR   −0.49941964161886926
Attrib KURTOSIS ABOUT_MAJOR   0.6650317167873591
Attrib KURTOSIS ABOUT_MINOR   10.395475966740529
Attrib HOLLOWS RATIO   −6.870649194663295
Sigmoid Node 8
Inputs   Weights
Threshold   −1.928906611496497
Attrib COMPACTNESS   2.5113598156526975
Attrib CIRCULARITY   −1.4773829608959563

Attrib DISTANCE CIRCULARITY   1.952080816559919
Attrib RADIUS RATIO   −1.0884595888277968
Attrib PR.AXIS ASPECT RATIO   1.0095863958800841
Attrib MAX.LENGTH ASPECT RATIO   0.4427857478007392
Attrib SCATTER RATIO   −1.5915395195362094
Attrib ELONGATEDNESS   3.4535316459063994
Attrib PR.AXIS RECTANGULARITY   −0.6951049007519089
Attrib MAX.LENGTH RECTANGULARITY   2.4343258221375246
Attrib SCALED VARIANCE_MAJOR   −1.2742527938230463
Attrib SCALED VARIANCE_MINOR   −0.987538744451715
Attrib SCALED RADIUS OF GYRATION   −2.5817444895776878
Attrib SKEWNESS ABOUT_MAJOR   1.8551992990650295
Attrib SKEWNESS ABOUT_MINOR   0.7151835859151369
Attrib KURTOSIS ABOUT_MAJOR   1.130748910915849
Attrib KURTOSIS ABOUT_MINOR   −0.5274114029575742
Attrib HOLLOWS RATIO   0.06900352915143906
Sigmoid Node 9
Inputs   Weights
Threshold   0.8809957504862262
Attrib COMPACTNESS   −1.5738526548954805
Attrib CIRCULARITY   0.023800255990771766
Attrib DISTANCE CIRCULARITY   −4.719616871151399
Attrib RADIUS RATIO   −0.2060409862994886
Attrib PR.AXIS ASPECT RATIO   2.5367297419260164
Attrib MAX.LENGTH ASPECT RATIO   −3.4669708968808486
Attrib SCATTER RATIO   0.17949671168568007
Attrib ELONGATEDNESS   −2.619783004075374
Attrib PR.AXIS RECTANGULARITY   −0.5267309204957583
Attrib MAX.LENGTH RECTANGULARITY   −5.192196459588883
Attrib SCALED VARIANCE_MAJOR   −0.6939989556215098
Attrib SCALED VARIANCE_MINOR   0.6651635477515736
Attrib SCALED RADIUS OF GYRATION   2.6724311999862542
Attrib SKEWNESS ABOUT_MAJOR   1.031427478752306
Attrib SKEWNESS ABOUT_MINOR   −1.0067986632131696
Attrib KURTOSIS ABOUT_MAJOR   0.5737026361983523
Attrib KURTOSIS ABOUT_MINOR   1.5683404246441937
Attrib HOLLOWS RATIO   −4.742224866634496
Sigmoid Node 10
Inputs   Weights
Threshold   1.0306543484077313
Attrib COMPACTNESS   2.90594874973695
Attrib CIRCULARITY   0.5240980275713463
Attrib DISTANCE CIRCULARITY   2.6567252599065783
Attrib RADIUS RATIO   −3.3235477741285333
Attrib PR.AXIS ASPECT RATIO   3.113175724963678
Attrib MAX.LENGTH ASPECT RATIO   2.8832259596670236
Attrib SCATTER RATIO   −2.5148056019800715
Attrib ELONGATEDNESS   1.9703845620759217
Attrib PR.AXIS RECTANGULARITY   −1.9154025481645693

Attrib MAX.LENGTH RECTANGULARITY   5.638958883685365
Attrib SCALED VARIANCE_MAJOR   −2.3829524995861
Attrib SCALED VARIANCE_MINOR   −2.659756771805208
Attrib SCALED RADIUS OF GYRATION   −1.6371122514844088
Attrib SKEWNESS ABOUT_MAJOR   4.82815768079671
Attrib SKEWNESS ABOUT_MINOR   −1.1492416505130376
Attrib KURTOSIS ABOUT_MAJOR   −0.11136695365573185
Attrib KURTOSIS ABOUT_MINOR   −0.8609497911882357
Attrib HOLLOWS RATIO   2.127130308765542
Sigmoid Node 11
Inputs   Weights
Threshold   −1.9532734570003931
Attrib COMPACTNESS   −0.6518972711234642
Attrib CIRCULARITY   −1.8840991917649037
Attrib DISTANCE CIRCULARITY   0.3708820524834642
Attrib RADIUS RATIO   3.8226233309173216
Attrib PR.AXIS ASPECT RATIO   0.5231337955594223
Attrib MAX.LENGTH ASPECT RATIO   0.4416669578112183
Attrib SCATTER RATIO   0.5565805295930196
Attrib ELONGATEDNESS   0.31766229487619935
Attrib PR.AXIS RECTANGULARITY   −0.8920393809776629
Attrib MAX.LENGTH RECTANGULARITY   −4.466082536129169
Attrib SCALED VARIANCE_MAJOR   2.1006620525127224
Attrib SCALED VARIANCE_MINOR   0.7491171068324776
Attrib SCALED RADIUS OF GYRATION   1.2929203531292544
Attrib SKEWNESS ABOUT_MAJOR   0.07208320276512291
Attrib SKEWNESS ABOUT_MINOR   −1.500130369816168
Attrib KURTOSIS ABOUT_MAJOR   −0.9413497298164145
Attrib KURTOSIS ABOUT_MINOR   −2.6797917818676895
Attrib HOLLOWS RATIO   −0.9085254871403402
Sigmoid Node 12
Inputs   Weights
Threshold   1.28484446785509
Attrib COMPACTNESS   −1.9940387446260435
Attrib CIRCULARITY   1.5608660678146244
Attrib DISTANCE CIRCULARITY   −0.3996175171459396
Attrib RADIUS RATIO   0.8073599984246587
Attrib PR.AXIS ASPECT RATIO   0.3525831268266525
Attrib MAX.LENGTH ASPECT RATIO   0.5612091226289438
Attrib SCATTER RATIO   0.2564610307007318
Attrib ELONGATEDNESS   −1.8480453285860285
Attrib PR.AXIS RECTANGULARITY   −0.655838956127565
Attrib MAX.LENGTH RECTANGULARITY   −2.524792905243929
Attrib SCALED VARIANCE_MAJOR   1.1233003765835925
Attrib SCALED VARIANCE_MINOR   0.3691773513622492
Attrib SCALED RADIUS OF GYRATION   1.3635981031260713
Attrib SKEWNESS ABOUT_MAJOR   −1.0279031905153917
Attrib SKEWNESS ABOUT_MINOR   3.9330225042311007
Attrib KURTOSIS ABOUT_MAJOR   −1.024010720158908

Attrib KURTOSIS ABOUT_MINOR   2.2963492804635606
Attrib HOLLOWS RATIO   −0.6596633728086969
Sigmoid Node 13
Inputs   Weights
Threshold   −1.1276890505588058
Attrib COMPACTNESS   −5.670634460644292
Attrib CIRCULARITY   1.6215532103693153
Attrib DISTANCE CIRCULARITY   1.3416110981355915
Attrib RADIUS RATIO   −0.40285867768690686
Attrib PR.AXIS ASPECT RATIO   −0.07549841614542878
Attrib MAX.LENGTH ASPECT RATIO   1.7257391481163813
Attrib SCATTER RATIO   1.8006460651131087
Attrib ELONGATEDNESS   −0.42970201103348915
Attrib PR.AXIS RECTANGULARITY   1.0856184509909057
Attrib MAX.LENGTH RECTANGULARITY   0.3103882569906723
Attrib SCALED VARIANCE_MAJOR   0.8607802592056646
Attrib SCALED VARIANCE_MINOR   2.310847526238388
Attrib SCALED RADIUS OF GYRATION   −1.5450798469019573
Attrib SKEWNESS ABOUT_MAJOR   2.3912062409760457
Attrib SKEWNESS ABOUT_MINOR   −0.20801214129440662
Attrib KURTOSIS ABOUT_MAJOR   3.5879020830052952
Attrib KURTOSIS ABOUT_MINOR   −5.2234150117429765
Attrib HOLLOWS RATIO   −4.702388718926633
Sigmoid Node 14
Inputs   Weights
Threshold   −1.1820270474515706
Attrib COMPACTNESS   −2.382194059332152
Attrib CIRCULARITY   1.2889375823400593
Attrib DISTANCE CIRCULARITY   2.64965501317779877
Attrib RADIUS RATIO   0.8728825935803094
Attrib PR.AXIS ASPECT RATIO   −5.991510678932109
Attrib MAX.LENGTH ASPECT RATIO   −0.20187258064615324
Attrib SCATTER RATIO   2.521392258569188
Attrib ELONGATEDNESS   −1.7946008398706295
Attrib PR.AXIS RECTANGULARITY   1.4026185937368105
Attrib MAX.LENGTH RECTANGULARITY   2.127155678163494
Attrib SCALED VARIANCE_MAJOR   3.7931006071818114
Attrib SCALED VARIANCE_MINOR   2.3334312997719424
Attrib SCALED RADIUS OF GYRATION   −1.273787208792404
Attrib SKEWNESS ABOUT_MAJOR   −3.40647252521606
Attrib SKEWNESS ABOUT_MINOR   0.08693747039115347
Attrib KURTOSIS ABOUT_MAJOR   1.1685983142337764
Attrib KURTOSIS ABOUT_MINOR   1.0768299287604564
Attrib HOLLOWS RATIO   −0.6290928174767051
Sigmoid Node 15
Inputs   Weights
Threshold   1.097468681505084
Attrib COMPACTNESS   1.7212167500419104
Attrib CIRCULARITY   −0.28253372507823304

Attrib DISTANCE CIRCULARITY   0.32128556925822305
Attrib RADIUS RATIO   −1.1819478866936783
Attrib PR.AXIS ASPECT RATIO   3.3845213939704055
Attrib MAX.LENGTH ASPECT RATIO   0.7125870030803858
Attrib SCATTER RATIO   −0.8557505419288336
Attrib ELONGATEDNESS   −0.9017988390292179
Attrib PR.AXIS RECTANGULARITY   −0.9761831945279754
Attrib MAX.LENGTH RECTANGULARITY   1.270954426944162
Attrib SCALED VARIANCE_MAJOR   −1.4123907827835827
Attrib SCALED VARIANCE_MINOR   −0.9818219482401022
Attrib SCALED RADIUS OF GYRATION   −1.046905678337877
Attrib SKEWNESS ABOUT_MAJOR   2.5439365481599174
Attrib SKEWNESS ABOUT_MINOR   −0.9398177080280371
Attrib KURTOSIS ABOUT_MAJOR   −0.05760952606015795
Attrib KURTOSIS ABOUT_MINOR   1.1661082570559118
Attrib HOLLOWS RATIO   0.6167101860847816
Sigmoid Node 16
Inputs   Weights
Threshold   −1.0451936288301813
Attrib COMPACTNESS   −0.7297804281492625
Attrib CIRCULARITY   0.8765574712732243
Attrib DISTANCE CIRCULARITY   0.36483962771560513
Attrib RADIUS RATIO   2.3011062947432763
Attrib PR.AXIS ASPECT RATIO   −3.188175617328948
Attrib MAX.LENGTH ASPECT RATIO   1.1688525149836597
Attrib SCATTER RATIO   −0.9645467682510317
Attrib ELONGATEDNESS   2.8560386168495286
Attrib PR.AXIS RECTANGULARITY   −1.100437114285787
Attrib MAX.LENGTH RECTANGULARITY   −0.5504614691446862
Attrib SCALED VARIANCE_MAJOR   1.808948687803369
Attrib SCALED VARIANCE_MINOR   −0.7985797465314988
Attrib SCALED RADIUS OF GYRATION   1.5389827044944053
Attrib SKEWNESS ABOUT_MAJOR   −2.078304049258328
Attrib SKEWNESS ABOUT_MINOR   −1.1781992188859238
Attrib KURTOSIS ABOUT_MAJOR   1.4370483673473022
Attrib KURTOSIS ABOUT_MINOR   −0.9532831200088824
Attrib HOLLOWS RATIO   0.01702396175849631
Sigmoid Node 17
Inputs   Weights
Threshold   −2.0671415647075153
Attrib COMPACTNESS   3.7354383206278414
Attrib CIRCULARITY   −4.902201467275446
Attrib DISTANCE CIRCULARITY   −0.18301873642994176
Attrib RADIUS RATIO   2.8296864880845813
Attrib PR.AXIS ASPECT RATIO   −0.8506700467634553
Attrib MAX.LENGTH ASPECT RATIO   −2.1059918355454346
Attrib SCATTER RATIO   −0.03770293256855201
Attrib ELONGATEDNESS   3.2641002969742634
Attrib PR.AXIS RECTANGULARITY   3.6838552709410735

Attrib MAX.LENGTH RECTANGULARITY   −2.0586642269546034
Attrib SCALED VARIANCE_MAJOR   −0.13334732270568195
Attrib SCALED VARIANCE_MINOR   0.5992139899401985
Attrib SCALED RADIUS OF GYRATION   −1.5490639674878401
Attrib SKEWNESS ABOUT_MAJOR   −0.8024394051252436
Attrib SKEWNESS ABOUT_MINOR   2.944449543552909
Attrib KURTOSIS ABOUT_MAJOR   −2.0259405369561434
Attrib KURTOSIS ABOUT_MINOR   −1.104169631193091
Attrib HOLLOWS RATIO   −3.5071831264505553
Sigmoid Node 18
Inputs   Weights
Threshold   −3.5471481699631235
Attrib COMPACTNESS   1.5429961695549435
Attrib CIRCULARITY   −2.38893524142652
Attrib DISTANCE CIRCULARITY   −2.3350028991673626
Attrib RADIUS RATIO   2.0845245221893562
Attrib PR.AXIS ASPECT RATIO   −0.3979728806991847
Attrib MAX.LENGTH ASPECT RATIO   −1.2473050610379106
Attrib SCATTER RATIO   −2.040280586021582
Attrib ELONGATEDNESS   5.3357373776591634
Attrib PR.AXIS RECTANGULARITY   −1.247107305526792
Attrib MAX.LENGTH RECTANGULARITY   −3.564412902518265
Attrib SCALED VARIANCE_MAJOR   0.4498915205028135
Attrib SCALED VARIANCE_MINOR   −0.7226019340273436
Attrib SCALED RADIUS OF GYRATION   1.1430557193070223
Attrib SKEWNESS ABOUT_MAJOR   0.763215316663903
Attrib SKEWNESS ABOUT_MINOR   1.164969153017804
Attrib KURTOSIS ABOUT_MAJOR   1.6172299107625672
Attrib KURTOSIS ABOUT_MINOR   −0.28131348042893967
Attrib HOLLOWS RATIO   −1.2959874078123175
Sigmoid Node 19
Inputs   Weights
Threshold   0.5515389163896081
Attrib COMPACTNESS   −0.9995342200609288
Attrib CIRCULARITY   −0.638103837049l793
Attrib DISTANCE CIRCULARITY   −5.731146132902869
Attrib RADIUS RATIO   −3.9738065141592167
Attrib PR.AXIS ASPECT RATIO   4.619255638468826
Attrib MAX.LENGTH ASPECT RATIO   −2.47136846383234
Attrib SCATTER RATIO   0.07462729529638402
Attrib ELONGATEDNESS   −4.843793237535654
Attrib PR.AXIS RECTANGULARITY   1.9596315950429584
Attrib MAX.LENGTH RECTANGULARITY   0.911737795706313
Attrib SCALED VARIANCE_MAJOR   0.23214509423394616
Attrib SCALED VARIANCE_MINOR   0.05349228257928755
Attrib SCALED RADIUS OF GYRATION   0.7204929978423574
Attrib SKEWNESS ABOUT_MAJOR   3.1785144552969826
Attrib SKEWNESS ABOUT_MINOR   −2.984154013935625
Attrib KURTOSIS ABOUT_MAJOR   1.7077285303508491

Attrib KURTOSIS ABOUT_MINOR   5.321120170175028
Attrib HOLLOWS RATIO   −6.769335654318404
Sigmoid Node 20
Inputs   Weights
Threshold   0.7940306172751089
Attrib COMPACTNESS   1.8512077770800957
Attrib CIRCULARITY   0.603123055167251
Attrib DISTANCE CIRCULARITY   2.330710402798729
Attrib RADIUS RATIO   −3.468621976376812
Attrib PR.AXIS ASPECT RATIO   2.8151002974866866
Attrib MAX.LENGTH ASPECT RATIO   3.1642037051233207
Attrib SCATTER RATIO   −2.200516437792992
Attrib ELONGATEDNESS   1.2498796983047136
Attrib PR.AXIS RECTANGULARITY   −1.8710864473793003
Attrib MAX.LENGTH RECTANGULARITY   5.1197769783739515
Attrib SCALED VARIANCE_MAJOR   −2.084707901264158
Attrib SCALED VARIANCE_MINOR   −2.5270071519853845
Attrib SCALED RADIUS OF GYRATION   −2.154970810704431
Attrib SKEWNESS ABOUT_MAJOR   5.167980296488682
Attrib SKEWNESS ABOUT_MINOR   −0.4718286661735957
Attrib KURTOSIS ABOUT_MAJOR   −1.0744307629164547
Attrib KURTOSIS ABOUT_MINOR   −1.0275010284959958
Attrib HOLLOWS RATIO   1.8795161954170188
Sigmoid Node 21
Inputs   Weights
Threshold   0.43411627589335255
Attrib COMPACTNESS   −0.49546028697556077
Attrib CIRCULARITY   0.004211695666440612
Attrib DISTANCE CIRCULARITY   2.3787057337601896
Attrib RADIUS RATIO   0.3291107215628056
Attrib PR.AXIS ASPECT RATIO   1.4111403782700278
Attrib MAX.LENGTH ASPECT RATIO   0.30262116179363946
Attrib SCATTER RATIO   0.1282876032658156
Attrib ELONGATEDNESS   −1.9226742300258342
Attrib PR.AXIS RECTANGULARITY   −0.6072909046838002
Attrib MAX.LENGTH RECTANGULARITY   −2.596671710312963
Attrib SCALED VARIANCE_MAJOR   0.9912582543242068
Attrib SCALED VARIANCE_MINOR   0.3068607160486732
Attrib SCALED RADIUS OF GYRATION   0.5293973383404401
Attrib SKEWNESS ABOUT_MAJOR   0.924395791322912
Attrib SKEWNESS ABOUT_MINOR   −0.6261413415501345
Attrib KURTOSIS ABOUT_MAJOR   0.5380014603072331
Attrib KURTOSIS ABOUT_MINOR   2.067014591610703
Attrib HOLLOWS RATIO   −1.8876208135464647
Class opel
Input
Node 0
Class saab
Input

Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.6 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   744   87.9433 %
Incorrectly Classified Instances   102   12.0567 %
Kappa statistic   0.8392
Mean absolute error   0.0924
Root mean squared error   0.213
Relative absolute error   24.6574 %
Root relative squared error   49.1969 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,764	0,066	0,794	0,764	0,779	0,707	0,933	0,843	opel
0,797	0,072	0,794	0,797	0,795	0,725	0,949	0,858	saab
1,000	0,010	0,973	1,000	0,986	0,982	1,000	0,999	bus
0,960	0,014	0,955	0,960	0,957	0,944	0,997	0,991	van
Weighted Avg.	0,879	0,041	0,878	0,879	0,879	0,838	0,969	0,922

=== Confusion Matrix ===

```
  a   b   c   d   <-- classified as
162  43   1   6 |   a = opel
 40 173   1   3 |   b = saab
  0   0 218   0 |   c = bus
  2   2   4 191 |   d = van
```

7 7ª tentativa

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron −L 0.7 −M 0.2 −N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

═══ Classifier model (full training set) ═══

Sigmoid Node 0
Inputs   Weights
Threshold   2.3416981590681023
Node 4   9.553175364696544
Node 5   10.552334286361898
Node 6   10.082128975461387
Node 7   −11.710546567943641
Node 8   −20.10756546185049
Node 9   −10.836389620071174
Node 10   −8.310009660916569
Node 11   6.351347248410782
Node 12   −10.67913308999082
Node 13   −3.5370210301442335
Node 14   −6.1830621683686795
Sigmoid Node 1
Inputs   Weights

Threshold   −7.528553353260648
Node 4   −11.805843832750181
Node 5   −11.451939372428786
Node 6   −8.543853081183606
Node 7   11.86014005000456
Node 8   3.287855166404695
Node 9   11.299133019746797
Node 10   11.016631410544036
Node 11   −6.344727155338478
Node 12   −17.80938725431551
Node 13   9.68379228295098
Node 14   12.352201110462062
Sigmoid Node 2
Inputs   Weights
Threshold   −1.2119200315567373
Node 4   1.851716185415753
Node 5   4.979078443771749
Node 6   6.356040704103091
Node 7   2.748673070316116
Node 8   13.696428837306
Node 9   −2.6101691287658464
Node 10   −2.219839345456749
Node 11   −3.4297617549563633
Node 12   −6.839221691602406
Node 13   −16.214961199049363
Node 14   −19.554977206946226
Sigmoid Node 3
Inputs   Weights
Threshold   −7.506850035125784
Node 4   −1.832858498418526
Node 5   −1.5195102485197831
Node 6   −6.091499235657367
Node 7   −2.129796541111599
Node 8   −0.8920608590768198
Node 9   5.101269791349431
Node 10   −0.7500977065757206
Node 11   −7.685686290503062
Node 12   13.684178374800775
Node 13   1.0979173133007902
Node 14   −1.0903121523262562
Sigmoid Node 4
Inputs   Weights
Threshold   −5.23733494443067
Attrib COMPACTNESS   −8.368615546754139
Attrib CIRCULARITY   −2.819253452060979
Attrib DISTANCE CIRCULARITY   3.833834947121197
Attrib RADIUS RATIO   −5.1810600891771115
Attrib PR.AXIS ASPECT RATIO   −4.617491266354403
Attrib MAX.LENGTH ASPECT RATIO   4.333822189630567

Attrib SCATTER RATIO   6.567783850082054
Attrib ELONGATEDNESS   −6.333909822551755
Attrib PR.AXIS RECTANGULARITY   2.0461126464418182
Attrib MAX.LENGTH RECTANGULARITY   3.6725008546966538
Attrib SCALED VARIANCE_MAJOR   4.634014058925703
Attrib SCALED VARIANCE_MINOR   9.4126056948817
Attrib SCALED RADIUS OF GYRATION   −6.544243111386985
Attrib SKEWNESS ABOUT_MAJOR   2.380583161617975
Attrib SKEWNESS ABOUT_MINOR   4.375451752554836
Attrib KURTOSIS ABOUT_MAJOR   7.470468522614569
Attrib KURTOSIS ABOUT_MINOR   4.278028355719222
Attrib HOLLOWS RATIO   −5.3586844953875525
Sigmoid Node 5
Inputs   Weights
Threshold   0.42089418908049436
Attrib COMPACTNESS   −1.73743118215374
Attrib CIRCULARITY   8.025864341011571
Attrib DISTANCE CIRCULARITY   −9.038287290449004
Attrib RADIUS RATIO   10.167726854771253
Attrib PR.AXIS ASPECT RATIO   4.3105342887323275
Attrib MAX.LENGTH ASPECT RATIO   −6.125964379356875
Attrib SCATTER RATIO   5.938850354822055
Attrib ELONGATEDNESS   −8.079699873884067
Attrib PR.AXIS RECTANGULARITY   −0.9490411810161612
Attrib MAX.LENGTH RECTANGULARITY   5.126129035920924
Attrib SCALED VARIANCE_MAJOR   2.710201510862373
Attrib SCALED VARIANCE_MINOR   7.709351479402268
Attrib SCALED RADIUS OF GYRATION   −7.8446646591708635
Attrib SKEWNESS ABOUT_MAJOR   −2.1751353412821093
Attrib SKEWNESS ABOUT_MINOR   −1.810957555798064
Attrib KURTOSIS ABOUT_MAJOR   2.615356720692497
Attrib KURTOSIS ABOUT_MINOR   20.195781076458463
Attrib HOLLOWS RATIO   −18.266057121715004
Sigmoid Node 6
Inputs   Weights
Threshold   −3.3172234736546833
Attrib COMPACTNESS   −12.581798102448378
Attrib CIRCULARITY   11.97350234331806
Attrib DISTANCE CIRCULARITY   −0.4118391506015806
Attrib RADIUS RATIO   −2.7402552061019305
Attrib PR.AXIS ASPECT RATIO   −2.2814248158281694
Attrib MAX.LENGTH ASPECT RATIO   2.631333917849711
Attrib SCATTER RATIO   3.180828719157149
Attrib ELONGATEDNESS   4.6490385008518915
Attrib PR.AXIS RECTANGULARITY   5.673365827256029
Attrib MAX.LENGTH RECTANGULARITY   −4.043000157387297
Attrib SCALED VARIANCE_MAJOR   −0.10493824242135315
Attrib SCALED VARIANCE_MINOR   7.475975179355622
Attrib SCALED RADIUS OF GYRATION   4.521017307060063

Attrib SKEWNESS ABOUT_MAJOR   4.126825748685578
Attrib SKEWNESS ABOUT_MINOR   3.2147211501777706
Attrib KURTOSIS ABOUT_MAJOR   7.503790833876144
Attrib KURTOSIS ABOUT_MINOR   −17.856650965197858
Attrib HOLLOWS RATIO   −8.32317809245592
Sigmoid Node 7
Inputs   Weights
Threshold   −1.0359544606429671
Attrib COMPACTNESS   12.087738583878108
Attrib CIRCULARITY   −2.647930512959339
Attrib DISTANCE CIRCULARITY   −3.236468766805927
Attrib RADIUS RATIO   −4.9647141620499
Attrib PR.AXIS ASPECT RATIO   0.521903120621885
Attrib MAX.LENGTH ASPECT RATIO   −2.0344325299804873
Attrib SCATTER RATIO   5.418434702564439
Attrib ELONGATEDNESS   −2.7161356251725883
Attrib PR.AXIS RECTANGULARITY   0.9577641512142521
Attrib MAX.LENGTH RECTANGULARITY   2.636064122261253
Attrib SCALED VARIANCE_MAJOR   3.6328844381929133
Attrib SCALED VARIANCE_MINOR   4.069705442157138
Attrib SCALED RADIUS OF GYRATION   1.2087048835292085
Attrib SKEWNESS ABOUT_MAJOR   6.670869248938459
Attrib SKEWNESS ABOUT_MINOR   9.596760399490515
Attrib KURTOSIS ABOUT_MAJOR   2.779545634663578
Attrib KURTOSIS ABOUT_MINOR   −7.127967465303933
Attrib HOLLOWS RATIO   −3.48329953828509
Sigmoid Node 8
Inputs   Weights
Threshold   0.9500760605008629
Attrib COMPACTNESS   −2.098618603079999
Attrib CIRCULARITY   −3.3230047505953046
Attrib DISTANCE CIRCULARITY   −14.435993097423038
Attrib RADIUS RATIO   −14.533692294733681
Attrib PR.AXIS ASPECT RATIO   22.260956668418455
Attrib MAX.LENGTH ASPECT RATIO   −15.351321146441293
Attrib SCATTER RATIO   1.8798061594133673
Attrib ELONGATEDNESS   −20.50475157889438
Attrib PR.AXIS RECTANGULARITY   0.45297316240212115
Attrib MAX.LENGTH RECTANGULARITY   4.019106383861276
Attrib SCALED VARIANCE_MAJOR   −3.6265921492500155
Attrib SCALED VARIANCE_MINOR   0.06960648687250832
Attrib SCALED RADIUS OF GYRATION   −0.2845409961069615
Attrib SKEWNESS ABOUT_MAJOR   12.644931529454393
Attrib SKEWNESS ABOUT_MINOR   −3.862688925086085
Attrib KURTOSIS ABOUT_MAJOR   0.5741815565226442
Attrib KURTOSIS ABOUT_MINOR   11.305561780594042
Attrib HOLLOWS RATIO   −8.114971520454619
Sigmoid Node 9
Inputs   Weights

Threshold   −0.29645546404129564
Attrib COMPACTNESS   1.95219850639333
Attrib CIRCULARITY   −8.141517240857462
Attrib DISTANCE CIRCULARITY   12.535833565750487
Attrib RADIUS RATIO   −7.614190963372864
Attrib PR.AXIS ASPECT RATIO   3.750065239403674
Attrib MAX.LENGTH ASPECT RATIO   0.9777862641823769
Attrib SCATTER RATIO   −1.6944875521135523
Attrib ELONGATEDNESS   2.495669449847686
Attrib PR.AXIS RECTANGULARITY   2.798558524066805
Attrib MAX.LENGTH RECTANGULARITY   2.814026242897252
Attrib SCALED VARIANCE_MAJOR   4.252011052560862
Attrib SCALED VARIANCE_MINOR   −6.484913549970635
Attrib SCALED RADIUS OF GYRATION   7.6630167059538685
Attrib SKEWNESS ABOUT_MAJOR   15.440580776065723
Attrib SKEWNESS ABOUT_MINOR   −5.38383733648405
Attrib KURTOSIS ABOUT_MAJOR   2.3117720055042863
Attrib KURTOSIS ABOUT_MINOR   −12.434833713565423
Attrib HOLLOWS RATIO   19.107869269569697
Sigmoid Node 10
Inputs   Weights
Threshold   0.2431058582644477
Attrib COMPACTNESS   8.987422613022533
Attrib CIRCULARITY   −7.321356176414836
Attrib DISTANCE CIRCULARITY   −3.587751209706213
Attrib RADIUS RATIO   2.1783544819542957
Attrib PR.AXIS ASPECT RATIO   3.4867569311652247
Attrib MAX.LENGTH ASPECT RATIO   −2.5074021771189416
Attrib SCATTER RATIO   −0.22461787638229672
Attrib ELONGATEDNESS   2.0569818363928625
Attrib PR.AXIS RECTANGULARITY   6.3335811739898835
Attrib MAX.LENGTH RECTANGULARITY   0.4898961892260531
Attrib SCALED VARIANCE_MAJOR   −1.9231615367809884
Attrib SCALED VARIANCE_MINOR   1.1892640626150677
Attrib SCALED RADIUS OF GYRATION   −4.229522574631031
Attrib SKEWNESS ABOUT_MAJOR   −1.6060219414547574
Attrib SKEWNESS ABOUT_MINOR   6.720027095207096
Attrib KURTOSIS ABOUT_MAJOR   10.001247820501908
Attrib KURTOSIS ABOUT_MINOR   −2.2500392858169453
Attrib HOLLOWS RATIO   −9.349952446004327
Sigmoid Node 11
Inputs   Weights
Threshold   −0.47497091459811913
Attrib COMPACTNESS   −13.750761954993157
Attrib CIRCULARITY   −9.620619701068993
Attrib DISTANCE CIRCULARITY   5.94203145375523
Attrib RADIUS RATIO   6.303044157843965
Attrib PR.AXIS ASPECT RATIO   1.5740650764360629
Attrib MAX.LENGTH ASPECT RATIO   0.5409930591309545

Attrib SCATTER RATIO   5.900565858915801
Attrib ELONGATEDNESS   −7.064669316388749
Attrib PR.AXIS RECTANGULARITY   −2.797849763778351
Attrib MAX.LENGTH RECTANGULARITY   −12.118586376977218
Attrib SCALED VARIANCE_MAJOR   3.3275804971823852
Attrib SCALED VARIANCE_MINOR   3.6417559834760294
Attrib SCALED RADIUS OF GYRATION   2.264587339929302
Attrib SKEWNESS ABOUT_MAJOR   5.826729704780182
Attrib SKEWNESS ABOUT_MINOR   −2.508594030763493
Attrib KURTOSIS ABOUT_MAJOR   10.391609998733028
Attrib KURTOSIS ABOUT_MINOR   −7.5378071157785635
Attrib HOLLOWS RATIO   1.2219040122931706
Sigmoid Node 12
Inputs   Weights
Threshold   10.344264867363869
Attrib COMPACTNESS   12.935137745860095
Attrib CIRCULARITY   3.1898705126386497
Attrib DISTANCE CIRCULARITY   10.414359053102146
Attrib RADIUS RATIO   −12.877181915360069
Attrib PR.AXIS ASPECT RATIO   9.661543644587958
Attrib MAX.LENGTH ASPECT RATIO   16.06468595509524
Attrib SCATTER RATIO   −8.743202285609582
Attrib ELONGATEDNESS   9.773830733815466
Attrib PR.AXIS RECTANGULARITY   −7.826795869155039
Attrib MAX.LENGTH RECTANGULARITY   19.440079404864054
Attrib SCALED VARIANCE_MAJOR   −6.736484062016312
Attrib SCALED VARIANCE_MINOR   −8.791933784309668
Attrib SCALED RADIUS OF GYRATION   −12.035671362066406
Attrib SKEWNESS ABOUT_MAJOR   26.277730786496086
Attrib SKEWNESS ABOUT_MINOR   −3.2597128674686653
Attrib KURTOSIS ABOUT_MAJOR   −4.005734092463398
Attrib KURTOSIS ABOUT_MINOR   −5.837047065574214
Attrib HOLLOWS RATIO   12.852973914754426
Sigmoid Node 13
Inputs   Weights
Threshold   −14.800524661962928
Attrib COMPACTNESS   5.478363040945143
Attrib CIRCULARITY   −10.899197148273917
Attrib DISTANCE CIRCULARITY   4.376528690462495
Attrib RADIUS RATIO   3.2898930532754127
Attrib PR.AXIS ASPECT RATIO   −9.32866627004013
Attrib MAX.LENGTH ASPECT RATIO   −0.06267594139628746
Attrib SCATTER RATIO   −1.304850654219079
Attrib ELONGATEDNESS   7.411095993530895
Attrib PR.AXIS RECTANGULARITY   7.201720585698105
Attrib MAX.LENGTH RECTANGULARITY   −13.404359501361476
Attrib SCALED VARIANCE_MAJOR   1.0332681598704394
Attrib SCALED VARIANCE_MINOR   2.599157710444483
Attrib SCALED RADIUS OF GYRATION   −5.02378916416793

Attrib SKEWNESS ABOUT_MAJOR   −5.563541830011913
Attrib SKEWNESS ABOUT_MINOR   4.516179489609085
Attrib KURTOSIS ABOUT_MAJOR   −4.207077325362578
Attrib KURTOSIS ABOUT_MINOR   −5.16394158313765
Attrib HOLLOWS RATIO   −8.820662917860595
Sigmoid Node 14
Inputs   Weights
Threshold   −4.681865175499363
Attrib COMPACTNESS   −9.529983859507505
Attrib CIRCULARITY   0.09272266257951513
Attrib DISTANCE CIRCULARITY   −1.9404808550775425
Attrib RADIUS RATIO   8.970240060786542
Attrib PR.AXIS ASPECT RATIO   −17.189814734247456
Attrib MAX.LENGTH ASPECT RATIO   9.033397761339948
Attrib SCATTER RATIO   4.3221022307860455
Attrib ELONGATEDNESS   −2.0330311502366127
Attrib PR.AXIS RECTANGULARITY   7.174356977008702
Attrib MAX.LENGTH RECTANGULARITY   7.8235672926124025
Attrib SCALED VARIANCE_MAJOR   9.577695353316074
Attrib SCALED VARIANCE_MINOR   1.1435694058448005
Attrib SCALED RADIUS OF GYRATION   −7.010602220257689
Attrib SKEWNESS ABOUT_MAJOR   −12.968279421715462
Attrib SKEWNESS ABOUT_MINOR   −1.0193504449918966
Attrib KURTOSIS ABOUT_MAJOR   0.33291925494352803
Attrib KURTOSIS ABOUT_MINOR   −6.916546669478815
Attrib HOLLOWS RATIO   8.774181283270295
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.79 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   398   94.5368 %

```
Incorrectly Classified Instances          23                  5.4632 %
Kappa statistic                           0.9271
Mean absolute error                       0.04
Root mean squared error                   0.1554
Relative absolute error                   10.6722 %
Root relative squared error               35.9001 %
Total Number of Instances                 421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,848	0,009	0,967	0,848	0,904	0,878	0,949	0,924	opel
0,972	0,038	0,897	0,972	0,933	0,910	0,980	0,944	saab
0,991	0,026	0,931	0,991	0,960	0,946	0,994	0,984	bus
0,970	0,000	1,000	0,970	0,985	0,980	1,000	1,000	van
Weighted Avg.	0,945	0,019	0,948	0,945	0,945	0,928	0,980	0,963

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
89   10   6    0 |   a = opel
2   105   1    0 |   b = saab
1    0  108    0 |   c = bus
0    2    1   96 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:      weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:    vehicle
Instances:   421
Attributes:  19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
```

SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   2.3416981590681023
Node 4   9.553175364696544
Node 5   10.552334286361898
Node 6   10.082128975461387
Node 7   −11.710546567943641
Node 8   −20.10756546185049
Node 9   −10.836389620071174
Node 10   −8.310009660916569
Node 11   6.351347248410782
Node 12   −10.67913308999082
Node 13   −3.5370210301442335
Node 14   −6.1830621683686795
Sigmoid Node 1
Inputs   Weights
Threshold   −7.528553353260648
Node 4   −11.805843832750181
Node 5   −11.451939372428786
Node 6   −8.543853081183606
Node 7   11.86014005000456
Node 8   3.287855166404695
Node 9   11.299133019746797
Node 10   11.016631410544036
Node 11   −6.344727155338478
Node 12   −17.80938725431551
Node 13   9.68379228295098
Node 14   12.352201110462062
Sigmoid Node 2
Inputs   Weights
Threshold   −1.2119200315567373
Node 4   1.851716185415753

Node 5   4.979078443771749
Node 6   6.356040704103091
Node 7   2.748673070316116
Node 8   13.696428837306
Node 9   −2.6101691287658464
Node 10   −2.219839345456749
Node 11   −3.4297617549563633
Node 12   −6.839221691602406
Node 13   −16.214961199049363
Node 14   −19.554977206946226
Sigmoid Node 3
Inputs   Weights
Threshold   −7.506850035125784
Node 4   −1.832858498418526
Node 5   −1.5195102485197831
Node 6   −6.091499235657367
Node 7   −2.129796541111599
Node 8   −0.8920608590768198
Node 9   5.101269791349431
Node 10   −0.7500977065757206
Node 11   −7.685686290503062
Node 12   13.684178374800775
Node 13   1.0979173133007902
Node 14   −1.0903121523262562
Sigmoid Node 4
Inputs   Weights
Threshold   −5.23733494443067
Attrib COMPACTNESS   −8.368615546754139
Attrib CIRCULARITY   −2.819253452060979
Attrib DISTANCE CIRCULARITY   3.833834947121197
Attrib RADIUS RATIO   −5.1810600891771115
Attrib PR.AXIS ASPECT RATIO   −4.617491266354403
Attrib MAX.LENGTH ASPECT RATIO   4.333822189630567
Attrib SCATTER RATIO   6.567783850082054
Attrib ELONGATEDNESS   −6.333909822551755
Attrib PR.AXIS RECTANGULARITY   2.0461126464418182
Attrib MAX.LENGTH RECTANGULARITY   3.6725008546966538
Attrib SCALED VARIANCE_MAJOR   4.634014058925703
Attrib SCALED VARIANCE_MINOR   9.4126056948817
Attrib SCALED RADIUS OF GYRATION   −6.544243111386985
Attrib SKEWNESS ABOUT_MAJOR   2.380583161617975
Attrib SKEWNESS ABOUT_MINOR   4.375451752554836
Attrib KURTOSIS ABOUT_MAJOR   7.470468522614569
Attrib KURTOSIS ABOUT_MINOR   4.278028355719222
Attrib HOLLOWS RATIO   −5.3586844953875525
Sigmoid Node 5
Inputs   Weights
Threshold   0.42089418908049436
Attrib COMPACTNESS   −1.73743118215374

Attrib CIRCULARITY   8.025864341011571
Attrib DISTANCE CIRCULARITY   −9.038287290449004
Attrib RADIUS RATIO   10.167726854771253
Attrib PR.AXIS ASPECT RATIO   4.3105342887323275
Attrib MAX.LENGTH ASPECT RATIO   −6.125964379356875
Attrib SCATTER RATIO   5.938850354822055
Attrib ELONGATEDNESS   −8.079699873884067
Attrib PR.AXIS RECTANGULARITY   −0.9490411810161612
Attrib MAX.LENGTH RECTANGULARITY   5.126129035920924
Attrib SCALED VARIANCE_MAJOR   2.710201510862373
Attrib SCALED VARIANCE_MINOR   7.709351479402268
Attrib SCALED RADIUS OF GYRATION   −7.8446646591708635
Attrib SKEWNESS ABOUT_MAJOR   −2.1751353412821093
Attrib SKEWNESS ABOUT_MINOR   −1.810957555798064
Attrib KURTOSIS ABOUT_MAJOR   2.615356720692497
Attrib KURTOSIS ABOUT_MINOR   20.195781076458463
Attrib HOLLOWS RATIO   −18.266057121715004
Sigmoid Node 6
Inputs   Weights
Threshold   −3.3172234736546833
Attrib COMPACTNESS   −12.581798102448378
Attrib CIRCULARITY   11.97350234331806
Attrib DISTANCE CIRCULARITY   −0.4118391506015806
Attrib RADIUS RATIO   −2.7402552061019305
Attrib PR.AXIS ASPECT RATIO   −2.2814248158281694
Attrib MAX.LENGTH ASPECT RATIO   2.631333917849711
Attrib SCATTER RATIO   3.180828719157149
Attrib ELONGATEDNESS   4.6490385008518915
Attrib PR.AXIS RECTANGULARITY   5.673365827256029
Attrib MAX.LENGTH RECTANGULARITY   −4.043000157387297
Attrib SCALED VARIANCE_MAJOR   −0.10493824242135315
Attrib SCALED VARIANCE_MINOR   7.475975179355622
Attrib SCALED RADIUS OF GYRATION   4.521017307060063
Attrib SKEWNESS ABOUT_MAJOR   4.126825748685578
Attrib SKEWNESS ABOUT_MINOR   3.2147211501777706
Attrib KURTOSIS ABOUT_MAJOR   7.503790833876144
Attrib KURTOSIS ABOUT_MINOR   −17.856650965197858
Attrib HOLLOWS RATIO   −8.32317809245592
Sigmoid Node 7
Inputs   Weights
Threshold   −1.0359544606429671
Attrib COMPACTNESS   12.087738583878108
Attrib CIRCULARITY   −2.647930512959339
Attrib DISTANCE CIRCULARITY   −3.236468766805927
Attrib RADIUS RATIO   −4.9647141620499
Attrib PR.AXIS ASPECT RATIO   0.521903120621885
Attrib MAX.LENGTH ASPECT RATIO   −2.034325299804873
Attrib SCATTER RATIO   5.418434702564439
Attrib ELONGATEDNESS   −2.7161356251725883

Attrib PR.AXIS RECTANGULARITY   0.9577641512142521
Attrib MAX.LENGTH RECTANGULARITY   2.636064122261253
Attrib SCALED VARIANCE_MAJOR   3.6328844381929133
Attrib SCALED VARIANCE_MINOR   4.069705442157138
Attrib SCALED RADIUS OF GYRATION   1.2087048835292085
Attrib SKEWNESS ABOUT_MAJOR   6.670869248938459
Attrib SKEWNESS ABOUT_MINOR   9.596760399490515
Attrib KURTOSIS ABOUT_MAJOR   2.779545634663578
Attrib KURTOSIS ABOUT_MINOR   −7.127967465303933
Attrib HOLLOWS RATIO   −3.48329953828509
Sigmoid Node 8
Inputs   Weights
Threshold   0.9500760605008629
Attrib COMPACTNESS   −2.098618603079999
Attrib CIRCULARITY   −3.3230047505953046
Attrib DISTANCE CIRCULARITY   −14.435993097423038
Attrib RADIUS RATIO   −14.533692294733681
Attrib PR.AXIS ASPECT RATIO   22.260956668418455
Attrib MAX.LENGTH ASPECT RATIO   −15.351321146441293
Attrib SCATTER RATIO   1.8798061594133673
Attrib ELONGATEDNESS   −20.50475157889438
Attrib PR.AXIS RECTANGULARITY   0.45297316240212115
Attrib MAX.LENGTH RECTANGULARITY   4.019106383861276
Attrib SCALED VARIANCE_MAJOR   −3.6265921492500155
Attrib SCALED VARIANCE_MINOR   0.06960648687250832
Attrib SCALED RADIUS OF GYRATION   −0.2845409961069615
Attrib SKEWNESS ABOUT_MAJOR   12.644931529454393
Attrib SKEWNESS ABOUT_MINOR   −3.862688925086085
Attrib KURTOSIS ABOUT_MAJOR   0.5741815565226442
Attrib KURTOSIS ABOUT_MINOR   11.305561780594042
Attrib HOLLOWS RATIO   −8.114971520454619
Sigmoid Node 9
Inputs   Weights
Threshold   −0.29645546404129564
Attrib COMPACTNESS   1.95219850639333
Attrib CIRCULARITY   −8.141517240857462
Attrib DISTANCE CIRCULARITY   12.535833565750487
Attrib RADIUS RATIO   −7.614190963372864
Attrib PR.AXIS ASPECT RATIO   3.750065239403674
Attrib MAX.LENGTH ASPECT RATIO   0.9777862641823769
Attrib SCATTER RATIO   −1.6944875521135523
Attrib ELONGATEDNESS   2.495669449847686
Attrib PR.AXIS RECTANGULARITY   2.798585524066805
Attrib MAX.LENGTH RECTANGULARITY   2.814026242897252
Attrib SCALED VARIANCE_MAJOR   4.252011052560862
Attrib SCALED VARIANCE_MINOR   −6.484913549970635
Attrib SCALED RADIUS OF GYRATION   7.6630167059538685
Attrib SKEWNESS ABOUT_MAJOR   15.440580776065723
Attrib SKEWNESS ABOUT_MINOR   −5.38383733648400

Attrib KURTOSIS ABOUT_MAJOR   2.3117720055042863
Attrib KURTOSIS ABOUT_MINOR   −12.434833713565423
Attrib HOLLOWS RATIO   19.107869269569697
Sigmoid Node 10
Inputs   Weights
Threshold   0.2431058582644477
Attrib COMPACTNESS   8.987422613022533
Attrib CIRCULARITY   −7.321356176414836
Attrib DISTANCE CIRCULARITY   −3.587751209706213
Attrib RADIUS RATIO   2.1783544819542957
Attrib PR.AXIS ASPECT RATIO   3.4867569311652247
Attrib MAX.LENGTH ASPECT RATIO   −2.5074021771189416
Attrib SCATTER RATIO   −0.22461787638229672
Attrib ELONGATEDNESS   2.0569818363928625
Attrib PR.AXIS RECTANGULARITY   6.3335811739898835
Attrib MAX.LENGTH RECTANGULARITY   0.4898961892260531
Attrib SCALED VARIANCE_MAJOR   −1.9231615367809884
Attrib SCALED VARIANCE_MINOR   1.1892640626150677
Attrib SCALED RADIUS OF GYRATION   −4.229522574631031
Attrib SKEWNESS ABOUT_MAJOR   −1.6060219414547574
Attrib SKEWNESS ABOUT_MINOR   6.720027095207096
Attrib KURTOSIS ABOUT_MAJOR   10.001247820501908
Attrib KURTOSIS ABOUT_MINOR   −2.2500392858169453
Attrib HOLLOWS RATIO   −9.349952446004327
Sigmoid Node 11
Inputs   Weights
Threshold   −0.47497091459811913
Attrib COMPACTNESS   −13.750761954993157
Attrib CIRCULARITY   −9.620619701068993
Attrib DISTANCE CIRCULARITY   5.94203145375523
Attrib RADIUS RATIO   6.3030344157843965
Attrib PR.AXIS ASPECT RATIO   1.5740650764360629
Attrib MAX.LENGTH ASPECT RATIO   0.5409930591309545
Attrib SCATTER RATIO   5.900565858915801
Attrib ELONGATEDNESS   −7.064669316388749
Attrib PR.AXIS RECTANGULARITY   −2.797849763778351
Attrib MAX.LENGTH RECTANGULARITY   −12.118586376977218
Attrib SCALED VARIANCE_MAJOR   3.3275804971823852
Attrib SCALED VARIANCE_MINOR   3.6417559834760294
Attrib SCALED RADIUS OF GYRATION   2.264587339929302
Attrib SKEWNESS ABOUT_MAJOR   5.826729704780182
Attrib SKEWNESS ABOUT_MINOR   −2.508594030763493
Attrib KURTOSIS ABOUT_MAJOR   10.391609998733028
Attrib KURTOSIS ABOUT_MINOR   −7.5378071157785635
Attrib HOLLOWS RATIO   1.2219040122931706
Sigmoid Node 12
Inputs   Weights
Threshold   10.344264867363869
Attrib COMPACTNESS   12.935137745860095

Attrib CIRCULARITY   3.1898705126386497
Attrib DISTANCE CIRCULARITY   10.414359053102146
Attrib RADIUS RATIO   −12.877181915360069
Attrib PR.AXIS ASPECT RATIO   9.661543644587958
Attrib MAX.LENGTH ASPECT RATIO   16.06468595509524
Attrib SCATTER RATIO   −8.743202285609582
Attrib ELONGATEDNESS   9.773830733815466
Attrib PR.AXIS RECTANGULARITY   −7.826795869155039
Attrib MAX.LENGTH RECTANGULARITY   19.440079404864054
Attrib SCALED VARIANCE_MAJOR   −6.736484062016312
Attrib SCALED VARIANCE_MINOR   −8.791933784309668
Attrib SCALED RADIUS OF GYRATION   −12.035671362066406
Attrib SKEWNESS ABOUT_MAJOR   26.277730786496086
Attrib SKEWNESS ABOUT_MINOR   −3.2597128674686653
Attrib KURTOSIS ABOUT_MAJOR   −4.005734092463398
Attrib KURTOSIS ABOUT_MINOR   −5.837047065574214
Attrib HOLLOWS RATIO   12.852973914754426
Sigmoid Node 13
Inputs   Weights
Threshold   −14.800524661962928
Attrib COMPACTNESS   5.478363040945143
Attrib CIRCULARITY   −10.899197148273917
Attrib DISTANCE CIRCULARITY   4.376528690462495
Attrib RADIUS RATIO   3.2898930532754127
Attrib PR.AXIS ASPECT RATIO   −9.32866627004013
Attrib MAX.LENGTH ASPECT RATIO   −0.06267594139628746
Attrib SCATTER RATIO   −1.304850654219079
Attrib ELONGATEDNESS   7.411095993530895
Attrib PR.AXIS RECTANGULARITY   7.201720585698105
Attrib MAX.LENGTH RECTANGULARITY   −13.404359501361476
Attrib SCALED VARIANCE_MAJOR   1.0332681598704394
Attrib SCALED VARIANCE_MINOR   2.599157710444483
Attrib SCALED RADIUS OF GYRATION   −5.02378916416793
Attrib SKEWNESS ABOUT_MAJOR   −5.563541830011913
Attrib SKEWNESS ABOUT_MINOR   4.516179489609085
Attrib KURTOSIS ABOUT_MAJOR   −4.207077325362578
Attrib KURTOSIS ABOUT_MINOR   −5.16394158313765
Attrib HOLLOWS RATIO   −8.820662917860595
Sigmoid Node 14
Inputs   Weights
Threshold   −4.681865175499363
Attrib COMPACTNESS   −9.529983859507505
Attrib CIRCULARITY   0.09272266257951513
Attrib DISTANCE CIRCULARITY   −1.9404808550775425
Attrib RADIUS RATIO   8.970240060786542
Attrib PR.AXIS ASPECT RATIO   −17.189814734247456
Attrib MAX.LENGTH ASPECT RATIO   9.033397761339948
Attrib SCATTER RATIO   4.3221022307860455
Attrib ELONGATEDNESS   −2.0330311502366127

```
Attrib PR.AXIS RECTANGULARITY     7.174356977008702
Attrib MAX.LENGTH RECTANGULARITY     7.8235672926124025
Attrib SCALED VARIANCE_MAJOR     9.577695353316074
Attrib SCALED VARIANCE_MINOR     1.1435694058448005
Attrib SCALED RADIUS OF GYRATION     −7.010602220257689
Attrib SKEWNESS ABOUT_MAJOR     −12.968279421715462
Attrib SKEWNESS ABOUT_MINOR     −1.0193504449918966
Attrib KURTOSIS ABOUT_MAJOR     0.33291925494352803
Attrib KURTOSIS ABOUT_MINOR     −6.916546669478815
Attrib HOLLOWS RATIO     8.774181283270295
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3
```

Time taken to build model: 2.61 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

```
Correctly Classified Instances         729               86.1702 %
Incorrectly Classified Instances       117               13.8298 %
Kappa statistic                          0.8154
Mean absolute error                      0.0804
Root mean squared error                  0.2478
Relative absolute error                 21.4495 %
Root relative squared error             57.2459 %
Total Number of Instances              846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F–Measure	MCC	ROC Area	PRC Area	Class
0,679	0,047	0,828	0,679	0,746	0,678	0,883	0,782	opel
0,857	0,107	0,735	0,857	0,791	0,716	0,919	0,764	saab

0,982	0,027	0,926	0,982	0,953	0,937	0,993
0,981	bus					
0,930	0,005	0,984	0,930	0,956	0,944	0,993
0,985	van					
Weighted Avg.		0,862	0,047	0,866	0,862	0,861
0,817	0,947	0,877				

=== Confusion Matrix ===

```
a    b    c    d    <--- classified as
144   55   10    3  |    a = opel
27  186    4    0  |    b = saab
 1    3  214    0  |    c = bus
 2    9    3  185  |    d = van
```

8 8ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set: size unknown (reading incrementally)
```

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

Sigmoid Node 0

Inputs   Weights
Threshold   −0.16334050123262792
Node 4   2.063434912563473
Node 5   2.553672076673514
Node 6   −6.655840995630926
Node 7   −3.781752991458039
Sigmoid Node 1
Inputs   Weights
Threshold   −13.641989732814238
Node 4   12.178113939490112
Node 5   8.495093236513068
Node 6   −3.3383492514636632
Node 7   3.3556128692325373
Sigmoid Node 2
Inputs   Weights
Threshold   0.318552401397369
Node 4   −5.077273438228979
Node 5   −16.517354112964934
Node 6   12.219710440418728
Node 7   −6.170254599852359
Sigmoid Node 3
Inputs   Weights
Threshold   −0.6100035096225471
Node 4   −19.850842202239587
Node 5   −0.2302005739512353
Node 6   −2.2988738324630726
Node 7   4.6626110587239635
Sigmoid Node 4
Inputs   Weights
Threshold   −6.827051714582455
Attrib COMPACTNESS   −5.655527771358092
Attrib CIRCULARITY   −8.578260656523332
Attrib DISTANCE CIRCULARITY   −10.326321178895869
Attrib RADIUS RATIO   13.86807778980533
Attrib PR.AXIS ASPECT RATIO   −16.76213153768611
Attrib MAX.LENGTH ASPECT RATIO   −14.021966360996284
Attrib SCATTER RATIO   3.3013714909744927
Attrib ELONGATEDNESS   −1.2075411072736193
Attrib PR.AXIS RECTANGULARITY   12.004205766151205
Attrib MAX.LENGTH RECTANGULARITY   −12.861421679323854
Attrib SCALED VARIANCE_MAJOR   17.845508577438785
Attrib SCALED VARIANCE_MINOR   8.435799688222664
Attrib SCALED RADIUS OF GYRATION   11.37264117209989
Attrib SKEWNESS ABOUT_MAJOR   −21.165635415292815
Attrib SKEWNESS ABOUT_MINOR   3.7112343107881167
Attrib KURTOSIS ABOUT_MAJOR   0.7055671405808832
Attrib KURTOSIS ABOUT_MINOR   2.4026711602937683
Attrib HOLLOWS RATIO   −7.071165689386018
Sigmoid Node 5

Inputs   Weights
Threshold   −15.129858056534554
Attrib COMPACTNESS   −3.7131739345698285
Attrib CIRCULARITY   −10.750836097820159
Attrib DISTANCE CIRCULARITY   −17.599706242769855
Attrib RADIUS RATIO   11.026783130658906
Attrib PR.AXIS ASPECT RATIO   3.9129748705524943
Attrib MAX.LENGTH ASPECT RATIO   −4.923146432966823
Attrib SCATTER RATIO   0.2866137612569457
Attrib ELONGATEDNESS   3.7778011086144683
Attrib PR.AXIS RECTANGULARITY   3.591370581982546
Attrib MAX.LENGTH RECTANGULARITY   −14.282215548755557
Attrib SCALED VARIANCE_MAJOR   −7.479653206477098
Attrib SCALED VARIANCE_MINOR   4.160792741068748
Attrib SCALED RADIUS OF GYRATION   10.714334419642487
Attrib SKEWNESS ABOUT_MAJOR   −1.8225171351245344
Attrib SKEWNESS ABOUT_MINOR   −3.3627765686872686
Attrib KURTOSIS ABOUT_MAJOR   −1.009175829105379
Attrib KURTOSIS ABOUT_MINOR   −2.061094489054318
Attrib HOLLOWS RATIO   −2.7829556183076942
Sigmoid Node 6
Inputs   Weights
Threshold   6.072212415862546
Attrib COMPACTNESS   −3.6843323080348216
Attrib CIRCULARITY   2.210102018313942
Attrib DISTANCE CIRCULARITY   −12.94677518623554
Attrib RADIUS RATIO   −18.05648614164741
Attrib PR.AXIS ASPECT RATIO   28.195511214379355
Attrib MAX.LENGTH ASPECT RATIO   −17.432047815135277
Attrib SCATTER RATIO   4.149297266109451
Attrib ELONGATEDNESS   −13.504114116766605
Attrib PR.AXIS RECTANGULARITY   1.417981983856571
Attrib MAX.LENGTH RECTANGULARITY   −4.511358861654296
Attrib SCALED VARIANCE_MAJOR   −7.368695277621233
Attrib SCALED VARIANCE_MINOR   8.272649174782796
Attrib SCALED RADIUS OF GYRATION   1.6584376308774822
Attrib SKEWNESS ABOUT_MAJOR   17.233946057842292
Attrib SKEWNESS ABOUT_MINOR   −2.6699324416694106
Attrib KURTOSIS ABOUT_MAJOR   0.6032195877372174
Attrib KURTOSIS ABOUT_MINOR   8.869038565574234
Attrib HOLLOWS RATIO   −1.5555875917894897
Sigmoid Node 7
Inputs   Weights
Threshold   −1.0009861017191604
Attrib COMPACTNESS   14.793215631632686
Attrib CIRCULARITY   −27.924224319120917
Attrib DISTANCE CIRCULARITY   9.638069037886346
Attrib RADIUS RATIO   −1.8906406815530241
Attrib PR.AXIS ASPECT RATIO   −3.55238048240068

Attrib MAX.LENGTH ASPECT RATIO   3.6864760999161943
Attrib SCATTER RATIO   −7.027015614251598
Attrib ELONGATEDNESS   16.84440818287121
Attrib PR.AXIS RECTANGULARITY   11.638722916040905
Attrib MAX.LENGTH RECTANGULARITY   16.301564190258635
Attrib SCALED VARIANCE_MAJOR   −2.140835296275626
Attrib SCALED VARIANCE_MINOR   −11.50330700948201
Attrib SCALED RADIUS OF GYRATION   14.190829127218855
Attrib SKEWNESS ABOUT_MAJOR   3.7853783256261706
Attrib SKEWNESS ABOUT_MINOR   −2.199789498348879
Attrib KURTOSIS ABOUT_MAJOR   −1.8263659854932175
Attrib KURTOSIS ABOUT_MINOR   −12.924599039823693
Attrib HOLLOWS RATIO   14.384485368336968
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.58 seconds

═══ Evaluation on test set ═══

Time taken to test model on supplied test set: 0 seconds

═══ Summary ═══

Correctly Classified Instances   344   81.7102 %
Incorrectly Classified Instances   77   18.2898 %
Kappa statistic   0.7563
Mean absolute error   0.113
Root mean squared error   0.2486
Relative absolute error   30.1538 %
Root relative squared error   57.432 %
Total Number of Instances   421

═══ Detailed Accuracy By Class ═══

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

0,876	0,199	0,594	0,876	0,708	0,607	0,911
0,704	opel					
0,444	0,029	0,842	0,444	0,582	0,531	0,918
0,819	saab					
0,982	0,006	0,982	0,982	0,982	0,975	1,000
0,999	bus					
0,980	0,009	0,970	0,980	0,975	0,967	0,997
0,962	van					
Weighted Avg.	0,817	0,061	0,846	0,817	0,809	
0,767	0,956	0,871				

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
92   9    1    3  |   a = opel
60   48   0    0  |   b = saab
2    0   107   0  |   c = bus
1    0    1   97  |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:       weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:     vehicle
Instances:    421
Attributes:   19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
```

Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.16334050123262792
Node 4   2.063434912563473
Node 5   2.553672076673514
Node 6   −6.655840995630926
Node 7   −3.781752991458039
Sigmoid Node 1
Inputs   Weights
Threshold   −13.641989732814238
Node 4   12.178113939490112
Node 5   8.495093236513068
Node 6   −3.3383492514636632
Node 7   3.3556128692325373
Sigmoid Node 2
Inputs   Weights
Threshold   0.318552401397369
Node 4   −5.077273438228979
Node 5   −16.517354112964934
Node 6   12.219710440418728
Node 7   −6.170254599852359
Sigmoid Node 3
Inputs   Weights
Threshold   −0.6100035096225471
Node 4   −19.85084220223958 7
Node 5   −0.2302005739512353
Node 6   −2.2988738324630726
Node 7   4.6626110587239635
Sigmoid Node 4
Inputs   Weights
Threshold   −6.827051714582455
Attrib COMPACTNESS   −5.655527771358092
Attrib CIRCULARITY   −8.578260656523332
Attrib DISTANCE CIRCULARITY   −10.326321178895869
Attrib RADIUS RATIO   13.86807778980533
Attrib PR.AXIS ASPECT RATIO   −16.76213153768611
Attrib MAX.LENGTH ASPECT RATIO   −14.021966360996284
Attrib SCATTER RATIO   3.3013714909744927
Attrib ELONGATEDNESS   −1.207541107273 6193
Attrib PR.AXIS RECTANGULARITY   12.004205766151205
Attrib MAX.LENGTH RECTANGULARITY   −12.861421679323854
Attrib SCALED VARIANCE_MAJOR   17.845508577438785
Attrib SCALED VARIANCE_MINOR   8.435799688222664
Attrib SCALED RADIUS OF GYRATION   11.37264117209989

119

Attrib SKEWNESS ABOUT_MAJOR -21.165635415292815
Attrib SKEWNESS ABOUT_MINOR 3.7112343107881167
Attrib KURTOSIS ABOUT_MAJOR 0.7055671405808832
Attrib KURTOSIS ABOUT_MINOR 2.4026711602937683
Attrib HOLLOWS RATIO -7.071165689386018
Sigmoid Node 5
Inputs   Weights
Threshold -15.129858056534554
Attrib COMPACTNESS -3.7131739345698285
Attrib CIRCULARITY -10.750836097820159
Attrib DISTANCE CIRCULARITY -17.599706242769855
Attrib RADIUS RATIO 11.026783130658906
Attrib PR.AXIS ASPECT RATIO 3.9129748705524943
Attrib MAX.LENGTH ASPECT RATIO -4.923146432966823
Attrib SCATTER RATIO 0.2866137612569457
Attrib ELONGATEDNESS 3.7778011086144683
Attrib PR.AXIS RECTANGULARITY 3.591370581982546
Attrib MAX.LENGTH RECTANGULARITY -14.282215548755557
Attrib SCALED VARIANCE_MAJOR -7.479653206477098
Attrib SCALED VARIANCE_MINOR 4.160792741068748
Attrib SCALED RADIUS OF GYRATION 10.714334419642487
Attrib SKEWNESS ABOUT_MAJOR -1.8225171351245344
Attrib SKEWNESS ABOUT_MINOR -3.3627765686872686
Attrib KURTOSIS ABOUT_MAJOR -1.009175829105379
Attrib KURTOSIS ABOUT_MINOR -2.061094489054318
Attrib HOLLOWS RATIO -2.7829556183076942
Sigmoid Node 6
Inputs   Weights
Threshold 6.072212415862546
Attrib COMPACTNESS -3.6843323080348216
Attrib CIRCULARITY 2.210102018313942
Attrib DISTANCE CIRCULARITY -12.94677518623554
Attrib RADIUS RATIO -18.05648614164741
Attrib PR.AXIS ASPECT RATIO 28.195511214379355
Attrib MAX.LENGTH ASPECT RATIO -17.432047815135277
Attrib SCATTER RATIO 4.149297266109451
Attrib ELONGATEDNESS -13.504114116766605
Attrib PR.AXIS RECTANGULARITY 1.417981983856571
Attrib MAX.LENGTH RECTANGULARITY -4.511358861654296
Attrib SCALED VARIANCE_MAJOR -7.368695277621233
Attrib SCALED VARIANCE_MINOR 8.272649174782796
Attrib SCALED RADIUS OF GYRATION 1.6584376308774822
Attrib SKEWNESS ABOUT_MAJOR 17.233946057842292
Attrib SKEWNESS ABOUT_MINOR -2.6699324416694106
Attrib KURTOSIS ABOUT_MAJOR 0.6032195877372174
Attrib KURTOSIS ABOUT_MINOR 8.869038565574234
Attrib HOLLOWS RATIO -1.5555875917894897
Sigmoid Node 7
Inputs   Weights

Threshold   −1.0009861017191604
Attrib COMPACTNESS   14.793215631632686
Attrib CIRCULARITY   −27.924224319120917
Attrib DISTANCE CIRCULARITY   9.638069037886346
Attrib RADIUS RATIO   −1.8906406815530241
Attrib PR.AXIS ASPECT RATIO   −3.55238048240068
Attrib MAX.LENGTH ASPECT RATIO   3.6864760999161943
Attrib SCATTER RATIO   −7.027015614251598
Attrib ELONGATEDNESS   16.84440818287121
Attrib PR.AXIS RECTANGULARITY   11.638722916040905
Attrib MAX.LENGTH RECTANGULARITY   16.301564190258635
Attrib SCALED VARIANCE_MAJOR   −2.140835296275626
Attrib SCALED VARIANCE_MINOR   −11.50330700948201
Attrib SCALED RADIUS OF GYRATION   14.190829127218855
Attrib SKEWNESS ABOUT_MAJOR   3.7853783256261706
Attrib SKEWNESS ABOUT_MINOR   −2.199789498348879
Attrib KURTOSIS ABOUT_MAJOR   −1.8263659854932175
Attrib KURTOSIS ABOUT_MINOR   −12.924599039823693
Attrib HOLLOWS RATIO   14.384485368336968
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.84 seconds

═══ Evaluation on test set ═══

Time taken to test model on supplied test set: 0.01 seconds

═══ Summary ═══

Correctly Classified Instances   658   77.7778 %
Incorrectly Classified Instances   188   22.2222 %
Kappa statistic   0.7039
Mean absolute error   0.1294
Root mean squared error   0.276
Relative absolute error   34.5152 %
Root relative squared error   63.76   %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,844	0,232	0,549	0,844	0,665	0,545	0,879	0,622	opel
0,387	0,035	0,792	0,387	0,520	0,464	0,911	0,765	saab
0,968	0,013	0,963	0,968	0,966	0,954	0,998	0,995	bus
0,925	0,017	0,944	0,925	0,934	0,914	0,992	0,944	van
Weighted Avg.	0,074	0,811	0,778	0,769	0,717	0,944	0,831	

=== Confusion Matrix ===

```
  a   b   c   d   <-- classified as
179  21   3   9 |   a = opel
131  84   0   2 |   b = saab
  7   0 211   0 |   c = bus
  9   1   5 184 |   d = van
```

9 9ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
```

KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −8.203489361339983
Node 4   −9.961231690445226
Node 5   −7.963317765545437
Node 6   10.193748864111592
Node 7   11.85916203612254
Node 8   −5.4792489498924
Node 9   3.271670870554917
Node 10   9.017272190837078
Node 11   −8.107529587899268
Node 12   3.2934081668758775
Node 13   5.9548295342950786
Node 14   0.20861116966502918
Node 15   −6.111423077661824
Node 16   −12.178277946214187
Node 17   8.542135294837466
Node 18   7.961645752976833
Node 19   −14.613922503768546
Node 20   −6.402998948392835
Node 21   8.90849605994628
Sigmoid Node 1
Inputs   Weights
Threshold   −6.78580428972007
Node 4   6.01777213608824
Node 5   9.893270365467869
Node 6   −5.785967897202327
Node 7   −8.920798494920405
Node 8   −5.96752861777055
Node 9   −7.654794203004208
Node 10   −10.238650953856702
Node 11   9.202751720381897
Node 12   −5.546812400567394
Node 13   −7.139959494990554
Node 14   14.66441125646336
Node 15   −9.607760732064623
Node 16   10.158074440103121
Node 17   5.42863143009172
Node 18   2.7714537067113825
Node 19   6.866912643409186
Node 20   −17.545765540882368

Node 21   −8.94028614037263
Sigmoid Node 2
Inputs   Weights
Threshold   1.167187415190814
Node 4   3.3863340228208827
Node 5   −2.6259571022659087
Node 6   −0.08416120141019323
Node 7   2.0140887068207807
Node 8   −2.061613425395353
Node 9   7.820168547243923
Node 10   1.8481213703716186
Node 11   −0.011606256811402888
Node 12   −1.8706096623412722
Node 13   −0.10219999091072769
Node 14   −14.47875603684527
Node 15   8.700673215287082
Node 16   −2.266437014520573
Node 17   −12.918869144628339
Node 18   −5.172995596307522
Node 19   7.548194407781892
Node 20   −5.010240812406904
Node 21   −0.2539564788517312
Sigmoid Node 3
Inputs   Weights
Threshold   −7.369691380321452
Node 4   −1.1534823253320285
Node 5   6.1645239972175405
Node 6   −2.35550655388827
Node 7   −2.0942884594076943
Node 8   2.869259233898552
Node 9   −8.116746762563551
Node 10   4.941173667667074
Node 11   −0.30552244089209873
Node 12   −1.241930358676757
Node 13   −3.3406020350594923
Node 14   −1.768827773906871
Node 15   −1.6681376297146941
Node 16   0.3374865916599511
Node 17   0.5289154312025317
Node 18   −3.3262217574209623
Node 19   −0.6420161047278814
Node 20   13.743271419172777
Node 21   −5.592572900386016
Sigmoid Node 4
Inputs   Weights
Threshold   −0.2867304689804343
Attrib COMPACTNESS   6.486542222071891
Attrib CIRCULARITY   −4.148314751674402
Attrib DISTANCE CIRCULARITY   −3.8564397123023855

Attrib RADIUS RATIO   −3.6849763253104104
Attrib PR.AXIS ASPECT RATIO   0.5665978542233897
Attrib MAX.LENGTH ASPECT RATIO   −3.3957082156494005
Attrib SCATTER RATIO   1.3317581669445302
Attrib ELONGATEDNESS   −2.755000617866951
Attrib PR.AXIS RECTANGULARITY   −1.027844076717511
Attrib MAX.LENGTH RECTANGULARITY   −0.42634268504045425
Attrib SCALED VARIANCE_MAJOR   1.957563742137486
Attrib SCALED VARIANCE_MINOR   0.47211646078611585
Attrib SCALED RADIUS OF GYRATION   6.258997116987927
Attrib SKEWNESS ABOUT_MAJOR   5.607339480467588
Attrib SKEWNESS ABOUT_MINOR   −1.4315663756637063
Attrib KURTOSIS ABOUT_MAJOR   3.5933135671658465
Attrib KURTOSIS ABOUT_MINOR   4.682107690293269
Attrib HOLLOWS RATIO   −5.4838459929644126
Sigmoid Node 5
Inputs   Weights
Threshold   0.05619840339252739
Attrib COMPACTNESS   −6.4146729567201435
Attrib CIRCULARITY   −6.339418675116028
Attrib DISTANCE CIRCULARITY   5.077990484062497
Attrib RADIUS RATIO   −2.8177386181066786
Attrib PR.AXIS ASPECT RATIO   3.4521491581437704
Attrib MAX.LENGTH ASPECT RATIO   3.88343515296988883
Attrib SCATTER RATIO   0.21710156851633192
Attrib ELONGATEDNESS   6.216546276801493
Attrib PR.AXIS RECTANGULARITY   1.9200732074904778
Attrib MAX.LENGTH RECTANGULARITY   0.8366333893075298
Attrib SCALED VARIANCE_MAJOR   2.473408306552678
Attrib SCALED VARIANCE_MINOR   −1.0411290664837158
Attrib SCALED RADIUS OF GYRATION   11.347109909714138
Attrib SKEWNESS ABOUT_MAJOR   0.3310140269851851
Attrib SKEWNESS ABOUT_MINOR   0.7459104140734999
Attrib KURTOSIS ABOUT_MAJOR   −5.52373901202291
Attrib KURTOSIS ABOUT_MINOR   −11.095455854753968
Attrib HOLLOWS RATIO   24.576305224207943
Sigmoid Node 6
Inputs   Weights
Threshold   −3.704549147174551717
Attrib COMPACTNESS   −3.500575298059791
Attrib CIRCULARITY   −7.325798130194072
Attrib DISTANCE CIRCULARITY   1.9604947031719384
Attrib RADIUS RATIO   3.903454555837692
Attrib PR.AXIS ASPECT RATIO   1.884319662864958
Attrib MAX.LENGTH ASPECT RATIO   5.87055382131083
Attrib SCATTER RATIO   5.188521975199885
Attrib ELONGATEDNESS   −3.896506823599909
Attrib PR.AXIS RECTANGULARITY   −5.291117858629435
Attrib MAX.LENGTH RECTANGULARITY   −11.101661196359727

Attrib SCALED VARIANCE_MAJOR   2.6215105890273604
Attrib SCALED VARIANCE_MINOR   4.450738391295168
Attrib SCALED RADIUS OF GYRATION   0.1105540303750417
Attrib SKEWNESS ABOUT_MAJOR   4.61420873216097
Attrib SKEWNESS ABOUT_MINOR   −10.560459738504923
Attrib KURTOSIS ABOUT_MAJOR   3.799008992384855
Attrib KURTOSIS ABOUT_MINOR   −7.715516472219767
Attrib HOLLOWS RATIO   4.252602182854952
Sigmoid Node 7
Inputs   Weights
Threshold   −2.1838124750009325
Attrib COMPACTNESS   −4.6647861721888795
Attrib CIRCULARITY   9.825102192269517
Attrib DISTANCE CIRCULARITY   −7.097202176148765
Attrib RADIUS RATIO   −2.0384569572924254
Attrib PR.AXIS ASPECT RATIO   −6.569272456544881
Attrib MAX.LENGTH ASPECT RATIO   −3.018511713722001
Attrib SCATTER RATIO   2.239552814952639
Attrib ELONGATEDNESS   −5.091077475910991
Attrib PR.AXIS RECTANGULARITY   8.161701054075452
Attrib MAX.LENGTH RECTANGULARITY   −3.2587397245502183
Attrib SCALED VARIANCE_MAJOR   −0.7778803250600825
Attrib SCALED VARIANCE_MINOR   5.191254877932462
Attrib SCALED RADIUS OF GYRATION   −0.868965931119499
Attrib SKEWNESS ABOUT_MAJOR   −2.156121879082444
Attrib SKEWNESS ABOUT_MINOR   4.009138733920073
Attrib KURTOSIS ABOUT_MAJOR   3.4850398763020403
Attrib KURTOSIS ABOUT_MINOR   30.060516823323585
Attrib HOLLOWS RATIO   −24.099403586739964
Sigmoid Node 8
Inputs   Weights
Threshold   −2.575769078685425
Attrib COMPACTNESS   9.43945684756463
Attrib CIRCULARITY   −2.303398974936718
Attrib DISTANCE CIRCULARITY   −6.174977021297574
Attrib RADIUS RATIO   1.7901881873540646
Attrib PR.AXIS ASPECT RATIO   6.17728393412921
Attrib MAX.LENGTH ASPECT RATIO   0.5101702741603764
Attrib SCATTER RATIO   −1.8227636339270232
Attrib ELONGATEDNESS   2.0429854736609125
Attrib PR.AXIS RECTANGULARITY   −2.356351695902407
Attrib MAX.LENGTH RECTANGULARITY   1.488193217670281
Attrib SCALED VARIANCE_MAJOR   −1.1457600499962215
Attrib SCALED VARIANCE_MINOR   −0.4628602229162923
Attrib SCALED RADIUS OF GYRATION   −3.7253484106422294
Attrib SKEWNESS ABOUT_MAJOR   2.1702816406669
Attrib SKEWNESS ABOUT_MINOR   −1.922664033603809
Attrib KURTOSIS ABOUT_MAJOR   −3.0878021198192855
Attrib KURTOSIS ABOUT_MINOR   3.108204026801441

Attrib HOLLOWS RATIO   0.3572399920845822
Sigmoid Node 9
Inputs   Weights
Threshold   2.479513968351416
Attrib COMPACTNESS   −4.54446364518878
Attrib CIRCULARITY   6.2585802380872675
Attrib DISTANCE CIRCULARITY   −5.606221609820902
Attrib RADIUS RATIO   0.03208777723509721
Attrib PR.AXIS ASPECT RATIO   12.558870237799209
Attrib MAX.LENGTH ASPECT RATIO   −7.394903002738183
Attrib SCATTER RATIO   0.9224573694864251
Attrib ELONGATEDNESS   −8.803740388393983
Attrib PR.AXIS RECTANGULARITY   −0.2895032306689838
Attrib MAX.LENGTH RECTANGULARITY   −2.184293846592205
Attrib SCALED VARIANCE_MAJOR   −4.782911015841452
Attrib SCALED VARIANCE_MINOR   1.7107933515228795
Attrib SCALED RADIUS OF GYRATION   −1.319266050486645
Attrib SKEWNESS ABOUT_MAJOR   4.980864218575451
Attrib SKEWNESS ABOUT_MINOR   1.1641316178215888
Attrib KURTOSIS ABOUT_MAJOR   −0.8316408862176267
Attrib KURTOSIS ABOUT_MINOR   11.361057287003632
Attrib HOLLOWS RATIO   −3.8882503923062965
Sigmoid Node 10
Inputs   Weights
Threshold   2.847250478513538
Attrib COMPACTNESS   7.2679806552961965
Attrib CIRCULARITY   −1.0972266033270872
Attrib DISTANCE CIRCULARITY   7.233370318860085
Attrib RADIUS RATIO   −1.8504727973542652
Attrib PR.AXIS ASPECT RATIO   1.41990264054605
Attrib MAX.LENGTH ASPECT RATIO   9.61561635746589
Attrib SCATTER RATIO   −2.5791871233786283
Attrib ELONGATEDNESS   4.148040205756056
Attrib PR.AXIS RECTANGULARITY   0.1680585438729213
Attrib MAX.LENGTH RECTANGULARITY   8.18254235279121
Attrib SCALED VARIANCE_MAJOR   −1.9398510010200543
Attrib SCALED VARIANCE_MINOR   −2.7351486871158563
Attrib SCALED RADIUS OF GYRATION   −14.427769785854354
Attrib SKEWNESS ABOUT_MAJOR   10.954406501770425
Attrib SKEWNESS ABOUT_MINOR   0.15303948310502585
Attrib KURTOSIS ABOUT_MAJOR   −8.049283838857853
Attrib KURTOSIS ABOUT_MINOR   −9.862777357626326
Attrib HOLLOWS RATIO   5.121718880565387
Sigmoid Node 11
Inputs   Weights
Threshold   −0.6453979560579419
Attrib COMPACTNESS   −0.6258781169732294
Attrib CIRCULARITY   −5.82547840737318
Attrib DISTANCE CIRCULARITY   3.154177706400207

Attrib RADIUS RATIO   5.003379303676485
Attrib PR.AXIS ASPECT RATIO   5.29033814657123
Attrib MAX.LENGTH ASPECT RATIO   −2.5740465514731325
Attrib SCATTER RATIO   −0.9458591262678895
Attrib ELONGATEDNESS   2.8407247905770676
Attrib PR.AXIS RECTANGULARITY   4.736965062717618
Attrib MAX.LENGTH RECTANGULARITY   −1.165381565020243
Attrib SCALED VARIANCE_MAJOR   −4.286669699912327
Attrib SCALED VARIANCE_MINOR   −1.4115087213805
Attrib SCALED RADIUS OF GYRATION   −4.24523917626577
Attrib SKEWNESS ABOUT_MAJOR   1.2681015265021471
Attrib SKEWNESS ABOUT_MINOR   11.28214626226963
Attrib KURTOSIS ABOUT_MAJOR   −3.4951994805571633
Attrib KURTOSIS ABOUT_MINOR   −6.221085619062514
Attrib HOLLOWS RATIO   −4.150433987813361
Sigmoid Node 12
Inputs   Weights
Threshold   0.3598902020856201
Attrib COMPACTNESS   −6.148213162154927
Attrib CIRCULARITY   −6.049759710557095
Attrib DISTANCE CIRCULARITY   6.221398638777274
Attrib RADIUS RATIO   2.3040149839148434
Attrib PR.AXIS ASPECT RATIO   1.0512559014805256
Attrib MAX.LENGTH ASPECT RATIO   3.41653247225788
Attrib SCATTER RATIO   3.749548810583177
Attrib ELONGATEDNESS   −3.3268697929956565
Attrib PR.AXIS RECTANGULARITY   −3.604735760516678
Attrib MAX.LENGTH RECTANGULARITY   −9.112384603214116
Attrib SCALED VARIANCE_MAJOR   2.58596930239565273
Attrib SCALED VARIANCE_MINOR   3.59792630522166126
Attrib SCALED RADIUS OF GYRATION   4.285724014082546
Attrib SKEWNESS ABOUT_MAJOR   0.8865330053723307
Attrib SKEWNESS ABOUT_MINOR   0.4374032362317465
Attrib KURTOSIS ABOUT_MAJOR   6.872630598183272
Attrib KURTOSIS ABOUT_MINOR   −2.619914083559985
Attrib HOLLOWS RATIO   −0.18143657064726848
Sigmoid Node 13
Inputs   Weights
Threshold   0.2552196334555046
Attrib COMPACTNESS   −1.2658915736397258
Attrib CIRCULARITY   3.779179276735448
Attrib DISTANCE CIRCULARITY   4.676128023830301
Attrib RADIUS RATIO   6.2230931618839165
Attrib PR.AXIS ASPECT RATIO   1.207405522351113
Attrib MAX.LENGTH ASPECT RATIO   6.997984083485826
Attrib SCATTER RATIO   2.8486358408050405
Attrib ELONGATEDNESS   −5.252707628299418
Attrib PR.AXIS RECTANGULARITY   −7.003411398092747
Attrib MAX.LENGTH RECTANGULARITY   −2.1206470014378263

Attrib SCALED VARIANCE_MAJOR   3.2094288397992643
Attrib SCALED VARIANCE_MINOR   3.8198937379826066
Attrib SCALED RADIUS OF GYRATION   −3.809045887315518
Attrib SKEWNESS ABOUT_MAJOR   0.40769482429934567
Attrib SKEWNESS ABOUT_MINOR   −2.807957458751802
Attrib KURTOSIS ABOUT_MAJOR   −1.936443898223497
Attrib KURTOSIS ABOUT_MINOR   10.53286635797707
Attrib HOLLOWS RATIO   −7.059213201974281
Sigmoid Node 14
Inputs   Weights
Threshold   −2.5375116014430015
Attrib COMPACTNESS   −3.3957881089495
Attrib CIRCULARITY   1.0157459531967692
Attrib DISTANCE CIRCULARITY   −0.6800790981567807
Attrib RADIUS RATIO   5.578118413923879
Attrib PR.AXIS ASPECT RATIO   −11.658965007483054
Attrib MAX.LENGTH ASPECT RATIO   2.1245010554771433
Attrib SCATTER RATIO   3.2555350649546497
Attrib ELONGATEDNESS   −2.5647334968005655
Attrib PR.AXIS RECTANGULARITY   3.4144394846909383
Attrib MAX.LENGTH RECTANGULARITY   15.063035463265361
Attrib SCALED VARIANCE_MAJOR   9.080502147302374
Attrib SCALED VARIANCE_MINOR   2.536056907237753
Attrib SCALED RADIUS OF GYRATION   −9.80010793779816
Attrib SKEWNESS ABOUT_MAJOR   −10.839225742494211
Attrib SKEWNESS ABOUT_MINOR   −1.5740062604819838
Attrib KURTOSIS ABOUT_MAJOR   2.2104885082107955
Attrib KURTOSIS ABOUT_MINOR   0.029858724860378327
Attrib HOLLOWS RATIO   1.4418381235367952
Sigmoid Node 15
Inputs   Weights
Threshold   −4.586612812214111
Attrib COMPACTNESS   −3.07389177571113
Attrib CIRCULARITY   6.844921850157651
Attrib DISTANCE CIRCULARITY   −3.055451161710679
Attrib RADIUS RATIO   −4.446722850838276
Attrib PR.AXIS ASPECT RATIO   −0.14268605698829656
Attrib MAX.LENGTH ASPECT RATIO   2.70779835007959
Attrib SCATTER RATIO   0.020722720025808057
Attrib ELONGATEDNESS   1.8715057954783283
Attrib PR.AXIS RECTANGULARITY   −1.469572153148656
Attrib MAX.LENGTH RECTANGULARITY   4.189992093570805
Attrib SCALED VARIANCE_MAJOR   0.5845050381904405
Attrib SCALED VARIANCE_MINOR   0.91715129122223
Attrib SCALED RADIUS OF GYRATION   3.1530166205750647
Attrib SKEWNESS ABOUT_MAJOR   2.8604293743203097
Attrib SKEWNESS ABOUT_MINOR   0.6765802030181114
Attrib KURTOSIS ABOUT_MAJOR   2.150129124977364
Attrib KURTOSIS ABOUT_MINOR   −2.6773174483906734

Attrib HOLLOWS RATIO   −6.6563705559096675
Sigmoid Node 16
Inputs   Weights
Threshold   0.4515818288832224
Attrib COMPACTNESS   8.221244070071865
Attrib CIRCULARITY   −2.882386906753751
Attrib DISTANCE CIRCULARITY   3.9391361561107336
Attrib RADIUS RATIO   4.292832918083339
Attrib PR.AXIS ASPECT RATIO   6.864498542199669
Attrib MAX.LENGTH ASPECT RATIO   3.3292723448756103
Attrib SCATTER RATIO   2.5303077801366554
Attrib ELONGATEDNESS   −0.9078695327621946
Attrib PR.AXIS RECTANGULARITY   −1.856965945266721
Attrib MAX.LENGTH RECTANGULARITY   −2.1783997291315993
Attrib SCALED VARIANCE_MAJOR   0.9387656020888154
Attrib SCALED VARIANCE_MINOR   0.5444410780023324
Attrib SCALED RADIUS OF GYRATION   3.138454908616868
Attrib SKEWNESS ABOUT_MAJOR   4.086605420160781
Attrib SKEWNESS ABOUT_MINOR   9.813188080219172
Attrib KURTOSIS ABOUT_MAJOR   −0.8821901856654978
Attrib KURTOSIS ABOUT_MINOR   −9.455801624999017
Attrib HOLLOWS RATIO   2.041323888912931
Sigmoid Node 17
Inputs   Weights
Threshold   −13.599641536863322
Attrib COMPACTNESS   5.84897132771601
Attrib CIRCULARITY   −8.73477723593633
Attrib DISTANCE CIRCULARITY   1.658962593465526
Attrib RADIUS RATIO   0.5647929030752985
Attrib PR.AXIS ASPECT RATIO   −10.381232762088764
Attrib MAX.LENGTH ASPECT RATIO   −3.094763349327436
Attrib SCATTER RATIO   −0.8465754909335268
Attrib ELONGATEDNESS   11.30679049984928
Attrib PR.AXIS RECTANGULARITY   1.122836378772519
Attrib MAX.LENGTH RECTANGULARITY   −8.682522456568103
Attrib SCALED VARIANCE_MAJOR   3.3389938281363367
Attrib SCALED VARIANCE_MINOR   2.3548076075238367
Attrib SCALED RADIUS OF GYRATION   0.24448284189823968
Attrib SKEWNESS ABOUT_MAJOR   −6.187430094420648
Attrib SKEWNESS ABOUT_MINOR   6.327388196252027
Attrib KURTOSIS ABOUT_MAJOR   −0.9074954144252209
Attrib KURTOSIS ABOUT_MINOR   1.272677197447756
Attrib HOLLOWS RATIO   −7.805792671514745
Sigmoid Node 18
Inputs   Weights
Threshold   −5.492093576635118
Attrib COMPACTNESS   3.994901639345471
Attrib CIRCULARITY   −5.293482997699194
Attrib DISTANCE CIRCULARITY   −4.270150509813661

Attrib RADIUS RATIO   4.322517567846101
Attrib PR.AXIS ASPECT RATIO   1.0752900167799526
Attrib MAX.LENGTH ASPECT RATIO   −1.2007135307029857
Attrib SCATTER RATIO   0.502974156465151
Attrib ELONGATEDNESS   1.6181238430289417
Attrib PR.AXIS RECTANGULARITY   −0.6135425068339044
Attrib MAX.LENGTH RECTANGULARITY   −11.03854034893455
Attrib SCALED VARIANCE_MAJOR   −0.30624422511128235
Attrib SCALED VARIANCE_MINOR   1.8342145926578801
Attrib SCALED RADIUS OF GYRATION   3.6112972721434637
Attrib SKEWNESS ABOUT_MAJOR   0.7796150242814179
Attrib SKEWNESS ABOUT_MINOR   −2.910902831883563
Attrib KURTOSIS ABOUT_MAJOR   0.8805585475311317
Attrib KURTOSIS ABOUT_MINOR   −3.8604651978358913
Attrib HOLLOWS RATIO   −0.19893640738711174
Sigmoid Node 19
Inputs   Weights
Threshold   −1.3941024927430081
Attrib COMPACTNESS   5.619072697696972
Attrib CIRCULARITY   −9.126189746123108
Attrib DISTANCE CIRCULARITY   −20.185080966920633
Attrib RADIUS RATIO   −6.064375029617563
Attrib PR.AXIS ASPECT RATIO   6.639034132888785
Attrib MAX.LENGTH ASPECT RATIO   −6.613654988425393
Attrib SCATTER RATIO   1.1693645343266295
Attrib ELONGATEDNESS   −9.627559609696256
Attrib PR.AXIS RECTANGULARITY   3.1758226993129135
Attrib MAX.LENGTH RECTANGULARITY   1.5964113920945455
Attrib SCALED VARIANCE_MAJOR   4.142374214304359
Attrib SCALED VARIANCE_MINOR   1.16397751860129
Attrib SCALED RADIUS OF GYRATION   0.1281130832451702
Attrib SKEWNESS ABOUT_MAJOR   3.4961330850194123
Attrib SKEWNESS ABOUT_MINOR   −7.954064719520952
Attrib KURTOSIS ABOUT_MAJOR   3.551626932694194
Attrib KURTOSIS ABOUT_MINOR   18.00674780108986
Attrib HOLLOWS RATIO   −17.416175571088075
Sigmoid Node 20
Inputs   Weights
Threshold   3.4121570712457734
Attrib COMPACTNESS   13.70507674363026
Attrib CIRCULARITY   3.66178197780265
Attrib DISTANCE CIRCULARITY   5.9434490468110805
Attrib RADIUS RATIO   −9.376808115154153
Attrib PR.AXIS ASPECT RATIO   7.223347587125419
Attrib MAX.LENGTH ASPECT RATIO   9.703884844463904
Attrib SCATTER RATIO   −6.438751785490711
Attrib ELONGATEDNESS   10.627369782417137
Attrib PR.AXIS RECTANGULARITY   −4.674578295254173
Attrib MAX.LENGTH RECTANGULARITY   17.145128794797603

Attrib SCALED VARIANCE_MAJOR   −7.33952882109376
Attrib SCALED VARIANCE_MINOR   −6.514331653353802
Attrib SCALED RADIUS OF GYRATION   −9.998479626747121
Attrib SKEWNESS ABOUT_MAJOR   15.383524965899332
Attrib SKEWNESS ABOUT_MINOR   −2.869708668233052
Attrib KURTOSIS ABOUT_MAJOR   −2.434599741340741
Attrib KURTOSIS ABOUT_MINOR   −6.658141191515296
Attrib HOLLOWS RATIO   9.402409860750005
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7889153893858529
Attrib COMPACTNESS   −13.352081685532077
Attrib CIRCULARITY   1.694900430264929
Attrib DISTANCE CIRCULARITY   −0.8632784724980442
Attrib RADIUS RATIO   4.365487676610952
Attrib PR.AXIS ASPECT RATIO   0.29383584489918746
Attrib MAX.LENGTH ASPECT RATIO   −1.0696426121981584
Attrib SCATTER RATIO   1.7772481031871863
Attrib ELONGATEDNESS   0.9290732089944195
Attrib PR.AXIS RECTANGULARITY   5.625488131845753
Attrib MAX.LENGTH RECTANGULARITY   −4.799219649319126
Attrib SCALED VARIANCE_MAJOR   1.4394477125362202
Attrib SCALED VARIANCE_MINOR   4.0750516544069315
Attrib SCALED RADIUS OF GYRATION   9.80345979043361
Attrib SKEWNESS ABOUT_MAJOR   0.7354920560957671
Attrib SKEWNESS ABOUT_MINOR   2.347566457538122
Attrib KURTOSIS ABOUT_MAJOR   7.7864495163849465
Attrib KURTOSIS ABOUT_MINOR   −12.214995362303082
Attrib HOLLOWS RATIO   −6.961739431114882
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 4.29 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances	415	98.5748 %
Incorrectly Classified Instances	6	1.4252 %
Kappa statistic	0.981	
Mean absolute error	0.0163	
Root mean squared error	0.0873	
Relative absolute error	4.3516 %	
Root relative squared error	20.1619 %	
Total Number of Instances	421	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,952	0,003	0,990	0,952	0,971	0,962	0,982	0,938	opel
0,991	0,010	0,973	0,991	0,982	0,975	0,988	0,965	saab
1,000	0,006	0,982	1,000	0,991	0,988	1,000	0,999	bus
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	van
Weighted Avg.	0,986	0,005	0,986	0,986	0,986	0,981	0,992	0,975

=== Confusion Matrix ===

```
  a   b   c   d   <-- classified as
100   3   2   0 |   a = opel
  1 107   0   0 |   b = saab
  0   0 109   0 |   c = bus
  0   0   0  99 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY

RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −8.203489361339983
Node 4   −9.961231690445226
Node 5   −7.963317765545437
Node 6   10.193748864111592
Node 7   11.85916203612254
Node 8   −5.4792489498924
Node 9   3.271670870554917
Node 10   9.017272190837078
Node 11   −8.107529587899268
Node 12   3.2934081668758775
Node 13   5.9548295342950786
Node 14   0.20861116966502918
Node 15   −6.111423077661824
Node 16   −12.178277946214187
Node 17   8.542135294837466
Node 18   7.961645752976833
Node 19   −14.613922503768546
Node 20   −6.402998948392835
Node 21   8.90849605994628
Sigmoid Node 1
Inputs   Weights
Threshold   −6.78580428972007
Node 4   6.01777213608824
Node 5   9.893270365467869
Node 6   −5.785967897202327
Node 7   −8.920798494920405
Node 8   −5.96752861777055

134

Node 9   −7.654794203004208
Node 10   −10.238650953856702
Node 11   9.202751720381897
Node 12   −5.546812400567394
Node 13   −7.139959494990554
Node 14   14.66441125646336
Node 15   −9.607760732064623
Node 16   10.158074440103121
Node 17   5.42863143009172
Node 18   2.7714537067113825
Node 19   6.866912643409186
Node 20   −17.545765540882368
Node 21   −8.94028614037263
Sigmoid Node 2
Inputs   Weights
Threshold   1.167187415190814
Node 4   3.3863340228208827
Node 5   −2.62595710226590 87
Node 6   −0.08416120141019323
Node 7   2.0140887068207807
Node 8   −2.061613425395353
Node 9   7.820168547243923
Node 10   1.8481213703716186
Node 11   −0.011606256811402888
Node 12   −1.8706096623412722
Node 13   −0.10219999091072769
Node 14   −14.47875603684527
Node 15   8.700673215287082
Node 16   −2.266437014520573
Node 17   −12.918869144628339
Node 18   −5.172995596307522
Node 19   7.548194407781892
Node 20   −5.010240812406904
Node 21   −0.2539564788517312
Sigmoid Node 3
Inputs   Weights
Threshold   −7.369691380321452
Node 4   −1.1534823253320285
Node 5   6.1645239972175405
Node 6   −2.35550655388827
Node 7   −2.0942884594076943
Node 8   2.869259233898552
Node 9   −8.116746762563551
Node 10   4.941173667667074
Node 11   −0.30552244089209873
Node 12   −1.241930358676757
Node 13   −3.3406020350594923
Node 14   −1.768827773906871
Node 15   −1.6681376297146941

Node 16   0.3374865916599511
Node 17   0.5289154312025317
Node 18   −3.3262217574209623
Node 19   −0.6420161047278814
Node 20   13.743271419172777
Node 21   −5.592572900386016
Sigmoid Node 4
Inputs   Weights
Threshold   −0.2867304689804343
Attrib COMPACTNESS   6.486542222071891
Attrib CIRCULARITY   −4.148314751674402
Attrib DISTANCE CIRCULARITY   −3.8564397123023855
Attrib RADIUS RATIO   −3.6849763253104104
Attrib PR.AXIS ASPECT RATIO   0.5665978542233897
Attrib MAX.LENGTH ASPECT RATIO   −3.3957082156494005
Attrib SCATTER RATIO   1.3317581669445302
Attrib ELONGATEDNESS   −2.755000617866951
Attrib PR.AXIS RECTANGULARITY   −1.027844076717511
Attrib MAX.LENGTH RECTANGULARITY   −0.42634268504045425
Attrib SCALED VARIANCE_MAJOR   1.957563742137486
Attrib SCALED VARIANCE_MINOR   0.47211646078611585
Attrib SCALED RADIUS OF GYRATION   6.258997116987927
Attrib SKEWNESS ABOUT_MAJOR   5.607339480467588
Attrib SKEWNESS ABOUT_MINOR   −1.4315663756637063
Attrib KURTOSIS ABOUT_MAJOR   3.5933135671658465
Attrib KURTOSIS ABOUT_MINOR   4.682107690293269
Attrib HOLLOWS RATIO   −5.4838459929644126
Sigmoid Node 5
Inputs   Weights
Threshold   0.05619840339252739
Attrib COMPACTNESS   −6.4146729567201435
Attrib CIRCULARITY   −6.339418675116028
Attrib DISTANCE CIRCULARITY   5.077990484062497
Attrib RADIUS RATIO   −2.8177386181066786
Attrib PR.AXIS ASPECT RATIO   3.4521491581437704
Attrib MAX.LENGTH ASPECT RATIO   3.8834351529698883
Attrib SCATTER RATIO   0.21710156851633192
Attrib ELONGATEDNESS   6.216546276801493
Attrib PR.AXIS RECTANGULARITY   1.9200732074904778
Attrib MAX.LENGTH RECTANGULARITY   0.8366333893075298
Attrib SCALED VARIANCE_MAJOR   2.473408306552678
Attrib SCALED VARIANCE_MINOR   −1.0411290664837158
Attrib SCALED RADIUS OF GYRATION   11.347109909714138
Attrib SKEWNESS ABOUT_MAJOR   0.3310140269851851
Attrib SKEWNESS ABOUT_MINOR   0.7459104140734999
Attrib KURTOSIS ABOUT_MAJOR   −5.52373901202291
Attrib KURTOSIS ABOUT_MINOR   −11.095455854753968
Attrib HOLLOWS RATIO   24.576305224207943
Sigmoid Node 6

Inputs   Weights
Threshold   −3.7045491471745517
Attrib COMPACTNESS   −3.500575298059791
Attrib CIRCULARITY   −7.325798130194072
Attrib DISTANCE CIRCULARITY   1.9604947031719384
Attrib RADIUS RATIO   3.903454555837692
Attrib PR.AXIS ASPECT RATIO   1.884319662864958
Attrib MAX.LENGTH ASPECT RATIO   5.87055382131083
Attrib SCATTER RATIO   5.188521975199885
Attrib ELONGATEDNESS   −3.896506823599909
Attrib PR.AXIS RECTANGULARITY   −5.291117858629435
Attrib MAX.LENGTH RECTANGULARITY   −11.101661196359727
Attrib SCALED VARIANCE_MAJOR   2.6215105890273604
Attrib SCALED VARIANCE_MINOR   4.450738391295168
Attrib SCALED RADIUS OF GYRATION   0.1105540303750417
Attrib SKEWNESS ABOUT_MAJOR   4.61420873216097
Attrib SKEWNESS ABOUT_MINOR   −10.560459738504923
Attrib KURTOSIS ABOUT_MAJOR   3.799008992384855
Attrib KURTOSIS ABOUT_MINOR   −7.715516472219767
Attrib HOLLOWS RATIO   4.252602182854952
Sigmoid Node 7
Inputs   Weights
Threshold   −2.1838124750009325
Attrib COMPACTNESS   −4.6647861721888795
Attrib CIRCULARITY   9.825102192269517
Attrib DISTANCE CIRCULARITY   −7.097202176148765
Attrib RADIUS RATIO   −2.0384569572924254
Attrib PR.AXIS ASPECT RATIO   −6.569272456544881
Attrib MAX.LENGTH ASPECT RATIO   −3.018511713722001
Attrib SCATTER RATIO   2.239552814952639
Attrib ELONGATEDNESS   −5.091077475910991
Attrib PR.AXIS RECTANGULARITY   8.161701054075452
Attrib MAX.LENGTH RECTANGULARITY   −3.2587397245502183
Attrib SCALED VARIANCE_MAJOR   −0.7778803250600825
Attrib SCALED VARIANCE_MINOR   5.191254877932462
Attrib SCALED RADIUS OF GYRATION   −0.868965931119499
Attrib SKEWNESS ABOUT_MAJOR   −2.156121879082444
Attrib SKEWNESS ABOUT_MINOR   4.009138733920073
Attrib KURTOSIS ABOUT_MAJOR   3.4850398763020403
Attrib KURTOSIS ABOUT_MINOR   30.060516823323585
Attrib HOLLOWS RATIO   −24.099403586739964
Sigmoid Node 8
Inputs   Weights
Threshold   −2.575769078685425
Attrib COMPACTNESS   9.43945684756463
Attrib CIRCULARITY   −2.303398974936718
Attrib DISTANCE CIRCULARITY   −6.174977021297574
Attrib RADIUS RATIO   1.790188187354 0646
Attrib PR.AXIS ASPECT RATIO   6.17728393412921

Attrib MAX.LENGTH ASPECT RATIO   0.5101702741603764
Attrib SCATTER RATIO   −1.8227636339270232
Attrib ELONGATEDNESS   2.0429854736609125
Attrib PR.AXIS RECTANGULARITY   −2.356351695902407
Attrib MAX.LENGTH RECTANGULARITY   1.488193217670281
Attrib SCALED VARIANCE_MAJOR   −1.1457600499962215
Attrib SCALED VARIANCE_MINOR   −0.4628602229162923
Attrib SCALED RADIUS OF GYRATION   −3.7253484106422294
Attrib SKEWNESS ABOUT_MAJOR   2.1702816406669
Attrib SKEWNESS ABOUT_MINOR   −1.922664033603809
Attrib KURTOSIS ABOUT_MAJOR   −3.0878021198192855
Attrib KURTOSIS ABOUT_MINOR   3.108204026801441
Attrib HOLLOWS RATIO   0.3572399920845822
Sigmoid Node 9
Inputs   Weights
Threshold   2.479513968351416
Attrib COMPACTNESS   −4.54446364518878
Attrib CIRCULARITY   6.2585802380872675
Attrib DISTANCE CIRCULARITY   −5.606221609820902
Attrib RADIUS RATIO   0.03208777723509721
Attrib PR.AXIS ASPECT RATIO   12.558870237799209
Attrib MAX.LENGTH ASPECT RATIO   −7.394903002738183
Attrib SCATTER RATIO   0.9224573694864251
Attrib ELONGATEDNESS   −8.803740388393983
Attrib PR.AXIS RECTANGULARITY   −0.2895032306689838
Attrib MAX.LENGTH RECTANGULARITY   −2.184293846592205
Attrib SCALED VARIANCE_MAJOR   −4.782911015841452
Attrib SCALED VARIANCE_MINOR   1.7107933515228795
Attrib SCALED RADIUS OF GYRATION   −1.319266050486645
Attrib SKEWNESS ABOUT_MAJOR   4.980864218575451
Attrib SKEWNESS ABOUT_MINOR   1.1641316178215888
Attrib KURTOSIS ABOUT_MAJOR   −0.8316408862176267
Attrib KURTOSIS ABOUT_MINOR   11.361057287003632
Attrib HOLLOWS RATIO   −3.8882503923062965
Sigmoid Node 10
Inputs   Weights
Threshold   2.847250478513538
Attrib COMPACTNESS   7.2679806552961965
Attrib CIRCULARITY   −1.0972266033270872
Attrib DISTANCE CIRCULARITY   7.233370318860085
Attrib RADIUS RATIO   −1.8504727973542652
Attrib PR.AXIS ASPECT RATIO   1.41990264054605
Attrib MAX.LENGTH ASPECT RATIO   9.61561635746589
Attrib SCATTER RATIO   −2.5791871233786283
Attrib ELONGATEDNESS   4.148040205756056
Attrib PR.AXIS RECTANGULARITY   0.1680585438729213
Attrib MAX.LENGTH RECTANGULARITY   8.18254235279121
Attrib SCALED VARIANCE_MAJOR   −1.9398510010200543
Attrib SCALED VARIANCE_MINOR   −2.7351486871158563

Attrib SCALED RADIUS OF GYRATION   −14.427769785854354
Attrib SKEWNESS ABOUT_MAJOR   10.954406501770425
Attrib SKEWNESS ABOUT_MINOR   0.15303948310502585
Attrib KURTOSIS ABOUT_MAJOR   −8.049283838857853
Attrib KURTOSIS ABOUT_MINOR   −9.862777357626326
Attrib HOLLOWS RATIO   5.121718880565387
Sigmoid Node 11
Inputs   Weights
Threshold   −0.6453979560579419
Attrib COMPACTNESS   −0.6258781169732294
Attrib CIRCULARITY   −5.82547840737318
Attrib DISTANCE CIRCULARITY   3.154177706400207
Attrib RADIUS RATIO   5.003379303676485
Attrib PR.AXIS ASPECT RATIO   5.29033814657123
Attrib MAX.LENGTH ASPECT RATIO   −2.5740465514731325
Attrib SCATTER RATIO   −0.9458591262678895
Attrib ELONGATEDNESS   2.8407247905770676
Attrib PR.AXIS RECTANGULARITY   4.736965062717618
Attrib MAX.LENGTH RECTANGULARITY   −1.165381565020243
Attrib SCALED VARIANCE_MAJOR   −4.286669699912327
Attrib SCALED VARIANCE_MINOR   −1.4115087213805
Attrib SCALED RADIUS OF GYRATION   −4.24523917626577
Attrib SKEWNESS ABOUT_MAJOR   1.2681015265021471
Attrib SKEWNESS ABOUT_MINOR   11.28214626226963
Attrib KURTOSIS ABOUT_MAJOR   −3.4951994805571633
Attrib KURTOSIS ABOUT_MINOR   −6.221085619062514
Attrib HOLLOWS RATIO   −4.150433987813361
Sigmoid Node 12
Inputs   Weights
Threshold   0.3598902020856201
Attrib COMPACTNESS   −6.148213162154927
Attrib CIRCULARITY   −6.049759710557095
Attrib DISTANCE CIRCULARITY   6.221398638777274
Attrib RADIUS RATIO   2.3040149839148434
Attrib PR.AXIS ASPECT RATIO   1.0512559014805256
Attrib MAX.LENGTH ASPECT RATIO   3.41653247225788
Attrib SCATTER RATIO   3.749548810583177
Attrib ELONGATEDNESS   −3.3268697929956565
Attrib PR.AXIS RECTANGULARITY   −3.604735760516678
Attrib MAX.LENGTH RECTANGULARITY   −9.112384603214116
Attrib SCALED VARIANCE_MAJOR   2.5859693023965273
Attrib SCALED VARIANCE_MINOR   3.5979263052166126
Attrib SCALED RADIUS OF GYRATION   4.285724014082546
Attrib SKEWNESS ABOUT_MAJOR   0.8865330053723307
Attrib SKEWNESS ABOUT_MINOR   0.4374032362317465
Attrib KURTOSIS ABOUT_MAJOR   6.872630598183272
Attrib KURTOSIS ABOUT_MINOR   −2.619914083559985
Attrib HOLLOWS RATIO   −0.18143657064726848
Sigmoid Node 13

Inputs   Weights
Threshold   0.2552196334555046
Attrib COMPACTNESS   −1.2658915736397258
Attrib CIRCULARITY   3.779179276735448
Attrib DISTANCE CIRCULARITY   4.676128023830301
Attrib RADIUS RATIO   6.2230931618839165
Attrib PR.AXIS ASPECT RATIO   1.207405522351113
Attrib MAX.LENGTH ASPECT RATIO   6.997984083485826
Attrib SCATTER RATIO   2.8486358408050405
Attrib ELONGATEDNESS   −5.252707628299418
Attrib PR.AXIS RECTANGULARITY   −7.003411398092747
Attrib MAX.LENGTH RECTANGULARITY   −2.1206470014378263
Attrib SCALED VARIANCE_MAJOR   3.2094288397992643
Attrib SCALED VARIANCE_MINOR   3.8198937379826066
Attrib SCALED RADIUS OF GYRATION   −3.809045887315518
Attrib SKEWNESS ABOUT_MAJOR   0.40769482429934567
Attrib SKEWNESS ABOUT_MINOR   −2.807957458751802
Attrib KURTOSIS ABOUT_MAJOR   −1.936443898223497
Attrib KURTOSIS ABOUT_MINOR   10.53286635797707
Attrib HOLLOWS RATIO   −7.059213201974281
Sigmoid Node 14
Inputs   Weights
Threshold   −2.5375116014430015
Attrib COMPACTNESS   −3.3957881089495
Attrib CIRCULARITY   1.0157459531967692
Attrib DISTANCE CIRCULARITY   −0.6800790981567807
Attrib RADIUS RATIO   5.578118413923879
Attrib PR.AXIS ASPECT RATIO   −11.658965007483054
Attrib MAX.LENGTH ASPECT RATIO   2.1245010554771433
Attrib SCATTER RATIO   3.2555350649546497
Attrib ELONGATEDNESS   −2.5647334968005655
Attrib PR.AXIS RECTANGULARITY   3.4144394846909383
Attrib MAX.LENGTH RECTANGULARITY   15.063035463265361
Attrib SCALED VARIANCE_MAJOR   9.080502147302374
Attrib SCALED VARIANCE_MINOR   2.536056907237753
Attrib SCALED RADIUS OF GYRATION   −9.80010793779816
Attrib SKEWNESS ABOUT_MAJOR   −10.839225742494211
Attrib SKEWNESS ABOUT_MINOR   −1.5740062604819838
Attrib KURTOSIS ABOUT_MAJOR   2.2104885082107955
Attrib KURTOSIS ABOUT_MINOR   0.029858724860378327
Attrib HOLLOWS RATIO   1.4418381235367952
Sigmoid Node 15
Inputs   Weights
Threshold   −4.586612812214111
Attrib COMPACTNESS   −3.07389177571113
Attrib CIRCULARITY   6.844921850157651
Attrib DISTANCE CIRCULARITY   −3.055451161710679
Attrib RADIUS RATIO   −4.446722850838276
Attrib PR.AXIS ASPECT RATIO   −0.14268605698829656

Attrib MAX.LENGTH ASPECT RATIO   2.70779835007959
Attrib SCATTER RATIO   0.020722720025808057
Attrib ELONGATEDNESS   1.8715057954783283
Attrib PR.AXIS RECTANGULARITY   −1.469572153148656
Attrib MAX.LENGTH RECTANGULARITY   4.189992093570805
Attrib SCALED VARIANCE_MAJOR   0.5845050381904405
Attrib SCALED VARIANCE_MINOR   0.91715129122223
Attrib SCALED RADIUS OF GYRATION   3.1530166205750647
Attrib SKEWNESS ABOUT_MAJOR   2.8604293743203097
Attrib SKEWNESS ABOUT_MINOR   0.6765802030181114
Attrib KURTOSIS ABOUT_MAJOR   2.150129124977364
Attrib KURTOSIS ABOUT_MINOR   −2.6773174483906734
Attrib HOLLOWS RATIO   −6.6563705559096675
Sigmoid Node 16
Inputs   Weights
Threshold   0.4515818288832224
Attrib COMPACTNESS   8.221244070071865
Attrib CIRCULARITY   −2.882386906753751
Attrib DISTANCE CIRCULARITY   3.9391361561107336
Attrib RADIUS RATIO   4.292832918083339
Attrib PR.AXIS ASPECT RATIO   6.864498542199669
Attrib MAX.LENGTH ASPECT RATIO   3.3292723448756103
Attrib SCATTER RATIO   2.5303077801366554
Attrib ELONGATEDNESS   −0.9078695327621946
Attrib PR.AXIS RECTANGULARITY   −1.856965945266721
Attrib MAX.LENGTH RECTANGULARITY   −2.1783997291315993
Attrib SCALED VARIANCE_MAJOR   0.9387656020888154
Attrib SCALED VARIANCE_MINOR   0.5444410780023324
Attrib SCALED RADIUS OF GYRATION   3.138454908616868
Attrib SKEWNESS ABOUT_MAJOR   4.086605420160781
Attrib SKEWNESS ABOUT_MINOR   9.813188080219172
Attrib KURTOSIS ABOUT_MAJOR   −0.8821901856654978
Attrib KURTOSIS ABOUT_MINOR   −9.455801624999017
Attrib HOLLOWS RATIO   2.041323888912931
Sigmoid Node 17
Inputs   Weights
Threshold   −13.599641536863322
Attrib COMPACTNESS   5.84897132771601
Attrib CIRCULARITY   −8.73477723593633
Attrib DISTANCE CIRCULARITY   1.658962593465526
Attrib RADIUS RATIO   0.5647929030752985
Attrib PR.AXIS ASPECT RATIO   −10.381232762088764
Attrib MAX.LENGTH ASPECT RATIO   −3.094763349327436
Attrib SCATTER RATIO   −0.8465754909335268
Attrib ELONGATEDNESS   11.30679049984928
Attrib PR.AXIS RECTANGULARITY   1.122836378772519
Attrib MAX.LENGTH RECTANGULARITY   −8.682522456568103
Attrib SCALED VARIANCE_MAJOR   3.3389938281363367
Attrib SCALED VARIANCE_MINOR   2.3548076075238367

Attrib SCALED RADIUS OF GYRATION   0.24448284189823968
Attrib SKEWNESS ABOUT_MAJOR   −6.187430094420648
Attrib SKEWNESS ABOUT_MINOR   6.327388196252027
Attrib KURTOSIS ABOUT_MAJOR   −0.9074954144252209
Attrib KURTOSIS ABOUT_MINOR   1.272677197447756
Attrib HOLLOWS RATIO   −7.805792671514745
Sigmoid Node 18
Inputs   Weights
Threshold   −5.492093576635118
Attrib COMPACTNESS   3.994901639345471
Attrib CIRCULARITY   −5.293482997699194
Attrib DISTANCE CIRCULARITY   −4.270150509813661
Attrib RADIUS RATIO   4.322517567846101
Attrib PR.AXIS ASPECT RATIO   1.0752900167799526
Attrib MAX.LENGTH ASPECT RATIO   −1.2007135307029857
Attrib SCATTER RATIO   0.502974156465151
Attrib ELONGATEDNESS   1.6181238430289417
Attrib PR.AXIS RECTANGULARITY   −0.6135425068339044
Attrib MAX.LENGTH RECTANGULARITY   −11.03854034893455
Attrib SCALED VARIANCE_MAJOR   −0.30624422511128235
Attrib SCALED VARIANCE_MINOR   1.8342145926578801
Attrib SCALED RADIUS OF GYRATION   3.6112972721434637
Attrib SKEWNESS ABOUT_MAJOR   0.7796150242814179
Attrib SKEWNESS ABOUT_MINOR   −2.910902831883563
Attrib KURTOSIS ABOUT_MAJOR   0.8805585475311317
Attrib KURTOSIS ABOUT_MINOR   −3.8604651978358913
Attrib HOLLOWS RATIO   −0.19893640738711174
Sigmoid Node 19
Inputs   Weights
Threshold   −1.3941024927430081
Attrib COMPACTNESS   5.619072697696972
Attrib CIRCULARITY   −9.126189746123108
Attrib DISTANCE CIRCULARITY   −20.185080966920633
Attrib RADIUS RATIO   −6.064375029617563
Attrib PR.AXIS ASPECT RATIO   6.639034132888785
Attrib MAX.LENGTH ASPECT RATIO   −6.613654988425393
Attrib SCATTER RATIO   1.1693645343266295
Attrib ELONGATEDNESS   −9.627559609696256
Attrib PR.AXIS RECTANGULARITY   3.1758226993129135
Attrib MAX.LENGTH RECTANGULARITY   1.5964113920945455
Attrib SCALED VARIANCE_MAJOR   4.142374214304359
Attrib SCALED VARIANCE_MINOR   1.16397751860129
Attrib SCALED RADIUS OF GYRATION   0.1281130832451702
Attrib SKEWNESS ABOUT_MAJOR   3.4961330850194123
Attrib SKEWNESS ABOUT_MINOR   −7.954064719520952
Attrib KURTOSIS ABOUT_MAJOR   3.551626932694194
Attrib KURTOSIS ABOUT_MINOR   18.00674780108986
Attrib HOLLOWS RATIO   −17.416175571088075
Sigmoid Node 20

Inputs   Weights
Threshold   3.4121570712457734
Attrib COMPACTNESS   13.70507674363026
Attrib CIRCULARITY   3.66017819778026
Attrib DISTANCE CIRCULARITY   5.9434490468110805
Attrib RADIUS RATIO   −9.376808115154153
Attrib PR.AXIS ASPECT RATIO   7.223347587125419
Attrib MAX.LENGTH ASPECT RATIO   9.703884844463904
Attrib SCATTER RATIO   −6.438751785490711
Attrib ELONGATEDNESS   10.627369782417137
Attrib PR.AXIS RECTANGULARITY   −4.674578295254173
Attrib MAX.LENGTH RECTANGULARITY   17.145128794797603
Attrib SCALED VARIANCE_MAJOR   −7.33952882109376
Attrib SCALED VARIANCE_MINOR   −6.514331653353802
Attrib SCALED RADIUS OF GYRATION   −9.998479626747121
Attrib SKEWNESS ABOUT_MAJOR   15.383524965899332
Attrib SKEWNESS ABOUT_MINOR   −2.869708668233052
Attrib KURTOSIS ABOUT_MAJOR   −2.434599741340741
Attrib KURTOSIS ABOUT_MINOR   −6.658141191515296
Attrib HOLLOWS RATIO   9.402409860750005
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7889153893858529
Attrib COMPACTNESS   −13.352081685532077
Attrib CIRCULARITY   1.694900430264929
Attrib DISTANCE CIRCULARITY   −0.8632784724980442
Attrib RADIUS RATIO   4.365487676610952
Attrib PR.AXIS ASPECT RATIO   0.29383584489918746
Attrib MAX.LENGTH ASPECT RATIO   −1.0696426121981584
Attrib SCATTER RATIO   1.7772481031871863
Attrib ELONGATEDNESS   0.9290732089944195
Attrib PR.AXIS RECTANGULARITY   5.625488131845753
Attrib MAX.LENGTH RECTANGULARITY   −4.799219649319126
Attrib SCALED VARIANCE_MAJOR   1.4394477125362202
Attrib SCALED VARIANCE_MINOR   4.0750516544069315
Attrib SCALED RADIUS OF GYRATION   9.80345979043361
Attrib SKEWNESS ABOUT_MAJOR   0.7354920560957671
Attrib SKEWNESS ABOUT_MINOR   2.347566457538122
Attrib KURTOSIS ABOUT_MAJOR   7.7864495163849465
Attrib KURTOSIS ABOUT_MINOR   −12.214995362303082
Attrib HOLLOWS RATIO   −6.961739431114882
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input

Node 2
Class van
Input
Node 3

Time taken to build model: 3.56 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   755   89.2435 %
Incorrectly Classified Instances   91   10.7565 %
Kappa statistic   0.8565
Mean absolute error   0.0638
Root mean squared error   0.2168
Relative absolute error   17.0214 %
Root relative squared error   50.089 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,821	0,066	0,806	0,821	0,813	0,750	0,930	0,821	opel
0,811	0,052	0,842	0,811	0,826	0,768	0,939	0,845	saab
0,986	0,014	0,960	0,986	0,973	0,963	0,998	0,994	bus
0,955	0,011	0,964	0,955	0,960	0,947	0,991	0,968	van
Weighted Avg.	0,892	0,036	0,892	0,892	0,892	0,856	0,964	0,906

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
174  28    5    5 |   a = opel
38  176    1    2 |   b = saab
2    1  215    0 |   c = bus
2    4    3  190 |   d = van
```

10 10ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.5253426626789907
Node 4   3.0782945397937302
Node 5   −1.509197860551068
Node 6   4.103881784709611
Node 7   −4.706751128343433
Node 8   −7.883333605758596
Node 9   −5.614701089607111
Node 10   −2.1816716981819773
Node 11   2.0392096488454032
Node 12   −2.7141027384139367
Node 13   1.0698636033570716
Node 14   1.8913793496108258
Sigmoid Node 1
Inputs   Weights
Threshold   −1.014875710394121
Node 4   −4.18303518862295
Node 5   −2.0506792749123894

145

Node 6   −6.105289901646461
Node 7   4.37307916677491
Node 8   1.2451226170564917
Node 9   4.07325349646219
Node 10   −2.3656703447186946
Node 11   −1.3354234589079668
Node 12   −9.114584042849843
Node 13   4.419604274910941
Node 14   5.523218569819863
Sigmoid Node 2
Inputs   Weights
Threshold   −0.12208415603531034
Node 4   1.8127319565799307
Node 5   4.920100382654805
Node 6   1.926051713105261
Node 7   1.1289947406525052
Node 8   6.5442527302201725
Node 9   −4.227820464965455
Node 10   2.22856148967198
Node 11   −0.7757214254281625
Node 12   −3.4907217847810412
Node 13   −9.535004132077747
Node 14   −9.196475464658732
Sigmoid Node 3
Inputs   Weights
Threshold   −2.704605889027812
Node 4   −2.6252993253989203
Node 5   1.6812792945252477
Node 6   −2.63139454321754
Node 7   −2.4219478577624503
Node 8   −2.871632658553833
Node 9   4.552058551366743
Node 10   −2.6650200459009867
Node 11   −6.198968988490219
Node 12   10.159174601585542
Node 13   0.3787279941870502
Node 14   −1.0526348683534403
Sigmoid Node 4
Inputs   Weights
Threshold   −1.2151018464219454
Attrib COMPACTNESS   −6.546865944771511
Attrib CIRCULARITY   2.3100151307650263
Attrib DISTANCE CIRCULARITY   0.6319696268216269
Attrib RADIUS RATIO   0.12198771376091762
Attrib PR.AXIS ASPECT RATIO   0.37594070215003683
Attrib MAX.LENGTH ASPECT RATIO   1.3275916614194685
Attrib SCATTER RATIO   1.5054264036246237
Attrib ELONGATEDNESS   −0.018417156877901606
Attrib PR.AXIS RECTANGULARITY   1.5711591500314332

Attrib MAX.LENGTH RECTANGULARITY   0.4952731519667719
Attrib SCALED VARIANCE_MAJOR   0.40004891208046656
Attrib SCALED VARIANCE_MINOR   2.4199900677529858
Attrib SCALED RADIUS OF GYRATION   0.3012173572838693
Attrib SKEWNESS ABOUT_MAJOR   1.7374437151346358
Attrib SKEWNESS ABOUT_MINOR   0.4848352169293145
Attrib KURTOSIS ABOUT_MAJOR   1.6318308347207804
Attrib KURTOSIS ABOUT_MINOR   −4.0177440415371555
Attrib HOLLOWS RATIO   −5.453731524889458
Sigmoid Node 5
Inputs   Weights
Threshold   1.2553000276906252
Attrib COMPACTNESS   0.9630217789652339
Attrib CIRCULARITY   0.46138405232539476
Attrib DISTANCE CIRCULARITY   −0.5076982667938683
Attrib RADIUS RATIO   −0.11639672943690033
Attrib PR.AXIS ASPECT RATIO   4.954350093370195
Attrib MAX.LENGTH ASPECT RATIO   0.8049410710146641
Attrib SCATTER RATIO   −1.359081747154158
Attrib ELONGATEDNESS   −0.5102925331153798
Attrib PR.AXIS RECTANGULARITY   −1.3585009616314685
Attrib MAX.LENGTH RECTANGULARITY   2.38963554966687574
Attrib SCALED VARIANCE_MAJOR   −1.5836568170049057
Attrib SCALED VARIANCE_MINOR   −1.552588679023702
Attrib SCALED RADIUS OF GYRATION   −1.7074486101958661
Attrib SKEWNESS ABOUT_MAJOR   2.6750724654329834
Attrib SKEWNESS ABOUT_MINOR   −1.2890014415873379
Attrib KURTOSIS ABOUT_MAJOR   −1.5146074523718083
Attrib KURTOSIS ABOUT_MINOR   0.4615401824858937
Attrib HOLLOWS RATIO   2.1219372709568454
Sigmoid Node 6
Inputs   Weights
Threshold   0.2598283070450795
Attrib COMPACTNESS   −0.7976704795628063
Attrib CIRCULARITY   3.703146419325274
Attrib DISTANCE CIRCULARITY   −0.5786769529146769
Attrib RADIUS RATIO   −0.03401266179151739
Attrib PR.AXIS ASPECT RATIO   0.479268885929904217
Attrib MAX.LENGTH ASPECT RATIO   −1.7821285142498857
Attrib SCATTER RATIO   1.1230429388912715
Attrib ELONGATEDNESS   −1.3362487394884073
Attrib PR.AXIS RECTANGULARITY   1.3682765315549996
Attrib MAX.LENGTH RECTANGULARITY   −0.742004640667188
Attrib SCALED VARIANCE_MAJOR   0.23699192663515226
Attrib SCALED VARIANCE_MINOR   2.5250472444623737
Attrib SCALED RADIUS OF GYRATION   −0.9632805939592114
Attrib SKEWNESS ABOUT_MAJOR   −0.8189759673553335
Attrib SKEWNESS ABOUT_MINOR   2.478855068209863
Attrib KURTOSIS ABOUT_MAJOR   1.6042941963740411

Attrib KURTOSIS ABOUT_MINOR   9.08242607635761
Attrib HOLLOWS RATIO   −7.398708445245435
Sigmoid Node 7
Inputs   Weights
Threshold   1.4072211976113402
Attrib COMPACTNESS   6.523013470174932
Attrib CIRCULARITY   −1.047861859332568
Attrib DISTANCE CIRCULARITY   −1.9138555812848248
Attrib RADIUS RATIO   −0.4238645795858869
Attrib PR.AXIS ASPECT RATIO   1.6050596922112856
Attrib MAX.LENGTH ASPECT RATIO   −0.25355464783669607
Attrib SCATTER RATIO   1.4574292452312134
Attrib ELONGATEDNESS   1.3261353872043833
Attrib PR.AXIS RECTANGULARITY   1.1460410400396297
Attrib MAX.LENGTH RECTANGULARITY   −1.118709994122827
Attrib SCALED VARIANCE_MAJOR   −0.7752835118659182
Attrib SCALED VARIANCE_MINOR   1.4022428947129075
Attrib SCALED RADIUS OF GYRATION   2.6459933809129352
Attrib SKEWNESS ABOUT_MAJOR   1.0690838471428175
Attrib SKEWNESS ABOUT_MINOR   3.914751926326232
Attrib KURTOSIS ABOUT_MAJOR   2.1177687461950074
Attrib KURTOSIS ABOUT_MINOR   −3.3704211451082013
Attrib HOLLOWS RATIO   −2.2605262881267754
Sigmoid Node 8
Inputs   Weights
Threshold   0.06709692908417329
Attrib COMPACTNESS   −2.66713745027544
Attrib CIRCULARITY   0.10132240880680157
Attrib DISTANCE CIRCULARITY   −6.223153362311072
Attrib RADIUS RATIO   −5.273179477134432
Attrib PR.AXIS ASPECT RATIO   4.555115080789395
Attrib MAX.LENGTH ASPECT RATIO   −2.2049611573521246
Attrib SCATTER RATIO   1.0901107017079463
Attrib ELONGATEDNESS   −7.316660012044536
Attrib PR.AXIS RECTANGULARITY   −0.060130693022891785
Attrib MAX.LENGTH RECTANGULARITY   1.4193744514622382
Attrib SCALED VARIANCE_MAJOR   1.0048851428394068
Attrib SCALED VARIANCE_MINOR   0.2814875990909234
Attrib SCALED RADIUS OF GYRATION   0.523455825886533
Attrib SKEWNESS ABOUT_MAJOR   3.6583427989725403
Attrib SKEWNESS ABOUT_MINOR   −1.7976978622594357
Attrib KURTOSIS ABOUT_MAJOR   1.1367529764946434
Attrib KURTOSIS ABOUT_MINOR   5.333472762398488
Attrib HOLLOWS RATIO   −4.87793651679173
Sigmoid Node 9
Inputs   Weights
Threshold   −1.4659661574769283
Attrib COMPACTNESS   1.7679194702829562
Attrib CIRCULARITY   −4.929514890161483

148

Attrib DISTANCE CIRCULARITY   5.540241211022013
Attrib RADIUS RATIO   −2.5457249246547016
Attrib PR.AXIS ASPECT RATIO   1.1943303372055163
Attrib MAX.LENGTH ASPECT RATIO   0.9889658575374791
Attrib SCATTER RATIO   −1.562315698126575
Attrib ELONGATEDNESS   1.8343910018912708
Attrib PR.AXIS RECTANGULARITY   −0.39944123425388994
Attrib MAX.LENGTH RECTANGULARITY   3.241751625539927
Attrib SCALED VARIANCE_MAJOR   0.019103915391331397
Attrib SCALED VARIANCE_MINOR   −3.3008127127393285
Attrib SCALED RADIUS OF GYRATION   5.339320658144292
Attrib SKEWNESS ABOUT_MAJOR   3.579797094991573
Attrib SKEWNESS ABOUT_MINOR   0.8646467889672551
Attrib KURTOSIS ABOUT_MAJOR   −0.8762962296557338
Attrib KURTOSIS ABOUT_MINOR   −6.530250301267699
Attrib HOLLOWS RATIO   9.158429288541493
Sigmoid Node 10
Inputs   Weights
Threshold   0.8301925688459859
Attrib COMPACTNESS   0.8805303698041737
Attrib CIRCULARITY   −2.0006560852769
Attrib DISTANCE CIRCULARITY   1.1227682846041287
Attrib RADIUS RATIO   0.6013081380877131
Attrib PR.AXIS ASPECT RATIO   1.4053082555075322
Attrib MAX.LENGTH ASPECT RATIO   0.5278259650869195
Attrib SCATTER RATIO   0.7201529556298673
Attrib ELONGATEDNESS   −1.5025399854597803
Attrib PR.AXIS RECTANGULARITY   1.2226052680423807
Attrib MAX.LENGTH RECTANGULARITY   −2.792117613703544
Attrib SCALED VARIANCE_MAJOR   0.674943510309388
Attrib SCALED VARIANCE_MINOR   0.5986416845672465
Attrib SCALED RADIUS OF GYRATION   0.46079858001662743
Attrib SKEWNESS ABOUT_MAJOR   0.017670532800698822
Attrib SKEWNESS ABOUT_MINOR   −0.6463590657785896
Attrib KURTOSIS ABOUT_MAJOR   −0.44509828637050775
Attrib KURTOSIS ABOUT_MINOR   1.3932004288651028
Attrib HOLLOWS RATIO   0.26482145135800944
Sigmoid Node 11
Inputs   Weights
Threshold   −0.007765402265098077
Attrib COMPACTNESS   −5.5216720248262465
Attrib CIRCULARITY   2.8215957254327777
Attrib DISTANCE CIRCULARITY   −0.629599927302519
Attrib RADIUS RATIO   1.1915780712529045
Attrib PR.AXIS ASPECT RATIO   0.1628548410077803
Attrib MAX.LENGTH ASPECT RATIO   0.978390744174378
Attrib SCATTER RATIO   0.7791631999629709
Attrib ELONGATEDNESS   −2.139477681316128
Attrib PR.AXIS RECTANGULARITY   −2.180465124918981

Attrib MAX.LENGTH RECTANGULARITY   −2.9505639836563495
Attrib SCALED VARIANCE_MAJOR   0.7381238637262753
Attrib SCALED VARIANCE_MINOR   0.8462627645980678
Attrib SCALED RADIUS OF GYRATION   2.0282115554346505
Attrib SKEWNESS ABOUT_MAJOR   −1.0561329553307972
Attrib SKEWNESS ABOUT_MINOR   −1.0063284991611405
Attrib KURTOSIS ABOUT_MAJOR   3.7452270797935796
Attrib KURTOSIS ABOUT_MINOR   1.439121355880505
Attrib HOLLOWS RATIO   −2.328414480254739
Sigmoid Node 12
Inputs   Weights
Threshold   1.112554653073332
Attrib COMPACTNESS   5.211199405186158
Attrib CIRCULARITY   0.8587359106337268
Attrib DISTANCE CIRCULARITY   3.5439897882923654
Attrib RADIUS RATIO   −4.338195734223877
Attrib PR.AXIS ASPECT RATIO   3.16700162712439
Attrib MAX.LENGTH ASPECT RATIO   4.45287375796005
Attrib SCATTER RATIO   −3.4640285714756325
Attrib ELONGATEDNESS   4.434101211008916
Attrib PR.AXIS RECTANGULARITY   −2.7054219430261406
Attrib MAX.LENGTH RECTANGULARITY   8.325766660157624
Attrib SCALED VARIANCE_MAJOR   −2.8525979280269356
Attrib SCALED VARIANCE_MINOR   −3.6656126784416396
Attrib SCALED RADIUS OF GYRATION   −3.633677990523758
Attrib SKEWNESS ABOUT_MAJOR   7.95248162469433
Attrib SKEWNESS ABOUT_MINOR   −1.2454731282152918
Attrib KURTOSIS ABOUT_MAJOR   −0.6944205944084485
Attrib KURTOSIS ABOUT_MINOR   −3.417830015355462
Attrib HOLLOWS RATIO   4.760456538737724
Sigmoid Node 13
Inputs   Weights
Threshold   −5.130751905197779
Attrib COMPACTNESS   2.096950401628363
Attrib CIRCULARITY   −5.529001768010279
Attrib DISTANCE CIRCULARITY   0.5211272869766855
Attrib RADIUS RATIO   3.959154102785557
Attrib PR.AXIS ASPECT RATIO   −2.811217631021628
Attrib MAX.LENGTH ASPECT RATIO   −1.4722341644802257
Attrib SCATTER RATIO   0.4012164270351226
Attrib ELONGATEDNESS   3.570627658878335
Attrib PR.AXIS RECTANGULARITY   2.2884940902865294
Attrib MAX.LENGTH RECTANGULARITY   −6.627264197066197
Attrib SCALED VARIANCE_MAJOR   1.1061342737267144
Attrib SCALED VARIANCE_MINOR   1.7989223783308577
Attrib SCALED RADIUS OF GYRATION   0.15835216643825645
Attrib SKEWNESS ABOUT_MAJOR   −3.2863768667740154
Attrib SKEWNESS ABOUT_MINOR   1.919645176268084
Attrib KURTOSIS ABOUT_MAJOR   −1.1252263060738765

Attrib KURTOSIS ABOUT_MINOR   −1.411713334734652
Attrib HOLLOWS RATIO   −3.694551992544645
Sigmoid Node 14
Inputs   Weights
Threshold   −1.4400074383311945
Attrib COMPACTNESS   −0.46336897622677853
Attrib CIRCULARITY   1.65747083242799
Attrib DISTANCE CIRCULARITY   1.80575173747978
Attrib RADIUS RATIO   1.1605246482747404
Attrib PR.AXIS ASPECT RATIO   −6.113650243729539
Attrib MAX.LENGTH ASPECT RATIO   3.933513716290628
Attrib SCATTER RATIO   −0.29419527551927804
Attrib ELONGATEDNESS   2.2214659686271068
Attrib PR.AXIS RECTANGULARITY   0.07088799222654665
Attrib MAX.LENGTH RECTANGULARITY   3.3435272590078142
Attrib SCALED VARIANCE_MAJOR   5.011849936011469
Attrib SCALED VARIANCE_MINOR   −0.8438113430748388
Attrib SCALED RADIUS OF GYRATION   −0.028234812263761
Attrib SKEWNESS ABOUT_MAJOR   −3.1780166168944173
Attrib SKEWNESS ABOUT_MINOR   −1.6181825031993238
Attrib KURTOSIS ABOUT_MAJOR   0.44182097411113314
Attrib KURTOSIS ABOUT_MINOR   1.0440577881766557
Attrib HOLLOWS RATIO   2.8258339787674234
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   388   92.1615 %
Incorrectly Classified Instances   33   7.8385 %
Kappa statistic   0.8954
Mean absolute error   0.0905

```
Root mean squared error                    0.1868
Relative absolute error                    24.1407 %
Root relative squared error                43.1506 %
Total Number of Instances          421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,819	0,041	0,869	0,819	0,843	0,794	0,959	0,896	opel
0,870	0,061	0,832	0,870	0,851	0,798	0,964	0,903	saab
1,000	0,003	0,991	1,000	0,995	0,994	1,000	1,000	bus
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	van
Weighted Avg.	0,922	0,027	0,922	0,922	0,921	0,895	0,981	0,949

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
86   19   0    0 |    a = opel
13   94   1    0 |    b = saab
0    0  109    0 |    c = bus
0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
```

MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold -0.5253426626789907
Node 4 3.0782945397937302
Node 5 -1.509197860551068
Node 6 4.103881784709611
Node 7 -4.706751128343433
Node 8 -7.883333605758596
Node 9 -5.614701089607111
Node 10 -2.1816716981819773
Node 11 2.0392096488454032
Node 12 -2.7141027384139367
Node 13 1.0698636033570716
Node 14 1.8913793496108258
Sigmoid Node 1
Inputs   Weights
Threshold -1.014875710394121
Node 4 -4.18303518862295
Node 5 -2.0506792749123894
Node 6 -6.105289901646461
Node 7 4.37307916677491
Node 8 1.2451226170564917
Node 9 4.07325349646219
Node 10 -2.3656703447186946
Node 11 -1.3354234589079668
Node 12 -9.114584042849843
Node 13 4.419604274910941
Node 14 5.523218569819863
Sigmoid Node 2
Inputs   Weights
Threshold -0.12208415603531034
Node 4 1.8127319565799307
Node 5 4.920100382654805
Node 6 1.926051713105261
Node 7 1.1289947406525052

153

Node 8   6.5442527302201725
Node 9   −4.227820464965455
Node 10   2.22856148967198
Node 11   −0.7757214254281625
Node 12   −3.4907217847810412
Node 13   −9.535004132077747
Node 14   −9.196475464658732
Sigmoid Node 3
Inputs   Weights
Threshold   −2.704605889027812
Node 4   −2.6252993253989203
Node 5   1.6812792945252477
Node 6   −2.63139454321754
Node 7   −2.4219478577624503
Node 8   −2.871632658553833
Node 9   4.552058551366743
Node 10   −2.6650200459009867
Node 11   −6.198968988490219
Node 12   10.159174601585542
Node 13   0.3787279941870502
Node 14   −1.052348683534403
Sigmoid Node 4
Inputs   Weights
Threshold   −1.2151018464219454
Attrib COMPACTNESS   −6.546865944771511
Attrib CIRCULARITY   2.3100151307650263
Attrib DISTANCE CIRCULARITY   0.6319696268216269
Attrib RADIUS RATIO   0.12198771376091762
Attrib PR.AXIS ASPECT RATIO   0.37594070215003683
Attrib MAX.LENGTH ASPECT RATIO   1.3275916614194685
Attrib SCATTER RATIO   1.5054264036246237
Attrib ELONGATEDNESS   −0.018417156877901606
Attrib PR.AXIS RECTANGULARITY   1.5711591500314332
Attrib MAX.LENGTH RECTANGULARITY   0.4952731519667719
Attrib SCALED VARIANCE_MAJOR   0.40004891208046656
Attrib SCALED VARIANCE_MINOR   2.4199900677529858
Attrib SCALED RADIUS OF GYRATION   0.3012173572838693
Attrib SKEWNESS ABOUT_MAJOR   1.7374437151346358
Attrib SKEWNESS ABOUT_MINOR   0.4848352169293145
Attrib KURTOSIS ABOUT_MAJOR   1.6318308347207804
Attrib KURTOSIS ABOUT_MINOR   −4.0177440415371555
Attrib HOLLOWS RATIO   −5.453731524889458
Sigmoid Node 5
Inputs   Weights
Threshold   1.2553000276906252
Attrib COMPACTNESS   0.9630217789652339
Attrib CIRCULARITY   0.46138405232539476
Attrib DISTANCE CIRCULARITY   −0.5076982667938683
Attrib RADIUS RATIO   −0.11639672943690033

Attrib PR.AXIS ASPECT RATIO   4.954350093370195
Attrib MAX.LENGTH ASPECT RATIO   0.8049410710146641
Attrib SCATTER RATIO   −1.359081747154158
Attrib ELONGATEDNESS   −0.5102925331153798
Attrib PR.AXIS RECTANGULARITY   −1.3585009616314685
Attrib MAX.LENGTH RECTANGULARITY   2.3896355496687574
Attrib SCALED VARIANCE_MAJOR   −1.5836568170049057
Attrib SCALED VARIANCE_MINOR   −1.552588679023702
Attrib SCALED RADIUS OF GYRATION   −1.7074486101958661
Attrib SKEWNESS ABOUT_MAJOR   2.6750724654329834
Attrib SKEWNESS ABOUT_MINOR   −1.2890014415873379
Attrib KURTOSIS ABOUT_MAJOR   −1.5146074523718083
Attrib KURTOSIS ABOUT_MINOR   0.4615401824858937
Attrib HOLLOWS RATIO   2.1219372709568454
Sigmoid Node 6
Inputs   Weights
Threshold   0.2598283070450795
Attrib COMPACTNESS   −0.7976704795628063
Attrib CIRCULARITY   3.703146419325274
Attrib DISTANCE CIRCULARITY   −0.5786769529146769
Attrib RADIUS RATIO   −0.03401266179151739
Attrib PR.AXIS ASPECT RATIO   0.479268885929904217
Attrib MAX.LENGTH ASPECT RATIO   −1.7821285142498857
Attrib SCATTER RATIO   1.1230429388912715
Attrib ELONGATEDNESS   −1.3362487394884073
Attrib PR.AXIS RECTANGULARITY   1.3682765315549996
Attrib MAX.LENGTH RECTANGULARITY   −0.742004640667188
Attrib SCALED VARIANCE_MAJOR   0.23699192663515226
Attrib SCALED VARIANCE_MINOR   2.5250472444623737
Attrib SCALED RADIUS OF GYRATION   −0.9632805939592114
Attrib SKEWNESS ABOUT_MAJOR   −0.8189759673553335
Attrib SKEWNESS ABOUT_MINOR   2.478855068209863
Attrib KURTOSIS ABOUT_MAJOR   1.6042941963740411
Attrib KURTOSIS ABOUT_MINOR   9.08242607635761
Attrib HOLLOWS RATIO   −7.398708445245435
Sigmoid Node 7
Inputs   Weights
Threshold   1.4072211976113402
Attrib COMPACTNESS   6.523013470174932
Attrib CIRCULARITY   −1.047861859332568
Attrib DISTANCE CIRCULARITY   −1.9138555812848248
Attrib RADIUS RATIO   −0.4238645795858869
Attrib PR.AXIS ASPECT RATIO   1.6050596922112856
Attrib MAX.LENGTH ASPECT RATIO   −0.25355464783669607
Attrib SCATTER RATIO   1.4574292452312134
Attrib ELONGATEDNESS   1.3261353872043833
Attrib PR.AXIS RECTANGULARITY   1.1460410400396297
Attrib MAX.LENGTH RECTANGULARITY   −1.118709994122827
Attrib SCALED VARIANCE_MAJOR   −0.7752835118659182

Attrib SCALED VARIANCE_MINOR   1.4022428947129075
Attrib SCALED RADIUS OF GYRATION   2.6459933809129352
Attrib SKEWNESS ABOUT_MAJOR   1.0690838471428175
Attrib SKEWNESS ABOUT_MINOR   3.914751926326232
Attrib KURTOSIS ABOUT_MAJOR   2.1177687461950074
Attrib KURTOSIS ABOUT_MINOR   −3.3704211451082013
Attrib HOLLOWS RATIO   −2.2605262881267754
Sigmoid Node 8
Inputs   Weights
Threshold   0.06709692908417329
Attrib COMPACTNESS   −2.66713745027544
Attrib CIRCULARITY   0.10132240880680157
Attrib DISTANCE CIRCULARITY   −6.223153362311072
Attrib RADIUS RATIO   −5.273179477134432
Attrib PR.AXIS ASPECT RATIO   4.555115080789395
Attrib MAX.LENGTH ASPECT RATIO   −2.2049611573521246
Attrib SCATTER RATIO   1.0901107017079463
Attrib ELONGATEDNESS   −7.316660012044536
Attrib PR.AXIS RECTANGULARITY   −0.060130693022891785
Attrib MAX.LENGTH RECTANGULARITY   1.4193744514622382
Attrib SCALED VARIANCE_MAJOR   1.0048851428394068
Attrib SCALED VARIANCE_MINOR   0.2814875990909234
Attrib SCALED RADIUS OF GYRATION   0.523455825886533
Attrib SKEWNESS ABOUT_MAJOR   3.6583427989725403
Attrib SKEWNESS ABOUT_MINOR   −1.7976978622594357
Attrib KURTOSIS ABOUT_MAJOR   1.1367529764946434
Attrib KURTOSIS ABOUT_MINOR   5.333472762398488
Attrib HOLLOWS RATIO   −4.87793651679173
Sigmoid Node 9
Inputs   Weights
Threshold   −1.4659661574769283
Attrib COMPACTNESS   1.7679194702829562
Attrib CIRCULARITY   −4.929514890161483
Attrib DISTANCE CIRCULARITY   5.540241211022013
Attrib RADIUS RATIO   −2.5457249246547016
Attrib PR.AXIS ASPECT RATIO   1.1943303372055163
Attrib MAX.LENGTH ASPECT RATIO   0.9889658575374791
Attrib SCATTER RATIO   −1.562315698126575
Attrib ELONGATEDNESS   1.8343910018912708
Attrib PR.AXIS RECTANGULARITY   −0.39944123425388994
Attrib MAX.LENGTH RECTANGULARITY   3.241751625539927
Attrib SCALED VARIANCE_MAJOR   0.019103915391331397
Attrib SCALED VARIANCE_MINOR   −3.3008127127393285
Attrib SCALED RADIUS OF GYRATION   5.339320658144292
Attrib SKEWNESS ABOUT_MAJOR   3.579797094991573
Attrib SKEWNESS ABOUT_MINOR   0.8646467889672551
Attrib KURTOSIS ABOUT_MAJOR   −0.8762962296557338
Attrib KURTOSIS ABOUT_MINOR   −6.530250301267699
Attrib HOLLOWS RATIO   9.158429288541493

Sigmoid Node 10
Inputs   Weights
Threshold   0.8301925688459859
Attrib COMPACTNESS   0.8805303698041737
Attrib CIRCULARITY   −2.0006560852769
Attrib DISTANCE CIRCULARITY   1.1227682846041287
Attrib RADIUS RATIO   0.6013081380877131
Attrib PR.AXIS ASPECT RATIO   1.4053082555075322
Attrib MAX.LENGTH ASPECT RATIO   0.5278259650869195
Attrib SCATTER RATIO   0.7201529556298673
Attrib ELONGATEDNESS   −1.5025399854597803
Attrib PR.AXIS RECTANGULARITY   1.2226052680423807
Attrib MAX.LENGTH RECTANGULARITY   −2.792117613703544
Attrib SCALED VARIANCE_MAJOR   0.674943510309388
Attrib SCALED VARIANCE_MINOR   0.5986416845672465
Attrib SCALED RADIUS OF GYRATION   0.46079858001662743
Attrib SKEWNESS ABOUT_MAJOR   0.017670532800698822
Attrib SKEWNESS ABOUT_MINOR   −0.6463590657785896
Attrib KURTOSIS ABOUT_MAJOR   −0.44509828637050775
Attrib KURTOSIS ABOUT_MINOR   1.3932004288651028
Attrib HOLLOWS RATIO   0.26482145135800944
Sigmoid Node 11
Inputs   Weights
Threshold   −0.007765402265098077
Attrib COMPACTNESS   −5.5216720248262465
Attrib CIRCULARITY   2.8215957254327777
Attrib DISTANCE CIRCULARITY   −0.629599927302519
Attrib RADIUS RATIO   1.1915780712529045
Attrib PR.AXIS ASPECT RATIO   0.1628548410077803
Attrib MAX.LENGTH ASPECT RATIO   0.978390744174378
Attrib SCATTER RATIO   0.7791631999629709
Attrib ELONGATEDNESS   −2.139477681316128
Attrib PR.AXIS RECTANGULARITY   −2.180465124918981
Attrib MAX.LENGTH RECTANGULARITY   −2.9505639836563495
Attrib SCALED VARIANCE_MAJOR   0.7381238637262753
Attrib SCALED VARIANCE_MINOR   0.8462627645980678
Attrib SCALED RADIUS OF GYRATION   2.0282115554346505
Attrib SKEWNESS ABOUT_MAJOR   −1.0561329553307972
Attrib SKEWNESS ABOUT_MINOR   −1.0063284991611405
Attrib KURTOSIS ABOUT_MAJOR   3.7452270797935796
Attrib KURTOSIS ABOUT_MINOR   1.439121355880505
Attrib HOLLOWS RATIO   −2.328414480254739
Sigmoid Node 12
Inputs   Weights
Threshold   1.112554653073332
Attrib COMPACTNESS   5.211199405186158
Attrib CIRCULARITY   0.8587359106337268
Attrib DISTANCE CIRCULARITY   3.5439897882923654
Attrib RADIUS RATIO   −4.338195734223877

Attrib PR.AXIS ASPECT RATIO   3.16700162712439
Attrib MAX.LENGTH ASPECT RATIO   4.45287375796005
Attrib SCATTER RATIO   −3.4640285714756325
Attrib ELONGATEDNESS   4.434101211008916
Attrib PR.AXIS RECTANGULARITY   −2.7054219430261406
Attrib MAX.LENGTH RECTANGULARITY   8.325766660157624
Attrib SCALED VARIANCE_MAJOR   −2.8525979280269356
Attrib SCALED VARIANCE_MINOR   −3.6656126784416396
Attrib SCALED RADIUS OF GYRATION   −3.633677990523758
Attrib SKEWNESS ABOUT_MAJOR   7.95248162469433
Attrib SKEWNESS ABOUT_MINOR   −1.245473128215

2918
Attrib KURTOSIS ABOUT_MAJOR   −0.6944205944084485
Attrib KURTOSIS ABOUT_MINOR   −3.417830015355462
Attrib HOLLOWS RATIO   4.760456538737724
Sigmoid Node 13
Inputs   Weights
Threshold   −5.130751905197779
Attrib COMPACTNESS   2.096950401628363
Attrib CIRCULARITY   −5.529001768010279
Attrib DISTANCE CIRCULARITY   0.5211272869766855
Attrib RADIUS RATIO   3.959154102785557
Attrib PR.AXIS ASPECT RATIO   −2.811217631021628
Attrib MAX.LENGTH ASPECT RATIO   −1.4722341644802257
Attrib SCATTER RATIO   0.4012164270351226
Attrib ELONGATEDNESS   3.570627658878335
Attrib PR.AXIS RECTANGULARITY   2.2884940902865294
Attrib MAX.LENGTH RECTANGULARITY   −6.627264197066197
Attrib SCALED VARIANCE_MAJOR   1.1061342737267144
Attrib SCALED VARIANCE_MINOR   1.7989223783308577
Attrib SCALED RADIUS OF GYRATION   0.15835216643825645
Attrib SKEWNESS ABOUT_MAJOR   −3.2863768667740154
Attrib SKEWNESS ABOUT_MINOR   1.919645176268084
Attrib KURTOSIS ABOUT_MAJOR   −1.1252263060738765
Attrib KURTOSIS ABOUT_MINOR   −1.411713334734652
Attrib HOLLOWS RATIO   −3.694551992544645
Sigmoid Node 14
Inputs   Weights
Threshold   −1.4400074383311945
Attrib COMPACTNESS   −0.46336897622677853
Attrib CIRCULARITY   1.65747083242799
Attrib DISTANCE CIRCULARITY   1.80575173747978
Attrib RADIUS RATIO   1.1605246482747404
Attrib PR.AXIS ASPECT RATIO   −6.113650243729539
Attrib MAX.LENGTH ASPECT RATIO   3.933513716290628
Attrib SCATTER RATIO   −0.29419527551927804
Attrib ELONGATEDNESS   2.2214659686271068
Attrib PR.AXIS RECTANGULARITY   0.07088799222654665
Attrib MAX.LENGTH RECTANGULARITY   3.3435272590078142
Attrib SCALED VARIANCE_MAJOR   5.011849936011469

```
Attrib SCALED VARIANCE_MINOR      −0.8438113430748388
Attrib SCALED RADIUS OF GYRATION      −0.028234812263761
Attrib SKEWNESS ABOUT_MAJOR      −3.1780166168944173
Attrib SKEWNESS ABOUT_MINOR      −1.6181825031993238
Attrib KURTOSIS ABOUT_MAJOR      0.44182097411113314
Attrib KURTOSIS ABOUT_MINOR      1.0440577881766557
Attrib HOLLOWS RATIO      2.8258339787674234
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3
```

Time taken to build model: 3.58 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

```
Correctly Classified Instances          725                85.6974 %
Incorrectly Classified Instances        121                14.3026 %
Kappa statistic                           0.8092
Mean absolute error                       0.1115
Root mean squared error                   0.2293
Relative absolute error                  29.747  %
Root relative squared error             52.9733 %
Total Number of Instances                846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,717	0,073	0,768	0,717	0,741	0,660	0,927	0,793	opel
0,765	0,099	0,728	0,765	0,746	0,656	0,930	0,821	saab
1,000	0,011	0,969	1,000	0,984	0,979	1,000	1,000	bus

0,950	0,009	0,969	0,950	0,959	0,947	0,997
0,992	van					
Weighted Avg.		0,857	0,049	0,857	0,857	0,856
0,809	0,963	0,900				

=== Confusion Matrix ===

```
 a   b   c   d   <-- classified as
152  54   2   4 |   a = opel
 46 166   3   2 |   b = saab
  0   0 218   0 |   c = bus
  0   8   2 189 |   d = van
```

11 11ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
               COMPACTNESS
               CIRCULARITY
               DISTANCE CIRCULARITY
               RADIUS RATIO
               PR.AXIS ASPECT RATIO
               MAX.LENGTH ASPECT RATIO
               SCATTER RATIO
               ELONGATEDNESS
               PR.AXIS RECTANGULARITY
               MAX.LENGTH RECTANGULARITY
               SCALED VARIANCE_MAJOR
               SCALED VARIANCE_MINOR
               SCALED RADIUS OF GYRATION
               SKEWNESS ABOUT_MAJOR
               SKEWNESS ABOUT_MINOR
               KURTOSIS ABOUT_MAJOR
               KURTOSIS ABOUT_MINOR
               HOLLOWS RATIO
               Class
Test mode:     user supplied test set:  size unknown (reading incrementally)
```

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

```
Sigmoid Node 0
    Inputs    Weights
    Threshold    0.09805793313295566
```

Node 4   2.0143483965563513
Node 5   2.59117823416125
Node 6   −6.192699238324377
Node 7   −4.176938582479266
Sigmoid Node 1
Inputs   Weights
Threshold   −8.09194004853871
Node 4   6.81572966635606
Node 5   4.547623064052019
Node 6   −1.4808476194454316
Node 7   3.339321129220358
Sigmoid Node 2
Inputs   Weights
Threshold   0.4644115281376004
Node 4   −3.8276087493595368
Node 5   −9.344918829065975
Node 6   8.657929819628793
Node 7   −10.467961715503273
Sigmoid Node 3
Inputs   Weights
Threshold   0.06731357755821334
Node 4   −11.880074428250529
Node 5   1.7058178125339305
Node 6   −1.8604844568704202
Node 7   7.55089589255117
Sigmoid Node 4
Inputs   Weights
Threshold   −3.243753527771217
Attrib COMPACTNESS   −2.734387362687074
Attrib CIRCULARITY   −2.1314689914948186
Attrib DISTANCE CIRCULARITY   −3.1496476000389606
Attrib RADIUS RATIO   5.729632972416015
Attrib PR.AXIS ASPECT RATIO   −6.724029942131074
Attrib MAX.LENGTH ASPECT RATIO   −5.440001482221372
Attrib SCATTER RATIO   3.373982003680642
Attrib ELONGATEDNESS   −1.3867074257407346
Attrib PR.AXIS RECTANGULARITY   4.863196380026248
Attrib MAX.LENGTH RECTANGULARITY   −9.791416335375024
Attrib SCALED VARIANCE_MAJOR   4.7106900637872755
Attrib SCALED VARIANCE_MINOR   4.523951611977931
Attrib SCALED RADIUS OF GYRATION   4.557255833752197
Attrib SKEWNESS ABOUT_MAJOR   −8.539536714647587
Attrib SKEWNESS ABOUT_MINOR   1.6936424881026295
Attrib KURTOSIS ABOUT_MAJOR   1.087730595295149
Attrib KURTOSIS ABOUT_MINOR   2.3887178319521665
Attrib HOLLOWS RATIO   −3.8220229566697257
Sigmoid Node 5
Inputs   Weights
Threshold   −6.448680827825682

Attrib COMPACTNESS   0.5530838162982298
Attrib CIRCULARITY   −4.977523549171987
Attrib DISTANCE CIRCULARITY   −5.210417233123641
Attrib RADIUS RATIO   2.2689330669016647
Attrib PR.AXIS ASPECT RATIO   −2.489985195890577
Attrib MAX.LENGTH ASPECT RATIO   −1.42665248371443
Attrib SCATTER RATIO   1.789686629515091
Attrib ELONGATEDNESS   1.1596532242950945
Attrib PR.AXIS RECTANGULARITY   3.0352624437024205
Attrib MAX.LENGTH RECTANGULARITY   −3.999570351910481
Attrib SCALED VARIANCE_MAJOR   −0.3590197085482384
Attrib SCALED VARIANCE_MINOR   2.4419818047518023
Attrib SCALED RADIUS OF GYRATION   0.4545934343330557
Attrib SKEWNESS ABOUT_MAJOR   −2.144521301821153
Attrib SKEWNESS ABOUT_MINOR   −1.4133850570169348
Attrib KURTOSIS ABOUT_MAJOR   0.48208819295666505
Attrib KURTOSIS ABOUT_MINOR   −1.8379100240746418
Attrib HOLLOWS RATIO   −1.6864091221235498
Sigmoid Node 6
Inputs   Weights
Threshold   3.6768880551696435
Attrib COMPACTNESS   −0.09520002076840899
Attrib CIRCULARITY   −1.9152680450416197
Attrib DISTANCE CIRCULARITY   −5.815449236870674
Attrib RADIUS RATIO   −6.332294358700488
Attrib PR.AXIS ASPECT RATIO   9.338467309473325
Attrib MAX.LENGTH ASPECT RATIO   −4.750128679459726
Attrib SCATTER RATIO   0.4771300096963834
Attrib ELONGATEDNESS   −5.54682584715859
Attrib PR.AXIS RECTANGULARITY   1.1579209654818219
Attrib MAX.LENGTH RECTANGULARITY   −0.342549270844944
Attrib SCALED VARIANCE_MAJOR   0.45976943861444264
Attrib SCALED VARIANCE_MINOR   1.19407873490925565
Attrib SCALED RADIUS OF GYRATION   0.5941265486453728
Attrib SKEWNESS ABOUT_MAJOR   6.355040742695632
Attrib SKEWNESS ABOUT_MINOR   −1.2753659167000797
Attrib KURTOSIS ABOUT_MAJOR   0.146149551250016
Attrib KURTOSIS ABOUT_MINOR   4.618425811577188
Attrib HOLLOWS RATIO   −2.5259156363892883
Sigmoid Node 7
Inputs   Weights
Threshold   −2.644662911256472
Attrib COMPACTNESS   6.458435000689934
Attrib CIRCULARITY   −8.500301458243479
Attrib DISTANCE CIRCULARITY   5.649731477311134
Attrib RADIUS RATIO   1.0447204042410734
Attrib PR.AXIS ASPECT RATIO   −3.988240231683719
Attrib MAX.LENGTH ASPECT RATIO   1.3560809568554362
Attrib SCATTER RATIO   −3.7979295102634016

Attrib ELONGATEDNESS   9.321071580442242
Attrib PR.AXIS RECTANGULARITY   2.551614760865225
Attrib MAX.LENGTH RECTANGULARITY   5.451886050523206
Attrib SCALED VARIANCE_MAJOR   3.348327762989005
Attrib SCALED VARIANCE_MINOR   −5.052730203905392
Attrib SCALED RADIUS OF GYRATION   4.471022562824842
Attrib SKEWNESS ABOUT_MAJOR   0.39158385307785604
Attrib SKEWNESS ABOUT_MINOR   −0.30057969154948566
Attrib KURTOSIS ABOUT_MAJOR   −0.9217716779624189
Attrib KURTOSIS ABOUT_MINOR   −6.117690770141743
Attrib HOLLOWS RATIO   6.15402895902428
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 4.35 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   339   80.5226 %
Incorrectly Classified Instances   82   19.4774 %
Kappa statistic   0.7405
Mean absolute error   0.1347
Root mean squared error   0.2516
Relative absolute error   35.9265 %
Root relative squared error   58.1089 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,867	0,190	0,603	0,867	0,711	0,611	0,913	0,762	opel

163

0,398	0,019	0,878	0,398	0,548	0,516	0,923	0,808	saab
0,991	0,029	0,923	0,991	0,956	0,941	0,999	0,999	bus
0,980	0,022	0,933	0,980	0,956	0,942	0,999	0,997	van
Weighted Avg.	0,805	0,065	0,834	0,805	0,790	0,750	0,958	0,890

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
91    6    4    4 |    a = opel
60   43    3    2 |    b = saab
0    0  108    1 |    c = bus
0    0    2   97 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.09805793313295566
Node 4   2.0143483965563513
Node 5   2.59117823416125
Node 6   −6.192699238324377
Node 7   −4.176938582479266
Sigmoid Node 1
Inputs   Weights
Threshold   −8.09194004853871
Node 4   6.81572966635606
Node 5   4.547623064052019
Node 6   −1.4808476194454316
Node 7   3.339321129220358
Sigmoid Node 2
Inputs   Weights
Threshold   0.4644115281376004
Node 4   −3.8276087493595368
Node 5   −9.344918829065975
Node 6   8.657929819628793
Node 7   −10.467961715503273
Sigmoid Node 3
Inputs   Weights
Threshold   0.06731357755821334
Node 4   −11.880074428250529
Node 5   1.7058178125339305
Node 6   −1.8604844568704202
Node 7   7.55089589255117
Sigmoid Node 4
Inputs   Weights
Threshold   −3.243753527771217
Attrib COMPACTNESS   −2.734387362687074
Attrib CIRCULARITY   −2.1314689914948186
Attrib DISTANCE CIRCULARITY   −3.1496476000389606
Attrib RADIUS RATIO   5.729632972416015
Attrib PR.AXIS ASPECT RATIO   −6.724029942131074
Attrib MAX.LENGTH ASPECT RATIO   −5.440001482221372
Attrib SCATTER RATIO   3.373982003680642
Attrib ELONGATEDNESS   −1.3867074257407346
Attrib PR.AXIS RECTANGULARITY   4.863196380026248
Attrib MAX.LENGTH RECTANGULARITY   −9.791416335375024
Attrib SCALED VARIANCE_MAJOR   4.7106900637872755
Attrib SCALED VARIANCE_MINOR   4.523951611977931
Attrib SCALED RADIUS OF GYRATION   4.557255833752197
Attrib SKEWNESS ABOUT_MAJOR   −8.539536714647587
Attrib SKEWNESS ABOUT_MINOR   1.6936424881026295

165

Attrib KURTOSIS ABOUT_MAJOR   1.087730595295149
Attrib KURTOSIS ABOUT_MINOR   2.3887178319521665
Attrib HOLLOWS RATIO   −3.8220229566697257
Sigmoid Node 5
Inputs   Weights
Threshold   −6.448680827825682
Attrib COMPACTNESS   0.5530838162982298
Attrib CIRCULARITY   −4.977523549171987
Attrib DISTANCE CIRCULARITY   −5.210417233123641
Attrib RADIUS RATIO   2.2689330669016647
Attrib PR.AXIS ASPECT RATIO   −2.489985195890577
Attrib MAX.LENGTH ASPECT RATIO   −1.42665248371443
Attrib SCATTER RATIO   1.789686629515091
Attrib ELONGATEDNESS   1.1596532242950945
Attrib PR.AXIS RECTANGULARITY   3.0352624437024205
Attrib MAX.LENGTH RECTANGULARITY   −3.999570351910481
Attrib SCALED VARIANCE_MAJOR   −0.3590197085482384
Attrib SCALED VARIANCE_MINOR   2.4419818047518023
Attrib SCALED RADIUS OF GYRATION   0.4545934343330557
Attrib SKEWNESS ABOUT_MAJOR   −2.144521301821153
Attrib SKEWNESS ABOUT_MINOR   −1.4133850570169348
Attrib KURTOSIS ABOUT_MAJOR   0.48208819295666505
Attrib KURTOSIS ABOUT_MINOR   −1.8379100240746418
Attrib HOLLOWS RATIO   −1.6864091221235498
Sigmoid Node 6
Inputs   Weights
Threshold   3.6768880551696435
Attrib COMPACTNESS   −0.09520002076840899
Attrib CIRCULARITY   −1.9152680450416197
Attrib DISTANCE CIRCULARITY   −5.815449236870674
Attrib RADIUS RATIO   −6.332294358700488
Attrib PR.AXIS ASPECT RATIO   9.338467309473325
Attrib MAX.LENGTH ASPECT RATIO   −4.750128679459726
Attrib SCATTER RATIO   0.4771300096963834
Attrib ELONGATEDNESS   −5.54682584715859
Attrib PR.AXIS RECTANGULARITY   1.1579209654818219
Attrib MAX.LENGTH RECTANGULARITY   −0.342549270844944
Attrib SCALED VARIANCE_MAJOR   0.45976943861444264
Attrib SCALED VARIANCE_MINOR   1.19407873490092565
Attrib SCALED RADIUS OF GYRATION   0.5941265486453728
Attrib SKEWNESS ABOUT_MAJOR   6.355040742695632
Attrib SKEWNESS ABOUT_MINOR   −1.2753659167000797
Attrib KURTOSIS ABOUT_MAJOR   0.146149551250016
Attrib KURTOSIS ABOUT_MINOR   4.618425811577188
Attrib HOLLOWS RATIO   −2.5259156363892883
Sigmoid Node 7
Inputs   Weights
Threshold   −2.644662911256472
Attrib COMPACTNESS   6.45843500689934

Attrib CIRCULARITY   −8.500301458243479
Attrib DISTANCE CIRCULARITY   5.649731477311134
Attrib RADIUS RATIO   1.0447204042410734
Attrib PR.AXIS ASPECT RATIO   −3.988240231683719
Attrib MAX.LENGTH ASPECT RATIO   1.3560809568554362
Attrib SCATTER RATIO   −3.7979295102634016
Attrib ELONGATEDNESS   9.321071580442242
Attrib PR.AXIS RECTANGULARITY   2.551614760865225
Attrib MAX.LENGTH RECTANGULARITY   5.451886050523206
Attrib SCALED VARIANCE_MAJOR   3.348327762989005
Attrib SCALED VARIANCE_MINOR   −5.052730203905392
Attrib SCALED RADIUS OF GYRATION   4.471022562824842
Attrib SKEWNESS ABOUT_MAJOR   0.39158385307785604
Attrib SKEWNESS ABOUT_MINOR   −0.30057969154948566
Attrib KURTOSIS ABOUT_MAJOR   −0.9217716779624189
Attrib KURTOSIS ABOUT_MINOR   −6.117690770141743
Attrib HOLLOWS RATIO   6.15402895902428
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.63 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   659   77.896
%
Incorrectly Classified Instances   187   22.104
%
Kappa statistic   0.7055
Mean absolute error   0.1441
Root mean squared error   0.2663
Relative absolute error   38.4533 %
Root relative squared error   61.5096 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,835	0,213	0,567	0,835	0,676	0,559	0,891	0,699	opel
0,346	0,025	0,824	0,346	0,487	0,451	0,912	0,772	saab
0,995	0,032	0,916	0,995	0,954	0,938	0,999	0,998	bus
0,955	0,025	0,922	0,955	0,938	0,919	0,996	0,985	van
Weighted Avg.	0,779	0,074	0,806	0,779	0,761	0,714	0,949	0,862

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
177  15   10   10  |   a = opel
133  75   4    5   |   b = saab
0    0   217   1   |   c = bus
2    1    6   190  |   d = van
```

12 12ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
```

KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.0901173776408602
Node 4   −4.47710690667624
Node 5   −5.046946256756377
Node 6   −0.8924230739176174
Node 7   6.541653991670312
Node 8   −3.532689577675336
Node 9   2.691806727553611
Node 10   −2.900357201130698
Node 11   −0.897015346073958
Node 12   1.6399753524285117
Node 13   −2.0976153785206653
Node 14   0.4199526428633861
Node 15   −1.6417387560545271
Node 16   −2.49050837146826
Node 17   1.564937741587138
Node 18   4.947796379214205
Node 19   −10.277528849591938
Node 20   −2.090487572997314
Node 21   2.4337365717866395
Sigmoid Node 1
Inputs   Weights
Threshold   0.44461857541436567
Node 4   5.048354208869452
Node 5   3.6038346815762146
Node 6   −0.6396962448566567
Node 7   −8.651316404900559
Node 8   −0.7678793648299177
Node 9   −4.681902786496473
Node 10   −5.411770703907111
Node 11   −0.6950080469848985
Node 12   −1.2858627810087253
Node 13   −1.8342906458813288
Node 14   5.026624626896363
Node 15   −1.6305925161478465
Node 16   4.095973825920414
Node 17   2.930886166248399
Node 18   4.207136433569071
Node 19   3.0967725891264584
Node 20   −6.374336867256876

169

Node 21   −3.5976393724989113
Sigmoid Node 2
Inputs   Weights
Threshold   −0.7890906389248604
Node 4   0.5001096096349278
Node 5   −2.8724386296711284
Node 6   1.5618536106098047
Node 7   3.4285400774300823
Node 8   −2.37967442712446
Node 9   2.898943243415068
Node 10   −2.129594659148111
Node 11   −3.02403354330056
Node 12   0.4263241674495034
Node 13   1.1086759453649704
Node 14   −7.7972650224302855
Node 15   3.1046999266896544
Node 16   −4.178297276804398
Node 17   −8.447460761000642
Node 18   −5.5230288766781825
Node 19   5.368933815709701
Node 20   −0.741492860071883
Node 21   3.034534327170585
Sigmoid Node 3
Inputs   Weights
Threshold   −1.6468297185984866
Node 4   0.158594758409507
Node 5   3.401211175673733
Node 6   −4.386438105860612
Node 7   −2.749844481546245
Node 8   3.4816907672531126
Node 9   −3.875267016597208
Node 10   6.675114557169075
Node 11   −2.4131299973070455
Node 12   −3.662848029288326
Node 13   −1.3283155923576893
Node 14   −1.5364185688574057
Node 15   1.0016820311768875
Node 16   −0.3088467785899635
Node 17   0.4593202928739138
Node 18   −0.11150690391578695
Node 19   −1.9834044840849894
Node 20   7.086139507773532
Node 21   −3.59524383675434 8
Sigmoid Node 4
Inputs   Weights
Threshold   1.057648267578742
Attrib COMPACTNESS   5.360405123479933
Attrib CIRCULARITY   −2.9513904438886276
Attrib DISTANCE CIRCULARITY   −0.9633798789779044

Attrib RADIUS RATIO   0.9708008122292412
Attrib PR.AXIS ASPECT RATIO   2.1486809173110073
Attrib MAX.LENGTH ASPECT RATIO   −0.7735815299368938
Attrib SCATTER RATIO   1.232014934717683
Attrib ELONGATEDNESS   0.9179832233729809
Attrib PR.AXIS RECTANGULARITY   1.246123211573621
Attrib MAX.LENGTH RECTANGULARITY   −1.796020333948371
Attrib SCALED VARIANCE_MAJOR   −1.0962255470701077
Attrib SCALED VARIANCE_MINOR   1.2659047502116743
Attrib SCALED RADIUS OF GYRATION   1.3236759638087827
Attrib SKEWNESS ABOUT_MAJOR   0.4958875275596645
Attrib SKEWNESS ABOUT_MINOR   5.736781614364271
Attrib KURTOSIS ABOUT_MAJOR   1.7766743633035742
Attrib KURTOSIS ABOUT_MINOR   −2.2696727140033355
Attrib HOLLOWS RATIO   −3.373387886705396
Sigmoid Node 5
Inputs   Weights
Threshold   −1.0983487038123196
Attrib COMPACTNESS   3.650229515770701
Attrib CIRCULARITY   −4.736710196475308
Attrib DISTANCE CIRCULARITY   4.88539610658867
Attrib RADIUS RATIO   −1.4673115334274616
Attrib PR.AXIS ASPECT RATIO   0.6327716179414773
Attrib MAX.LENGTH ASPECT RATIO   0.4688217301222349
Attrib SCATTER RATIO   −0.7854536876214686
Attrib ELONGATEDNESS   3.03462979702151
Attrib PR.AXIS RECTANGULARITY   0.699935407926436
Attrib MAX.LENGTH RECTANGULARITY   1.1138958008720155
Attrib SCALED VARIANCE_MAJOR   0.37609933021126446
Attrib SCALED VARIANCE_MINOR   −1.9681494353397573
Attrib SCALED RADIUS OF GYRATION   3.705020677199877
Attrib SKEWNESS ABOUT_MAJOR   2.7689816764256494
Attrib SKEWNESS ABOUT_MINOR   −1.4104814813848867
Attrib KURTOSIS ABOUT_MAJOR   0.1320568386575861
Attrib KURTOSIS ABOUT_MINOR   −6.005528035329885
Attrib HOLLOWS RATIO   7.178602524718009
Sigmoid Node 6
Inputs   Weights
Threshold   0.3781824404001681
Attrib COMPACTNESS   −1.5853628582319277
Attrib CIRCULARITY   0.01236180653884344
Attrib DISTANCE CIRCULARITY   −0.6412712815348397
Attrib RADIUS RATIO   0.8399180663584584
Attrib PR.AXIS ASPECT RATIO   0.8511611763273867
Attrib MAX.LENGTH ASPECT RATIO   0.66784923169521
Attrib SCATTER RATIO   0.5458828869028234
Attrib ELONGATEDNESS   −2.155869605237557
Attrib PR.AXIS RECTANGULARITY   −0.41532192186744205
Attrib MAX.LENGTH RECTANGULARITY   −2.8609358565441143

Attrib SCALED VARIANCE_MAJOR   0.9501149737214235
Attrib SCALED VARIANCE_MINOR   0.4602787442462592
Attrib SCALED RADIUS OF GYRATION   1.058689381041967
Attrib SKEWNESS ABOUT_MAJOR -0.5667725925426784
Attrib SKEWNESS ABOUT_MINOR   0.7152308963305534
Attrib KURTOSIS ABOUT_MAJOR -0.5760692452619608
Attrib KURTOSIS ABOUT_MINOR   2.475577256908743
Attrib HOLLOWS RATIO -0.42082680840721665
Sigmoid Node 7
Inputs   Weights
Threshold -0.43478843775282583
Attrib COMPACTNESS -0.3561677942507035
Attrib CIRCULARITY   4.168938142537171
Attrib DISTANCE CIRCULARITY -0.14409015134446057
Attrib RADIUS RATIO   2.767724173945222
Attrib PR.AXIS ASPECT RATIO   2.435990056735731
Attrib MAX.LENGTH ASPECT RATIO -0.855473619823471
Attrib SCATTER RATIO   2.1250906773565257
Attrib ELONGATEDNESS -4.681623189924182
Attrib PR.AXIS RECTANGULARITY   1.050093155673898
Attrib MAX.LENGTH RECTANGULARITY -0.6061508168382989
Attrib SCALED VARIANCE_MAJOR   1.2510319239970928
Attrib SCALED VARIANCE_MINOR   3.386473676918776
Attrib SCALED RADIUS OF GYRATION -2.691739422493615
Attrib SKEWNESS ABOUT_MAJOR   0.17242478063204936
Attrib SKEWNESS ABOUT_MINOR -1.078662012509999
Attrib KURTOSIS ABOUT_MAJOR   1.052951074208688
Attrib KURTOSIS ABOUT_MINOR   11.406257042286605
Attrib HOLLOWS RATIO -8.613973586986393
Sigmoid Node 8
Inputs   Weights
Threshold -2.503031469344839
Attrib COMPACTNESS   3.464324645160493
Attrib CIRCULARITY -1.5773130747566746
Attrib DISTANCE CIRCULARITY   0.2410442861889343
Attrib RADIUS RATIO -0.7498114568517132
Attrib PR.AXIS ASPECT RATIO   1.31328931690624
Attrib MAX.LENGTH ASPECT RATIO   1.0052951686416813
Attrib SCATTER RATIO -1.6048213033167376
Attrib ELONGATEDNESS   3.5213809660068796
Attrib PR.AXIS RECTANGULARITY -1.204150257256219
Attrib MAX.LENGTH RECTANGULARITY   2.6035894918883
Attrib SCALED VARIANCE_MAJOR -0.8526135642020838
Attrib SCALED VARIANCE_MINOR -0.8256573850709853
Attrib SCALED RADIUS OF GYRATION -2.8689399102526196
Attrib SKEWNESS ABOUT_MAJOR   1.9959907416587244
Attrib SKEWNESS ABOUT_MINOR -1.6717148846275147
Attrib KURTOSIS ABOUT_MAJOR   1.0226938925709617
Attrib KURTOSIS ABOUT_MINOR   0.49825189625598176

Attrib HOLLOWS RATIO   1.017435109376702
Sigmoid Node 9
Inputs   Weights
Threshold   1.0632070631174149
Attrib COMPACTNESS   −5.286379050864721
Attrib CIRCULARITY   1.231704011857995
Attrib DISTANCE CIRCULARITY   −3.7175060539855265
Attrib RADIUS RATIO   −0.43194251104593745
Attrib PR.AXIS ASPECT RATIO   2.5714601266837835
Attrib MAX.LENGTH ASPECT RATIO   −3.8376661126011666
Attrib SCATTER RATIO   0.10868903013600918
Attrib ELONGATEDNESS   −3.639280834047659
Attrib PR.AXIS RECTANGULARITY   −1.762552437538858
Attrib MAX.LENGTH RECTANGULARITY   −4.837709882545078
Attrib SCALED VARIANCE_MAJOR   −1.0850267009900774
Attrib SCALED VARIANCE_MINOR   0.35516660569885006
Attrib SCALED RADIUS OF GYRATION   3.964995351101322
Attrib SKEWNESS ABOUT_MAJOR   1.2242723449703092
Attrib SKEWNESS ABOUT_MINOR   0.30809952566650173
Attrib KURTOSIS ABOUT_MAJOR   2.3241389067164397
Attrib KURTOSIS ABOUT_MINOR   1.303441792387171
Attrib HOLLOWS RATIO   −4.95976535963445
Sigmoid Node 10
Inputs   Weights
Threshold   0.5924260262474118
Attrib COMPACTNESS   3.298730913168296
Attrib CIRCULARITY   1.0934017407314867
Attrib DISTANCE CIRCULARITY   2.7992588145127626
Attrib RADIUS RATIO   −3.047240152566927
Attrib PR.AXIS ASPECT RATIO   3.2736067703255016
Attrib MAX.LENGTH ASPECT RATIO   2.651791987725488
Attrib SCATTER RATIO   −2.717210396602663
Attrib ELONGATEDNESS   2.8347669391082033
Attrib PR.AXIS RECTANGULARITY   −3.1503218838479796
Attrib MAX.LENGTH RECTANGULARITY   6.135405646067198
Attrib SCALED VARIANCE_MAJOR   −2.3054817799886735
Attrib SCALED VARIANCE_MINOR   −2.6463808161239126
Attrib SCALED RADIUS OF GYRATION   −2.8495234271475023
Attrib SKEWNESS ABOUT_MAJOR   6.057274968682247
Attrib SKEWNESS ABOUT_MINOR   −1.061564328623092
Attrib KURTOSIS ABOUT_MAJOR   −0.3089735727981796
Attrib KURTOSIS ABOUT_MINOR   −2.106780865198478
Attrib HOLLOWS RATIO   3.115196177206478
Sigmoid Node 11
Inputs   Weights
Threshold   −1.575882410115183
Attrib COMPACTNESS   −0.06345256943303762
Attrib CIRCULARITY   −1.9002219732656997
Attrib DISTANCE CIRCULARITY   0.7690632389750494

173

Attrib RADIUS RATIO   1.3617927466837227
Attrib PR.AXIS ASPECT RATIO   −0.9664395069698212
Attrib MAX.LENGTH ASPECT RATIO   0.4635168763379709
Attrib SCATTER RATIO   0.35629734094500676
Attrib ELONGATEDNESS   0.4240101944040331S
Attrib PR.AXIS RECTANGULARITY   0.38240417828175643
Attrib MAX.LENGTH RECTANGULARITY   −2.586343647791513
Attrib SCALED VARIANCE_MAJOR   1.245847339436896
Attrib SCALED VARIANCE_MINOR   0.40651540374418793
Attrib SCALED RADIUS OF GYRATION   0.15248700271306692
Attrib SKEWNESS ABOUT_MAJOR   −0.9300249358158058
Attrib SKEWNESS ABOUT_MINOR   1.2009466470815937
Attrib KURTOSIS ABOUT_MAJOR   1.7482017431847425
Attrib KURTOSIS ABOUT_MINOR   −0.5050457321419718
Attrib HOLLOWS RATIO   −0.7080542196277393
Sigmoid Node 12
Inputs   Weights
Threshold   −0.1439702121188781
Attrib COMPACTNESS   −3.068992175525179
Attrib CIRCULARITY   0.16576774571696828
Attrib DISTANCE CIRCULARITY   −0.3721392593742165
Attrib RADIUS RATIO   0.8962550425820082
Attrib PR.AXIS ASPECT RATIO   0.599255920117058
Attrib MAX.LENGTH ASPECT RATIO   0.9722451806569411
Attrib SCATTER RATIO   0.5004742651819117
Attrib ELONGATEDNESS   −0.744706126779569
Attrib PR.AXIS RECTANGULARITY   −0.37931799244944153
Attrib MAX.LENGTH RECTANGULARITY   −2.2572496797864603
Attrib SCALED VARIANCE_MAJOR   0.6176235999719265
Attrib SCALED VARIANCE_MINOR   0.45562639769058993
Attrib SCALED RADIUS OF GYRATION   0.44896373380159105
Attrib SKEWNESS ABOUT_MAJOR   0.3644289210128107
Attrib SKEWNESS ABOUT_MINOR   −0.39449263565100967
Attrib KURTOSIS ABOUT_MAJOR   3.668608366804056
Attrib KURTOSIS ABOUT_MINOR   −0.7811731150608724
Attrib HOLLOWS RATIO   −0.19402513592506201
Sigmoid Node 13
Inputs   Weights
Threshold   0.2799781823931535
Attrib COMPACTNESS   −1.0441364313092145
Attrib CIRCULARITY   0.8564565323172628
Attrib DISTANCE CIRCULARITY   0.9628512275723035
Attrib RADIUS RATIO   −0.27837272772301236
Attrib PR.AXIS ASPECT RATIO   0.85581963166659
Attrib MAX.LENGTH ASPECT RATIO   0.017885716378266796
Attrib SCATTER RATIO   0.3796227652524752
Attrib ELONGATEDNESS   −1.49962017025066
Attrib PR.AXIS RECTANGULARITY   −0.5556902989063822
Attrib MAX.LENGTH RECTANGULARITY   −0.25336927929780145

Attrib SCALED VARIANCE_MAJOR   0.559594820847153
Attrib SCALED VARIANCE_MINOR   0.4915446962553267
Attrib SCALED RADIUS OF GYRATION   −0.13307370355409123
Attrib SKEWNESS ABOUT_MAJOR   0.8838481162234721
Attrib SKEWNESS ABOUT_MINOR   0.33020194459175417
Attrib KURTOSIS ABOUT_MAJOR   −0.6852116219411275
Attrib KURTOSIS ABOUT_MINOR   1.2425125905661174
Attrib HOLLOWS RATIO   −1.8177151491565473
Sigmoid Node 14
Inputs   Weights
Threshold   −1.27523178949397
Attrib COMPACTNESS   −2.8685823481318944
Attrib CIRCULARITY   1.4228670597390045
Attrib DISTANCE CIRCULARITY   2.474802069468114
Attrib RADIUS RATIO   1.6975838681349569
Attrib PR.AXIS ASPECT RATIO   −5.555991772863976
Attrib MAX.LENGTH ASPECT RATIO   0.8875468756023351
Attrib SCATTER RATIO   2.238190297118771
Attrib ELONGATEDNESS   −1.2104790490009654
Attrib PR.AXIS RECTANGULARITY   1.8947758777998396
Attrib MAX.LENGTH RECTANGULARITY   3.8883487592583807
Attrib SCALED VARIANCE_MAJOR   3.757466384017187
Attrib SCALED VARIANCE_MINOR   1.9507520679724737
Attrib SCALED RADIUS OF GYRATION   −1.3536232059221105
Attrib SKEWNESS ABOUT_MAJOR   −3.96798492493842
Attrib SKEWNESS ABOUT_MINOR   −1.2771019248431377
Attrib KURTOSIS ABOUT_MAJOR   0.9694139430961431
Attrib KURTOSIS ABOUT_MINOR   0.8450612580891725
Attrib HOLLOWS RATIO   0.7579934494686469
Sigmoid Node 15
Inputs   Weights
Threshold   0.6163790483443619
Attrib COMPACTNESS   1.4003884230582242
Attrib CIRCULARITY   −0.3868007267505445
Attrib DISTANCE CIRCULARITY   −0.055129032686375236
Attrib RADIUS RATIO   −0.15502561270140397
Attrib PR.AXIS ASPECT RATIO   3.4140562564264494
Attrib MAX.LENGTH ASPECT RATIO   −0.1792039658247609
Attrib SCATTER RATIO   −0.4339279940538741
Attrib ELONGATEDNESS   −1.0505461519306163
Attrib PR.AXIS RECTANGULARITY   −0.9483794334723054
Attrib MAX.LENGTH RECTANGULARITY   0.2984873957876819
Attrib SCALED VARIANCE_MAJOR   −1.008982284664582
Attrib SCALED VARIANCE_MINOR   −0.32093754769028093
Attrib SCALED RADIUS OF GYRATION   −1.3769025430903703
Attrib SKEWNESS ABOUT_MAJOR   2.3737294902676727
Attrib SKEWNESS ABOUT_MINOR   −0.45677528975868514
Attrib KURTOSIS ABOUT_MAJOR   −0.6051509718672728
Attrib KURTOSIS ABOUT_MINOR   1.2677361675666887

Attrib HOLLOWS RATIO   0.2816771922524885
Sigmoid Node 16
Inputs   Weights
Threshold   −0.28833521727077477
Attrib COMPACTNESS   −1.6448200623984506
Attrib CIRCULARITY   1.2169243272669865
Attrib DISTANCE CIRCULARITY   0.17670151428174158
Attrib RADIUS RATIO   1.6276098861571466
Attrib PR.AXIS ASPECT RATIO   1.1181327662622278
Attrib MAX.LENGTH ASPECT RATIO   0.47912749056490606
Attrib SCATTER RATIO   −0.253187333434039
Attrib ELONGATEDNESS   1.2186970965783464
Attrib PR.AXIS RECTANGULARITY   −0.5768008179446644
Attrib MAX.LENGTH RECTANGULARITY   2.3288538595924733
Attrib SCALED VARIANCE_MAJOR   0.6052013799609353
Attrib SCALED VARIANCE_MINOR   −1.0340204427525472
Attrib SCALED RADIUS OF GYRATION   4.969220409395045
Attrib SKEWNESS ABOUT_MAJOR   0.5742085711763437
Attrib SKEWNESS ABOUT_MINOR   −0.32599069426798255
Attrib KURTOSIS ABOUT_MAJOR   −0.3731878246490918
Attrib KURTOSIS ABOUT_MINOR   −5.218328843211597
Attrib HOLLOWS RATIO   3.9322573308271282
Sigmoid Node 17
Inputs   Weights
Threshold   −5.055121764188726
Attrib COMPACTNESS   2.247252111885887
Attrib CIRCULARITY   −4.813298378256952
Attrib DISTANCE CIRCULARITY   −0.32614312702716086
Attrib RADIUS RATIO   1.479941032175189
Attrib PR.AXIS ASPECT RATIO   −3.4299818378920865
Attrib MAX.LENGTH ASPECT RATIO   −1.8602860868832618
Attrib SCATTER RATIO   −0.17337638364576788
Attrib ELONGATEDNESS   4.965711085564175
Attrib PR.AXIS RECTANGULARITY   1.3284533718349671
Attrib MAX.LENGTH RECTANGULARITY   −4.328681411323446
Attrib SCALED VARIANCE_MAJOR   0.8601153281414825
Attrib SCALED VARIANCE_MINOR   1.001629163105112
Attrib SCALED RADIUS OF GYRATION   −0.45120613180527697
Attrib SKEWNESS ABOUT_MAJOR   −1.6280156551903975
Attrib SKEWNESS ABOUT_MINOR   3.410504782687384
Attrib KURTOSIS ABOUT_MAJOR   −0.30897462894588307
Attrib KURTOSIS ABOUT_MINOR   −0.38533344692820176
Attrib HOLLOWS RATIO   −3.1740257204552154
Sigmoid Node 18
Inputs   Weights
Threshold   −3.1535465442238992
Attrib COMPACTNESS   0.37427174575017197
Attrib CIRCULARITY   −4.0174460667232985
Attrib DISTANCE CIRCULARITY   −3.3249011420175463

Attrib RADIUS RATIO   3.085584771243804
Attrib PR.AXIS ASPECT RATIO   1.2150614770542432
Attrib MAX.LENGTH ASPECT RATIO   −0.22395111023083716
Attrib SCATTER RATIO   −0.17976060988411502
Attrib ELONGATEDNESS   2.289151676981671
Attrib PR.AXIS RECTANGULARITY   0.8402847169845775
Attrib MAX.LENGTH RECTANGULARITY   −4.978664875009369
Attrib SCALED VARIANCE_MAJOR   0.7083071572821911
Attrib SCALED VARIANCE_MINOR   0.66965105250972245
Attrib SCALED RADIUS OF GYRATION   1.3000194629122892
Attrib SKEWNESS ABOUT_MAJOR   0.9538769216562858
Attrib SKEWNESS ABOUT_MINOR   −2.2551297799282355
Attrib KURTOSIS ABOUT_MAJOR   0.6003459486268204
Attrib KURTOSIS ABOUT_MINOR   −1.5739337516336278
Attrib HOLLOWS RATIO   −1.4967179955799124
Sigmoid Node 19
Inputs   Weights
Threshold   1.236184904213755
Attrib COMPACTNESS   1.1810753713681459
Attrib CIRCULARITY   −2.127141912509981
Attrib DISTANCE CIRCULARITY   −8.700589534519358
Attrib RADIUS RATIO   −2.7791174251549804
Attrib PR.AXIS ASPECT RATIO   5.961261922142163
Attrib MAX.LENGTH ASPECT RATIO   −4.092083364064269
Attrib SCATTER RATIO   0.9035908644800471
Attrib ELONGATEDNESS   −4.713625144570146
Attrib PR.AXIS RECTANGULARITY   1.2170610965351392
Attrib MAX.LENGTH RECTANGULARITY   −0.36198914334994803
Attrib SCALED VARIANCE_MAJOR   −0.023405835741314125
Attrib SCALED VARIANCE_MINOR   1.3756837729523594
Attrib SCALED RADIUS OF GYRATION   1.3930281602548684
Attrib SKEWNESS ABOUT_MAJOR   3.760393978139718
Attrib SKEWNESS ABOUT_MINOR   −4.26753512855724
Attrib KURTOSIS ABOUT_MAJOR   1.2734045433735233
Attrib KURTOSIS ABOUT_MINOR   6.249963289723269
Attrib HOLLOWS RATIO   −7.260189907610669
Sigmoid Node 20
Inputs   Weights
Threshold   0.7299975469194063
Attrib COMPACTNESS   3.0161968867140905
Attrib CIRCULARITY   1.9148495339242215
Attrib DISTANCE CIRCULARITY   2.7886827104187537
Attrib RADIUS RATIO   −3.4435322614583277
Attrib PR.AXIS ASPECT RATIO   3.0562480030770716
Attrib MAX.LENGTH ASPECT RATIO   2.5713007836712
Attrib SCATTER RATIO   −2.4937523091589227
Attrib ELONGATEDNESS   2.220153090531981
Attrib PR.AXIS RECTANGULARITY   −3.117551332615675
Attrib MAX.LENGTH RECTANGULARITY   6.226123064004497

Attrib SCALED VARIANCE_MAJOR   −2.216348189403976
Attrib SCALED VARIANCE_MINOR   −2.615395231657577
Attrib SCALED RADIUS OF GYRATION   −2.587851654052159
Attrib SKEWNESS ABOUT_MAJOR   6.884905363296031
Attrib SKEWNESS ABOUT_MINOR   0.2653123363565098
Attrib KURTOSIS ABOUT_MAJOR   −1.957333842913722
Attrib KURTOSIS ABOUT_MINOR   −2.132242044390803
Attrib HOLLOWS RATIO   2.601659362324911
Sigmoid Node 21
Inputs   Weights
Threshold   −0.4612123188895009
Attrib COMPACTNESS   −4.899997325810865
Attrib CIRCULARITY   1.8001184642971872
Attrib DISTANCE CIRCULARITY   0.3242495308165743
Attrib RADIUS RATIO   −0.3941473846930091
Attrib PR.AXIS ASPECT RATIO   0.237287358253632
Attrib MAX.LENGTH ASPECT RATIO   1.7894066487670617
Attrib SCATTER RATIO   1.2203677312921997
Attrib ELONGATEDNESS   −0.47404138061645806
Attrib PR.AXIS RECTANGULARITY   0.8545772440201984
Attrib MAX.LENGTH RECTANGULARITY   0.37806732488064587
Attrib SCALED VARIANCE_MAJOR   0.7584359510883706
Attrib SCALED VARIANCE_MINOR   1.691357552475656
Attrib SCALED RADIUS OF GYRATION   −0.01778847530931123
Attrib SKEWNESS ABOUT_MAJOR   1.8188443773426402
Attrib SKEWNESS ABOUT_MINOR   0.3433047884204922
Attrib KURTOSIS ABOUT_MAJOR   2.9183023972955016
Attrib KURTOSIS ABOUT_MINOR   −3.7861145506159337
Attrib HOLLOWS RATIO   −4.602034440491123
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   390   92.6366 %
Incorrectly Classified Instances   31   7.3634 %
Kappa statistic   0.9018
Mean absolute error   0.0755
Root mean squared error   0.1803
Relative absolute error   20.1315 %
Root relative squared error   41.6465 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,829	0,032	0,897	0,829	0,861	0,819	0,958	0,906	opel
0,880	0,048	0,864	0,880	0,872	0,827	0,964	0,919	saab
1,000	0,013	0,965	1,000	0,982	0,976	1,000	1,000	bus
1,000	0,006	0,980	1,000	0,990	0,987	1,000	1,000	van
Weighted Avg.	0,926	0,025	0,925	0,926	0,925	0,901	0,980	0,956

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
87   15   1    2  |   a = opel
10   95   3    0  |   b = saab
0    0  109    0  |   c = bus
0    0    0   99  |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY

RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.0901173776408602
Node 4   −4.47710690667624
Node 5   −5.046946256756377
Node 6   −0.8924230739176174
Node 7   6.541653991670312
Node 8   −3.532689577675336
Node 9   2.691806727553611
Node 10   −2.900357201130698
Node 11   −0.897015346073958
Node 12   1.6399753524285117
Node 13   −2.0976153785206653
Node 14   0.4199526428633861
Node 15   −1.6417387560545271
Node 16   −2.490050837146826
Node 17   1.564937741587138
Node 18   4.947796379214205
Node 19   −10.277528849591938
Node 20   −2.09048757297314
Node 21   2.4337365717866395
Sigmoid Node 1
Inputs   Weights
Threshold   0.44461857541436567
Node 4   5.048354208869452
Node 5   3.6038346815762146
Node 6   −0.6396962448566567
Node 7   −8.651316404900559
Node 8   −0.7678793648299177

180

```
Node 9       −4.681902786496473
Node 10      −5.411770703907111
Node 11      −0.6950080469848985
Node 12      −1.2858627810087253
Node 13      −1.8342906458813288
Node 14       5.026624626896363
Node 15      −1.6305925161478465
Node 16       4.095973825920414
Node 17       2.930886166248399
Node 18       4.207136433569071
Node 19       3.0967725891264584
Node 20      −6.374336867256876
Node 21      −3.5976393724989113
Sigmoid Node 2
Inputs       Weights
Threshold      −0.7890906389248604
Node 4        0.5001096096349278
Node 5       −2.8724386296711284
Node 6        1.5618536106098047
Node 7        3.4285400774300823
Node 8       −2.37967442712446
Node 9        2.898943243415068
Node 10      −2.129594659148111
Node 11      −3.02403354330056
Node 12       0.4263241674495034
Node 13       1.1086759453649704
Node 14      −7.7972650224302855
Node 15       3.1046999266896544
Node 16      −4.178297276804398
Node 17      −8.447460761000642
Node 18      −5.5230288766781825
Node 19       5.368933815709701
Node 20      −0.741492860071883
Node 21       3.034534327170585
Sigmoid Node 3
Inputs       Weights
Threshold      −1.6468297185984866
Node 4        0.158594758409507
Node 5        3.401211175673733
Node 6       −4.386438105860612
Node 7       −2.749844481546245
Node 8        3.4816907672531126
Node 9       −3.875267016597208
Node 10       6.675114557169075
Node 11      −2.4131299973070455
Node 12      −3.662848029288326
Node 13      −1.328315923576893
Node 14      −1.5364185688574057
Node 15       1.0016820311768875
```

Node 16   −0.3088467785899635
Node 17   0.4593202928739138
Node 18   −0.11150690391578695
Node 19   −1.983404840849894
Node 20   7.086139507773532
Node 21   −3.595243836754348
Sigmoid Node 4
Inputs   Weights
Threshold   1.057648267578742
Attrib COMPACTNESS   5.360405123479933
Attrib CIRCULARITY   −2.951390438886276
Attrib DISTANCE CIRCULARITY   −0.9633798789779044
Attrib RADIUS RATIO   0.9708008122292412
Attrib PR.AXIS ASPECT RATIO   2.1486809173110073
Attrib MAX.LENGTH ASPECT RATIO   −0.7735815299368938
Attrib SCATTER RATIO   1.232014934717683
Attrib ELONGATEDNESS   0.9179832233729809
Attrib PR.AXIS RECTANGULARITY   1.246123211573621
Attrib MAX.LENGTH RECTANGULARITY   −1.796020333948371
Attrib SCALED VARIANCE_MAJOR   −1.0962255470701077
Attrib SCALED VARIANCE_MINOR   1.2659047502116743
Attrib SCALED RADIUS OF GYRATION   1.3236759638087827
Attrib SKEWNESS ABOUT_MAJOR   0.4958875275596645
Attrib SKEWNESS ABOUT_MINOR   5.736781614364271
Attrib KURTOSIS ABOUT_MAJOR   1.7766743633035742
Attrib KURTOSIS ABOUT_MINOR   −2.2696727140033355
Attrib HOLLOWS RATIO   −3.373387886705396
Sigmoid Node 5
Inputs   Weights
Threshold   −1.0983487038123196
Attrib COMPACTNESS   3.650229515770701
Attrib CIRCULARITY   −4.736710196475308
Attrib DISTANCE CIRCULARITY   4.88539610658867
Attrib RADIUS RATIO   −1.4673115334274616
Attrib PR.AXIS ASPECT RATIO   0.6327716179414773
Attrib MAX.LENGTH ASPECT RATIO   0.4688217301222349
Attrib SCATTER RATIO   −0.7854536876214686
Attrib ELONGATEDNESS   3.03462979702151
Attrib PR.AXIS RECTANGULARITY   0.699935407926436
Attrib MAX.LENGTH RECTANGULARITY   1.1138958008720155
Attrib SCALED VARIANCE_MAJOR   0.37609933021126446
Attrib SCALED VARIANCE_MINOR   −1.9681494353397573
Attrib SCALED RADIUS OF GYRATION   3.705020677199877
Attrib SKEWNESS ABOUT_MAJOR   2.7689816764256494
Attrib SKEWNESS ABOUT_MINOR   −1.4104814813848867
Attrib KURTOSIS ABOUT_MAJOR   0.1320568386575861
Attrib KURTOSIS ABOUT_MINOR   −6.005528035329885
Attrib HOLLOWS RATIO   7.178602524718009
Sigmoid Node 6

Inputs   Weights
Threshold   0.3781824404001681
Attrib COMPACTNESS   −1.5853628582319277
Attrib CIRCULARITY   0.01236180653884344
Attrib DISTANCE CIRCULARITY   −0.6412712815348397
Attrib RADIUS RATIO   0.8399180663584584
Attrib PR.AXIS ASPECT RATIO   0.8511611763273867
Attrib MAX.LENGTH ASPECT RATIO   0.66784923169521
Attrib SCATTER RATIO   0.5458828869028234
Attrib ELONGATEDNESS   −2.155869605237557
Attrib PR.AXIS RECTANGULARITY   −0.41532192186744205
Attrib MAX.LENGTH RECTANGULARITY   −2.8609358565441143
Attrib SCALED VARIANCE_MAJOR   0.9501149737214235
Attrib SCALED VARIANCE_MINOR   0.4602787442462592
Attrib SCALED RADIUS OF GYRATION   1.058689381041967
Attrib SKEWNESS ABOUT_MAJOR   −0.5667725925426784
Attrib SKEWNESS ABOUT_MINOR   0.7152308963305534
Attrib KURTOSIS ABOUT_MAJOR   −0.5760692452619608
Attrib KURTOSIS ABOUT_MINOR   2.475577256908743
Attrib HOLLOWS RATIO   −0.42082680840721665
Sigmoid Node 7
Inputs   Weights
Threshold   −0.43478843775282583
Attrib COMPACTNESS   −0.3561677942507035
Attrib CIRCULARITY   4.168938142537171
Attrib DISTANCE CIRCULARITY   −0.14409015134446057
Attrib RADIUS RATIO   2.767724173945222
Attrib PR.AXIS ASPECT RATIO   2.435990056735731
Attrib MAX.LENGTH ASPECT RATIO   −0.855473619823471
Attrib SCATTER RATIO   2.1250906773565257
Attrib ELONGATEDNESS   −4.681623189924182
Attrib PR.AXIS RECTANGULARITY   1.050093155673898
Attrib MAX.LENGTH RECTANGULARITY   −0.6061508168382989
Attrib SCALED VARIANCE_MAJOR   1.2510319239970928
Attrib SCALED VARIANCE_MINOR   3.386473676918776
Attrib SCALED RADIUS OF GYRATION   −2.691739422493615
Attrib SKEWNESS ABOUT_MAJOR   0.17242478063204936
Attrib SKEWNESS ABOUT_MINOR   −1.078662012509999
Attrib KURTOSIS ABOUT_MAJOR   1.052951074208688
Attrib KURTOSIS ABOUT_MINOR   11.406257042286605
Attrib HOLLOWS RATIO   −8.613973586986393
Sigmoid Node 8
Inputs   Weights
Threshold   −2.503031469344839
Attrib COMPACTNESS   3.464324645160493
Attrib CIRCULARITY   −1.5773130747566746
Attrib DISTANCE CIRCULARITY   0.2410442861889343
Attrib RADIUS RATIO   −0.7498114568517132
Attrib PR.AXIS ASPECT RATIO   1.31328931690624

Attrib MAX.LENGTH ASPECT RATIO   1.0052951686416813
Attrib SCATTER RATIO   −1.6048213033167376
Attrib ELONGATEDNESS   3.5213809660068796
Attrib PR.AXIS RECTANGULARITY   −1.204150257256219
Attrib MAX.LENGTH RECTANGULARITY   2.6035894918883
Attrib SCALED VARIANCE_MAJOR   −0.8526135642020838
Attrib SCALED VARIANCE_MINOR   −0.8256573850709853
Attrib SCALED RADIUS OF GYRATION   −2.8689399102526196
Attrib SKEWNESS ABOUT_MAJOR   1.9959907416587244
Attrib SKEWNESS ABOUT_MINOR   −1.6717148846275147
Attrib KURTOSIS ABOUT_MAJOR   1.0226938925709617
Attrib KURTOSIS ABOUT_MINOR   0.49825189625598176
Attrib HOLLOWS RATIO   1.017435109376702
Sigmoid Node 9
Inputs   Weights
Threshold   1.0632070631174149
Attrib COMPACTNESS   −5.286379050864721
Attrib CIRCULARITY   1.231704011857995
Attrib DISTANCE CIRCULARITY   −3.7175060539855265
Attrib RADIUS RATIO   −0.43194251104593745
Attrib PR.AXIS ASPECT RATIO   2.5714601266837835
Attrib MAX.LENGTH ASPECT RATIO   −3.8376661126011666
Attrib SCATTER RATIO   0.10868903013600918
Attrib ELONGATEDNESS   −3.639280834047659
Attrib PR.AXIS RECTANGULARITY   −1.762552437538858
Attrib MAX.LENGTH RECTANGULARITY   −4.837709882545078
Attrib SCALED VARIANCE_MAJOR   −1.0850267009900774
Attrib SCALED VARIANCE_MINOR   0.35516660569885006
Attrib SCALED RADIUS OF GYRATION   3.964995351101322
Attrib SKEWNESS ABOUT_MAJOR   1.2242723449703092
Attrib SKEWNESS ABOUT_MINOR   0.30809952566650173
Attrib KURTOSIS ABOUT_MAJOR   2.3241389067164397
Attrib KURTOSIS ABOUT_MINOR   1.303441792387171
Attrib HOLLOWS RATIO   −4.95976535963445
Sigmoid Node 10
Inputs   Weights
Threshold   0.5924260262474118
Attrib COMPACTNESS   3.298730913168296
Attrib CIRCULARITY   1.0934017407314867
Attrib DISTANCE CIRCULARITY   2.7992588145127626
Attrib RADIUS RATIO   −3.047240152566927
Attrib PR.AXIS ASPECT RATIO   3.2736067703255016
Attrib MAX.LENGTH ASPECT RATIO   2.651791987725488
Attrib SCATTER RATIO   −2.717210396602663
Attrib ELONGATEDNESS   2.8347669391082033
Attrib PR.AXIS RECTANGULARITY   −3.1503218838479796
Attrib MAX.LENGTH RECTANGULARITY   6.135405646067198
Attrib SCALED VARIANCE_MAJOR   −2.3054817799886735
Attrib SCALED VARIANCE_MINOR   −2.6463808161239126

Attrib SCALED RADIUS OF GYRATION   −2.8495234271475023
Attrib SKEWNESS ABOUT_MAJOR   6.057274968682247
Attrib SKEWNESS ABOUT_MINOR   −1.061564328623092
Attrib KURTOSIS ABOUT_MAJOR   −0.3089735727981796
Attrib KURTOSIS ABOUT_MINOR   −2.106780865198478
Attrib HOLLOWS RATIO   3.115196177206478
Sigmoid Node 11
Inputs   Weights
Threshold   −1.575882410115183
Attrib COMPACTNESS   −0.06345256943303762
Attrib CIRCULARITY   −1.9002219732656997
Attrib DISTANCE CIRCULARITY   0.7690632389750494
Attrib RADIUS RATIO   1.3617927466837227
Attrib PR.AXIS ASPECT RATIO   −0.9664395069698212
Attrib MAX.LENGTH ASPECT RATIO   0.4635168763379709
Attrib SCATTER RATIO   0.35629734094500676
Attrib ELONGATEDNESS   0.42401019440403315
Attrib PR.AXIS RECTANGULARITY   0.38240417828175643
Attrib MAX.LENGTH RECTANGULARITY   −2.586343647791513
Attrib SCALED VARIANCE_MAJOR   1.245847339436896
Attrib SCALED VARIANCE_MINOR   0.40651540374418793
Attrib SCALED RADIUS OF GYRATION   0.15248700271306692
Attrib SKEWNESS ABOUT_MAJOR   −0.9300249358158058
Attrib SKEWNESS ABOUT_MINOR   1.2009466470815937
Attrib KURTOSIS ABOUT_MAJOR   1.7482017431847425
Attrib KURTOSIS ABOUT_MINOR   −0.5050457321419718
Attrib HOLLOWS RATIO   −0.7080542196277393
Sigmoid Node 12
Inputs   Weights
Threshold   −0.1439702121188781
Attrib COMPACTNESS   −3.068992175525179
Attrib CIRCULARITY   0.16576774571696828
Attrib DISTANCE CIRCULARITY   −0.3721392593742165
Attrib RADIUS RATIO   0.8962550425820082
Attrib PR.AXIS ASPECT RATIO   0.599255920117058
Attrib MAX.LENGTH ASPECT RATIO   0.9722451806569411
Attrib SCATTER RATIO   0.5004742651819117
Attrib ELONGATEDNESS   −0.744706126779569
Attrib PR.AXIS RECTANGULARITY   −0.37931799244944153
Attrib MAX.LENGTH RECTANGULARITY   −2.2572496797864603
Attrib SCALED VARIANCE_MAJOR   0.6176235999719265
Attrib SCALED VARIANCE_MINOR   0.45562639769058993
Attrib SCALED RADIUS OF GYRATION   0.44896373380159105
Attrib SKEWNESS ABOUT_MAJOR   0.3644289210128107
Attrib SKEWNESS ABOUT_MINOR   −0.39449263565100967
Attrib KURTOSIS ABOUT_MAJOR   3.668608366804056
Attrib KURTOSIS ABOUT_MINOR   −0.7811731150608724
Attrib HOLLOWS RATIO   −0.19402513592506201
Sigmoid Node 13

Inputs   Weights
Threshold   0.2799781823931535
Attrib COMPACTNESS   −1.0441364313092145
Attrib CIRCULARITY   0.8564565323172628
Attrib DISTANCE CIRCULARITY   0.9628512275723035
Attrib RADIUS RATIO   −0.27837272772301236
Attrib PR.AXIS ASPECT RATIO   0.85581963166659
Attrib MAX.LENGTH ASPECT RATIO   0.017885716378266796
Attrib SCATTER RATIO   0.3796227652524752
Attrib ELONGATEDNESS   −1.49962017025066
Attrib PR.AXIS RECTANGULARITY   −0.5556902989063822
Attrib MAX.LENGTH RECTANGULARITY   −0.25336927929780145
Attrib SCALED VARIANCE_MAJOR   0.559594820847153
Attrib SCALED VARIANCE_MINOR   0.4915446962553267
Attrib SCALED RADIUS OF GYRATION   −0.13307370355409123
Attrib SKEWNESS ABOUT_MAJOR   0.8838481162234721
Attrib SKEWNESS ABOUT_MINOR   0.33020194459175417
Attrib KURTOSIS ABOUT_MAJOR   −0.6852116219411275
Attrib KURTOSIS ABOUT_MINOR   1.2425125905661174
Attrib HOLLOWS RATIO   −1.8177151491565473
Sigmoid Node 14
Inputs   Weights
Threshold   −1.27523178949397
Attrib COMPACTNESS   −2.8685823481318944
Attrib CIRCULARITY   1.4228670597390045
Attrib DISTANCE CIRCULARITY   2.474802069468114
Attrib RADIUS RATIO   1.6975838681349569
Attrib PR.AXIS ASPECT RATIO   −5.555991772863976
Attrib MAX.LENGTH ASPECT RATIO   0.8875468756023351
Attrib SCATTER RATIO   2.238190297118771
Attrib ELONGATEDNESS   −1.2104790490009654
Attrib PR.AXIS RECTANGULARITY   1.8947758777998396
Attrib MAX.LENGTH RECTANGULARITY   3.8883487592583807
Attrib SCALED VARIANCE_MAJOR   3.757466384017187
Attrib SCALED VARIANCE_MINOR   1.9507520679724737
Attrib SCALED RADIUS OF GYRATION   −1.3536232059221105
Attrib SKEWNESS ABOUT_MAJOR   −3.96798492493842
Attrib SKEWNESS ABOUT_MINOR   −1.2771019248431377
Attrib KURTOSIS ABOUT_MAJOR   0.9694139430961431
Attrib KURTOSIS ABOUT_MINOR   0.8450612580891725
Attrib HOLLOWS RATIO   0.7579934494686469
Sigmoid Node 15
Inputs   Weights
Threshold   0.616379048343619
Attrib COMPACTNESS   1.4003884230582242
Attrib CIRCULARITY   −0.3868007267505445
Attrib DISTANCE CIRCULARITY   −0.055129032686375236
Attrib RADIUS RATIO   −0.15502561270140397
Attrib PR.AXIS ASPECT RATIO   3.4140562564264494

Attrib MAX.LENGTH ASPECT RATIO   −0.1792039658247609
Attrib SCATTER RATIO   −0.4339279940538741
Attrib ELONGATEDNESS   −1.0505461519306163
Attrib PR.AXIS RECTANGULARITY   −0.9483794334723054
Attrib MAX.LENGTH RECTANGULARITY   0.2984873957876819
Attrib SCALED VARIANCE_MAJOR   −1.008982284664582
Attrib SCALED VARIANCE_MINOR   −0.32093754769028093
Attrib SCALED RADIUS OF GYRATION   −1.3769025430903703
Attrib SKEWNESS ABOUT_MAJOR   2.3737294902676727
Attrib SKEWNESS ABOUT_MINOR   −0.45677528975868514
Attrib KURTOSIS ABOUT_MAJOR   −0.6051509718672728
Attrib KURTOSIS ABOUT_MINOR   1.2677361675666887
Attrib HOLLOWS RATIO   0.2816771922524885
Sigmoid Node 16
Inputs   Weights
Threshold   −0.28833521727077477
Attrib COMPACTNESS   −1.6448200623984506
Attrib CIRCULARITY   1.2169243272669865
Attrib DISTANCE CIRCULARITY   0.17670151428174158
Attrib RADIUS RATIO   1.6276098861571466
Attrib PR.AXIS ASPECT RATIO   1.11813276662622278
Attrib MAX.LENGTH ASPECT RATIO   0.47912749056490606
Attrib SCATTER RATIO   −0.2531873334334039
Attrib ELONGATEDNESS   1.2186970965783464
Attrib PR.AXIS RECTANGULARITY   −0.5768008179446644
Attrib MAX.LENGTH RECTANGULARITY   2.3288538595924733
Attrib SCALED VARIANCE_MAJOR   0.6052013799609353
Attrib SCALED VARIANCE_MINOR   −1.0340204427525472
Attrib SCALED RADIUS OF GYRATION   4.969220409395045
Attrib SKEWNESS ABOUT_MAJOR   0.5742085711763437
Attrib SKEWNESS ABOUT_MINOR   −0.32599069426798255
Attrib KURTOSIS ABOUT_MAJOR   −0.3731878246490918
Attrib KURTOSIS ABOUT_MINOR   −5.218328843211597
Attrib HOLLOWS RATIO   3.9322573308271282
Sigmoid Node 17
Inputs   Weights
Threshold   −5.055121764188726
Attrib COMPACTNESS   2.247252111885887
Attrib CIRCULARITY   −4.813298378256952
Attrib DISTANCE CIRCULARITY   −0.32614312702716086
Attrib RADIUS RATIO   1.479941032175189
Attrib PR.AXIS ASPECT RATIO   −3.4299818378920865
Attrib MAX.LENGTH ASPECT RATIO   −1.8602860868832618
Attrib SCATTER RATIO   −0.1737638364576788
Attrib ELONGATEDNESS   4.965711085564175
Attrib PR.AXIS RECTANGULARITY   1.3284533718349671
Attrib MAX.LENGTH RECTANGULARITY   −4.328681411323446
Attrib SCALED VARIANCE_MAJOR   0.8601153281414825
Attrib SCALED VARIANCE_MINOR   1.001629163105112

Attrib SCALED RADIUS OF GYRATION   −0.45120613180527697
Attrib SKEWNESS ABOUT_MAJOR   −1.6280156551903975
Attrib SKEWNESS ABOUT_MINOR   3.410504782687384
Attrib KURTOSIS ABOUT_MAJOR   −0.30897462894588307
Attrib KURTOSIS ABOUT_MINOR   −0.38533344692820176
Attrib HOLLOWS RATIO   −3.1740257204552154
Sigmoid Node 18
Inputs   Weights
Threshold   −3.1535465442238992
Attrib COMPACTNESS   0.37427174575017197
Attrib CIRCULARITY   −4.0174460667232985
Attrib DISTANCE CIRCULARITY   −3.3249011420175463
Attrib RADIUS RATIO   3.085584771243804
Attrib PR.AXIS ASPECT RATIO   1.2150614770542432
Attrib MAX.LENGTH ASPECT RATIO   −0.22395111023083716
Attrib SCATTER RATIO   −0.17976060988411502
Attrib ELONGATEDNESS   2.289151676981671
Attrib PR.AXIS RECTANGULARITY   0.8402847169845775
Attrib MAX.LENGTH RECTANGULARITY   −4.978664875009369
Attrib SCALED VARIANCE_MAJOR   0.7083071572821911
Attrib SCALED VARIANCE_MINOR   0.6696510525097245
Attrib SCALED RADIUS OF GYRATION   1.3000194629122892
Attrib SKEWNESS ABOUT_MAJOR   0.9538769216562858
Attrib SKEWNESS ABOUT_MINOR   −2.2551297799282355
Attrib KURTOSIS ABOUT_MAJOR   0.6003459486268204
Attrib KURTOSIS ABOUT_MINOR   −1.5739337516336278
Attrib HOLLOWS RATIO   −1.4967179955799124
Sigmoid Node 19
Inputs   Weights
Threshold   1.236184904213755
Attrib COMPACTNESS   1.1810753713681459
Attrib CIRCULARITY   −2.127141912509981
Attrib DISTANCE CIRCULARITY   −8.700589534519358
Attrib RADIUS RATIO   −2.7791174251549804
Attrib PR.AXIS ASPECT RATIO   5.961261922142163
Attrib MAX.LENGTH ASPECT RATIO   −4.092083364064269
Attrib SCATTER RATIO   0.9035908644800471
Attrib ELONGATEDNESS   −4.713625144570146
Attrib PR.AXIS RECTANGULARITY   1.2170610965351392
Attrib MAX.LENGTH RECTANGULARITY   −0.36198914334994803
Attrib SCALED VARIANCE_MAJOR   −0.023405835741314125
Attrib SCALED VARIANCE_MINOR   1.3756837729523594
Attrib SCALED RADIUS OF GYRATION   1.3930281602548684
Attrib SKEWNESS ABOUT_MAJOR   3.760393978139718
Attrib SKEWNESS ABOUT_MINOR   −4.26753512855724
Attrib KURTOSIS ABOUT_MAJOR   1.2734045433735233
Attrib KURTOSIS ABOUT_MINOR   6.249963289723269
Attrib HOLLOWS RATIO   −7.260189907610669
Sigmoid Node 20

Inputs   Weights
Threshold   0.7299975469194063
Attrib COMPACTNESS   3.0161968867140905
Attrib CIRCULARITY   1.9148495339242215
Attrib DISTANCE CIRCULARITY   2.7886827104187537
Attrib RADIUS RATIO   −3.4435322614583277
Attrib PR.AXIS ASPECT RATIO   3.0562480030770716
Attrib MAX.LENGTH ASPECT RATIO   2.5713007836712
Attrib SCATTER RATIO   −2.4937523091589227
Attrib ELONGATEDNESS   2.220153090531981
Attrib PR.AXIS RECTANGULARITY   −3.117551332615675
Attrib MAX.LENGTH RECTANGULARITY   6.226123064004497
Attrib SCALED VARIANCE_MAJOR   −2.216348189403976
Attrib SCALED VARIANCE_MINOR   −2.615395231657577
Attrib SCALED RADIUS OF GYRATION   −2.587851654052159
Attrib SKEWNESS ABOUT_MAJOR   6.884905363296031
Attrib SKEWNESS ABOUT_MINOR   0.2653123363565098
Attrib KURTOSIS ABOUT_MAJOR   −1.957333842913722
Attrib KURTOSIS ABOUT_MINOR   −2.132242044390803
Attrib HOLLOWS RATIO   2.601659362324911
Sigmoid Node 21
Inputs   Weights
Threshold   −0.4612123188895009
Attrib COMPACTNESS   −4.899997325810865
Attrib CIRCULARITY   1.8001184642971872
Attrib DISTANCE CIRCULARITY   0.3242495308165743
Attrib RADIUS RATIO   −0.3941473846930091
Attrib PR.AXIS ASPECT RATIO   0.237287358253632
Attrib MAX.LENGTH ASPECT RATIO   1.7894066487670617
Attrib SCATTER RATIO   1.2203677312921997
Attrib ELONGATEDNESS   −0.47404138061645806
Attrib PR.AXIS RECTANGULARITY   0.8545772440201984
Attrib MAX.LENGTH RECTANGULARITY   0.37806732488064587
Attrib SCALED VARIANCE_MAJOR   0.7584359510883706
Attrib SCALED VARIANCE_MINOR   1.691357552475656
Attrib SCALED RADIUS OF GYRATION   −0.01778847530931123
Attrib SKEWNESS ABOUT_MAJOR   1.8188443773426402
Attrib SKEWNESS ABOUT_MINOR   0.3433047884204922
Attrib KURTOSIS ABOUT_MAJOR   2.9183023972955016
Attrib KURTOSIS ABOUT_MINOR   −3.7861145506159337
Attrib HOLLOWS RATIO   −4.602034440491123
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input

Node 2
Class van
Input
Node 3

Time taken to build model: 2.4 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   732   86.5248 %
Incorrectly Classified Instances   114   13.4752 %
Kappa statistic   0.8202
Mean absolute error   0.1003
Root mean squared error   0.2309
Relative absolute error   26.7574 %
Root relative squared error   53.3354 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,708	0,063	0,789	0,708	0,746	0,669	0,909	0,785	opel
0,793	0,089	0,754	0,793	0,773	0,692	0,933	0,816	saab
1,000	0,013	0,965	1,000	0,982	0,976	1,000	0,999	bus
0,965	0,015	0,950	0,965	0,958	0,944	0,997	0,991	van
Weighted Avg.	0,865	0,046	0,863	0,865	0,864	0,819	0,959	0,897

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
150   53    2    7 |    a = opel
37  172    5    3 |    b = saab
0    0  218    0 |    c = bus
3    3    1  192 |    d = van
```

13   13ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.1 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.31828367805492797
Node 4   1.5224808957263953
Node 5   −1.5934507325674743
Node 6   −0.6024476996108014
Node 7   −2.5200703277696497
Node 8   −5.569632462094087
Node 9   −4.973091823982756
Node 10   −2.5284431648635732
Node 11   1.7010950977366182
Node 12   −2.234291761342175
Node 13   2.2176705821655003
Node 14   2.8481044731108422
Sigmoid Node 1
Inputs   Weights
Threshold   −0.38262655092592973
Node 4   −4.319713435732569
Node 5   −2.009949478075239

191

Node 6   −3.6326787048923075
Node 7   1.0662791970313796
Node 8   −0.4475388881882941
Node 9   2.676442443074452
Node 10   0.3445059725889344
Node 11   −0.022167609951703443
Node 12   −5.54938309613752
Node 13   2.7476046299445214
Node 14   1.954386956097241
Sigmoid Node 2
Inputs   Weights
Threshold   −0.8128625080166659
Node 4   1.4128062535674464
Node 5   1.9266906379824786
Node 6   2.552575563308546
Node 7   0.12361304208143774
Node 8   6.406925839707982
Node 9   −3.214378126665145
Node 10   0.4947046549992114
Node 11   1.0327125085525093
Node 12   −1.9265081403431945
Node 13   −7.210300223076961
Node 14   −6.309917101436339
Sigmoid Node 3
Inputs   Weights
Threshold   −0.23527749922877228
Node 4   −1.4402814768045522
Node 5   3.0853822610261923
Node 6   −1.7840593779146383
Node 7   −2.4189736248756346
Node 8   −2.903408708722061
Node 9   4.478798053829114
Node 10   −2.065429399129094
Node 11   −5.40976992550756
Node 12   6.294224995693516
Node 13   −0.3941206779120458
Node 14   −1.5392511647398541
Sigmoid Node 4
Inputs   Weights
Threshold   −0.21658116087756904
Attrib COMPACTNESS   −3.0245140644282094
Attrib CIRCULARITY   1.4808664715433675
Attrib DISTANCE CIRCULARITY   1.020166550354954
Attrib RADIUS RATIO   0.2963495728531606
Attrib PR.AXIS ASPECT RATIO   0.6984080982805076
Attrib MAX.LENGTH ASPECT RATIO   0.36399817575040166
Attrib SCATTER RATIO   0.7969097700894144
Attrib ELONGATEDNESS   −1.3584310427213926
Attrib PR.AXIS RECTANGULARITY   −0.03340879001639821

Attrib MAX.LENGTH RECTANGULARITY   0.33842757730336737
Attrib SCALED VARIANCE_MAJOR   0.7314858370347976
Attrib SCALED VARIANCE_MINOR   1.146914720290533
Attrib SCALED RADIUS OF GYRATION   −1.780721020236476
Attrib SKEWNESS ABOUT_MAJOR   0.711181639188175
Attrib SKEWNESS ABOUT_MINOR   −0.30684475259028887
Attrib KURTOSIS ABOUT_MAJOR   1.1945929342823687
Attrib KURTOSIS ABOUT_MINOR   1.4146208499326003
Attrib HOLLOWS RATIO   −3.055083504528846
Sigmoid Node 5
Inputs   Weights
Threshold   0.5053956718427945
Attrib COMPACTNESS   0.7607624765226478
Attrib CIRCULARITY   0.5495870691478988
Attrib DISTANCE CIRCULARITY   0.5284849074558262
Attrib RADIUS RATIO   −1.1325933597206583
Attrib PR.AXIS ASPECT RATIO   2.284710784766796
Attrib MAX.LENGTH ASPECT RATIO   0.9441083350790423
Attrib SCATTER RATIO   −1.2564881261045475
Attrib ELONGATEDNESS   0.18716778138108675
Attrib PR.AXIS RECTANGULARITY   −1.5388912907693821
Attrib MAX.LENGTH RECTANGULARITY   2.6712097789625955
Attrib SCALED VARIANCE_MAJOR   −1.071325020537135
Attrib SCALED VARIANCE_MINOR   −1.4273211859810504
Attrib SCALED RADIUS OF GYRATION   −1.4281159923823648
Attrib SKEWNESS ABOUT_MAJOR   2.1619261990201277
Attrib SKEWNESS ABOUT_MINOR   −0.2980790093763337
Attrib KURTOSIS ABOUT_MAJOR   −0.6056283963679934
Attrib KURTOSIS ABOUT_MINOR   0.320819851986037
Attrib HOLLOWS RATIO   0.8167373042537954
Sigmoid Node 6
Inputs   Weights
Threshold   0.5903168426898311
Attrib COMPACTNESS   −0.3326618504492768
Attrib CIRCULARITY   0.4939576573962608
Attrib DISTANCE CIRCULARITY   −0.025111503636824177
Attrib RADIUS RATIO   0.020043838541525777
Attrib PR.AXIS ASPECT RATIO   1.6548769636925966
Attrib MAX.LENGTH ASPECT RATIO   −0.5660446597750928
Attrib SCATTER RATIO   0.443650901322926
Attrib ELONGATEDNESS   −2.086735803782446
Attrib PR.AXIS RECTANGULARITY   −0.16122907317909452
Attrib MAX.LENGTH RECTANGULARITY   −1.0771226421421949
Attrib SCALED VARIANCE_MAJOR   0.5986061490638892
Attrib SCALED VARIANCE_MINOR   0.6961344005071165
Attrib SCALED RADIUS OF GYRATION   −0.2684945520507811
Attrib SKEWNESS ABOUT_MAJOR   1.136745726224703
Attrib SKEWNESS ABOUT_MINOR   0.4241251117438459
Attrib KURTOSIS ABOUT_MAJOR   0.2101003497991515

Attrib KURTOSIS ABOUT_MINOR   3.1818398968091124
Attrib HOLLOWS RATIO   −1.684970153728032
Sigmoid Node 7
Inputs   Weights
Threshold   1.2386979016986877
Attrib COMPACTNESS   0.7665817209885707
Attrib CIRCULARITY   −2.439058894851047
Attrib DISTANCE CIRCULARITY   −0.7461830983045221
Attrib RADIUS RATIO   0.5667439733153664
Attrib PR.AXIS ASPECT RATIO   0.4945395697283144
Attrib MAX.LENGTH ASPECT RATIO   −0.1807425747091439
Attrib SCATTER RATIO   0.6157985780770013
Attrib ELONGATEDNESS   −1.207736765910031
Attrib PR.AXIS RECTANGULARITY   1.2139521080572986
Attrib MAX.LENGTH RECTANGULARITY   −2.5188401877403535
Attrib SCALED VARIANCE_MAJOR   0.8164851816454716
Attrib SCALED VARIANCE_MINOR   0.3069355294864312
Attrib SCALED RADIUS OF GYRATION   1.9184473802269897
Attrib SKEWNESS ABOUT_MAJOR   −0.21197515897386757
Attrib SKEWNESS ABOUT_MINOR   −0.507259526620597
Attrib KURTOSIS ABOUT_MAJOR   0.7802602736228801
Attrib KURTOSIS ABOUT_MINOR   −0.13294746270008065
Attrib HOLLOWS RATIO   0.3076542975819608
Sigmoid Node 8
Inputs   Weights
Threshold   0.2328761580704904
Attrib COMPACTNESS   −1.5967252309955853
Attrib CIRCULARITY   0.6972627734625094
Attrib DISTANCE CIRCULARITY   −4.256852594468726
Attrib RADIUS RATIO   −2.918091971241192
Attrib PR.AXIS ASPECT RATIO   3.242141544246923
Attrib MAX.LENGTH ASPECT RATIO   −1.847754313326767
Attrib SCATTER RATIO   0.8657482122524087
Attrib ELONGATEDNESS   −4.035846551055296
Attrib PR.AXIS RECTANGULARITY   −0.0629735671923909
Attrib MAX.LENGTH RECTANGULARITY   −0.37608245180773703
Attrib SCALED VARIANCE_MAJOR   0.16217007781179021
Attrib SCALED VARIANCE_MINOR   0.9111216807534188
Attrib SCALED RADIUS OF GYRATION   0.6856824469915842
Attrib SKEWNESS ABOUT_MAJOR   2.7094570871531825
Attrib SKEWNESS ABOUT_MINOR   −0.9259701068996847
Attrib KURTOSIS ABOUT_MAJOR   0.12575645065694757
Attrib KURTOSIS ABOUT_MINOR   4.217000756237841
Attrib HOLLOWS RATIO   −2.8497985267373522
Sigmoid Node 9
Inputs   Weights
Threshold   −1.2145073233021002
Attrib COMPACTNESS   2.728372504699998
Attrib CIRCULARITY   −2.8768418121386246

Attrib DISTANCE CIRCULARITY   3.459485582448362
Attrib RADIUS RATIO   −1.0558596592006306
Attrib PR.AXIS ASPECT RATIO   0.2778289538834906
Attrib MAX.LENGTH ASPECT RATIO   1.2190305835559705
Attrib SCATTER RATIO   −1.1121082025843716
Attrib ELONGATEDNESS   2.8440366233060925
Attrib PR.AXIS RECTANGULARITY   0.4330303406674211
Attrib MAX.LENGTH RECTANGULARITY   2.1437841643235336
Attrib SCALED VARIANCE_MAJOR   −0.3658410952280259
Attrib SCALED VARIANCE_MINOR   −1.4927349073623932
Attrib SCALED RADIUS OF GYRATION   2.0985268396285077
Attrib SKEWNESS ABOUT_MAJOR   1.2674660038441994
Attrib SKEWNESS ABOUT_MINOR   −0.18135324928403537
Attrib KURTOSIS ABOUT_MAJOR   −0.780230782981309
Attrib KURTOSIS ABOUT_MINOR   −3.6762984791891147
Attrib HOLLOWS RATIO   4.798193629459498
Sigmoid Node 10
Inputs   Weights
Threshold   0.5048971367095966
Attrib COMPACTNESS   0.7841403830407208
Attrib CIRCULARITY   −1.1223879240343646
Attrib DISTANCE CIRCULARITY   −0.4209754662062539
Attrib RADIUS RATIO   −0.09844264706679667
Attrib PR.AXIS ASPECT RATIO   0.701744653102231
Attrib MAX.LENGTH ASPECT RATIO   0.279585262659983
Attrib SCATTER RATIO   0.43910965314658035
Attrib ELONGATEDNESS   −0.6616865707627767
Attrib PR.AXIS RECTANGULARITY   0.8850245584228175
Attrib MAX.LENGTH RECTANGULARITY   −1.6145049606994883
Attrib SCALED VARIANCE_MAJOR   0.4265751397322911
Attrib SCALED VARIANCE_MINOR   0.3547550319299301
Attrib SCALED RADIUS OF GYRATION   0.8407183222093343
Attrib SKEWNESS ABOUT_MAJOR   0.7586108963352123
Attrib SKEWNESS ABOUT_MINOR   1.8281045542988075
Attrib KURTOSIS ABOUT_MAJOR   0.6752681477845474
Attrib KURTOSIS ABOUT_MINOR   −0.45058571088145594
Attrib HOLLOWS RATIO   −1.0107875400877735
Sigmoid Node 11
Inputs   Weights
Threshold   1.2188207747813906
Attrib COMPACTNESS   −3.3325807678211237
Attrib CIRCULARITY   1.6101565608941801
Attrib DISTANCE CIRCULARITY   −1.2409687712927444
Attrib RADIUS RATIO   1.1239163479260934
Attrib PR.AXIS ASPECT RATIO   −0.39801034238313354
Attrib MAX.LENGTH ASPECT RATIO   0.043336967367576314
Attrib SCATTER RATIO   1.0421700329471577
Attrib ELONGATEDNESS   −2.449837477346924
Attrib PR.AXIS RECTANGULARITY   0.15835295262115656

Attrib MAX.LENGTH RECTANGULARITY   −2.790789249098846
Attrib SCALED VARIANCE_MAJOR   0.9394888112014882
Attrib SCALED VARIANCE_MINOR   0.9744289129219332
Attrib SCALED RADIUS OF GYRATION   0.5781700382067466
Attrib SKEWNESS ABOUT_MAJOR   −1.579896207143015
Attrib SKEWNESS ABOUT_MINOR   0.43521988730467254
Attrib KURTOSIS ABOUT_MAJOR   0.04381615813294569
Attrib KURTOSIS ABOUT_MINOR   1.3804390931859722
Attrib HOLLOWS RATIO   −1.5421110047988609
Sigmoid Node 12
Inputs   Weights
Threshold   −0.7205387080876691
Attrib COMPACTNESS   2.3019523665664994
Attrib CIRCULARITY   0.37671585095709276
Attrib DISTANCE CIRCULARITY   2.898467441903435
Attrib RADIUS RATIO   −2.292795565088443
Attrib PR.AXIS ASPECT RATIO   1.407607837079892
Attrib MAX.LENGTH ASPECT RATIO   3.018108574729743
Attrib SCATTER RATIO   −2.089187740943668
Attrib ELONGATEDNESS   2.6990056383330057
Attrib PR.AXIS RECTANGULARITY   −1.873432888252249
Attrib MAX.LENGTH RECTANGULARITY   5.123708629349035
Attrib SCALED VARIANCE_MAJOR   −1.6050741132492579
Attrib SCALED VARIANCE_MINOR   −2.117228113915571
Attrib SCALED RADIUS OF GYRATION   −2.5103735785247174
Attrib SKEWNESS ABOUT_MAJOR   3.1341309114202796
Attrib SKEWNESS ABOUT_MINOR   −0.5116462106722109
Attrib KURTOSIS ABOUT_MAJOR   −1.0330400980307017
Attrib KURTOSIS ABOUT_MINOR   −1.9958247798920867
Attrib HOLLOWS RATIO   1.9005109279552175
Sigmoid Node 13
Inputs   Weights
Threshold   −2.6832215890708784
Attrib COMPACTNESS   1.3029745670235058
Attrib CIRCULARITY   −3.678598476991766
Attrib DISTANCE CIRCULARITY   −0.7555416891085901
Attrib RADIUS RATIO   2.2180965172419054
Attrib PR.AXIS ASPECT RATIO   −1.4100920202866187
Attrib MAX.LENGTH ASPECT RATIO   0.7033978116094101
Attrib SCATTER RATIO   −0.06216685577251226
Attrib ELONGATEDNESS   2.561891406301706
Attrib PR.AXIS RECTANGULARITY   0.9414745609200275
Attrib MAX.LENGTH RECTANGULARITY   −4.238789175210913
Attrib SCALED VARIANCE_MAJOR   0.7372919658705747
Attrib SCALED VARIANCE_MINOR   0.3974774784174368
Attrib SCALED RADIUS OF GYRATION   −0.6419273479738062
Attrib SKEWNESS ABOUT_MAJOR   −0.6521876479682615
Attrib SKEWNESS ABOUT_MINOR   1.4157661396456116
Attrib KURTOSIS ABOUT_MAJOR   −0.5296181233403646

Attrib KURTOSIS ABOUT_MINOR   −1.7008149128887309
Attrib HOLLOWS RATIO   −1.6902259162727564
Sigmoid Node 14
Inputs   Weights
Threshold   0.35646216623224625
Attrib COMPACTNESS   −1.2030881431448845
Attrib CIRCULARITY   1.6447182480424627
Attrib DISTANCE CIRCULARITY   2.2826209113040083
Attrib RADIUS RATIO   1.1047257281257565
Attrib PR.AXIS ASPECT RATIO   −3.096756002852791
Attrib MAX.LENGTH ASPECT RATIO   1.6618034630826075
Attrib SCATTER RATIO   0.36814193016399666
Attrib ELONGATEDNESS   −0.04911711418264463
Attrib PR.AXIS RECTANGULARITY   −0.06941955196147788
Attrib MAX.LENGTH RECTANGULARITY   0.8608363155820548
Attrib SCALED VARIANCE_MAJOR   2.794063123854235
Attrib SCALED VARIANCE_MINOR   −0.12343472198281426
Attrib SCALED RADIUS OF GYRATION   1.7405243620019657
Attrib SKEWNESS ABOUT_MAJOR   −2.094020326973117
Attrib SKEWNESS ABOUT_MINOR   0.2551331678309175
Attrib KURTOSIS ABOUT_MAJOR   1.1106764255695134
Attrib KURTOSIS ABOUT_MINOR   0.6581445872394202
Attrib HOLLOWS RATIO   1.325141358652204
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.13 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   357   84.7981 %
Incorrectly Classified Instances   64   15.2019 %
Kappa statistic   0.7973
Mean absolute error   0.1359

```
Root mean squared error                    0.2322
Relative absolute error                   36.2691 %
Root relative squared error               53.6459 %
Total Number of Instances                  421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,790	0,114	0,697	0,790	0,741	0,650	0,935	0,821	opel
0,630	0,061	0,782	0,630	0,697	0,614	0,935	0,826	saab
0,982	0,013	0,964	0,982	0,973	0,963	0,999	0,998	bus
1,000	0,016	0,952	1,000	0,975	0,968	1,000	1,000	van
Weighted Avg.	0,848	0,051	0,848	0,848	0,845	0,797	0,967	0,910

=== Confusion Matrix ===

```
 a   b   c   d   <-- classified as
83  19   0   3 |   a = opel
35  68   4   1 |   b = saab
 1   0 107   1 |   c = bus
 0   0   0  99 |   d = van
```

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

=== Run information ===

```
Scheme:          weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:        vehicle
Instances:       421
Attributes:      19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
```

MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.31828367805492797
Node 4   1.5224808957263953
Node 5   −1.59345073256747437
Node 6   −0.6024476996108014
Node 7   −2.5200703277696497
Node 8   −5.569632462094087
Node 9   −4.973091823982756
Node 10   −2.5284431648635732
Node 11   1.7010950977366182
Node 12   −2.234291761342175
Node 13   2.2176705821655003
Node 14   2.8481044731108422
Sigmoid Node 1
Inputs   Weights
Threshold   −0.38262655092592973
Node 4   −4.319713435732569
Node 5   −2.009949478075239
Node 6   −3.6326787048923075
Node 7   1.0662791970313796
Node 8   −0.4475388881882941
Node 9   2.676442443074452
Node 10   0.3445059725889344
Node 11   −0.022167609951703443
Node 12   −5.54938309613752
Node 13   2.7476046299445214
Node 14   1.954386956097241
Sigmoid Node 2
Inputs   Weights
Threshold   −0.8128625080166659
Node 4   1.4128062535674464
Node 5   1.9266906379824786
Node 6   2.552575563308546
Node 7   0.12361304208143774

199

```
Node  8      6.406925839707982
Node  9     −3.214378126665145
Node  10     0.4947046549992114
Node  11     1.0327125085525093
Node  12    −1.9265081403431945
Node  13    −7.210300223076961
Node  14    −6.309917101436339
Sigmoid  Node  3
Inputs      Weights
Threshold      −0.23527749922877228
Node  4     −1.4402814768045522
Node  5     3.0853822610261923
Node  6     −1.7840593779146383
Node  7     −2.4189736248756346
Node  8     −2.903408708722061
Node  9     4.478798053829114
Node  10     −2.065429399129094
Node  11     −5.40976992550756
Node  12     6.294224995693516
Node  13     −0.3941206779120458
Node  14     −1.5392511647398541
Sigmoid  Node  4
Inputs      Weights
Threshold      −0.21658116087756904
Attrib  COMPACTNESS      −3.0245140644282094
Attrib  CIRCULARITY      1.4808664715433675
Attrib  DISTANCE  CIRCULARITY      1.020166550354954
Attrib  RADIUS  RATIO      0.2963495728531606
Attrib  PR.AXIS  ASPECT  RATIO      0.6984080982805076
Attrib  MAX.LENGTH  ASPECT  RATIO      0.36399817575040166
Attrib  SCATTER  RATIO      0.7969097700894144
Attrib  ELONGATEDNESS      −1.3584310427213926
Attrib  PR.AXIS  RECTANGULARITY      −0.03340879001639821
Attrib  MAX.LENGTH  RECTANGULARITY      0.33842757730336737
Attrib  SCALED  VARIANCE_MAJOR      0.7314858370347976
Attrib  SCALED  VARIANCE_MINOR      1.146914720290533
Attrib  SCALED  RADIUS  OF  GYRATION      −1.780721020236476
Attrib  SKEWNESS  ABOUT_MAJOR      0.711181639188175
Attrib  SKEWNESS  ABOUT_MINOR      −0.30684475259028887
Attrib  KURTOSIS  ABOUT_MAJOR      1.1945929342823687
Attrib  KURTOSIS  ABOUT_MINOR      1.4146208499326003
Attrib  HOLLOWS  RATIO      −3.055308350445886
Sigmoid  Node  5
Inputs      Weights
Threshold      0.5053956718427945
Attrib  COMPACTNESS      0.7607624765226478
Attrib  CIRCULARITY      0.5495870691478988
Attrib  DISTANCE  CIRCULARITY      0.5284849074558262
Attrib  RADIUS  RATIO      −1.1325933597206583
```

Attrib PR.AXIS ASPECT RATIO   2.284710784766796
Attrib MAX.LENGTH ASPECT RATIO   0.9441083350790423
Attrib SCATTER RATIO   −1.2564881261045475
Attrib ELONGATEDNESS   0.18716778138108675
Attrib PR.AXIS RECTANGULARITY   −1.5388912907693821
Attrib MAX.LENGTH RECTANGULARITY   2.6712097789625955
Attrib SCALED VARIANCE_MAJOR   −1.071325020537135
Attrib SCALED VARIANCE_MINOR   −1.4273211859810504
Attrib SCALED RADIUS OF GYRATION   −1.4281159923823648
Attrib SKEWNESS ABOUT_MAJOR   2.1619261990201277
Attrib SKEWNESS ABOUT_MINOR   −0.2980790093763337
Attrib KURTOSIS ABOUT_MAJOR   −0.6056283963679934
Attrib KURTOSIS ABOUT_MINOR   0.320819851986037
Attrib HOLLOWS RATIO   0.8167373042537954
Sigmoid Node 6
Inputs   Weights
Threshold   0.5903168426898311
Attrib COMPACTNESS   −0.3326618504492768
Attrib CIRCULARITY   0.4939576573962608
Attrib DISTANCE CIRCULARITY   −0.025111503636824177
Attrib RADIUS RATIO   0.020043838541525777
Attrib PR.AXIS ASPECT RATIO   1.6548769636925966
Attrib MAX.LENGTH ASPECT RATIO   −0.5660446597750928
Attrib SCATTER RATIO   0.443650901322926
Attrib ELONGATEDNESS   −2.086735803782446
Attrib PR.AXIS RECTANGULARITY   −0.16122907317909452
Attrib MAX.LENGTH RECTANGULARITY   −1.0771226421421949
Attrib SCALED VARIANCE_MAJOR   0.5986061490638892
Attrib SCALED VARIANCE_MINOR   0.6961344005071165
Attrib SCALED RADIUS OF GYRATION   −0.2684945520507811
Attrib SKEWNESS ABOUT_MAJOR   1.136745726224703
Attrib SKEWNESS ABOUT_MINOR   0.4241251117438459
Attrib KURTOSIS ABOUT_MAJOR   0.2101003497991515
Attrib KURTOSIS ABOUT_MINOR   3.1818398968091124
Attrib HOLLOWS RATIO   −1.684970153728032
Sigmoid Node 7
Inputs   Weights
Threshold   1.2386979016986877
Attrib COMPACTNESS   0.7665817209885707
Attrib CIRCULARITY   −2.439058894851047
Attrib DISTANCE CIRCULARITY   −0.7461830983045221
Attrib RADIUS RATIO   0.5667439733153664
Attrib PR.AXIS ASPECT RATIO   0.4945395697283144
Attrib MAX.LENGTH ASPECT RATIO   −0.1807425747091439
Attrib SCATTER RATIO   0.6157985780770013
Attrib ELONGATEDNESS   −1.207736765910031
Attrib PR.AXIS RECTANGULARITY   1.2139521080572986
Attrib MAX.LENGTH RECTANGULARITY   −2.5188401877403535
Attrib SCALED VARIANCE_MAJOR   0.8164851816454716

Attrib SCALED VARIANCE_MINOR   0.3069355294864312
Attrib SCALED RADIUS OF GYRATION   1.9184473802269897
Attrib SKEWNESS ABOUT_MAJOR   −0.21197515897386757
Attrib SKEWNESS ABOUT_MINOR   −0.507259526620597
Attrib KURTOSIS ABOUT_MAJOR   0.7802602736228801
Attrib KURTOSIS ABOUT_MINOR   −0.13294746270008065
Attrib HOLLOWS RATIO   0.3076542975819608
Sigmoid Node 8
Inputs   Weights
Threshold   0.2328761580704904
Attrib COMPACTNESS   −1.5967252309955853
Attrib CIRCULARITY   0.6972627734625094
Attrib DISTANCE CIRCULARITY   −4.256852594468726
Attrib RADIUS RATIO   −2.918091971241192
Attrib PR.AXIS ASPECT RATIO   3.242141544246923
Attrib MAX.LENGTH ASPECT RATIO   −1.847754313326767
Attrib SCATTER RATIO   0.8657482122524087
Attrib ELONGATEDNESS   −4.035846551055296
Attrib PR.AXIS RECTANGULARITY   −0.0629735671923909
Attrib MAX.LENGTH RECTANGULARITY   −0.37608245180773703
Attrib SCALED VARIANCE_MAJOR   0.16217007781179021
Attrib SCALED VARIANCE_MINOR   0.9111216807534188
Attrib SCALED RADIUS OF GYRATION   0.6856824469915842
Attrib SKEWNESS ABOUT_MAJOR   2.7094570871531825
Attrib SKEWNESS ABOUT_MINOR   −0.9259701068996847
Attrib KURTOSIS ABOUT_MAJOR   0.12575645065694757
Attrib KURTOSIS ABOUT_MINOR   4.217000756237841
Attrib HOLLOWS RATIO   −2.8497985267373522
Sigmoid Node 9
Inputs   Weights
Threshold   −1.2145073233021002
Attrib COMPACTNESS   2.728372504699998
Attrib CIRCULARITY   −2.8768418121386246
Attrib DISTANCE CIRCULARITY   3.459485582448362
Attrib RADIUS RATIO   −1.0558596592006306
Attrib PR.AXIS ASPECT RATIO   0.2778289538834906
Attrib MAX.LENGTH ASPECT RATIO   1.2190305835559705
Attrib SCATTER RATIO   −1.1121082025843716
Attrib ELONGATEDNESS   2.8440366233060925
Attrib PR.AXIS RECTANGULARITY   0.4330303406674211
Attrib MAX.LENGTH RECTANGULARITY   2.1437841643235336
Attrib SCALED VARIANCE_MAJOR   −0.365841095280259
Attrib SCALED VARIANCE_MINOR   −1.4927349073623932
Attrib SCALED RADIUS OF GYRATION   2.0985268396285077
Attrib SKEWNESS ABOUT_MAJOR   1.2674660038441994
Attrib SKEWNESS ABOUT_MINOR   −0.18135324928403537
Attrib KURTOSIS ABOUT_MAJOR   −0.780230782981309
Attrib KURTOSIS ABOUT_MINOR   −3.6762984791891147
Attrib HOLLOWS RATIO   4.798193629459498

Sigmoid Node 10
Inputs   Weights
Threshold   0.5048971367095966
Attrib COMPACTNESS   0.784403830407208
Attrib CIRCULARITY   −1.1223879240343646
Attrib DISTANCE CIRCULARITY   −0.4209754662062539
Attrib RADIUS RATIO   −0.09844264706679667
Attrib PR.AXIS ASPECT RATIO   0.701744653102231
Attrib MAX.LENGTH ASPECT RATIO   0.279585262659983
Attrib SCATTER RATIO   0.43910965314658035
Attrib ELONGATEDNESS   −0.6616865707627767
Attrib PR.AXIS RECTANGULARITY   0.8850245584228175
Attrib MAX.LENGTH RECTANGULARITY   −1.6145049606994883
Attrib SCALED VARIANCE_MAJOR   0.4265751397322911
Attrib SCALED VARIANCE_MINOR   0.3547550319299301
Attrib SCALED RADIUS OF GYRATION   0.8407183222093343
Attrib SKEWNESS ABOUT_MAJOR   0.7586108963352123
Attrib SKEWNESS ABOUT_MINOR   1.8281045542988075
Attrib KURTOSIS ABOUT_MAJOR   0.6752681477845474
Attrib KURTOSIS ABOUT_MINOR   −0.45058571088145594
Attrib HOLLOWS RATIO   −1.010787540087735
Sigmoid Node 11
Inputs   Weights
Threshold   1.2188207747813906
Attrib COMPACTNESS   −3.3325807678211237
Attrib CIRCULARITY   1.6101565608941801
Attrib DISTANCE CIRCULARITY   −1.2409687712927444
Attrib RADIUS RATIO   1.1239163479260934
Attrib PR.AXIS ASPECT RATIO   −0.39801034238313354
Attrib MAX.LENGTH ASPECT RATIO   0.043336967367576314
Attrib SCATTER RATIO   1.0421700329471577
Attrib ELONGATEDNESS   −2.449837477346924
Attrib PR.AXIS RECTANGULARITY   0.15835295262115656
Attrib MAX.LENGTH RECTANGULARITY   −2.790789249098846
Attrib SCALED VARIANCE_MAJOR   0.9394888112014882
Attrib SCALED VARIANCE_MINOR   0.9744289129219332
Attrib SCALED RADIUS OF GYRATION   0.5781700382067466
Attrib SKEWNESS ABOUT_MAJOR   −1.579896207143015
Attrib SKEWNESS ABOUT_MINOR   0.43521988730467254
Attrib KURTOSIS ABOUT_MAJOR   0.04381615813294569
Attrib KURTOSIS ABOUT_MINOR   1.3804390931859722
Attrib HOLLOWS RATIO   −1.5421110047988609
Sigmoid Node 12
Inputs   Weights
Threshold   −0.7205387080876691
Attrib COMPACTNESS   2.3019523665664994
Attrib CIRCULARITY   0.37671585095709276
Attrib DISTANCE CIRCULARITY   2.898467441903435
Attrib RADIUS RATIO   −2.292795565088443

Attrib PR.AXIS ASPECT RATIO   1.407607837079892
Attrib MAX.LENGTH ASPECT RATIO   3.018108574729743
Attrib SCATTER RATIO   −2.089187740943668
Attrib ELONGATEDNESS   2.6990056383330057
Attrib PR.AXIS RECTANGULARITY   −1.873432888252249
Attrib MAX.LENGTH RECTANGULARITY   5.123708629349035
Attrib SCALED VARIANCE_MAJOR   −1.6050741132492579
Attrib SCALED VARIANCE_MINOR   −2.117228113915571
Attrib SCALED RADIUS OF GYRATION   −2.5103735785247174
Attrib SKEWNESS ABOUT_MAJOR   3.1341309114202796
Attrib SKEWNESS ABOUT_MINOR   −0.5116462106722109
Attrib KURTOSIS ABOUT_MAJOR   −1.0330400980307017
Attrib KURTOSIS ABOUT_MINOR   −1.9958247798920867
Attrib HOLLOWS RATIO   1.9005109279552175
Sigmoid Node 13
Inputs   Weights
Threshold   −2.6832215890708784
Attrib COMPACTNESS   1.3029745670235058
Attrib CIRCULARITY   −3.678598476991766
Attrib DISTANCE CIRCULARITY   −0.7555416891085901
Attrib RADIUS RATIO   2.2180965172419054
Attrib PR.AXIS ASPECT RATIO   −1.4100920202866187
Attrib MAX.LENGTH ASPECT RATIO   0.7033978116094101
Attrib SCATTER RATIO   −0.06216685577251226
Attrib ELONGATEDNESS   2.561891406301706
Attrib PR.AXIS RECTANGULARITY   0.9414745609200275
Attrib MAX.LENGTH RECTANGULARITY   −4.238789175210913
Attrib SCALED VARIANCE_MAJOR   0.7372919658705747
Attrib SCALED VARIANCE_MINOR   0.3974774784174368
Attrib SCALED RADIUS OF GYRATION   −0.6419273479738062
Attrib SKEWNESS ABOUT_MAJOR   −0.6521876479682615
Attrib SKEWNESS ABOUT_MINOR   1.4157661396456116
Attrib KURTOSIS ABOUT_MAJOR   −0.5296181233403646
Attrib KURTOSIS ABOUT_MINOR   −1.7008149128887309
Attrib HOLLOWS RATIO   −1.6902259162727564
Sigmoid Node 14
Inputs   Weights
Threshold   0.35646216623224625
Attrib COMPACTNESS   −1.2030881431448845
Attrib CIRCULARITY   1.6447182480424627
Attrib DISTANCE CIRCULARITY   2.2826209113040083
Attrib RADIUS RATIO   1.1047257281257565
Attrib PR.AXIS ASPECT RATIO   −3.096756002852791
Attrib MAX.LENGTH ASPECT RATIO   1.6618034630826075
Attrib SCATTER RATIO   0.36814193016399666
Attrib ELONGATEDNESS   −0.04911711418264463
Attrib PR.AXIS RECTANGULARITY   −0.06941955196147788
Attrib MAX.LENGTH RECTANGULARITY   0.8608363155820548
Attrib SCALED VARIANCE_MAJOR   2.794063123854235

Attrib SCALED VARIANCE_MINOR   −0.12343472198281426
Attrib SCALED RADIUS OF GYRATION   1.7405243620019657
Attrib SKEWNESS ABOUT_MAJOR   −2.094020326973117
Attrib SKEWNESS ABOUT_MINOR   0.2551331678309175
Attrib KURTOSIS ABOUT_MAJOR   1.1106764255695134
Attrib KURTOSIS ABOUT_MINOR   0.6581445872394202
Attrib HOLLOWS RATIO   1.325141358652204
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.08 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

```
Correctly Classified Instances         699               82.6241 %
Incorrectly Classified Instances       147               17.3759 %
Kappa statistic                          0.7683
Mean absolute error                      0.1434
Root mean squared error                  0.2451
Relative absolute error                 38.2441 %
Root relative squared error             56.6255 %
Total Number of Instances              846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,741	0,120	0,674	0,741	0,706	0,602	0,913	0,767	opel
0,613	0,072	0,747	0,613	0,673	0,580	0,925	0,809	saab
0,991	0,021	0,943	0,991	0,966	0,955	0,999	0,999	bus

0,970	0,020	0,937	0,970	0,953	0,939	0,997
0,990	van					
Weighted Avg.	0,826	0,058	0,824	0,826	0,823	
0,767	0,958	0,890				

=== Confusion Matrix ===

```
a    b    c    d    <--- classified as
157   42    5    8  |    a = opel
74  133    6    4  |    b = saab
1    0  216    1  |    c = bus
1    3    2  193  |    d = van
```

14 14ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.1 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.6816319331104205

Node 4   2.241506929288823
Node 5   4.208705698357348
Node 6   −4.746840396355256
Node 7   −2.6093961142476862
Sigmoid Node 1
Inputs   Weights
Threshold   −6.100863063699098
Node 4   4.829500390561201
Node 5   2.5906743118777045
Node 6   −1.6501653120276658
Node 7   3.0517169489841693
Sigmoid Node 2
Inputs   Weights
Threshold   −0.39101363404949213
Node 4   −1.6005411952941446
Node 5   −6.225887923501077
Node 6   7.868502005917659
Node 7   −7.45133423552991
Sigmoid Node 3
Inputs   Weights
Threshold   −0.21913570227299084
Node 4   −9.136606620784896
Node 5   −2.0039360263672417
Node 6   0.07738622982141097
Node 7   7.021508687470446
Sigmoid Node 4
Inputs   Weights
Threshold   −0.6017518559015018
Attrib COMPACTNESS   −2.759657575333832
Attrib CIRCULARITY   −0.09441400884085445
Attrib DISTANCE CIRCULARITY   −2.701270283690888
Attrib RADIUS RATIO   3.1872551105290134
Attrib PR.AXIS ASPECT RATIO   −2.8754288340840786
Attrib MAX.LENGTH ASPECT RATIO   −3.562545931077059
Attrib SCATTER RATIO   2.5044715170662712
Attrib ELONGATEDNESS   −2.218830574129153
Attrib PR.AXIS RECTANGULARITY   2.5376493302376284
Attrib MAX.LENGTH RECTANGULARITY   −6.626897948441452
Attrib SCALED VARIANCE_MAJOR   2.58668338040233
Attrib SCALED VARIANCE_MINOR   2.9165967225821454
Attrib SCALED RADIUS OF GYRATION   2.8547129996358334
Attrib SKEWNESS ABOUT_MAJOR   −4.7991817649266695
Attrib SKEWNESS ABOUT_MINOR   0.8063886487129208
Attrib KURTOSIS ABOUT_MAJOR   1.1158956850852326
Attrib KURTOSIS ABOUT_MINOR   1.8601306718283739
Attrib HOLLOWS RATIO   −2.6275336560572016
Sigmoid Node 5
Inputs   Weights
Threshold   −2.8748017988355987

Attrib COMPACTNESS   0.6649093686044515
Attrib CIRCULARITY   −3.175044959442746
Attrib DISTANCE CIRCULARITY   −0.4133750165866232
Attrib RADIUS RATIO   2.185527998103407
Attrib PR.AXIS ASPECT RATIO   −0.9046431016909132
Attrib MAX.LENGTH ASPECT RATIO   0.684367978261701
Attrib SCATTER RATIO   0.031554410885887424
Attrib ELONGATEDNESS   1.951675848495238
Attrib PR.AXIS RECTANGULARITY   0.7929456834062583
Attrib MAX.LENGTH RECTANGULARITY   −4.899795759244385
Attrib SCALED VARIANCE_MAJOR   0.8028285289323075
Attrib SCALED VARIANCE_MINOR   0.536907736615522
Attrib SCALED RADIUS OF GYRATION   −0.7695237210530808
Attrib SKEWNESS ABOUT_MAJOR   −0.9576006786873636
Attrib SKEWNESS ABOUT_MINOR   1.476212620265806
Attrib KURTOSIS ABOUT_MAJOR   −0.7854489242934647
Attrib KURTOSIS ABOUT_MINOR   −1.6988457309122773
Attrib HOLLOWS RATIO   −1.9113805984818608
Sigmoid Node 6
Inputs   Weights
Threshold   1.977365099641482
Attrib COMPACTNESS   1.5086129343223027
Attrib CIRCULARITY   −1.2866075585559096
Attrib DISTANCE CIRCULARITY   −3.776553063440882
Attrib RADIUS RATIO   −2.096957837871788
Attrib PR.AXIS ASPECT RATIO   4.115101254673547
Attrib MAX.LENGTH ASPECT RATIO   −3.599460266195255
Attrib SCATTER RATIO   0.6752683509613322
Attrib ELONGATEDNESS   −0.8221927393299711
Attrib PR.AXIS RECTANGULARITY   1.2232451157903967
Attrib MAX.LENGTH RECTANGULARITY   −1.764399764469356
Attrib SCALED VARIANCE_MAJOR   −1.8868460898872323
Attrib SCALED VARIANCE_MINOR   2.0247825182266124
Attrib SCALED RADIUS OF GYRATION   −0.0035613085133102997
Attrib SKEWNESS ABOUT_MAJOR   3.9130619851834023
Attrib SKEWNESS ABOUT_MINOR   −0.44050925454484074
Attrib KURTOSIS ABOUT_MAJOR   −0.53400668401517
Attrib KURTOSIS ABOUT_MINOR   2.148504796132464
Attrib HOLLOWS RATIO   −2.55964846815538
Sigmoid Node 7
Inputs   Weights
Threshold   −1.5139288960429593
Attrib COMPACTNESS   4.765752185758542
Attrib CIRCULARITY   −3.807896226213624
Attrib DISTANCE CIRCULARITY   2.5263497436070472
Attrib RADIUS RATIO   1.6108531881714763
Attrib PR.AXIS ASPECT RATIO   −3.0725062512834294
Attrib MAX.LENGTH ASPECT RATIO   1.2361908714600982
Attrib SCATTER RATIO   −1.7037604734576948

Attrib ELONGATEDNESS   4.884484737208992
Attrib PR.AXIS RECTANGULARITY   1.1333718893687488
Attrib MAX.LENGTH RECTANGULARITY   1.401921453843695
Attrib SCALED VARIANCE_MAJOR   0.7622108879455904
Attrib SCALED VARIANCE_MINOR   −1.882713844446105
Attrib SCALED RADIUS OF GYRATION   1.6933474662066101
Attrib SKEWNESS ABOUT_MAJOR   −0.7883337446237821
Attrib SKEWNESS ABOUT_MINOR   0.015025725433367408
Attrib KURTOSIS ABOUT_MAJOR   −0.6083770469269153
Attrib KURTOSIS ABOUT_MINOR   −4.202168741781545
Attrib HOLLOWS RATIO   3.0564346657988213
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 5.01 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   337   80.0475 %
Incorrectly Classified Instances   84   19.9525 %
Kappa statistic   0.734
Mean absolute error   0.1631
Root mean squared error   0.2593
Relative absolute error   43.526   %
Root relative squared error   59.897   %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,724	0,149	0,618	0,724	0,667	0,547	0,896	0,703	opel

0,509	0,070	0,714	0,509	0,595	0,496	0,901
0,711	saab					
0,991	0,032	0,915	0,991	0,952	0,935	0,997
0,995	bus					
0,990	0,016	0,951	0,990	0,970	0,961	1,000
0,999	van					
Weighted Avg.	0,800	0,067	0,798	0,800	0,793	
0,732	0,948	0,850				

=== Confusion Matrix ===

```
a    b    c    d   <--- classified as
76   22   3    4 |    a = opel
46   55   6    1 |    b = saab
1    0  108    0 |    c = bus
0    0    1   98 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.6816319331104205
Node 4   2.241506929288823
Node 5   4.208705698357348
Node 6   −4.746840396355256
Node 7   −2.6093961142476862
Sigmoid Node 1
Inputs   Weights
Threshold   −6.100863063699098
Node 4   4.829500390561201
Node 5   2.5906743118777045
Node 6   −1.6501653120276658
Node 7   3.0517169489841693
Sigmoid Node 2
Inputs   Weights
Threshold   −0.39101363404949213
Node 4   −1.6005411952941446
Node 5   −6.225887923501077
Node 6   7.868502005917659
Node 7   −7.45133423552991
Sigmoid Node 3
Inputs   Weights
Threshold   −0.21913570227299084
Node 4   −9.136606620784896
Node 5   −2.0039360263672417
Node 6   0.07738622982141097
Node 7   7.021508687470446
Sigmoid Node 4
Inputs   Weights
Threshold   −0.6017518559015018
Attrib COMPACTNESS   −2.759657575333832
Attrib CIRCULARITY   −0.09441400884085445
Attrib DISTANCE CIRCULARITY   −2.701270283690888
Attrib RADIUS RATIO   3.1872551105290134
Attrib PR.AXIS ASPECT RATIO   −2.8754288340840786
Attrib MAX.LENGTH ASPECT RATIO   −3.562545931077059
Attrib SCATTER RATIO   2.5044715170662712
Attrib ELONGATEDNESS   −2.218830574129153
Attrib PR.AXIS RECTANGULARITY   2.5376493302376284
Attrib MAX.LENGTH RECTANGULARITY   −6.626897948441452
Attrib SCALED VARIANCE_MAJOR   2.58668338040233
Attrib SCALED VARIANCE_MINOR   2.9165967225821454
Attrib SCALED RADIUS OF GYRATION   2.8547129996358334
Attrib SKEWNESS ABOUT_MAJOR   −4.7991817649266695
Attrib SKEWNESS ABOUT_MINOR   0.8063886487129208

Attrib KURTOSIS ABOUT_MAJOR   1.1158956850852326
Attrib KURTOSIS ABOUT_MINOR   1.8601306718283739
Attrib HOLLOWS RATIO   −2.6275336560572016
Sigmoid Node 5
Inputs   Weights
Threshold   −2.8748017988355987
Attrib COMPACTNESS   0.6649093686044515
Attrib CIRCULARITY   −3.175044959442746
Attrib DISTANCE CIRCULARITY   −0.4133750165866232
Attrib RADIUS RATIO   2.185527998103407
Attrib PR.AXIS ASPECT RATIO   −0.9046431016909132
Attrib MAX.LENGTH ASPECT RATIO   0.684367978261701
Attrib SCATTER RATIO   0.031554410885887424
Attrib ELONGATEDNESS   1.951675848495238
Attrib PR.AXIS RECTANGULARITY   0.7929456834062583
Attrib MAX.LENGTH RECTANGULARITY   −4.899795759244385
Attrib SCALED VARIANCE_MAJOR   0.8028285289323075
Attrib SCALED VARIANCE_MINOR   0.536907736615522
Attrib SCALED RADIUS OF GYRATION   −0.7695237210530808
Attrib SKEWNESS ABOUT_MAJOR   −0.9576006786873636
Attrib SKEWNESS ABOUT_MINOR   1.476212620265806
Attrib KURTOSIS ABOUT_MAJOR   −0.7854489242934647
Attrib KURTOSIS ABOUT_MINOR   −1.6988457309122773
Attrib HOLLOWS RATIO   −1.9113805984818608
Sigmoid Node 6
Inputs   Weights
Threshold   1.977365099641482
Attrib COMPACTNESS   1.5086129343223027
Attrib CIRCULARITY   −1.2866075585559096
Attrib DISTANCE CIRCULARITY   −3.776553063440882
Attrib RADIUS RATIO   −2.096957837871788
Attrib PR.AXIS ASPECT RATIO   4.115101254673547
Attrib MAX.LENGTH ASPECT RATIO   −3.599460266195255
Attrib SCATTER RATIO   0.6752683509613322
Attrib ELONGATEDNESS   −0.8221927393299711
Attrib PR.AXIS RECTANGULARITY   1.2232451157903967
Attrib MAX.LENGTH RECTANGULARITY   −1.764399764469356
Attrib SCALED VARIANCE_MAJOR   −1.8868460898872323
Attrib SCALED VARIANCE_MINOR   2.0247825182266124
Attrib SCALED RADIUS OF GYRATION   −0.0035613085133102997
Attrib SKEWNESS ABOUT_MAJOR   3.9130619851834023
Attrib SKEWNESS ABOUT_MINOR   −0.44050925454484074
Attrib KURTOSIS ABOUT_MAJOR   −0.53400668401517
Attrib KURTOSIS ABOUT_MINOR   2.148504796132464
Attrib HOLLOWS RATIO   −2.55964846815538
Sigmoid Node 7
Inputs   Weights
Threshold   −1.5139288960429593
Attrib COMPACTNESS   4.765752185758542

Attrib CIRCULARITY   −3.807896226213624
Attrib DISTANCE CIRCULARITY   2.5263497436070472
Attrib RADIUS RATIO   1.6108531881714763
Attrib PR.AXIS ASPECT RATIO   −3.0725062512834294
Attrib MAX.LENGTH ASPECT RATIO   1.2361908714600982
Attrib SCATTER RATIO   −1.7037604734576948
Attrib ELONGATEDNESS   4.884484737208992
Attrib PR.AXIS RECTANGULARITY   1.1333718893687488
Attrib MAX.LENGTH RECTANGULARITY   1.401921453843695
Attrib SCALED VARIANCE_MAJOR   0.7622108879455904
Attrib SCALED VARIANCE_MINOR   −1.882713844446105
Attrib SCALED RADIUS OF GYRATION   1.6933474662066101
Attrib SKEWNESS ABOUT_MAJOR   −0.7883337446237821
Attrib SKEWNESS ABOUT_MINOR   0.015025725433367408
Attrib KURTOSIS ABOUT_MAJOR   −0.6083770469269153
Attrib KURTOSIS ABOUT_MINOR   −4.202168741781545
Attrib HOLLOWS RATIO   3.0564346657988213
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 1.81 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   674   79.669
%
Incorrectly Classified Instances   172   20.331
%
Kappa statistic   0.729
Mean absolute error   0.1675
Root mean squared error   0.2652
Relative absolute error   44.6953 %
Root relative squared error   61.2693 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,726	0,147	0,623	0,726	0,671	0,553	0,887	0,695	opel
0,516	0,059	0,752	0,516	0,612	0,524	0,905	0,725	saab
0,995	0,041	0,893	0,995	0,941	0,922	0,998	0,997	bus
0,960	0,025	0,923	0,960	0,941	0,923	0,995	0,981	van
Weighted Avg.		0,797	0,068	0,796	0,797	0,789	0,728	0,946	0,848

=== Confusion Matrix ===

```
a   b   c   d   <-- classified as
154  36  12  10 |   a = opel
89 112  10   6 |   b = saab
1   0 217   0 |   c = bus
3   1   4 191 |   d = van
```

15 15ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:       weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:     vehicle
Instances:    421
Attributes:   19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
```

KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.8361266109240404
Node 4   −3.882561626347938
Node 5   −4.550506629289725
Node 6   −0.860633335177813
Node 7   1.3614568239984748
Node 8   −0.681708799203306
Node 9   0.3510709478930344
Node 10   −1.9741438698607199
Node 11   0.8323897377211352
Node 12   0.3619462769890368
Node 13   1.493614497295198
Node 14   1.538379401598814
Node 15   −0.9397529419045959
Node 16   1.2716025985276684
Node 17   −1.547565058541222
Node 18   2.0513071969260928
Node 19   −6.093787301803948
Node 20   −1.6916532739728676
Node 21   −1.0062295931195568
Sigmoid Node 1
Inputs   Weights
Threshold   0.28484919754318827
Node 4   2.258902239310736
Node 5   2.420033247862656
Node 6   0.5539683317567728
Node 7   −4.509560496802052
Node 8   −1.347101686638801
Node 9   −0.9734625105924858
Node 10   −3.918504843015146
Node 11   0.38145522460309067
Node 12   −0.7899503311081097
Node 13   −2.3739938299089265
Node 14   2.077543165604217
Node 15   −0.99048861806636
Node 16   0.33670679740728904
Node 17   2.282075318770071
Node 18   2.4933896745610657
Node 19   −0.17420191060417928
Node 20   −3.7928988562344426

215

Node 21   −2.0737764374663774
Sigmoid Node 2
Inputs   Weights
Threshold   −0.14063876566060204
Node 4   0.18154175323307478
Node 5   −3.4798325575691393
Node 6   0.7926531218882384
Node 7   2.902990908805387
Node 8   −0.999736354501267
Node 9   3.2496796755703934
Node 10   −0.11158065210605889
Node 11   −2.6646133570154253
Node 12   0.545535999608931
Node 13   0.6025816711916755
Node 14   −5.408601146528227
Node 15   1.6177281622406898
Node 16   −2.9729844173789917
Node 17   −4.10576287447257
Node 18   −4.264253775363847
Node 19   5.087929387113081
Node 20   0.37453258527731015
Node 21   0.42108494820398457
Sigmoid Node 3
Inputs   Weights
Threshold   −0.18602369509546907
Node 4   −0.6713018495294845
Node 5   3.4260879418079258
Node 6   −3.8270583080405483
Node 7   −2.6101006253683825
Node 8   3.076773431290434
Node 9   −3.41388516948306
Node 10   4.478287463970644
Node 11   −1.85407800830503
Node 12   −2.9146794599582364
Node 13   −0.8285086307035211
Node 14   −2.220055567127042
Node 15   1.8210549063839436
Node 16   −0.9068623797827882
Node 17   1.0665616368940893
Node 18   0.19911295116208919
Node 19   −2.2945158743293064
Node 20   4.277090165743786
Node 21   −1.6653163752813018
Sigmoid Node 4
Inputs   Weights
Threshold   −0.05198861500606198
Attrib COMPACTNESS   2.8408505952216188
Attrib CIRCULARITY   −1.2270411468477862
Attrib DISTANCE CIRCULARITY   0.47918664748582845

Attrib RADIUS RATIO   −0.08199944184754014
Attrib PR.AXIS ASPECT RATIO   0.811390128199194
Attrib MAX.LENGTH ASPECT RATIO   0.1869132822534514
Attrib SCATTER RATIO   0.47003883122776574
Attrib ELONGATEDNESS   0.19489952904542454
Attrib PR.AXIS RECTANGULARITY   1.076215347070313
Attrib MAX.LENGTH RECTANGULARITY   −1.126979595769938
Attrib SCALED VARIANCE_MAJOR   0.2987994782794038
Attrib SCALED VARIANCE_MINOR   0.42681077317635346
Attrib SCALED RADIUS OF GYRATION   1.8113001600227856
Attrib SKEWNESS ABOUT_MAJOR   1.5378506935843563
Attrib SKEWNESS ABOUT_MINOR   2.453888295324831
Attrib KURTOSIS ABOUT_MAJOR   0.903659837336094
Attrib KURTOSIS ABOUT_MINOR   −1.8476255676785738
Attrib HOLLOWS RATIO   −0.2230621776352759
Sigmoid Node 5
Inputs   Weights
Threshold   −1.335402600760016
Attrib COMPACTNESS   2.0329235330242237
Attrib CIRCULARITY   −2.4182302517720458
Attrib DISTANCE CIRCULARITY   2.8234667562293208
Attrib RADIUS RATIO   −0.26195622772267746
Attrib PR.AXIS ASPECT RATIO   −0.3582794875285692
Attrib MAX.LENGTH ASPECT RATIO   1.711254556030214
Attrib SCATTER RATIO   −0.9273803221957226
Attrib ELONGATEDNESS   2.746322677124668
Attrib PR.AXIS RECTANGULARITY   0.4543350876633282
Attrib MAX.LENGTH RECTANGULARITY   1.7707096607076593
Attrib SCALED VARIANCE_MAJOR   0.2058092263712335
Attrib SCALED VARIANCE_MINOR   −1.3009694229747457
Attrib SCALED RADIUS OF GYRATION   1.8529050368326179
Attrib SKEWNESS ABOUT_MAJOR   0.5001752862744182
Attrib SKEWNESS ABOUT_MINOR   −0.8544145310851283
Attrib KURTOSIS ABOUT_MAJOR   −0.815145699406031
Attrib KURTOSIS ABOUT_MINOR   −3.200736197481954
Attrib HOLLOWS RATIO   4.5165570769140775
Sigmoid Node 6
Inputs   Weights
Threshold   1.1329498658000192
Attrib COMPACTNESS   −1.3741276996948228
Attrib CIRCULARITY   −0.3684138110120435
Attrib DISTANCE CIRCULARITY   −1.2670816941490188
Attrib RADIUS RATIO   0.8384581396993425
Attrib PR.AXIS ASPECT RATIO   0.39247443627401596
Attrib MAX.LENGTH ASPECT RATIO   −0.1782635315612237
Attrib SCATTER RATIO   0.5519610222370235
Attrib ELONGATEDNESS   −1.5794206006881757
Attrib PR.AXIS RECTANGULARITY   0.3613029672861978
Attrib MAX.LENGTH RECTANGULARITY   −2.4904521247430345

Attrib SCALED VARIANCE_MAJOR   0.737092047603343
Attrib SCALED VARIANCE_MINOR   0.2674287872330221
Attrib SCALED RADIUS OF GYRATION   1.6454659398895102
Attrib SKEWNESS ABOUT_MAJOR   −0.9129879408078159
Attrib SKEWNESS ABOUT_MINOR   0.31187029248959297
Attrib KURTOSIS ABOUT_MAJOR   0.6147129437464309
Attrib KURTOSIS ABOUT_MINOR   1.0432553172068975
Attrib HOLLOWS RATIO   −0.14080597392979055
Sigmoid Node 7
Inputs   Weights
Threshold   0.7001156563833756
Attrib COMPACTNESS   −0.4949875669135699
Attrib CIRCULARITY   1.5493056550665703
Attrib DISTANCE CIRCULARITY   −0.039096137337284106
Attrib RADIUS RATIO   0.016687205109448485
Attrib PR.AXIS ASPECT RATIO   1.7049202510516546
Attrib MAX.LENGTH ASPECT RATIO   −0.16151129733508918
Attrib SCATTER RATIO   0.8898937378637718
Attrib ELONGATEDNESS   −2.8110453373861746
Attrib PR.AXIS RECTANGULARITY   0.12412398754759538
Attrib MAX.LENGTH RECTANGULARITY   −0.5612437089658883
Attrib SCALED VARIANCE_MAJOR   0.9067824897577458
Attrib SCALED VARIANCE_MINOR   1.234407887433405
Attrib SCALED RADIUS OF GYRATION   −1.063454116167777
Attrib SKEWNESS ABOUT_MAJOR   1.0640915445102925
Attrib SKEWNESS ABOUT_MINOR   0.33271091049157614
Attrib KURTOSIS ABOUT_MAJOR   0.3370123652086131
Attrib KURTOSIS ABOUT_MINOR   4.183321169454047
Attrib HOLLOWS RATIO   −2.916093811068021
Sigmoid Node 8
Inputs   Weights
Threshold   −1.074356808587 0734
Attrib COMPACTNESS   1.4318994632413269
Attrib CIRCULARITY   −0.3995216127909749
Attrib DISTANCE CIRCULARITY   1.1274627823876575
Attrib RADIUS RATIO   −0.8373055317553659
Attrib PR.AXIS ASPECT RATIO   0.36584739765179497
Attrib MAX.LENGTH ASPECT RATIO   0.708328319139463
Attrib SCATTER RATIO   −0.9551589372010397
Attrib ELONGATEDNESS   1.7433892458598732
Attrib PR.AXIS RECTANGULARITY   −0.7178490839124044
Attrib MAX.LENGTH RECTANGULARITY   1.857500601250682
Attrib SCALED VARIANCE_MAJOR   −0.7491480623505117
Attrib SCALED VARIANCE_MINOR   −0.7493202671073161
Attrib SCALED RADIUS OF GYRATION   −1.5140694890198476
Attrib SKEWNESS ABOUT_MAJOR   1.3054381753582236
Attrib SKEWNESS ABOUT_MINOR   0.21795168171042253
Attrib KURTOSIS ABOUT_MAJOR   0.323541182719934
Attrib KURTOSIS ABOUT_MINOR   −0.7171123429081313

Attrib HOLLOWS RATIO   0.7702652280328127
Sigmoid Node 9
Inputs   Weights
Threshold   0.6982360368077508
Attrib COMPACTNESS   −1.5838915409299235
Attrib CIRCULARITY   0.28493392731924594
Attrib DISTANCE CIRCULARITY   −2.3905852294459504
Attrib RADIUS RATIO   −0.3231211372595044
Attrib PR.AXIS ASPECT RATIO   1.1685816448096997
Attrib MAX.LENGTH ASPECT RATIO   −1.334796959054059
Attrib SCATTER RATIO   0.6581702738678994
Attrib ELONGATEDNESS   −1.9767446019454729
Attrib PR.AXIS RECTANGULARITY   −0.0580325523047302
Attrib MAX.LENGTH RECTANGULARITY   −2.8007271830804443
Attrib SCALED VARIANCE_MAJOR   −0.10448195431090798
Attrib SCALED VARIANCE_MINOR   0.735426925383136
Attrib SCALED RADIUS OF GYRATION   0.45765367312706473
Attrib SKEWNESS ABOUT_MAJOR   0.4428858997154718
Attrib SKEWNESS ABOUT_MINOR   0.6059935997167006
Attrib KURTOSIS ABOUT_MAJOR   0.05477524420933137
Attrib KURTOSIS ABOUT_MINOR   1.204504497868318
Attrib HOLLOWS RATIO   −2.0959502635671248
Sigmoid Node 10
Inputs   Weights
Threshold   −0.2811814418037655
Attrib COMPACTNESS   1.6807396413758329
Attrib CIRCULARITY   0.26297032228129424
Attrib DISTANCE CIRCULARITY   1.745685345955772
Attrib RADIUS RATIO   −1.8359728699640803
Attrib PR.AXIS ASPECT RATIO   1.9347212693450329
Attrib MAX.LENGTH ASPECT RATIO   2.233399857111306
Attrib SCATTER RATIO   −1.748601392142588
Attrib ELONGATEDNESS   1.512090593921799
Attrib PR.AXIS RECTANGULARITY   −1.7461242559441068
Attrib MAX.LENGTH RECTANGULARITY   3.824049006902373
Attrib SCALED VARIANCE_MAJOR   −1.3484981372727896
Attrib SCALED VARIANCE_MINOR   −1.8229187971990597
Attrib SCALED RADIUS OF GYRATION   −1.6741710098044804
Attrib SKEWNESS ABOUT_MAJOR   2.7448154374570737
Attrib SKEWNESS ABOUT_MINOR   −0.28603814112921616
Attrib KURTOSIS ABOUT_MAJOR   −0.7948324988338535
Attrib KURTOSIS ABOUT_MINOR   −1.222783166100721
Attrib HOLLOWS RATIO   1.3746847368372193
Sigmoid Node 11
Inputs   Weights
Threshold   −0.886774474627637
Attrib COMPACTNESS   −0.7460224858772371
Attrib CIRCULARITY   −1.1711220021184314
Attrib DISTANCE CIRCULARITY   −0.5804465311227833

Attrib RADIUS RATIO   1.4646713608964204
Attrib PR.AXIS ASPECT RATIO   −0.5059092099276339
Attrib MAX.LENGTH ASPECT RATIO   0.9895557850128432
Attrib SCATTER RATIO   −0.016462987425530574
Attrib ELONGATEDNESS   0.8295133624499303
Attrib PR.AXIS RECTANGULARITY   0.08250392838086827
Attrib MAX.LENGTH RECTANGULARITY   −2.4734443639372943
Attrib SCALED VARIANCE_MAJOR   0.749634667650471
Attrib SCALED VARIANCE_MINOR   0.05638284866099783
Attrib SCALED RADIUS OF GYRATION   0.2043025420512967
Attrib SKEWNESS ABOUT_MAJOR   −0.31266879970608624
Attrib SKEWNESS ABOUT_MINOR   0.5888979025666654
Attrib KURTOSIS ABOUT_MAJOR   0.3242723224866694
Attrib KURTOSIS ABOUT_MINOR   −0.8433278414516548
Attrib HOLLOWS RATIO   −0.6784932013246316
Sigmoid Node 12
Inputs   Weights
Threshold   0.30095451948043894
Attrib COMPACTNESS   −1.8203301732808856
Attrib CIRCULARITY   0.7252049557949403
Attrib DISTANCE CIRCULARITY   −0.6673056183162551
Attrib RADIUS RATIO   0.5931564372218974
Attrib PR.AXIS ASPECT RATIO   0.29958348574514126
Attrib MAX.LENGTH ASPECT RATIO   0.3574466345180463
Attrib SCATTER RATIO   0.35840681158072524
Attrib ELONGATEDNESS   −0.8629881751752173
Attrib PR.AXIS RECTANGULARITY   0.0029474504270604112
Attrib MAX.LENGTH RECTANGULARITY   −1.3582572760858869
Attrib SCALED VARIANCE_MAJOR   0.5933461621927322
Attrib SCALED VARIANCE_MINOR   0.3621071687295173
Attrib SCALED RADIUS OF GYRATION   0.34348264138426615
Attrib SKEWNESS ABOUT_MAJOR   −0.23888994890418994
Attrib SKEWNESS ABOUT_MINOR   0.648315538591071
Attrib KURTOSIS ABOUT_MAJOR   0.6098184402779548
Attrib KURTOSIS ABOUT_MINOR   0.5319862088114462
Attrib HOLLOWS RATIO   −0.8023380639269111
Sigmoid Node 13
Inputs   Weights
Threshold   −0.4576693450665294
Attrib COMPACTNESS   −1.7775152233397944
Attrib CIRCULARITY   0.8425162696374442
Attrib DISTANCE CIRCULARITY   0.9462643272921047
Attrib RADIUS RATIO   0.12201582041177288
Attrib PR.AXIS ASPECT RATIO   0.2898773070623652
Attrib MAX.LENGTH ASPECT RATIO   0.7087297136938668
Attrib SCATTER RATIO   0.5865173299929991
Attrib ELONGATEDNESS   −0.6182591479812816
Attrib PR.AXIS RECTANGULARITY   0.22460221262313806
Attrib MAX.LENGTH RECTANGULARITY   0.2848450865062971

Attrib SCALED VARIANCE_MAJOR   0.6942270213622596
Attrib SCALED VARIANCE_MINOR   0.819928472619289
Attrib SCALED RADIUS OF GYRATION   −1.4312585612213027
Attrib SKEWNESS ABOUT_MAJOR   0.6608625716982568
Attrib SKEWNESS ABOUT_MINOR   −0.35737289967773966
Attrib KURTOSIS ABOUT_MAJOR   0.8497317508249937
Attrib KURTOSIS ABOUT_MINOR   0.07063074539098914
Attrib HOLLOWS RATIO   −2.0724065635189737
Sigmoid Node 14
Inputs   Weights
Threshold   −0.05394364093233915
Attrib COMPACTNESS   −0.9878913834866462
Attrib CIRCULARITY   1.1833928615055027
Attrib DISTANCE CIRCULARITY   1.6750958931627993
Attrib RADIUS RATIO   0.7653489216865869
Attrib PR.AXIS ASPECT RATIO   −3.1331755560680077
Attrib MAX.LENGTH ASPECT RATIO   0.027566669897777247
Attrib SCATTER RATIO   1.5022689183764595
Attrib ELONGATEDNESS   −1.1252390901531186
Attrib PR.AXIS RECTANGULARITY   1.1504148301250625
Attrib MAX.LENGTH RECTANGULARITY   0.03567212520748859
Attrib SCALED VARIANCE_MAJOR   2.226923579981298
Attrib SCALED VARIANCE_MINOR   1.2895137587614147
Attrib SCALED RADIUS OF GYRATION   1.400239441305138
Attrib SKEWNESS ABOUT_MAJOR   −2.376117626646288
Attrib SKEWNESS ABOUT_MINOR   0.2924112935415173
Attrib KURTOSIS ABOUT_MAJOR   1.208004169024715
Attrib KURTOSIS ABOUT_MINOR   1.2665726158498423
Attrib HOLLOWS RATIO   0.2504832879346202
Sigmoid Node 15
Inputs   Weights
Threshold   0.06096608050428321
Attrib COMPACTNESS   0.8436768319472743
Attrib CIRCULARITY   −0.005569756048766268
Attrib DISTANCE CIRCULARITY   −0.08200157352077138
Attrib RADIUS RATIO   −0.9861323671430828
Attrib PR.AXIS ASPECT RATIO   1.8470738669426712
Attrib MAX.LENGTH ASPECT RATIO   0.19630077076858954
Attrib SCATTER RATIO   −0.7561596316572313
Attrib ELONGATEDNESS   −0.037952225516845545
Attrib PR.AXIS RECTANGULARITY   −0.9228576480857779
Attrib MAX.LENGTH RECTANGULARITY   1.2979570859362886
Attrib SCALED VARIANCE_MAJOR   −0.605992442606313
Attrib SCALED VARIANCE_MINOR   −0.7391349380633867
Attrib SCALED RADIUS OF GYRATION   −0.7449410215801654
Attrib SKEWNESS ABOUT_MAJOR   1.642560199140895
Attrib SKEWNESS ABOUT_MINOR   −0.25357325670037695
Attrib KURTOSIS ABOUT_MAJOR   −0.1897126472607619
Attrib KURTOSIS ABOUT_MINOR   0.8026664980985696

Attrib HOLLOWS RATIO   0.33937140765018087
Sigmoid Node 16
Inputs   Weights
Threshold   −0.4021472753456558
Attrib COMPACTNESS   −1.0991093978714295
Attrib CIRCULARITY   0.4455144464857044
Attrib DISTANCE CIRCULARITY   0.8546381790270465
Attrib RADIUS RATIO   1.510087176870593
Attrib PR.AXIS ASPECT RATIO   −1.6471047005996662
Attrib MAX.LENGTH ASPECT RATIO   1.061390574272486
Attrib SCATTER RATIO   −0.189280297378282
Attrib ELONGATEDNESS   1.222929991945218
Attrib PR.AXIS RECTANGULARITY   −0.10203563975565672
Attrib MAX.LENGTH RECTANGULARITY   0.03877304456082456
Attrib SCALED VARIANCE_MAJOR   0.5204984684113213
Attrib SCALED VARIANCE_MINOR   −0.2274318942605328
Attrib SCALED RADIUS OF GYRATION   −0.028905926213095477
Attrib SKEWNESS ABOUT_MAJOR   −1.376393595631791
Attrib SKEWNESS ABOUT_MINOR   0.019956213716280397
Attrib KURTOSIS ABOUT_MAJOR   0.08940299165072735
Attrib KURTOSIS ABOUT_MINOR   −0.9048302282199483
Attrib HOLLOWS RATIO   0.24382547698973922
Sigmoid Node 17
Inputs   Weights
Threshold   −0.7350765765888817
Attrib COMPACTNESS   2.8215674532508785
Attrib CIRCULARITY   −3.303638600554583
Attrib DISTANCE CIRCULARITY   −0.005819391277481566
Attrib RADIUS RATIO   1.4288859221846308
Attrib PR.AXIS ASPECT RATIO   −1.2594879047271457
Attrib MAX.LENGTH ASPECT RATIO   0.27973372431049176
Attrib SCATTER RATIO   0.16656143757706401
Attrib ELONGATEDNESS   1.774244209360382
Attrib PR.AXIS RECTANGULARITY   1.7421474330552418
Attrib MAX.LENGTH RECTANGULARITY   −1.5344986243926528
Attrib SCALED VARIANCE_MAJOR   0.3613218608581391
Attrib SCALED VARIANCE_MINOR   0.1136479140799737
Attrib SCALED RADIUS OF GYRATION   −0.016875929024718538
Attrib SKEWNESS ABOUT_MAJOR   −0.4590942554380274
Attrib SKEWNESS ABOUT_MINOR   1.2343950808107034
Attrib KURTOSIS ABOUT_MAJOR   −0.30115020011279797
Attrib KURTOSIS ABOUT_MINOR   −2.356105246738498
Attrib HOLLOWS RATIO   −0.10657521402466626
Sigmoid Node 18
Inputs   Weights
Threshold   −1.7533308157822505
Attrib COMPACTNESS   1.1054606456994625
Attrib CIRCULARITY   −2.629638915596831
Attrib DISTANCE CIRCULARITY   −1.4388837394760898

Attrib RADIUS RATIO   1.4041957651478632
Attrib PR.AXIS ASPECT RATIO   0.06300940017288348
Attrib MAX.LENGTH ASPECT RATIO   0.9927762885213587
Attrib SCATTER RATIO   −0.6255962446118237
Attrib ELONGATEDNESS   2.418753852618775
Attrib PR.AXIS RECTANGULARITY   0.00662434132724367
Attrib MAX.LENGTH RECTANGULARITY   −2.6894632697616623
Attrib SCALED VARIANCE_MAJOR   0.46945442159300743
Attrib SCALED VARIANCE_MINOR   −0.08527398228973355
Attrib SCALED RADIUS OF GYRATION   −0.7164833720536864
Attrib SKEWNESS ABOUT_MAJOR   0.7705942377569587
Attrib SKEWNESS ABOUT_MINOR   0.5449654439975578
Attrib KURTOSIS ABOUT_MAJOR   −0.40584027600552275
Attrib KURTOSIS ABOUT_MINOR   −1.0664201240239368
Attrib HOLLOWS RATIO   −1.140643187246319
Sigmoid Node 19
Inputs   Weights
Threshold   0.12464010378367206
Attrib COMPACTNESS   −0.9184766979032698
Attrib CIRCULARITY   −0.15579701636363283
Attrib DISTANCE CIRCULARITY   −3.9936023122012183
Attrib RADIUS RATIO   −2.6852343665249596
Attrib PR.AXIS ASPECT RATIO   3.255704752798767
Attrib MAX.LENGTH ASPECT RATIO   −1.8674980809889687
Attrib SCATTER RATIO   0.6310597403724852
Attrib ELONGATEDNESS   −4.055442791018329
Attrib PR.AXIS RECTANGULARITY   0.04818793926755299
Attrib MAX.LENGTH RECTANGULARITY   −0.5350017460131791
Attrib SCALED VARIANCE_MAJOR   0.5690381467996273
Attrib SCALED VARIANCE_MINOR   0.5148098935633427
Attrib SCALED RADIUS OF GYRATION   0.8798028802378954
Attrib SKEWNESS ABOUT_MAJOR   2.6913922386046045
Attrib SKEWNESS ABOUT_MINOR   −1.4210259246237265
Attrib KURTOSIS ABOUT_MAJOR   0.40279682213072665
Attrib KURTOSIS ABOUT_MINOR   3.867389506259323
Attrib HOLLOWS RATIO   −3.0464773100094957
Sigmoid Node 20
Inputs   Weights
Threshold   −0.19064231308140137
Attrib COMPACTNESS   1.2936138041268255
Attrib CIRCULARITY   0.45380264908885054
Attrib DISTANCE CIRCULARITY   1.588517263720912
Attrib RADIUS RATIO   −1.8345177197806628
Attrib PR.AXIS ASPECT RATIO   1.9663556982855075
Attrib MAX.LENGTH ASPECT RATIO   2.100671856462764
Attrib SCATTER RATIO   −1.6488085619740278
Attrib ELONGATEDNESS   1.2401818015689514
Attrib PR.AXIS RECTANGULARITY   −1.7403350574613246
Attrib MAX.LENGTH RECTANGULARITY   3.7200491670807403

Attrib SCALED VARIANCE_MAJOR   −1.3688583693923164
Attrib SCALED VARIANCE_MINOR   −1.7966954349849211
Attrib SCALED RADIUS OF GYRATION   −1.6377804907167433
Attrib SKEWNESS ABOUT_MAJOR   2.7115882368133697
Attrib SKEWNESS ABOUT_MINOR   −0.2064866894111376
Attrib KURTOSIS ABOUT_MAJOR   −0.7918404079929008
Attrib KURTOSIS ABOUT_MINOR   −1.1450209304973438
Attrib HOLLOWS RATIO   1.2528257898821988
Sigmoid Node 21
Inputs   Weights
Threshold   0.26983635402745043
Attrib COMPACTNESS   −0.8725812744753191
Attrib CIRCULARITY   −0.3212442441380875
Attrib DISTANCE CIRCULARITY   0.5397136918383689
Attrib RADIUS RATIO   0.5404840679604025
Attrib PR.AXIS ASPECT RATIO   0.8328753080700158
Attrib MAX.LENGTH ASPECT RATIO   0.3229396939936311
Attrib SCATTER RATIO   0.3316950530649336
Attrib ELONGATEDNESS   −1.183411886440075
Attrib PR.AXIS RECTANGULARITY   −0.08389768517781099
Attrib MAX.LENGTH RECTANGULARITY   −1.3733928931401491
Attrib SCALED VARIANCE_MAJOR   0.7277833612322832
Attrib SCALED VARIANCE_MINOR   0.35717582718742946
Attrib SCALED RADIUS OF GYRATION   −0.5253624205462949
Attrib SKEWNESS ABOUT_MAJOR   0.48175711837199475
Attrib SKEWNESS ABOUT_MINOR   0.18117364111436574
Attrib KURTOSIS ABOUT_MAJOR   0.541405575597933
Attrib KURTOSIS ABOUT_MINOR   1.0775931367114686
Attrib HOLLOWS RATIO   −0.8005598949296959
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.29 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

Correctly Classified Instances   362   85.9857 %
Incorrectly Classified Instances   59   14.0143 %
Kappa statistic   0.8132
Mean absolute error   0.1342
Root mean squared error   0.2278
Relative absolute error   35.7955 %
Root relative squared error   52.6314 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,819	0,104	0,723	0,819	0,768	0,687	0,939	0,850	opel
0,648	0,045	0,833	0,648	0,729	0,659	0,948	0,866	saab
0,982	0,026	0,930	0,982	0,955	0,940	0,999	0,997	bus
1,000	0,012	0,961	1,000	0,980	0,974	1,000	1,000	van
Weighted Avg.	0,860	0,047	0,861	0,860	0,856	0,813	0,971	0,927

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
86   14   3    2  |    a = opel
32   70   5    1  |    b = saab
1    0  107    1  |    c = bus
0    0    0   99  |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY

RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.8361266109240404
Node 4   −3.882561626347938
Node 5   −4.550506629289725
Node 6   −0.860633335177813
Node 7   1.3614568239984748
Node 8   −0.681708799203306
Node 9   0.3510709478930344
Node 10   −1.9741438698607199
Node 11   0.8323897377211352
Node 12   0.3619462769890368
Node 13   1.493614497295198
Node 14   1.538379401598814
Node 15   −0.9397529419045959
Node 16   1.2716025985276684
Node 17   −1.547565058541222
Node 18   2.0513071969260928
Node 19   −6.093787301803948
Node 20   −1.6916532739728676
Node 21   −1.0062295931195568
Sigmoid Node 1
Inputs   Weights
Threshold   0.28484919754318827
Node 4   2.258902239310736
Node 5   2.420033247862656
Node 6   0.5539683317567728
Node 7   −4.509560496802052
Node 8   −1.347101686638801

226

```
Node 9        −0.9734625105924858
Node 10       −3.918504843015146
Node 11       0.38145522460309067
Node 12       −0.7899503311081097
Node 13       −2.3739938299089265
Node 14       2.077543165604217
Node 15       −0.99048611806636
Node 16       0.33670679740728904
Node 17       2.282075318770071
Node 18       2.4933896745610657
Node 19       −0.17420191060417928
Node 20       −3.7928988562344426
Node 21       −2.0737764374663774
Sigmoid Node 2
Inputs        Weights
Threshold        −0.14063876566060204
Node 4        0.18154175323307478
Node 5        −3.4798325575691393
Node 6        0.7926531218882384
Node 7        2.902990908805387
Node 8        −0.999736354501267
Node 9        3.2496796755703934
Node 10       −0.11158065210605889
Node 11       −2.6646133570154253
Node 12       0.545535999608931
Node 13       0.6025816711916755
Node 14       −5.408601146528227
Node 15       1.6177281622406898
Node 16       −2.9729844173789917
Node 17       −4.10576287447257
Node 18       −4.264253775363847
Node 19       5.087929387113081
Node 20       0.37453258527731015
Node 21       0.42108494820398457
Sigmoid Node 3
Inputs        Weights
Threshold        −0.18602369509546907
Node 4        −0.6713018495294845
Node 5        3.4260879418079258
Node 6        −3.8270583080405483
Node 7        −2.6101006253683825
Node 8        3.076773431290434
Node 9        −3.41388516948306
Node 10       4.478287463970644
Node 11       −1.85407800830503
Node 12       −2.9146794599582364
Node 13       −0.8285086307035211
Node 14       −2.220055567127042
Node 15       1.8210549063839436
```

Node 16   −0.9068623797827882
Node 17   1.0665616368940893
Node 18   0.19911295116208919
Node 19   −2.2945158743293064
Node 20   4.277090165743786
Node 21   −1.6653163752813018
Sigmoid Node 4
Inputs   Weights
Threshold   −0.05198861500606198
Attrib COMPACTNESS   2.8408505952216188
Attrib CIRCULARITY   −1.2270411468477862
Attrib DISTANCE CIRCULARITY   0.47918664748582845
Attrib RADIUS RATIO   −0.08199944184754014
Attrib PR.AXIS ASPECT RATIO   0.811390128199194
Attrib MAX.LENGTH ASPECT RATIO   0.1869132822534514
Attrib SCATTER RATIO   0.47003883122776574
Attrib ELONGATEDNESS   0.19489952904542454
Attrib PR.AXIS RECTANGULARITY   1.076215347070313
Attrib MAX.LENGTH RECTANGULARITY   −1.126979595769938
Attrib SCALED VARIANCE_MAJOR   0.2987994782794038
Attrib SCALED VARIANCE_MINOR   0.42681077317635346
Attrib SCALED RADIUS OF GYRATION   1.8113001600227856
Attrib SKEWNESS ABOUT_MAJOR   1.5378506935843563
Attrib SKEWNESS ABOUT_MINOR   2.453888295324831
Attrib KURTOSIS ABOUT_MAJOR   0.903659837336094
Attrib KURTOSIS ABOUT_MINOR   −1.8476255676785738
Attrib HOLLOWS RATIO   −0.2230621776352759
Sigmoid Node 5
Inputs   Weights
Threshold   −1.3351402600760016
Attrib COMPACTNESS   2.0329235330242237
Attrib CIRCULARITY   −2.4182302517720458
Attrib DISTANCE CIRCULARITY   2.8234667562293208
Attrib RADIUS RATIO   −0.26195622772267746
Attrib PR.AXIS ASPECT RATIO   −0.3582794875285692
Attrib MAX.LENGTH ASPECT RATIO   1.711254556030214
Attrib SCATTER RATIO   −0.9273803221957226
Attrib ELONGATEDNESS   2.746322677124668
Attrib PR.AXIS RECTANGULARITY   0.4543350876633282
Attrib MAX.LENGTH RECTANGULARITY   1.7707096607076593
Attrib SCALED VARIANCE_MAJOR   0.2058092263712335
Attrib SCALED VARIANCE_MINOR   −1.3009694229747457
Attrib SCALED RADIUS OF GYRATION   1.8529050368326179
Attrib SKEWNESS ABOUT_MAJOR   0.5001752862744182
Attrib SKEWNESS ABOUT_MINOR   −0.8544145310851283
Attrib KURTOSIS ABOUT_MAJOR   −0.815145699406031
Attrib KURTOSIS ABOUT_MINOR   −3.200736197481954
Attrib HOLLOWS RATIO   4.5165570769140775
Sigmoid Node 6

```
Inputs      Weights
Threshold      1.1329498658000192
Attrib COMPACTNESS      −1.3741276996948228
Attrib CIRCULARITY      −0.368138110120435
Attrib DISTANCE CIRCULARITY      −1.2670816941490188
Attrib RADIUS RATIO      0.8384581396993425
Attrib PR.AXIS ASPECT RATIO      0.39247443627401596
Attrib MAX.LENGTH ASPECT RATIO      −0.1782635315612237
Attrib SCATTER RATIO      0.5519610222370235
Attrib ELONGATEDNESS      −1.5794206006881757
Attrib PR.AXIS RECTANGULARITY      0.3613029672861978
Attrib MAX.LENGTH RECTANGULARITY      −2.4904521247430345
Attrib SCALED VARIANCE_MAJOR      0.737092047603343
Attrib SCALED VARIANCE_MINOR      0.2674287872330221
Attrib SCALED RADIUS OF GYRATION      1.6454659398895102
Attrib SKEWNESS ABOUT_MAJOR      −0.9129879408078159
Attrib SKEWNESS ABOUT_MINOR      0.31187029248959297
Attrib KURTOSIS ABOUT_MAJOR      0.6147129437464309
Attrib KURTOSIS ABOUT_MINOR      1.0432553172068975
Attrib HOLLOWS RATIO      −0.14080597392979055
Sigmoid Node 7
Inputs      Weights
Threshold      0.7001156563833756
Attrib COMPACTNESS      −0.4949875669135699
Attrib CIRCULARITY      1.5493056550665703
Attrib DISTANCE CIRCULARITY      −0.039096137337284106
Attrib RADIUS RATIO      0.016687205109448485
Attrib PR.AXIS ASPECT RATIO      1.7049202510516546
Attrib MAX.LENGTH ASPECT RATIO      −0.16151129733508918
Attrib SCATTER RATIO      0.8898937378637718
Attrib ELONGATEDNESS      −2.8110453373861746
Attrib PR.AXIS RECTANGULARITY      0.12412398754759538
Attrib MAX.LENGTH RECTANGULARITY      −0.5612437089658883
Attrib SCALED VARIANCE_MAJOR      0.9067824897577458
Attrib SCALED VARIANCE_MINOR      1.234407887433405
Attrib SCALED RADIUS OF GYRATION      −1.063454116167777
Attrib SKEWNESS ABOUT_MAJOR      1.0640915445102925
Attrib SKEWNESS ABOUT_MINOR      0.33271091049157614
Attrib KURTOSIS ABOUT_MAJOR      0.3370123652086131
Attrib KURTOSIS ABOUT_MINOR      4.183321169454047
Attrib HOLLOWS RATIO      −2.916093811068021
Sigmoid Node 8
Inputs      Weights
Threshold      −1.074356085870734
Attrib COMPACTNESS      1.4318994632413269
Attrib CIRCULARITY      −0.3995216127909749
Attrib DISTANCE CIRCULARITY      1.1274627823876575
Attrib RADIUS RATIO      −0.8373055317553659
Attrib PR.AXIS ASPECT RATIO      0.36584739765179497
```

Attrib MAX.LENGTH ASPECT RATIO   0.708328319139463
Attrib SCATTER RATIO   −0.9551589372010397
Attrib ELONGATEDNESS   1.7433892458598732
Attrib PR.AXIS RECTANGULARITY   −0.7178490839124044
Attrib MAX.LENGTH RECTANGULARITY   1.857500601250682
Attrib SCALED VARIANCE_MAJOR   −0.7491480623505117
Attrib SCALED VARIANCE_MINOR   −0.7493202671073161
Attrib SCALED RADIUS OF GYRATION   −1.5140694890198476
Attrib SKEWNESS ABOUT_MAJOR   1.3054381753582236
Attrib SKEWNESS ABOUT_MINOR   0.21795168171042253
Attrib KURTOSIS ABOUT_MAJOR   0.323541182719934
Attrib KURTOSIS ABOUT_MINOR   −0.7171123429081313
Attrib HOLLOWS RATIO   0.7702652280328127
Sigmoid Node 9
Inputs   Weights
Threshold   0.6982360368077508
Attrib COMPACTNESS   −1.5838915409299235
Attrib CIRCULARITY   0.28493392731924594
Attrib DISTANCE CIRCULARITY   −2.3905852294459504
Attrib RADIUS RATIO   −0.32311211372595044
Attrib PR.AXIS ASPECT RATIO   1.1685816448096997
Attrib MAX.LENGTH ASPECT RATIO   −1.334796959054059
Attrib SCATTER RATIO   0.6581702738678994
Attrib ELONGATEDNESS   −1.9767446019454729
Attrib PR.AXIS RECTANGULARITY   −0.0580325523047302
Attrib MAX.LENGTH RECTANGULARITY   −2.8007271830804443
Attrib SCALED VARIANCE_MAJOR   −0.10448195431090798
Attrib SCALED VARIANCE_MINOR   0.735426925383136
Attrib SCALED RADIUS OF GYRATION   0.45765367312706473
Attrib SKEWNESS ABOUT_MAJOR   0.4428858997154718
Attrib SKEWNESS ABOUT_MINOR   0.6059935997167006
Attrib KURTOSIS ABOUT_MAJOR   0.05477524420933137
Attrib KURTOSIS ABOUT_MINOR   1.204504497868318
Attrib HOLLOWS RATIO   −2.0959502635671248
Sigmoid Node 10
Inputs   Weights
Threshold   −0.2811814418037655
Attrib COMPACTNESS   1.6807396413758329
Attrib CIRCULARITY   0.26297032228129424
Attrib DISTANCE CIRCULARITY   1.745685345955772
Attrib RADIUS RATIO   −1.8359728699640803
Attrib PR.AXIS ASPECT RATIO   1.9347212693450329
Attrib MAX.LENGTH ASPECT RATIO   2.233399857111306
Attrib SCATTER RATIO   −1.748601392142588
Attrib ELONGATEDNESS   1.512090593921799
Attrib PR.AXIS RECTANGULARITY   −1.7461242559441068
Attrib MAX.LENGTH RECTANGULARITY   3.824049006902373
Attrib SCALED VARIANCE_MAJOR   −1.3484981372727896
Attrib SCALED VARIANCE_MINOR   −1.8229187971990597

Attrib SCALED RADIUS OF GYRATION   −1.6741710098044804
Attrib SKEWNESS ABOUT_MAJOR   2.7448154374570737
Attrib SKEWNESS ABOUT_MINOR   −0.28603814112921616
Attrib KURTOSIS ABOUT_MAJOR   −0.7948324988338535
Attrib KURTOSIS ABOUT_MINOR   −1.222783166100721
Attrib HOLLOWS RATIO   1.3746847368372193
Sigmoid Node 11
Inputs   Weights
Threshold   −0.886774474627637
Attrib COMPACTNESS   −0.7460224858772371
Attrib CIRCULARITY   −1.1711220021184314
Attrib DISTANCE CIRCULARITY   −0.5804465311227833
Attrib RADIUS RATIO   1.4646713608964204
Attrib PR.AXIS ASPECT RATIO   −0.5059092099276339
Attrib MAX.LENGTH ASPECT RATIO   0.9895557850128432
Attrib SCATTER RATIO   −0.016462987425530574
Attrib ELONGATEDNESS   0.8295133624499303
Attrib PR.AXIS RECTANGULARITY   0.08250392838086827
Attrib MAX.LENGTH RECTANGULARITY   −2.4734443639372943
Attrib SCALED VARIANCE_MAJOR   0.749634667650471
Attrib SCALED VARIANCE_MINOR   0.05638284866099783
Attrib SCALED RADIUS OF GYRATION   0.2043025420512967
Attrib SKEWNESS ABOUT_MAJOR   −0.31266879970608624
Attrib SKEWNESS ABOUT_MINOR   0.5888979025666654
Attrib KURTOSIS ABOUT_MAJOR   0.3242723224866694
Attrib KURTOSIS ABOUT_MINOR   −0.8433278414516548
Attrib HOLLOWS RATIO   −0.6784932013246316
Sigmoid Node 12
Inputs   Weights
Threshold   0.30095451948043894
Attrib COMPACTNESS   −1.8203301732808856
Attrib CIRCULARITY   0.7252049557949403
Attrib DISTANCE CIRCULARITY   −0.6673056183162551
Attrib RADIUS RATIO   0.5931564372218974
Attrib PR.AXIS ASPECT RATIO   0.29958348574514126
Attrib MAX.LENGTH ASPECT RATIO   0.3574466345180463
Attrib SCATTER RATIO   0.35840681158072524
Attrib ELONGATEDNESS   −0.8629881751752173
Attrib PR.AXIS RECTANGULARITY   0.0029474504270604112
Attrib MAX.LENGTH RECTANGULARITY   −1.3582572760858869
Attrib SCALED VARIANCE_MAJOR   0.5933461621927322
Attrib SCALED VARIANCE_MINOR   0.3621071687295173
Attrib SCALED RADIUS OF GYRATION   0.34348264138426615
Attrib SKEWNESS ABOUT_MAJOR   −0.23888994890418994
Attrib SKEWNESS ABOUT_MINOR   0.648315538591071
Attrib KURTOSIS ABOUT_MAJOR   0.6098184402779548
Attrib KURTOSIS ABOUT_MINOR   0.5319862088114462
Attrib HOLLOWS RATIO   −0.8023380639269111
Sigmoid Node 13

Inputs   Weights
Threshold   −0.4576693450665294
Attrib COMPACTNESS   −1.7775152233397944
Attrib CIRCULARITY   0.8425162696374442
Attrib DISTANCE CIRCULARITY   0.9462643272921047
Attrib RADIUS RATIO   0.12201582041177288
Attrib PR.AXIS ASPECT RATIO   0.2898773070623652
Attrib MAX.LENGTH ASPECT RATIO   0.7087297136938668
Attrib SCATTER RATIO   0.5865173299929991
Attrib ELONGATEDNESS   −0.6182591479812816
Attrib PR.AXIS RECTANGULARITY   0.22460221262313806
Attrib MAX.LENGTH RECTANGULARITY   0.2848450865062971
Attrib SCALED VARIANCE_MAJOR   0.6942270213622596
Attrib SCALED VARIANCE_MINOR   0.819928472619289
Attrib SCALED RADIUS OF GYRATION   −1.4312585612213027
Attrib SKEWNESS ABOUT_MAJOR   0.6608625716982568
Attrib SKEWNESS ABOUT_MINOR   −0.35737289967773966
Attrib KURTOSIS ABOUT_MAJOR   0.8497317508249937
Attrib KURTOSIS ABOUT_MINOR   0.07063074539098914
Attrib HOLLOWS RATIO   −2.0724065635189737
Sigmoid Node 14
Inputs   Weights
Threshold   −0.05394364093233915
Attrib COMPACTNESS   −0.9878913834866462
Attrib CIRCULARITY   1.1833928615055027
Attrib DISTANCE CIRCULARITY   1.6750958931627993
Attrib RADIUS RATIO   0.7653489216865869
Attrib PR.AXIS ASPECT RATIO   −3.1331755560680077
Attrib MAX.LENGTH ASPECT RATIO   0.027566669897777247
Attrib SCATTER RATIO   1.5022689183764595
Attrib ELONGATEDNESS   −1.1252390901531186
Attrib PR.AXIS RECTANGULARITY   1.1504148301250625
Attrib MAX.LENGTH RECTANGULARITY   0.03567212520748859
Attrib SCALED VARIANCE_MAJOR   2.226923579981298
Attrib SCALED VARIANCE_MINOR   1.2895137587614147
Attrib SCALED RADIUS OF GYRATION   1.400239441305138
Attrib SKEWNESS ABOUT_MAJOR   −2.376117626646288
Attrib SKEWNESS ABOUT_MINOR   0.2924112935415173
Attrib KURTOSIS ABOUT_MAJOR   1.208004169024715
Attrib KURTOSIS ABOUT_MINOR   1.2665726158498423
Attrib HOLLOWS RATIO   0.2504832879346202
Sigmoid Node 15
Inputs   Weights
Threshold   0.06096608050428321
Attrib COMPACTNESS   0.8436768319472743
Attrib CIRCULARITY   −0.005569756048766268
Attrib DISTANCE CIRCULARITY   −0.08200157352077138
Attrib RADIUS RATIO   −0.986132367143 0828
Attrib PR.AXIS ASPECT RATIO   1.8470738669426712

Attrib MAX.LENGTH ASPECT RATIO   0.19630077076858954
Attrib SCATTER RATIO   −0.7561596316572313
Attrib ELONGATEDNESS   −0.037952225516845545
Attrib PR.AXIS RECTANGULARITY   −0.9228576480857779
Attrib MAX.LENGTH RECTANGULARITY   1.2979570859362886
Attrib SCALED VARIANCE_MAJOR   −0.605992442606313
Attrib SCALED VARIANCE_MINOR   −0.7391349380633867
Attrib SCALED RADIUS OF GYRATION   −0.7449410215801654
Attrib SKEWNESS ABOUT_MAJOR   1.642560199140895
Attrib SKEWNESS ABOUT_MINOR   −0.25357325670037695
Attrib KURTOSIS ABOUT_MAJOR   −0.1897126472607619
Attrib KURTOSIS ABOUT_MINOR   0.8026664980985696
Attrib HOLLOWS RATIO   0.33937140765018087
Sigmoid Node 16
Inputs   Weights
Threshold   −0.4021472753456558
Attrib COMPACTNESS   −1.0991093978714295
Attrib CIRCULARITY   0.4455144464857044
Attrib DISTANCE CIRCULARITY   0.8546381790270465
Attrib RADIUS RATIO   1.510087176870593
Attrib PR.AXIS ASPECT RATIO   −1.6471047005996662
Attrib MAX.LENGTH ASPECT RATIO   1.061390574272486
Attrib SCATTER RATIO   −0.189280297378282
Attrib ELONGATEDNESS   1.222929991945218
Attrib PR.AXIS RECTANGULARITY   −0.10203563975565672
Attrib MAX.LENGTH RECTANGULARITY   0.03877304456082456
Attrib SCALED VARIANCE_MAJOR   0.5204984684113213
Attrib SCALED VARIANCE_MINOR   −0.2274318942605328
Attrib SCALED RADIUS OF GYRATION   −0.028905926213095477
Attrib SKEWNESS ABOUT_MAJOR   −1.376393595631791
Attrib SKEWNESS ABOUT_MINOR   0.019956213716280397
Attrib KURTOSIS ABOUT_MAJOR   0.08940299165072735
Attrib KURTOSIS ABOUT_MINOR   −0.9048302282199483
Attrib HOLLOWS RATIO   0.24382547698973922
Sigmoid Node 17
Inputs   Weights
Threshold   −0.7350765765888817
Attrib COMPACTNESS   2.8215674532508785
Attrib CIRCULARITY   −3.303638600554583
Attrib DISTANCE CIRCULARITY   −0.005819391277481566
Attrib RADIUS RATIO   1.4288859221846308
Attrib PR.AXIS ASPECT RATIO   −1.2594879047271457
Attrib MAX.LENGTH ASPECT RATIO   0.27973372431049176
Attrib SCATTER RATIO   0.16656143757706401
Attrib ELONGATEDNESS   1.774244209360382
Attrib PR.AXIS RECTANGULARITY   1.7421474330552418
Attrib MAX.LENGTH RECTANGULARITY   −1.5344986243926528
Attrib SCALED VARIANCE_MAJOR   0.3613218608581391
Attrib SCALED VARIANCE_MINOR   0.1136479140799737

Attrib SCALED RADIUS OF GYRATION   −0.016875929024718538
Attrib SKEWNESS ABOUT_MAJOR   −0.4590942554380274
Attrib SKEWNESS ABOUT_MINOR   1.2343950808107034
Attrib KURTOSIS ABOUT_MAJOR   −0.30115020011279797
Attrib KURTOSIS ABOUT_MINOR   −2.356105246738498
Attrib HOLLOWS RATIO   −0.10657521402466626
Sigmoid Node 18
Inputs   Weights
Threshold   −1.7533308157822505
Attrib COMPACTNESS   1.1054606456994625
Attrib CIRCULARITY   −2.629638915596831
Attrib DISTANCE CIRCULARITY   −1.4388837394760898
Attrib RADIUS RATIO   1.4041957651478632
Attrib PR.AXIS ASPECT RATIO   0.06300940017288348
Attrib MAX.LENGTH ASPECT RATIO   0.9927762885213587
Attrib SCATTER RATIO   −0.6255962446118237
Attrib ELONGATEDNESS   2.418753852618775
Attrib PR.AXIS RECTANGULARITY   0.00662434132724367
Attrib MAX.LENGTH RECTANGULARITY   −2.6894632697616623
Attrib SCALED VARIANCE_MAJOR   0.46945442159300743
Attrib SCALED VARIANCE_MINOR   −0.08527398228973355
Attrib SCALED RADIUS OF GYRATION   −0.7164833720536864
Attrib SKEWNESS ABOUT_MAJOR   0.7705942377569587
Attrib SKEWNESS ABOUT_MINOR   0.5449654439975578
Attrib KURTOSIS ABOUT_MAJOR   −0.40584027600552275
Attrib KURTOSIS ABOUT_MINOR   −1.0664201240239368
Attrib HOLLOWS RATIO   −1.140643187246319
Sigmoid Node 19
Inputs   Weights
Threshold   0.12464010378367206
Attrib COMPACTNESS   −0.9184766979032698
Attrib CIRCULARITY   −0.15579701636363283
Attrib DISTANCE CIRCULARITY   −3.9936023122012183
Attrib RADIUS RATIO   −2.6852343665249596
Attrib PR.AXIS ASPECT RATIO   3.255704752798767
Attrib MAX.LENGTH ASPECT RATIO   −1.8674980809889687
Attrib SCATTER RATIO   0.6310597403724852
Attrib ELONGATEDNESS   −4.055442791018329
Attrib PR.AXIS RECTANGULARITY   0.04818793926755299
Attrib MAX.LENGTH RECTANGULARITY   −0.5350017460131791
Attrib SCALED VARIANCE_MAJOR   0.5690381467996273
Attrib SCALED VARIANCE_MINOR   0.5148098935633427
Attrib SCALED RADIUS OF GYRATION   0.8798028802378954
Attrib SKEWNESS ABOUT_MAJOR   2.6913922386046045
Attrib SKEWNESS ABOUT_MINOR   −1.4210259246237265
Attrib KURTOSIS ABOUT_MAJOR   0.40279682213072665
Attrib KURTOSIS ABOUT_MINOR   3.867389506259323
Attrib HOLLOWS RATIO   −3.0464773100094957
Sigmoid Node 20

Inputs   Weights
Threshold   −0.19064231308140137
Attrib COMPACTNESS   1.2936138041268255
Attrib CIRCULARITY   0.4538026490885054
Attrib DISTANCE CIRCULARITY   1.588517263720912
Attrib RADIUS RATIO   −1.8345177197806628
Attrib PR.AXIS ASPECT RATIO   1.9663556982855075
Attrib MAX.LENGTH ASPECT RATIO   2.100671856462764
Attrib SCATTER RATIO   −1.6488085619740278
Attrib ELONGATEDNESS   1.2401818015689514
Attrib PR.AXIS RECTANGULARITY   −1.7403350574613246
Attrib MAX.LENGTH RECTANGULARITY   3.7200491670807403
Attrib SCALED VARIANCE_MAJOR   −1.3688583693923164
Attrib SCALED VARIANCE_MINOR   −1.7966954349849211
Attrib SCALED RADIUS OF GYRATION   −1.6377804907167433
Attrib SKEWNESS ABOUT_MAJOR   2.7115882368133697
Attrib SKEWNESS ABOUT_MINOR   −0.2064866894111376
Attrib KURTOSIS ABOUT_MAJOR   −0.7918404079929008
Attrib KURTOSIS ABOUT_MINOR   −1.1450209304973438
Attrib HOLLOWS RATIO   1.2528257898821988
Sigmoid Node 21
Inputs   Weights
Threshold   0.26983635402745043
Attrib COMPACTNESS   −0.8725812744753191
Attrib CIRCULARITY   −0.3212442441338075
Attrib DISTANCE CIRCULARITY   0.5397136918383689
Attrib RADIUS RATIO   0.5404840679604025
Attrib PR.AXIS ASPECT RATIO   0.8328753080700158
Attrib MAX.LENGTH ASPECT RATIO   0.3229396939936311
Attrib SCATTER RATIO   0.3316950530649336
Attrib ELONGATEDNESS   −1.183411886440075
Attrib PR.AXIS RECTANGULARITY   −0.08389768517781099
Attrib MAX.LENGTH RECTANGULARITY   −1.3733928931401491
Attrib SCALED VARIANCE_MAJOR   0.7277833612322832
Attrib SCALED VARIANCE_MINOR   0.3571758271874 2946
Attrib SCALED RADIUS OF GYRATION   −0.5253624205462949
Attrib SKEWNESS ABOUT_MAJOR   0.48175711837199475
Attrib SKEWNESS ABOUT_MINOR   0.18117364111436574
Attrib KURTOSIS ABOUT_MAJOR   0.541405575597933
Attrib KURTOSIS ABOUT_MINOR   1.0775931367114686
Attrib HOLLOWS RATIO   −0.8005598949296959
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input

Node 2
Class van
Input
Node 3

Time taken to build model: 3.8 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   705   83.3333 %
Incorrectly Classified Instances   141   16.6667 %
Kappa statistic   0.7778
Mean absolute error   0.143
Root mean squared error   0.2427
Relative absolute error   38.1434 %
Root relative squared error   56.0722 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,778	0,121	0,682	0,778	0,727	0,630	0,916	0,781	opel
0,604	0,054	0,794	0,604	0,686	0,606	0,934	0,832	saab
0,991	0,025	0,931	0,991	0,960	0,946	0,999	0,998	bus
0,970	0,022	0,932	0,970	0,951	0,936	0,997	0,990	van
Weighted Avg.	0,833	0,056	0,834	0,833	0,829	0,777	0,961	0,899

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
165  33   6    8 |    a = opel
73  131   8    5 |    b = saab
1    0  216    1 |    c = bus
3    1    2  193 |    d = van
```

16 16ª tentativa

=== Run information ===

236

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.7 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.3542529858331827
Node 4   5.939370859077839
Node 5   5.856934773594556
Node 6   5.325921892706366
Node 7   −7.138170943329518
Node 8   −11.060499354006
Node 9   −6.728412038076667
Node 10   −4.283875946057869
Node 11   3.2190014457471436
Node 12   −5.37101164740053
Node 13   −0.7376569383755546
Node 14   −1.5901838169731102
Sigmoid Node 1
Inputs   Weights
Threshold   −4.34751932227591
Node 4   −7.000816359679194
Node 5   −6.6789348883820505

237

```
Node  6      −5.304036074912542
Node  7      7.105781446955928
Node  8      1.9762370058290293
Node  9      6.425643797295377
Node  10      5.592100045849798
Node  11      −2.2495620451614946
Node  12      −9.51786062596895
Node  13      5.54390253726939335
Node  14      6.635820784861365
Sigmoid  Node  2
Inputs      Weights
Threshold      1.1824846038335448
Node  4      1.8671592238691792
Node  5      1.9508649399793128
Node  6      4.467744250907649
Node  7      1.0356780671005215
Node  8      8.902498999598576
Node  9      −1.5051661142698276
Node  10      −0.5278031401618752
Node  11      −3.9077195283123136
Node  12      −3.8629505682572733
Node  13      −12.698922628982485
Node  14      −12.929595516764973
Sigmoid  Node  3
Inputs      Weights
Threshold      −4.368814551572399
Node  4      −1.8123649579808487
Node  5      −1.4716670631934412
Node  6      −4.36716553066664
Node  7      −2.09681450745847
Node  8      −2.53839451115161
Node  9      4.755488072233925
Node  10      −1.7180791513262723
Node  11      −6.922064634954629
Node  12      11.865210366312727
Node  13      0.7895056495706226
Node  14      −2.2151176832900052
Sigmoid  Node  4
Inputs      Weights
Threshold      −2.466245111802611
Attrib  COMPACTNESS      −4.8608445846589445
Attrib  CIRCULARITY      −3.5095915210793174
Attrib  DISTANCE CIRCULARITY      1.4760856865254284
Attrib  RADIUS RATIO      −0.8557105453217472
Attrib  PR.AXIS ASPECT RATIO      −1.4570531867372294
Attrib  MAX.LENGTH ASPECT RATIO      2.805062060957502
Attrib  SCATTER RATIO      4.999924765960953
Attrib  ELONGATEDNESS      −5.013212456917987
Attrib  PR.AXIS RECTANGULARITY      2.3906386381471307
```

238

Attrib MAX.LENGTH RECTANGULARITY   1.2666983128375724
Attrib SCALED VARIANCE_MAJOR   2.8764664829525812
Attrib SCALED VARIANCE_MINOR   6.046405020343915
Attrib SCALED RADIUS OF GYRATION   −3.738088797596089
Attrib SKEWNESS ABOUT_MAJOR   0.6543911885086231
Attrib SKEWNESS ABOUT_MINOR   2.7231279213464763
Attrib KURTOSIS ABOUT_MAJOR   6.191864615735547
Attrib KURTOSIS ABOUT_MINOR   1.4676961523181093
Attrib HOLLOWS RATIO   −5.411479384025805
Sigmoid Node 5
Inputs   Weights
Threshold   −0.19049521384539816
Attrib COMPACTNESS   −0.48954302659415067
Attrib CIRCULARITY   2.8239582270061754
Attrib DISTANCE CIRCULARITY   −2.138380676398425
Attrib RADIUS RATIO   6.193595526004549
Attrib PR.AXIS ASPECT RATIO   3.3682785621153917
Attrib MAX.LENGTH ASPECT RATIO   −1.7869817798933065
Attrib SCATTER RATIO   3.127207986531798
Attrib ELONGATEDNESS   −5.519926161933755
Attrib PR.AXIS RECTANGULARITY   2.4764816193306367
Attrib MAX.LENGTH RECTANGULARITY   −0.02754166883299491
Attrib SCALED VARIANCE_MAJOR   1.3325725090696419
Attrib SCALED VARIANCE_MINOR   4.5148876810286405
Attrib SCALED RADIUS OF GYRATION   −2.794238615312866
Attrib SKEWNESS ABOUT_MAJOR   −1.2146362489423612
Attrib SKEWNESS ABOUT_MINOR   −0.6735916489224179
Attrib KURTOSIS ABOUT_MAJOR   0.56613766269910129
Attrib KURTOSIS ABOUT_MINOR   13.281355744545493
Attrib HOLLOWS RATIO   −10.302536997358903
Sigmoid Node 6
Inputs   Weights
Threshold   −2.5055550102136874
Attrib COMPACTNESS   −10.88625276829765
Attrib CIRCULARITY   5.883965213152941
Attrib DISTANCE CIRCULARITY   −0.1315870909193023
Attrib RADIUS RATIO   −0.5647250591383317
Attrib PR.AXIS ASPECT RATIO   −0.9400395832609103
Attrib MAX.LENGTH ASPECT RATIO   2.038477396669859
Attrib SCATTER RATIO   0.9935843444166449
Attrib ELONGATEDNESS   2.3141488406145405
Attrib PR.AXIS RECTANGULARITY   4.203538591283847
Attrib MAX.LENGTH RECTANGULARITY   −0.8193938211612458
Attrib SCALED VARIANCE_MAJOR   0.44687965503570615
Attrib SCALED VARIANCE_MINOR   3.503772238942521
Attrib SCALED RADIUS OF GYRATION   5.350506792072902
Attrib SKEWNESS ABOUT_MAJOR   2.33075114863113
Attrib SKEWNESS ABOUT_MINOR   2.3131941715297986
Attrib KURTOSIS ABOUT_MAJOR   5.938472820158373

Attrib KURTOSIS ABOUT_MINOR   −8.828340326841648
Attrib HOLLOWS RATIO   −10.554868399356167
Sigmoid Node 7
Inputs   Weights
Threshold   −0.3768123574115639
Attrib COMPACTNESS   10.54062676179176
Attrib CIRCULARITY   −0.2208972708220497
Attrib DISTANCE CIRCULARITY   −3.8547401177919602
Attrib RADIUS RATIO   −3.637259269256333
Attrib PR.AXIS ASPECT RATIO   0.51106983815151
Attrib MAX.LENGTH ASPECT RATIO   −1.9637877918599025
Attrib SCATTER RATIO   4.163489797841056
Attrib ELONGATEDNESS   −1.8047163053003612
Attrib PR.AXIS RECTANGULARITY   −0.23068100105233796
Attrib MAX.LENGTH RECTANGULARITY   2.790581090652236
Attrib SCALED VARIANCE_MAJOR   2.019993451987584
Attrib SCALED VARIANCE_MINOR   3.045256031858082
Attrib SCALED RADIUS OF GYRATION   −0.720376808910041
Attrib SKEWNESS ABOUT_MAJOR   5.1459084707658915
Attrib SKEWNESS ABOUT_MINOR   4.612842455354594
Attrib KURTOSIS ABOUT_MAJOR   3.357243134158589
Attrib KURTOSIS ABOUT_MINOR   −5.853833541029495
Attrib HOLLOWS RATIO   −2.948040000611964
Sigmoid Node 8
Inputs   Weights
Threshold   −1.132552892381143
Attrib COMPACTNESS   −4.155881031630788
Attrib CIRCULARITY   −1.3750147181973211
Attrib DISTANCE CIRCULARITY   −9.415138655495706
Attrib RADIUS RATIO   −8.247647049414617
Attrib PR.AXIS ASPECT RATIO   11.59442708109006
Attrib MAX.LENGTH ASPECT RATIO   −7.90539123468728
Attrib SCATTER RATIO   2.3461641265556117
Attrib ELONGATEDNESS   −13.016140004763395
Attrib PR.AXIS RECTANGULARITY   −1.7668136587832741
Attrib MAX.LENGTH RECTANGULARITY   1.2408426512480837
Attrib SCALED VARIANCE_MAJOR   0.37587688109422196
Attrib SCALED VARIANCE_MINOR   1.0952652874173758
Attrib SCALED RADIUS OF GYRATION   0.767402787692588
Attrib SKEWNESS ABOUT_MAJOR   8.277156349305173
Attrib SKEWNESS ABOUT_MINOR   −4.707548817229692
Attrib KURTOSIS ABOUT_MAJOR   1.3762930983064716
Attrib KURTOSIS ABOUT_MINOR   8.215287810687094
Attrib HOLLOWS RATIO   −7.509230384349211
Sigmoid Node 9
Inputs   Weights
Threshold   −1.6000116521008885
Attrib COMPACTNESS   4.8912470397462755
Attrib CIRCULARITY   −8.0455917902748

Attrib DISTANCE CIRCULARITY   8.888384658435342
Attrib RADIUS RATIO   −3.278879980292946
Attrib PR.AXIS ASPECT RATIO   1.7331632181564736
Attrib MAX.LENGTH ASPECT RATIO   1.2058386846769813
Attrib SCATTER RATIO   −1.819390659273495
Attrib ELONGATEDNESS   3.1613442776977556
Attrib PR.AXIS RECTANGULARITY   0.46812429230773395
Attrib MAX.LENGTH RECTANGULARITY   2.216880658393444
Attrib SCALED VARIANCE_MAJOR   2.7093450388775038
Attrib SCALED VARIANCE_MINOR   −4.633475001655315
Attrib SCALED RADIUS OF GYRATION   6.035251393414653
Attrib SKEWNESS ABOUT_MAJOR   7.782324254713885
Attrib SKEWNESS ABOUT_MINOR   −2.8706144786437795
Attrib KURTOSIS ABOUT_MAJOR   −0.596018213408339
Attrib KURTOSIS ABOUT_MINOR   −9.767983593848315
Attrib HOLLOWS RATIO   14.0766668544341
Sigmoid Node 10
Inputs   Weights
Threshold   0.7444996535698085
Attrib COMPACTNESS   6.028385503871891
Attrib CIRCULARITY   −2.784425531632139
Attrib DISTANCE CIRCULARITY   −1.767996828476157
Attrib RADIUS RATIO   0.24140194120358804
Attrib PR.AXIS ASPECT RATIO   1.5554202624029267
Attrib MAX.LENGTH ASPECT RATIO   −0.7037685204238994
Attrib SCATTER RATIO   0.9912364349316428
Attrib ELONGATEDNESS   0.42124724842933237
Attrib PR.AXIS RECTANGULARITY   1.2354206919333384
Attrib MAX.LENGTH RECTANGULARITY   −2.176152217118629
Attrib SCALED VARIANCE_MAJOR   −0.1427386827854378
Attrib SCALED VARIANCE_MINOR   0.8345963692916255
Attrib SCALED RADIUS OF GYRATION   0.6886693731267645
Attrib SKEWNESS ABOUT_MAJOR   0.07050415451655478
Attrib SKEWNESS ABOUT_MINOR   5.843959550930947
Attrib KURTOSIS ABOUT_MAJOR   7.640624412918943
Attrib KURTOSIS ABOUT_MINOR   −1.1658929280354593
Attrib HOLLOWS RATIO   −7.105753327568063
Sigmoid Node 11
Inputs   Weights
Threshold   −0.963187105710406
Attrib COMPACTNESS   −7.628066308871519
Attrib CIRCULARITY   −2.31143885767392
Attrib DISTANCE CIRCULARITY   2.6123187941345196
Attrib RADIUS RATIO   3.512290116605136
Attrib PR.AXIS ASPECT RATIO   0.7344720077081056
Attrib MAX.LENGTH ASPECT RATIO   0.9320808773756022
Attrib SCATTER RATIO   1.9618484790951396
Attrib ELONGATEDNESS   −2.78934845095673
Attrib PR.AXIS RECTANGULARITY   −1.4505898187727488

Attrib MAX.LENGTH RECTANGULARITY   −7.0252739600883825
Attrib SCALED VARIANCE_MAJOR   1.5256207403930115
Attrib SCALED VARIANCE_MINOR   1.5197013763346452
Attrib SCALED RADIUS OF GYRATION   1.9110401904378325
Attrib SKEWNESS ABOUT_MAJOR   0.6086340451222704
Attrib SKEWNESS ABOUT_MINOR   −0.4772423882541998
Attrib KURTOSIS ABOUT_MAJOR   5.9652618203276555
Attrib KURTOSIS ABOUT_MINOR   −2.7286510409889333
Attrib HOLLOWS RATIO   −0.6669954372982654
Sigmoid Node 12
Inputs   Weights
Threshold   4.840753887109786
Attrib COMPACTNESS   8.955019718706088
Attrib CIRCULARITY   2.399159202175154
Attrib DISTANCE CIRCULARITY   5.525076583956911
Attrib RADIUS RATIO   −7.716851121664341
Attrib PR.AXIS ASPECT RATIO   6.534798600712476
Attrib MAX.LENGTH ASPECT RATIO   9.46468905151926
Attrib SCATTER RATIO   −6.474878887101794
Attrib ELONGATEDNESS   6.825754055748127
Attrib PR.AXIS RECTANGULARITY   −5.412889805763347
Attrib MAX.LENGTH RECTANGULARITY   13.959592699373218
Attrib SCALED VARIANCE_MAJOR   −4.19059749817645
Attrib SCALED VARIANCE_MINOR   −6.35996232204577
Attrib SCALED RADIUS OF GYRATION   −7.356955306233838
Attrib SKEWNESS ABOUT_MAJOR   15.524556190248651
Attrib SKEWNESS ABOUT_MINOR   −1.7482479353653089
Attrib KURTOSIS ABOUT_MAJOR   −1.562319937122789
Attrib KURTOSIS ABOUT_MINOR   −5.25856258627183
Attrib HOLLOWS RATIO   8.558024283343165
Sigmoid Node 13
Inputs   Weights
Threshold   −8.82254853920141
Attrib COMPACTNESS   3.7801720398404934
Attrib CIRCULARITY   −8.4342097573018
Attrib DISTANCE CIRCULARITY   2.0962322892725282
Attrib RADIUS RATIO   3.8017800722971944
Attrib PR.AXIS ASPECT RATIO   −5.514664955205797
Attrib MAX.LENGTH ASPECT RATIO   −0.015241563521894956
Attrib SCATTER RATIO   −0.14014015904571525
Attrib ELONGATEDNESS   5.004414385662126
Attrib PR.AXIS RECTANGULARITY   4.105004670002872
Attrib MAX.LENGTH RECTANGULARITY   −9.480279757097176
Attrib SCALED VARIANCE_MAJOR   1.3496783625249111
Attrib SCALED VARIANCE_MINOR   1.8591565257800677
Attrib SCALED RADIUS OF GYRATION   −2.6731770378154884
Attrib SKEWNESS ABOUT_MAJOR   −4.861133868361965
Attrib SKEWNESS ABOUT_MINOR   4.268873602417703
Attrib KURTOSIS ABOUT_MAJOR   −2.5207728910067195

Attrib KURTOSIS ABOUT_MINOR   −3.778968347143702
Attrib HOLLOWS RATIO   −6.38359172751709
Sigmoid Node 14
Inputs   Weights
Threshold   −3.8428587769677414
Attrib COMPACTNESS   −2.53456677979696
Attrib CIRCULARITY   −0.9415776845974257
Attrib DISTANCE CIRCULARITY   1.3826318095096364
Attrib RADIUS RATIO   4.291382468141932
Attrib PR.AXIS ASPECT RATIO   −11.136114319902452
Attrib MAX.LENGTH ASPECT RATIO   6.356649130777342
Attrib SCATTER RATIO   1.8446465711850843
Attrib ELONGATEDNESS   1.7448942881336098
Attrib PR.AXIS RECTANGULARITY   3.923408518742351
Attrib MAX.LENGTH RECTANGULARITY   4.005978094984655
Attrib SCALED VARIANCE_MAJOR   6.608008182194245
Attrib SCALED VARIANCE_MINOR   −0.552758321090724
Attrib SCALED RADIUS OF GYRATION   −1.7172984507413778
Attrib SKEWNESS ABOUT_MAJOR   −9.470912388690722
Attrib SKEWNESS ABOUT_MINOR   −1.1890034244157655
Attrib KURTOSIS ABOUT_MAJOR   −0.5773757284691471
Attrib KURTOSIS ABOUT_MINOR   −2.777697823982243
Attrib HOLLOWS RATIO   4.374639115092107
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 1.88 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   385   91.4489 %
Incorrectly Classified Instances   36   8.5511 %
Kappa statistic   0.8859
Mean absolute error   0.0762

```
Root mean squared error                        0.1872
Relative absolute error                      20.3263 %
Root relative squared error                  43.2409 %
Total Number of Instances                       421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,762	0,016	0,941	0,762	0,842	0,804	0,951	0,913	opel
0,944	0,083	0,797	0,944	0,864	0,818	0,971	0,906	saab
0,982	0,016	0,955	0,982	0,968	0,957	0,996	0,992	bus
0,970	0,000	1,000	0,970	0,985	0,980	1,000	1,000	van
Weighted Avg.		0,914	0,029	0,922	0,914	0,914	0,889	0,979	0,952

=== Confusion Matrix ===

```
 a    b    c    d   <-- classified as
80   23    2    0 |   a = opel
 4  102    2    0 |   b = saab
 1    1  107    0 |   c = bus
 0    2    1   96 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
```

MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.3542529858331827
Node 4   5.939370859077839
Node 5   5.856934773594556
Node 6   5.325921892706366
Node 7   −7.138170943329518
Node 8   −11.060499354006
Node 9   −6.728412038076667
Node 10   −4.283875946057869
Node 11   3.2190014457471436
Node 12   −5.37101164740053
Node 13   −0.7376569383755546
Node 14   −1.5901838169731102
Sigmoid Node 1
Inputs   Weights
Threshold   −4.34751932227591
Node 4   −7.000816359679194
Node 5   −6.6789348883820505
Node 6   −5.304036074912542
Node 7   7.105781446955928
Node 8   1.9762370058290293
Node 9   6.425643797295377
Node 10   5.592100045849798
Node 11   −2.2495620451614946
Node 12   −9.51786062596895
Node 13   5.5439025372693935
Node 14   6.635820784861365
Sigmoid Node 2
Inputs   Weights
Threshold   1.1824846038335448
Node 4   1.8671592238691792
Node 5   1.9508649399793128
Node 6   4.467744250907649
Node 7   1.0356780671005215

245

Node 8   8.902498999598576
Node 9   −1.5051661142698276
Node 10   −0.5278031401618752
Node 11   −3.9077195283123136
Node 12   −3.8629505682572733
Node 13   −12.698922628982485
Node 14   −12.929595516764973
Sigmoid Node 3
Inputs   Weights
Threshold   −4.368814551572399
Node 4   −1.8123649579808487
Node 5   −1.4716670631934412
Node 6   −4.36716553066664
Node 7   −2.09681450745847
Node 8   −2.53839451115161
Node 9   4.755488072233925
Node 10   −1.7180791513262723
Node 11   −6.922064634954629
Node 12   11.865210366312727
Node 13   0.7895056495706226
Node 14   −2.2151176832900052
Sigmoid Node 4
Inputs   Weights
Threshold   −2.466245111802611
Attrib COMPACTNESS   −4.8608445846589445
Attrib CIRCULARITY   −3.5095915210793174
Attrib DISTANCE CIRCULARITY   1.4760856865254284
Attrib RADIUS RATIO   −0.8557105453217472
Attrib PR.AXIS ASPECT RATIO   −1.4570531867372294
Attrib MAX.LENGTH ASPECT RATIO   2.805062060957502
Attrib SCATTER RATIO   4.999924765960953
Attrib ELONGATEDNESS   −5.013212456917987
Attrib PR.AXIS RECTANGULARITY   2.3906386381471307
Attrib MAX.LENGTH RECTANGULARITY   1.2666983128375724
Attrib SCALED VARIANCE_MAJOR   2.8764664829525812
Attrib SCALED VARIANCE_MINOR   6.046405020343915
Attrib SCALED RADIUS OF GYRATION   −3.738088797596089
Attrib SKEWNESS ABOUT_MAJOR   0.6543911885086231
Attrib SKEWNESS ABOUT_MINOR   2.7231279213464763
Attrib KURTOSIS ABOUT_MAJOR   6.191864615735547
Attrib KURTOSIS ABOUT_MINOR   1.4676961523181093
Attrib HOLLOWS RATIO   −5.411479384025805
Sigmoid Node 5
Inputs   Weights
Threshold   −0.19049521384539816
Attrib COMPACTNESS   −0.48954302659415067
Attrib CIRCULARITY   2.8239582270061754
Attrib DISTANCE CIRCULARITY   −2.138380676398425
Attrib RADIUS RATIO   6.193595526004549

Attrib PR.AXIS ASPECT RATIO   3.3682785621153917
Attrib MAX.LENGTH ASPECT RATIO   −1.7869817798933065
Attrib SCATTER RATIO   3.127207986531798
Attrib ELONGATEDNESS   −5.519926161933755
Attrib PR.AXIS RECTANGULARITY   2.4764816193306367
Attrib MAX.LENGTH RECTANGULARITY   −0.02754166883299491
Attrib SCALED VARIANCE_MAJOR   1.3325725090696419
Attrib SCALED VARIANCE_MINOR   4.5148876810286405
Attrib SCALED RADIUS OF GYRATION   −2.794238615312866
Attrib SKEWNESS ABOUT_MAJOR   −1.2146362489423612
Attrib SKEWNESS ABOUT_MINOR   −0.6735916489224179
Attrib KURTOSIS ABOUT_MAJOR   0.5661376269910129
Attrib KURTOSIS ABOUT_MINOR   13.281355744545493
Attrib HOLLOWS RATIO   −10.302536997358903
Sigmoid Node 6
Inputs   Weights
Threshold   −2.5055550102136874
Attrib COMPACTNESS   −10.88625276829765
Attrib CIRCULARITY   5.883965213152941
Attrib DISTANCE CIRCULARITY   −0.1315870909193023
Attrib RADIUS RATIO   −0.5647250591383317
Attrib PR.AXIS ASPECT RATIO   −0.9400395832609103
Attrib MAX.LENGTH ASPECT RATIO   2.038477396669859
Attrib SCATTER RATIO   0.9935843444166449
Attrib ELONGATEDNESS   2.3141488406145405
Attrib PR.AXIS RECTANGULARITY   4.203538591283847
Attrib MAX.LENGTH RECTANGULARITY   −0.8193938211612458
Attrib SCALED VARIANCE_MAJOR   0.44687965503570615
Attrib SCALED VARIANCE_MINOR   3.503772238942521
Attrib SCALED RADIUS OF GYRATION   5.350506792072902
Attrib SKEWNESS ABOUT_MAJOR   2.330075114863113
Attrib SKEWNESS ABOUT_MINOR   2.3131941715297986
Attrib KURTOSIS ABOUT_MAJOR   5.938472820158373
Attrib KURTOSIS ABOUT_MINOR   −8.828340326841648
Attrib HOLLOWS RATIO   −10.554868399356167
Sigmoid Node 7
Inputs   Weights
Threshold   −0.3768123574115639
Attrib COMPACTNESS   10.54062676179176
Attrib CIRCULARITY   −0.2208972708220497
Attrib DISTANCE CIRCULARITY   −3.8547401177919602
Attrib RADIUS RATIO   −3.637259269256333
Attrib PR.AXIS ASPECT RATIO   0.51106983815151
Attrib MAX.LENGTH ASPECT RATIO   −1.9637877918599025
Attrib SCATTER RATIO   4.163489797841056
Attrib ELONGATEDNESS   −1.8047163053003612
Attrib PR.AXIS RECTANGULARITY   −0.23068100105233796
Attrib MAX.LENGTH RECTANGULARITY   2.790581090652236
Attrib SCALED VARIANCE_MAJOR   2.019993451987584

Attrib SCALED VARIANCE_MINOR   3.045256031858082
Attrib SCALED RADIUS OF GYRATION   −0.720376808910041
Attrib SKEWNESS ABOUT_MAJOR   5.1459084707658915
Attrib SKEWNESS ABOUT_MINOR   4.612842455354594
Attrib KURTOSIS ABOUT_MAJOR   3.357243134158589
Attrib KURTOSIS ABOUT_MINOR   −5.853833541029495
Attrib HOLLOWS RATIO   −2.948040000611964
Sigmoid Node 8
Inputs   Weights
Threshold   −1.132552892381143
Attrib COMPACTNESS   −4.15588031630788
Attrib CIRCULARITY   −1.3750147181973211
Attrib DISTANCE CIRCULARITY   −9.415138655495706
Attrib RADIUS RATIO   −8.247647049414617
Attrib PR.AXIS ASPECT RATIO   11.59442708109006
Attrib MAX.LENGTH ASPECT RATIO   −7.90539123468728
Attrib SCATTER RATIO   2.3461641265556117
Attrib ELONGATEDNESS   −13.016140004763395
Attrib PR.AXIS RECTANGULARITY   −1.7668136587832741
Attrib MAX.LENGTH RECTANGULARITY   1.2408426512480837
Attrib SCALED VARIANCE_MAJOR   0.37587688109422196
Attrib SCALED VARIANCE_MINOR   1.0952652874173758
Attrib SCALED RADIUS OF GYRATION   0.767402787692588
Attrib SKEWNESS ABOUT_MAJOR   8.277156349305173
Attrib SKEWNESS ABOUT_MINOR   −4.707548817229692
Attrib KURTOSIS ABOUT_MAJOR   1.3762930983064716
Attrib KURTOSIS ABOUT_MINOR   8.215287810687094
Attrib HOLLOWS RATIO   −7.509230384349211
Sigmoid Node 9
Inputs   Weights
Threshold   −1.6000116521008885
Attrib COMPACTNESS   4.8912470397462755
Attrib CIRCULARITY   −8.0455917902748
Attrib DISTANCE CIRCULARITY   8.888384658435342
Attrib RADIUS RATIO   −3.278879980292946
Attrib PR.AXIS ASPECT RATIO   1.7331632181564736
Attrib MAX.LENGTH ASPECT RATIO   1.2058386846769813
Attrib SCATTER RATIO   −1.819390659273495
Attrib ELONGATEDNESS   3.1613442776977556
Attrib PR.AXIS RECTANGULARITY   0.46812429230773395
Attrib MAX.LENGTH RECTANGULARITY   2.216880658393444
Attrib SCALED VARIANCE_MAJOR   2.7093450388775038
Attrib SCALED VARIANCE_MINOR   −4.633475001655315
Attrib SCALED RADIUS OF GYRATION   6.035251393414653
Attrib SKEWNESS ABOUT_MAJOR   7.782324254713885
Attrib SKEWNESS ABOUT_MINOR   −2.8706144786437795
Attrib KURTOSIS ABOUT_MAJOR   −0.596018213408339
Attrib KURTOSIS ABOUT_MINOR   −9.767983593848315
Attrib HOLLOWS RATIO   14.0766668544341

Sigmoid Node 10
Inputs   Weights
Threshold   0.7444996535698085
Attrib COMPACTNESS   6.028385503871891
Attrib CIRCULARITY   −2.784425531632139
Attrib DISTANCE CIRCULARITY   −1.767996828476157
Attrib RADIUS RATIO   0.24140194120358804
Attrib PR.AXIS ASPECT RATIO   1.5554202624029267
Attrib MAX.LENGTH ASPECT RATIO   −0.7037685204238994
Attrib SCATTER RATIO   0.9912364349316428
Attrib ELONGATEDNESS   0.42124724842933237
Attrib PR.AXIS RECTANGULARITY   1.2354206919333384
Attrib MAX.LENGTH RECTANGULARITY   −2.176152217118629
Attrib SCALED VARIANCE_MAJOR   −0.1427386827854378
Attrib SCALED VARIANCE_MINOR   0.8345963692916255
Attrib SCALED RADIUS OF GYRATION   0.6886693731267645
Attrib SKEWNESS ABOUT_MAJOR   0.07050415451655478
Attrib SKEWNESS ABOUT_MINOR   5.843959550930947
Attrib KURTOSIS ABOUT_MAJOR   7.640624412918943
Attrib KURTOSIS ABOUT_MINOR   −1.1658929280354593
Attrib HOLLOWS RATIO   −7.105753327568063
Sigmoid Node 11
Inputs   Weights
Threshold   −0.963187105710406
Attrib COMPACTNESS   −7.628066308871519
Attrib CIRCULARITY   −2.311431885767392
Attrib DISTANCE CIRCULARITY   2.6123187941345196
Attrib RADIUS RATIO   3.512290116605136
Attrib PR.AXIS ASPECT RATIO   0.7344720077081056
Attrib MAX.LENGTH ASPECT RATIO   0.9320808773756022
Attrib SCATTER RATIO   1.9618484790951396
Attrib ELONGATEDNESS   −2.78934845095673
Attrib PR.AXIS RECTANGULARITY   −1.4505898187727488
Attrib MAX.LENGTH RECTANGULARITY   −7.0252739600883825
Attrib SCALED VARIANCE_MAJOR   1.5256207403930115
Attrib SCALED VARIANCE_MINOR   1.5197013763346452
Attrib SCALED RADIUS OF GYRATION   1.9110401904378325
Attrib SKEWNESS ABOUT_MAJOR   0.6086340451222704
Attrib SKEWNESS ABOUT_MINOR   −0.4772423882541998
Attrib KURTOSIS ABOUT_MAJOR   5.9652618203276555
Attrib KURTOSIS ABOUT_MINOR   −2.7286510409889333
Attrib HOLLOWS RATIO   −0.6669954372982654
Sigmoid Node 12
Inputs   Weights
Threshold   4.840753887109786
Attrib COMPACTNESS   8.955019718706088
Attrib CIRCULARITY   2.399159202175154
Attrib DISTANCE CIRCULARITY   5.525076583956911
Attrib RADIUS RATIO   −7.716851121664341

249

Attrib PR.AXIS ASPECT RATIO   6.534798600712476
Attrib MAX.LENGTH ASPECT RATIO   9.46468905151926
Attrib SCATTER RATIO   −6.474878887101794
Attrib ELONGATEDNESS   6.825754055748127
Attrib PR.AXIS RECTANGULARITY   −5.412889805763347
Attrib MAX.LENGTH RECTANGULARITY   13.959592699373218
Attrib SCALED VARIANCE_MAJOR   −4.19059749817645
Attrib SCALED VARIANCE_MINOR   −6.35996232204577
Attrib SCALED RADIUS OF GYRATION   −7.356955306233838
Attrib SKEWNESS ABOUT_MAJOR   15.524556190248651
Attrib SKEWNESS ABOUT_MINOR   −1.7482479353653089
Attrib KURTOSIS ABOUT_MAJOR   −1.562319937122789
Attrib KURTOSIS ABOUT_MINOR   −5.25856258627183
Attrib HOLLOWS RATIO   8.558024283343165
Sigmoid Node 13
Inputs   Weights
Threshold   −8.82254853920141
Attrib COMPACTNESS   3.7801720398404934
Attrib CIRCULARITY   −8.43420975733018
Attrib DISTANCE CIRCULARITY   2.0962322892725282
Attrib RADIUS RATIO   3.8017800722971944
Attrib PR.AXIS ASPECT RATIO   −5.514664955205797
Attrib MAX.LENGTH ASPECT RATIO   −0.015241563521894956
Attrib SCATTER RATIO   −0.14014015904571525
Attrib ELONGATEDNESS   5.004414385662126
Attrib PR.AXIS RECTANGULARITY   4.105004670002872
Attrib MAX.LENGTH RECTANGULARITY   −9.480279757097176
Attrib SCALED VARIANCE_MAJOR   1.3496783625249111
Attrib SCALED VARIANCE_MINOR   1.8591565257800677
Attrib SCALED RADIUS OF GYRATION   −2.6731770378154884
Attrib SKEWNESS ABOUT_MAJOR   −4.861133868361965
Attrib SKEWNESS ABOUT_MINOR   4.268873602417703
Attrib KURTOSIS ABOUT_MAJOR   −2.5207728910067195
Attrib KURTOSIS ABOUT_MINOR   −3.778968347143702
Attrib HOLLOWS RATIO   −6.38359172751709
Sigmoid Node 14
Inputs   Weights
Threshold   −3.8428587769677414
Attrib COMPACTNESS   −2.53456677979696
Attrib CIRCULARITY   −0.9415776845974257
Attrib DISTANCE CIRCULARITY   1.3826318095096364
Attrib RADIUS RATIO   4.291382468141932
Attrib PR.AXIS ASPECT RATIO   −11.136114319902452
Attrib MAX.LENGTH ASPECT RATIO   6.356649130777342
Attrib SCATTER RATIO   1.8446465711850843
Attrib ELONGATEDNESS   1.7448942881336098
Attrib PR.AXIS RECTANGULARITY   3.923408518742351
Attrib MAX.LENGTH RECTANGULARITY   4.005978094984655
Attrib SCALED VARIANCE_MAJOR   6.608008182194245

Attrib SCALED VARIANCE_MINOR   −0.552758321090724
Attrib SCALED RADIUS OF GYRATION   −1.7172984507413778
Attrib SKEWNESS ABOUT_MAJOR   −9.470912388690722
Attrib SKEWNESS ABOUT_MINOR   −1.1890034244157655
Attrib KURTOSIS ABOUT_MAJOR   −0.5773757284691471
Attrib KURTOSIS ABOUT_MINOR   −2.777697823982243
Attrib HOLLOWS RATIO   4.374639115092107
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.19 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   712   84.1608 %
Incorrectly Classified Instances   134   15.8392 %
Kappa statistic   0.7885
Mean absolute error   0.1075
Root mean squared error   0.2494
Relative absolute error   28.6921 %
Root relative squared error   57.6068 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,637	0,054	0,799	0,637	0,709	0,632	0,893	0,763	opel
0,853	0,140	0,678	0,853	0,755	0,666	0,914	0,763	saab
0,977	0,018	0,951	0,977	0,964	0,951	0,996	0,991	bus

0,899	0,002	0,994	0,899	0,945	0,931	0,994
0,989	van					
Weighted Avg.	0,842	0,054	0,853	0,842	0,842	
0,793	0,949	0,875				

=== Confusion Matrix ===

```
  a    b    c    d   <-- classified as
135   73    3    1 |    a = opel
 27  185    5    0 |    b = saab
  2    3  213    0 |    c = bus
  5   12    3  179 |    d = van
```

17 17ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set:  size unknown (reading incrementally)
```

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

```
Sigmoid Node 0
Inputs     Weights
Threshold      -0.9956559442448364
```

Node 4   3.140185952414479
Node 5   2.0508031836155953
Node 6   −6.060388487999421
Node 7   −3.7784748624942748
Sigmoid Node 1
Inputs   Weights
Threshold   −9.232023500699968
Node 4   7.979736003912511
Node 5   4.95034609259265
Node 6   −1.3879054588949737
Node 7   3.0369448008301796
Sigmoid Node 2
Inputs   Weights
Threshold   0.2675125400863237
Node 4   −4.229169399633116
Node 5   −12.428685954136187
Node 6   11.189358803018166
Node 7   −4.424536551956993
Sigmoid Node 3
Inputs   Weights
Threshold   −0.642403653550457
Node 4   −14.124209989800175
Node 5   −0.5233158496026776
Node 6   −2.1172647280307553
Node 7   4.860802949723938
Sigmoid Node 4
Inputs   Weights
Threshold   −6.853738129562264
Attrib COMPACTNESS   −6.363988816986022
Attrib CIRCULARITY   −4.709038236943981
Attrib DISTANCE CIRCULARITY   −2.2878268780655273
Attrib RADIUS RATIO   9.827233335429465
Attrib PR.AXIS ASPECT RATIO   −12.850471066928083
Attrib MAX.LENGTH ASPECT RATIO   −9.285464234546417
Attrib SCATTER RATIO   3.308539718967202
Attrib ELONGATEDNESS   0.4774854398378732
Attrib PR.AXIS RECTANGULARITY   8.300936614761438
Attrib MAX.LENGTH RECTANGULARITY   −15.268285611163165
Attrib SCALED VARIANCE_MAJOR   10.197590836204483
Attrib SCALED VARIANCE_MINOR   6.762503578654199
Attrib SCALED RADIUS OF GYRATION   9.419080802599202
Attrib SKEWNESS ABOUT_MAJOR   −12.420231042178104
Attrib SKEWNESS ABOUT_MINOR   2.4626354734049665
Attrib KURTOSIS ABOUT_MAJOR   0.8551237201323536
Attrib KURTOSIS ABOUT_MINOR   4.237977238660924
Attrib HOLLOWS RATIO   −6.853790703505218
Sigmoid Node 5
Inputs   Weights
Threshold   −9.02926947045443

Attrib COMPACTNESS   0.058974278628760216
Attrib CIRCULARITY   −5.92960969180437
Attrib DISTANCE CIRCULARITY   −11.940411791490074
Attrib RADIUS RATIO   5.659884307159651
Attrib PR.AXIS ASPECT RATIO   1.5982506902790068
Attrib MAX.LENGTH ASPECT RATIO   −2.763062479985049
Attrib SCATTER RATIO   0.990258009161258
Attrib ELONGATEDNESS   2.5300780776213823
Attrib PR.AXIS RECTANGULARITY   2.3231644780303498
Attrib MAX.LENGTH RECTANGULARITY   −6.473224178712453
Attrib SCALED VARIANCE_MAJOR   −2.7308951471254126
Attrib SCALED VARIANCE_MINOR   2.925260444790235
Attrib SCALED RADIUS OF GYRATION   1.1936368867983298
Attrib SKEWNESS ABOUT_MAJOR   −1.2271709145788545
Attrib SKEWNESS ABOUT_MINOR   −1.5751842360957242
Attrib KURTOSIS ABOUT_MAJOR   0.6961160145379273
Attrib KURTOSIS ABOUT_MINOR   −2.221502664807623
Attrib HOLLOWS RATIO   −3.4046816432652984
Sigmoid Node 6
Inputs   Weights
Threshold   3.4865339544994334
Attrib COMPACTNESS   −3.3143055354085793
Attrib CIRCULARITY   0.13050700428852116
Attrib DISTANCE CIRCULARITY   −11.154193296834832
Attrib RADIUS RATIO   −8.965588358035493
Attrib PR.AXIS ASPECT RATIO   15.261480667361973
Attrib MAX.LENGTH ASPECT RATIO   −11.833380488337063
Attrib SCATTER RATIO   2.083724932661849
Attrib ELONGATEDNESS   −9.693619212116044
Attrib PR.AXIS RECTANGULARITY   3.3970737563836892
Attrib MAX.LENGTH RECTANGULARITY   −3.545054521131925
Attrib SCALED VARIANCE_MAJOR   −3.6626019635333256
Attrib SCALED VARIANCE_MINOR   3.760123652366395
Attrib SCALED RADIUS OF GYRATION   3.098742279993274
Attrib SKEWNESS ABOUT_MAJOR   11.212470785062884
Attrib SKEWNESS ABOUT_MINOR   −2.120311919223402
Attrib KURTOSIS ABOUT_MAJOR   −0.691937075759871
Attrib KURTOSIS ABOUT_MINOR   6.416098125763035
Attrib HOLLOWS RATIO   −1.5908786189578503
Sigmoid Node 7
Inputs   Weights
Threshold   −0.7288964313300008
Attrib COMPACTNESS   10.044438484620764
Attrib CIRCULARITY   −17.816895806124148
Attrib DISTANCE CIRCULARITY   9.161727404173787
Attrib RADIUS RATIO   −1.1253054174402988
Attrib PR.AXIS ASPECT RATIO   −2.8439003555647413
Attrib MAX.LENGTH ASPECT RATIO   2.1617428025302616
Attrib SCATTER RATIO   −5.167085368901873

Attrib ELONGATEDNESS   15.744539230554562
Attrib PR.AXIS RECTANGULARITY   8.411258959231589
Attrib MAX.LENGTH RECTANGULARITY   8.43356782237705
Attrib SCALED VARIANCE_MAJOR   −0.13456815920349263
Attrib SCALED VARIANCE_MINOR   −6.3664741474418864
Attrib SCALED RADIUS OF GYRATION   9.551773983948037
Attrib SKEWNESS ABOUT_MAJOR   3.3024837329349803
Attrib SKEWNESS ABOUT_MINOR   −0.8245086772390686
Attrib KURTOSIS ABOUT_MAJOR   −1.6647456345026295
Attrib KURTOSIS ABOUT_MINOR   −8.844667906631997
Attrib HOLLOWS RATIO   10.237842692810036
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.67 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   334   79.3349 %
Incorrectly Classified Instances   87   20.6651 %
Kappa statistic   0.7247
Mean absolute error   0.1328
Root mean squared error   0.2663
Relative absolute error   35.4267 %
Root relative squared error   61.5142 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,895	0,206	0,591	0,895	0,712	0,615	0,898	0,705	opel

0,333	0,016	0,878	0,333	0,483	0,467	0,902
0,772	saab					
1,000	0,038	0,901	1,000	0,948	0,931	0,999
0,997	bus					
0,960	0,016	0,950	0,960	0,955	0,941	0,998
0,992	van					
Weighted Avg.		0,793	0,069	0,829	0,793	0,771
0,736	0,949	0,866				

=== Confusion Matrix ===

```
a    b    c    d   <— classified as
94    5    3    3 |    a = opel
65   36    5    2 |    b = saab
 0    0  109    0 |    c = bus
 0    0    4   95 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron −L 0.7 −M 0.2 −N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.9956559442448364
Node 4   3.140185952414479
Node 5   2.0508031836155953
Node 6   −6.060388487999421
Node 7   −3.7784748624942748
Sigmoid Node 1
Inputs   Weights
Threshold   −9.232023500699968
Node 4   7.979736003912511
Node 5   4.950346092592265
Node 6   −1.3879054588949737
Node 7   3.0369448008301796
Sigmoid Node 2
Inputs   Weights
Threshold   0.2675125400863237
Node 4   −4.229169399633116
Node 5   −12.428685954136187
Node 6   11.189358803018166
Node 7   −4.424536551956993
Sigmoid Node 3
Inputs   Weights
Threshold   −0.642403653550457
Node 4   −14.124209989800175
Node 5   −0.5233158496026776
Node 6   −2.1172647280307553
Node 7   4.860802949723938
Sigmoid Node 4
Inputs   Weights
Threshold   −6.853738129562264
Attrib COMPACTNESS   −6.363988816986022
Attrib CIRCULARITY   −4.709038236943981
Attrib DISTANCE CIRCULARITY   −2.2878268780655273
Attrib RADIUS RATIO   9.827233335429465
Attrib PR.AXIS ASPECT RATIO   −12.850471066928083
Attrib MAX.LENGTH ASPECT RATIO   −9.285464234546417
Attrib SCATTER RATIO   3.308539718967202
Attrib ELONGATEDNESS   0.4774854398378732
Attrib PR.AXIS RECTANGULARITY   8.300936614761438
Attrib MAX.LENGTH RECTANGULARITY   −15.268285611163165
Attrib SCALED VARIANCE_MAJOR   10.197590836204483
Attrib SCALED VARIANCE_MINOR   6.762503578654199
Attrib SCALED RADIUS OF GYRATION   9.419080802599202
Attrib SKEWNESS ABOUT_MAJOR   −12.420231042178104
Attrib SKEWNESS ABOUT_MINOR   2.4626354734049665

257

Attrib KURTOSIS ABOUT_MAJOR   0.8551237201323536
Attrib KURTOSIS ABOUT_MINOR   4.237977238660924
Attrib HOLLOWS RATIO   −6.853790703505218
Sigmoid Node 5
Inputs   Weights
Threshold   −9.02926947045443
Attrib COMPACTNESS   0.058974278628760216
Attrib CIRCULARITY   −5.92960969180437
Attrib DISTANCE CIRCULARITY   −11.940411791490074
Attrib RADIUS RATIO   5.659884307159651
Attrib PR.AXIS ASPECT RATIO   1.5982506902790068
Attrib MAX.LENGTH ASPECT RATIO   −2.763062479985049
Attrib SCATTER RATIO   0.990258009161258
Attrib ELONGATEDNESS   2.5300780776213823
Attrib PR.AXIS RECTANGULARITY   2.3231644780303498
Attrib MAX.LENGTH RECTANGULARITY   −6.473224178712453
Attrib SCALED VARIANCE_MAJOR   −2.7308951471254126
Attrib SCALED VARIANCE_MINOR   2.925260444790235
Attrib SCALED RADIUS OF GYRATION   1.1936368867983298
Attrib SKEWNESS ABOUT_MAJOR   −1.2271709145788545
Attrib SKEWNESS ABOUT_MINOR   −1.5751842360957242
Attrib KURTOSIS ABOUT_MAJOR   0.6961160145379273
Attrib KURTOSIS ABOUT_MINOR   −2.221502664807623
Attrib HOLLOWS RATIO   −3.4046816432652984
Sigmoid Node 6
Inputs   Weights
Threshold   3.4865339544994334
Attrib COMPACTNESS   −3.3143055354085793
Attrib CIRCULARITY   0.13050700428852116
Attrib DISTANCE CIRCULARITY   −11.154193296834832
Attrib RADIUS RATIO   −8.965588358035493
Attrib PR.AXIS ASPECT RATIO   15.261480667361973
Attrib MAX.LENGTH ASPECT RATIO   −11.833380488337063
Attrib SCATTER RATIO   2.083724932661849
Attrib ELONGATEDNESS   −9.693619212116044
Attrib PR.AXIS RECTANGULARITY   3.3970737563836892
Attrib MAX.LENGTH RECTANGULARITY   −3.545054521131925
Attrib SCALED VARIANCE_MAJOR   −3.6626019635333256
Attrib SCALED VARIANCE_MINOR   3.760123652366395
Attrib SCALED RADIUS OF GYRATION   3.098742279993274
Attrib SKEWNESS ABOUT_MAJOR   11.212470785062884
Attrib SKEWNESS ABOUT_MINOR   −2.120311919223402
Attrib KURTOSIS ABOUT_MAJOR   −0.691937075759871
Attrib KURTOSIS ABOUT_MINOR   6.416098125763035
Attrib HOLLOWS RATIO   −1.5908786189578503
Sigmoid Node 7
Inputs   Weights
Threshold   −0.7288964313300008
Attrib COMPACTNESS   10.04443484620764

```
Attrib CIRCULARITY        −17.816895806124148
Attrib DISTANCE CIRCULARITY       9.161727404173787
Attrib RADIUS RATIO       −1.1253054174402988
Attrib PR.AXIS ASPECT RATIO       −2.8439003555647413
Attrib MAX.LENGTH ASPECT RATIO       2.1617428025302616
Attrib SCATTER RATIO       −5.167085368901873
Attrib ELONGATEDNESS       15.744539230554562
Attrib PR.AXIS RECTANGULARITY       8.411258959231589
Attrib MAX.LENGTH RECTANGULARITY       8.43356782237705
Attrib SCALED VARIANCE_MAJOR       −0.13456815920349263
Attrib SCALED VARIANCE_MINOR       −6.3664741474418864
Attrib SCALED RADIUS OF GYRATION       9.551773983948037
Attrib SKEWNESS ABOUT_MAJOR       3.3024837329349803
Attrib SKEWNESS ABOUT_MINOR       −0.8245086772390686
Attrib KURTOSIS ABOUT_MAJOR       −1.6647456345026295
Attrib KURTOSIS ABOUT_MINOR       −8.844667906631997
Attrib HOLLOWS RATIO       10.237842692810036
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3


Time taken to build model: 5.76 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances         635               75.0591 %
Incorrectly Classified Instances       211               24.9409 %
Kappa statistic                        0.6676
Mean absolute error                    0.148
Root mean squared error                0.2891
Relative absolute error                39.4889 %
Root relative squared error            66.7827 %
Total Number of Instances              846

=== Detailed Accuracy By Class ===
```

TP Rate	FP Rate	Precision	Recall	F–Measure	MCC	ROC Area	PRC Area	Class
0,835	0,232	0,546	0,835	0,660	0,538	0,867	0,624	opel
0,263	0,022	0,803	0,263	0,396	0,379	0,889	0,724	saab
1,000	0,054	0,865	1,000	0,928	0,905	0,999	0,997	bus
0,920	0,025	0,920	0,920	0,920	0,895	0,992	0,971	van
Weighted Avg.		0,751	0,084	0,782	0,751	0,722	0,675	0,936	0,827

=== Confusion Matrix ===

```
 a    b    c    d    <-- classified as
177   13   13    9 |    a = opel
145   57    8    7 |    b = saab
  0    0  218    0 |    c = bus
  2    1   13  183 |    d = van
```

18 18ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.7 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR

HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −2.9632056002913876
Node 4   −5.001125477748584
Node 5   −5.177891503834578
Node 6   4.1461247299343045
Node 7   7.8206988127149835
Node 8   −3.5035415456972188
Node 9   −0.5525678166315148
Node 10   4.56055832657145
Node 11   −4.072305449061278
Node 12   2.5315897235571394
Node 13   3.353336488283479
Node 14   0.3834012865725182
Node 15   −0.429063197957358
Node 16   −6.639292407294156
Node 17   4.650970549830089
Node 18   4.7779581373290725
Node 19   −10.864787371012913
Node 20   −4.9344083083375025
Node 21   4.600329225944872
Sigmoid Node 1
Inputs   Weights
Threshold   −5.162160220758245
Node 4   −1.0873726524050962
Node 5   5.571856249396677
Node 6   −0.820051883157158
Node 7   −7.5671431821772845
Node 8   −1.9833580496880256
Node 9   −5.439367995099706
Node 10   −7.885160316834742
Node 11   4.508317408556839
Node 12   −5.011436814221905
Node 13   −4.091350156439105
Node 14   9.622286676634818
Node 15   −3.638348994256512
Node 16   7.435748858054065
Node 17   4.909835029902936
Node 18   3.136158041724084
Node 19   4.807422089338749
Node 20   −8.231967108648833
Node 21   −5.209069519844378
Sigmoid Node 2

```
Inputs        Weights
Threshold       0.6981724490723457
Node  4     2.321317696893557
Node  5     −0.7276206023516536
Node  6     −0.6097398259514346
Node  7     2.967269455094596
Node  8     −2.5539711010395623
Node  9     5.009819338960217
Node  10      −0.08801782714692671
Node  11      −1.521111471824076
Node  12      −1.5553119745669346
Node  13      0.9142441249786116
Node  14      −11.303793406109978
Node  15      7.7808477263686635
Node  16      −2.010939538375753
Node  17      −10.782655971282264
Node  18      −4.5796169295976386
Node  19      6.380403409062514
Node  20      −2.3776934159866125
Node  21      0.6316467996114632
Sigmoid  Node  3
Inputs        Weights
Threshold       −5.88035931935124
Node  4     −0.6749698528103808
Node  5     3.1122115888395636
Node  6     −1.9587832242741112
Node  7     −1.732103802318559
Node  8     2.4638189742303167
Node  9     −5.831288363521608
Node  10      6.532724807174919
Node  11      −0.8571346281539416
Node  12      −1.585272080824154
Node  13      −1.7077393266662162
Node  14      −0.36235994547383116
Node  15      −1.082247285688802
Node  16      0.5402200976540098
Node  17      1.5071554750385727
Node  18      −1.6656625067553656
Node  19      −1.7928408283738957
Node  20      10.510954357536525
Node  21      −3.3205954984879287
Sigmoid  Node  4
Inputs        Weights
Threshold       −0.6747639705884066
Attrib  COMPACTNESS      2.2509682977048615
Attrib  CIRCULARITY       −0.9567029546531116
Attrib  DISTANCE  CIRCULARITY        −0.9718343300605105
Attrib  RADIUS  RATIO      −1.6676679606413332
Attrib  PR.AXIS  ASPECT  RATIO      0.4037709788177621
```

Attrib MAX.LENGTH ASPECT RATIO   −0.4425540120325239
Attrib SCATTER RATIO   0.6076726290929371
Attrib ELONGATEDNESS   −0.9826455277601326
Attrib PR.AXIS RECTANGULARITY   0.7753258121793609
Attrib MAX.LENGTH RECTANGULARITY   −0.1104831912404895
Attrib SCALED VARIANCE_MAJOR   1.0327329364882696
Attrib SCALED VARIANCE_MINOR   0.5574499196313242
Attrib SCALED RADIUS OF GYRATION   1.1412742379781635
Attrib SKEWNESS ABOUT_MAJOR   2.2024631843787525
Attrib SKEWNESS ABOUT_MINOR   0.01380420349269981
Attrib KURTOSIS ABOUT_MAJOR   1.5513930916231098
Attrib KURTOSIS ABOUT_MINOR   1.2543379468527271
Attrib HOLLOWS RATIO   −4.154752009006539
Sigmoid Node 5
Inputs   Weights
Threshold   −1.558856219031484
Attrib COMPACTNESS   0.8590425143762707
Attrib CIRCULARITY   −4.205412301227368
Attrib DISTANCE CIRCULARITY   6.412495311766933
Attrib RADIUS RATIO   −3.047360960016779
Attrib PR.AXIS ASPECT RATIO   0.3976208743578445
Attrib MAX.LENGTH ASPECT RATIO   3.4497942876525327
Attrib SCATTER RATIO   −1.5580824866751894
Attrib ELONGATEDNESS   3.3361303980664356
Attrib PR.AXIS RECTANGULARITY   0.3500806277796151
Attrib MAX.LENGTH RECTANGULARITY   2.0911178469389555
Attrib SCALED VARIANCE_MAJOR   1.005175129070407
Attrib SCALED VARIANCE_MINOR   −2.6402282299693676
Attrib SCALED RADIUS OF GYRATION   6.200128194561823
Attrib SKEWNESS ABOUT_MAJOR   1.8381593221331476
Attrib SKEWNESS ABOUT_MINOR   −0.5148461216700011
Attrib KURTOSIS ABOUT_MAJOR   −4.826675115736962
Attrib KURTOSIS ABOUT_MINOR   −6.234795587473527
Attrib HOLLOWS RATIO   14.12656156283867
Sigmoid Node 6
Inputs   Weights
Threshold   −3.031473787948206
Attrib COMPACTNESS   −2.49758845380309
Attrib CIRCULARITY   −1.8294165134397566
Attrib DISTANCE CIRCULARITY   0.8164863850347789
Attrib RADIUS RATIO   2.3176960830410933
Attrib PR.AXIS ASPECT RATIO   0.9210826036066859
Attrib MAX.LENGTH ASPECT RATIO   2.236462370882992
Attrib SCATTER RATIO   1.854736645755806
Attrib ELONGATEDNESS   −0.5389884820675321
Attrib PR.AXIS RECTANGULARITY   −1.543509101808241
Attrib MAX.LENGTH RECTANGULARITY   −5.480192790352243
Attrib SCALED VARIANCE_MAJOR   1.0464938798822114
Attrib SCALED VARIANCE_MINOR   2.11119599141239

Attrib SCALED RADIUS OF GYRATION   −1.334202091041522
Attrib SKEWNESS ABOUT_MAJOR   0.7195628697563519
Attrib SKEWNESS ABOUT_MINOR   −6.692793812469213
Attrib KURTOSIS ABOUT_MAJOR   2.30168977691968
Attrib KURTOSIS ABOUT_MINOR   −3.0152666964636543
Attrib HOLLOWS RATIO   0.2037006768682198
Sigmoid Node 7
Inputs   Weights
Threshold   −1.435962356705481
Attrib COMPACTNESS   −2.790458704976964
Attrib CIRCULARITY   8.529745421968077
Attrib DISTANCE CIRCULARITY   −4.222734502087211
Attrib RADIUS RATIO   −0.692929353596132
Attrib PR.AXIS ASPECT RATIO   −1.1357926695145937
Attrib MAX.LENGTH ASPECT RATIO   −3.338733043044793
Attrib SCATTER RATIO   1.331848360933579
Attrib ELONGATEDNESS   −3.445595974553367
Attrib PR.AXIS RECTANGULARITY   4.092258746110636
Attrib MAX.LENGTH RECTANGULARITY   −1.2366586821859897
Attrib SCALED VARIANCE_MAJOR   −0.4308358800791659
Attrib SCALED VARIANCE_MINOR   3.9899845190355916
Attrib SCALED RADIUS OF GYRATION   −3.1232270413031773
Attrib SKEWNESS ABOUT_MAJOR   −2.603325760858461
Attrib SKEWNESS ABOUT_MINOR   4.107043874875964
Attrib KURTOSIS ABOUT_MAJOR   1.2398993916939254
Attrib KURTOSIS ABOUT_MINOR   20.94949153149319
Attrib HOLLOWS RATIO   −16.17374773108816
Sigmoid Node 8
Inputs   Weights
Threshold   −1.1422699132191436
Attrib COMPACTNESS   4.908271637760583
Attrib CIRCULARITY   −1.7588333780064556
Attrib DISTANCE CIRCULARITY   −3.065622565203293
Attrib RADIUS RATIO   1.138060379956383
Attrib PR.AXIS ASPECT RATIO   3.0162644554878693
Attrib MAX.LENGTH ASPECT RATIO   1.4191985497986503
Attrib SCATTER RATIO   −1.403304587404426
Attrib ELONGATEDNESS   1.3538599359808305
Attrib PR.AXIS RECTANGULARITY   −1.8083974820078657
Attrib MAX.LENGTH RECTANGULARITY   1.2716916838009185
Attrib SCALED VARIANCE_MAJOR   −0.505255797651223
Attrib SCALED VARIANCE_MINOR   −0.9129647460002989
Attrib SCALED RADIUS OF GYRATION   −1.5406776937877145
Attrib SKEWNESS ABOUT_MAJOR   0.9575333278321427
Attrib SKEWNESS ABOUT_MINOR   −0.9593888462311294
Attrib KURTOSIS ABOUT_MAJOR   −0.33529721100586835
Attrib KURTOSIS ABOUT_MINOR   1.6357772172345584
Attrib HOLLOWS RATIO   0.8861585568822615
Sigmoid Node 9

Inputs   Weights
Threshold   0.76074251916718
Attrib COMPACTNESS   −4.906869836983502
Attrib CIRCULARITY   3.8081359586137524
Attrib DISTANCE CIRCULARITY   −2.3457386219866776
Attrib RADIUS RATIO   −0.2481166929429816
Attrib PR.AXIS ASPECT RATIO   7.62131635769405
Attrib MAX.LENGTH ASPECT RATIO   −4.041530280737406
Attrib SCATTER RATIO   0.36737688168179367
Attrib ELONGATEDNESS   −6.025726994711125
Attrib PR.AXIS RECTANGULARITY   −1.0346109729809405
Attrib MAX.LENGTH RECTANGULARITY   −2.563885033801802
Attrib SCALED VARIANCE_MAJOR   −2.3851676158296957
Attrib SCALED VARIANCE_MINOR   0.9902831618975189
Attrib SCALED RADIUS OF GYRATION   −0.15894749781548315
Attrib SKEWNESS ABOUT_MAJOR   3.665506286470586
Attrib SKEWNESS ABOUT_MINOR   0.8838848052543947
Attrib KURTOSIS ABOUT_MAJOR   −1.3081474633330086
Attrib KURTOSIS ABOUT_MINOR   6.852559428809092
Attrib HOLLOWS RATIO   −2.611463469918461
Sigmoid Node 10
Inputs   Weights
Threshold   1.746555356404537
Attrib COMPACTNESS   3.9003475998648858
Attrib CIRCULARITY   0.23521385091041974
Attrib DISTANCE CIRCULARITY   6.413264859514988
Attrib RADIUS RATIO   −2.1769648308178726
Attrib PR.AXIS ASPECT RATIO   2.520408945082408
Attrib MAX.LENGTH ASPECT RATIO   6.099947186321264
Attrib SCATTER RATIO   −1.6018317142014784
Attrib ELONGATEDNESS   2.597238203847436
Attrib PR.AXIS RECTANGULARITY   −2.055445294345397
Attrib MAX.LENGTH RECTANGULARITY   6.976542721499556
Attrib SCALED VARIANCE_MAJOR   −1.8614871536902136
Attrib SCALED VARIANCE_MINOR   −2.0051816679548256
Attrib SCALED RADIUS OF GYRATION   −8.660072440897938
Attrib SKEWNESS ABOUT_MAJOR   8.70194477373586
Attrib SKEWNESS ABOUT_MINOR   −0.8638725496844202
Attrib KURTOSIS ABOUT_MAJOR   −4.25943543953797
Attrib KURTOSIS ABOUT_MINOR   −6.184012660486166
Attrib HOLLOWS RATIO   2.9953207724788524
Sigmoid Node 11
Inputs   Weights
Threshold   −0.8595751270296209
Attrib COMPACTNESS   3.8250449977433445
Attrib CIRCULARITY   −5.3766199272804
Attrib DISTANCE CIRCULARITY   1.3226779063852168
Attrib RADIUS RATIO   0.5928849873623112
Attrib PR.AXIS ASPECT RATIO   1.7580838641299872

Attrib MAX.LENGTH ASPECT RATIO   −0.2890721396492935
Attrib SCATTER RATIO   −0.2669609768093273
Attrib ELONGATEDNESS   1.6874079407963782
Attrib PR.AXIS RECTANGULARITY   2.501674083358783
Attrib MAX.LENGTH RECTANGULARITY   −3.13949996003203
Attrib SCALED VARIANCE_MAJOR   −1.5324823298641106
Attrib SCALED VARIANCE_MINOR   −0.818854597904911
Attrib SCALED RADIUS OF GYRATION   1.0417221150319023
Attrib SKEWNESS ABOUT_MAJOR   1.3470062389972666
Attrib SKEWNESS ABOUT_MINOR   7.122507875643384
Attrib KURTOSIS ABOUT_MAJOR   −0.7182327602027347
Attrib KURTOSIS ABOUT_MINOR   −6.252520212280283
Attrib HOLLOWS RATIO   −3.3575155836510326
Sigmoid Node 12
Inputs   Weights
Threshold   −0.917062751312022
Attrib COMPACTNESS   −3.0336794483074443
Attrib CIRCULARITY   −1.80478615684558
Attrib DISTANCE CIRCULARITY   2.8489905381985747
Attrib RADIUS RATIO   2.324022547328897
Attrib PR.AXIS ASPECT RATIO   2.10776943932248
Attrib MAX.LENGTH ASPECT RATIO   2.7238193116516767
Attrib SCATTER RATIO   1.2764911987428225
Attrib ELONGATEDNESS   −0.7660964365604443
Attrib PR.AXIS RECTANGULARITY   −1.9036995193917665
Attrib MAX.LENGTH RECTANGULARITY   −4.671216895427027
Attrib SCALED VARIANCE_MAJOR   0.8069356578686573
Attrib SCALED VARIANCE_MINOR   1.3839049212129653
Attrib SCALED RADIUS OF GYRATION   −0.696891190049735
Attrib SKEWNESS ABOUT_MAJOR   0.21998228183054327
Attrib SKEWNESS ABOUT_MINOR   −1.927100832770432
Attrib KURTOSIS ABOUT_MAJOR   7.189562766992872
Attrib KURTOSIS ABOUT_MINOR   −1.3442462822499164
Attrib HOLLOWS RATIO   0.1195164790636015
Sigmoid Node 13
Inputs   Weights
Threshold   −0.7717752216614225
Attrib COMPACTNESS   1.7610886117101314
Attrib CIRCULARITY   0.20181262854117668
Attrib DISTANCE CIRCULARITY   3.258367525604711
Attrib RADIUS RATIO   1.1911973973125252
Attrib PR.AXIS ASPECT RATIO   0.5692607336248068
Attrib MAX.LENGTH ASPECT RATIO   2.9207164350864514
Attrib SCATTER RATIO   2.142221605526497
Attrib ELONGATEDNESS   −3.6331325069004268
Attrib PR.AXIS RECTANGULARITY   −1.4492108649169926
Attrib MAX.LENGTH RECTANGULARITY   −1.0316549929702545
Attrib SCALED VARIANCE_MAJOR   1.9132256724676315
Attrib SCALED VARIANCE_MINOR   2.7135532880823354

Attrib SCALED RADIUS OF GYRATION   −5.22574815484327
Attrib SKEWNESS ABOUT_MAJOR   1.0397150779424353
Attrib SKEWNESS ABOUT_MINOR   −2.2797162823448067
Attrib KURTOSIS ABOUT_MAJOR   −2.2029045907998124
Attrib KURTOSIS ABOUT_MINOR   3.6294972317977026
Attrib HOLLOWS RATIO   −4.467035815491317
Sigmoid Node 14
Inputs   Weights
Threshold   −1.8871417672689534
Attrib COMPACTNESS   −2.9227001064505935
Attrib CIRCULARITY   2.0970572296184553
Attrib DISTANCE CIRCULARITY   0.35996039335725627
Attrib RADIUS RATIO   3.0220184500549525
Attrib PR.AXIS ASPECT RATIO   −8.952512608775638
Attrib MAX.LENGTH ASPECT RATIO   1.2316369953387118
Attrib SCATTER RATIO   2.6979804435971753
Attrib ELONGATEDNESS   −1.382688970528517
Attrib PR.AXIS RECTANGULARITY   3.0425404668107756
Attrib MAX.LENGTH RECTANGULARITY   11.629841576016187
Attrib SCALED VARIANCE_MAJOR   6.306406695529147
Attrib SCALED VARIANCE_MINOR   2.056533891236219
Attrib SCALED RADIUS OF GYRATION   −3.8424500547978813
Attrib SKEWNESS ABOUT_MAJOR   −7.450237641988229
Attrib SKEWNESS ABOUT_MINOR   −2.8786916658820836
Attrib KURTOSIS ABOUT_MAJOR   2.434557109584292
Attrib KURTOSIS ABOUT_MINOR   0.7033897384234011
Attrib HOLLOWS RATIO   2.310234283154766
Sigmoid Node 15
Inputs   Weights
Threshold   −3.1040251590774015
Attrib COMPACTNESS   −1.9734985814071577
Attrib CIRCULARITY   4.688627972277516
Attrib DISTANCE CIRCULARITY   −1.7005945006551575
Attrib RADIUS RATIO   −3.146178472583482
Attrib PR.AXIS ASPECT RATIO   −0.5005926875374085
Attrib MAX.LENGTH ASPECT RATIO   1.872919112890228
Attrib SCATTER RATIO   0.031275883476999236
Attrib ELONGATEDNESS   2.1640423706271346
Attrib PR.AXIS RECTANGULARITY   −0.5094466969964423
Attrib MAX.LENGTH RECTANGULARITY   2.9738101844350067
Attrib SCALED VARIANCE_MAJOR   −0.14626459707619066
Attrib SCALED VARIANCE_MINOR   0.8642409459514211
Attrib SCALED RADIUS OF GYRATION   0.5707546154258757
Attrib SKEWNESS ABOUT_MAJOR   2.431738962455697
Attrib SKEWNESS ABOUT_MINOR   0.38151653597072943
Attrib KURTOSIS ABOUT_MAJOR   2.001676067246061
Attrib KURTOSIS ABOUT_MINOR   −2.6873871094860613
Attrib HOLLOWS RATIO   −4.220123122730717
Sigmoid Node 16

Inputs   Weights
Threshold   0.020176400970739916
Attrib COMPACTNESS   5.989004929768877
Attrib CIRCULARITY   −2.5688094793410756
Attrib DISTANCE CIRCULARITY   3.3614630973597976
Attrib RADIUS RATIO   2.43471264566323
Attrib PR.AXIS ASPECT RATIO   4.5756982178878065
Attrib MAX.LENGTH ASPECT RATIO   1.7118722970027422
Attrib SCATTER RATIO   1.9922303906232421
Attrib ELONGATEDNESS   −0.3905315399764128
Attrib PR.AXIS RECTANGULARITY   −0.9744791170398253
Attrib MAX.LENGTH RECTANGULARITY   −1.983434743862241
Attrib SCALED VARIANCE_MAJOR   0.8081128102923758
Attrib SCALED VARIANCE_MINOR   0.44658695217370686
Attrib SCALED RADIUS OF GYRATION   3.6150585259721026
Attrib SKEWNESS ABOUT_MAJOR   3.549401323959444
Attrib SKEWNESS ABOUT_MINOR   6.968893857062657
Attrib KURTOSIS ABOUT_MAJOR   0.19589669183101996
Attrib KURTOSIS ABOUT_MINOR   −8.397097985322281
Attrib HOLLOWS RATIO   1.7197814191989038
Sigmoid Node 17
Inputs   Weights
Threshold   −9.554805685539325
Attrib COMPACTNESS   3.554856300654174
Attrib CIRCULARITY   −9.133227502022104
Attrib DISTANCE CIRCULARITY   −1.1025909462645749
Attrib RADIUS RATIO   0.7101350198384799
Attrib PR.AXIS ASPECT RATIO   −6.788915868608362
Attrib MAX.LENGTH ASPECT RATIO   −2.190252768702892
Attrib SCATTER RATIO   −0.33917474926190916
Attrib ELONGATEDNESS   8.261506910374338
Attrib PR.AXIS RECTANGULARITY   2.3855889460220006
Attrib MAX.LENGTH RECTANGULARITY   −6.777007193991807
Attrib SCALED VARIANCE_MAJOR   2.616103394107949
Attrib SCALED VARIANCE_MINOR   2.038045165217848
Attrib SCALED RADIUS OF GYRATION   −2.743187637616746
Attrib SKEWNESS ABOUT_MAJOR   −3.53536865618637
Attrib SKEWNESS ABOUT_MINOR   7.09982655945382
Attrib KURTOSIS ABOUT_MAJOR   −1.260275791139078
Attrib KURTOSIS ABOUT_MINOR   0.13668212123755094
Attrib HOLLOWS RATIO   −7.049518679747923
Sigmoid Node 18
Inputs   Weights
Threshold   −4.323046143493172
Attrib COMPACTNESS   2.4816468740789794
Attrib CIRCULARITY   −4.066055289549153
Attrib DISTANCE CIRCULARITY   −3.465106424930421
Attrib RADIUS RATIO   2.7336957894709273
Attrib PR.AXIS ASPECT RATIO   1.435452571324809

Attrib MAX.LENGTH ASPECT RATIO   −0.6555298538305677
Attrib SCATTER RATIO   −0.5480913747315461
Attrib ELONGATEDNESS   2.6995832084134226
Attrib PR.AXIS RECTANGULARITY   0.30727405646381645
Attrib MAX.LENGTH RECTANGULARITY   −6.170375410732273
Attrib SCALED VARIANCE_MAJOR   −0.007575745845368105
Attrib SCALED VARIANCE_MINOR   0.7990466937627374
Attrib SCALED RADIUS OF GYRATION   1.4958654225440329
Attrib SKEWNESS ABOUT_MAJOR   2.209643309437829
Attrib SKEWNESS ABOUT_MINOR   −2.532906995757778
Attrib KURTOSIS ABOUT_MAJOR   1.3106118069056139
Attrib KURTOSIS ABOUT_MINOR   −3.1265643973612223
Attrib HOLLOWS RATIO   −0.8732916647771941
Sigmoid Node 19
Inputs   Weights
Threshold   0.1252205004509926
Attrib COMPACTNESS   1.3485986582610552
Attrib CIRCULARITY   −5.067256366574567
Attrib DISTANCE CIRCULARITY   −15.254805526837815
Attrib RADIUS RATIO   −2.6072884307697044
Attrib PR.AXIS ASPECT RATIO   7.936104792325355
Attrib MAX.LENGTH ASPECT RATIO   −6.9194085208740095
Attrib SCATTER RATIO   2.3310159166359696
Attrib ELONGATEDNESS   −7.64423765481767
Attrib PR.AXIS RECTANGULARITY   1.4285624872540892
Attrib MAX.LENGTH RECTANGULARITY   0.8469111294171885
Attrib SCALED VARIANCE_MAJOR   0.0017802101766029566
Attrib SCALED VARIANCE_MINOR   2.173308037688275
Attrib SCALED RADIUS OF GYRATION   0.677228013106402
Attrib SKEWNESS ABOUT_MAJOR   4.343811838185186
Attrib SKEWNESS ABOUT_MINOR   −7.415168018130518
Attrib KURTOSIS ABOUT_MAJOR   2.0665653745527788
Attrib KURTOSIS ABOUT_MINOR   10.835957559188776
Attrib HOLLOWS RATIO   −12.527627847743112
Sigmoid Node 20
Inputs   Weights
Threshold   1.5852521817471459
Attrib COMPACTNESS   9.478377243035853
Attrib CIRCULARITY   2.032985366864482
Attrib DISTANCE CIRCULARITY   5.895355302907899
Attrib RADIUS RATIO   −5.747829084778827
Attrib PR.AXIS ASPECT RATIO   4.4822315218311495
Attrib MAX.LENGTH ASPECT RATIO   8.135621683682011
Attrib SCATTER RATIO   −5.10805248048681
Attrib ELONGATEDNESS   8.129850448600859
Attrib PR.AXIS RECTANGULARITY   −4.982002532330347
Attrib MAX.LENGTH RECTANGULARITY   11.828710315864802
Attrib SCALED VARIANCE_MAJOR   −4.560079879441926
Attrib SCALED VARIANCE_MINOR   −4.9414364599776395

Attrib SCALED RADIUS OF GYRATION   −6.125098493531587
Attrib SKEWNESS ABOUT_MAJOR   10.73316044611331
Attrib SKEWNESS ABOUT_MINOR   −2.072113991434307
Attrib KURTOSIS ABOUT_MAJOR   −1.381106976562548
Attrib KURTOSIS ABOUT_MINOR   −3.3941750291521076
Attrib HOLLOWS RATIO   5.6419681151235075
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7048751084030537
Attrib COMPACTNESS   −10.374168867106937
Attrib CIRCULARITY   2.251056840373015
Attrib DISTANCE CIRCULARITY   1.4788651779909137
Attrib RADIUS RATIO   3.493264576360435
Attrib PR.AXIS ASPECT RATIO   2.254655379818794
Attrib MAX.LENGTH ASPECT RATIO   0.309781044318456
Attrib SCATTER RATIO   1.3652478826408714
Attrib ELONGATEDNESS   0.7292621326497136
Attrib PR.AXIS RECTANGULARITY   0.910874764819999
Attrib MAX.LENGTH RECTANGULARITY   −1.9393927300218317
Attrib SCALED VARIANCE_MAJOR   0.35021473551116084
Attrib SCALED VARIANCE_MINOR   2.771677526423289
Attrib SCALED RADIUS OF GYRATION   4.929879726872876
Attrib SKEWNESS ABOUT_MAJOR   1.249401200387061
Attrib SKEWNESS ABOUT_MINOR   0.5722875780759757
Attrib KURTOSIS ABOUT_MAJOR   5.505264438194682
Attrib KURTOSIS ABOUT_MINOR   −8.42187906627676
Attrib HOLLOWS RATIO   −5.429218607875532
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.27 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

```
Correctly Classified Instances         386               91.6865 %
Incorrectly Classified Instances       35                 8.3135 %
Kappa statistic                        0.8891
Mean absolute error                    0.0635
Root mean squared error                0.1842
Relative absolute error                16.9404 %
Root relative squared error            42.5519 %
Total Number of Instances              421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,895	0,057	0,839	0,895	0,866	0,821	0,963	0,895	opel
0,815	0,035	0,889	0,815	0,850	0,803	0,963	0,903	saab
1,000	0,019	0,948	1,000	0,973	0,964	0,999	0,996	bus
0,960	0,000	1,000	0,960	0,979	0,974	1,000	1,000	van
Weighted Avg.	0,917	0,028	0,918	0,917	0,916	0,889	0,981	0,948

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
94   8    3    0  |    a = opel
18   88   2    0  |    b = saab
0    0  109    0  |    c = bus
0    3    1   95  |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
```

MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −2.9632056002913876
Node 4   −5.001125477748584
Node 5   −5.177891503834578
Node 6   4.1461247299343045
Node 7   7.8206988127149835
Node 8   −3.5035415456972188
Node 9   −0.5525678166315148
Node 10   4.56055832657145
Node 11   −4.072305449061278
Node 12   2.5315897235571394
Node 13   3.353336488283479
Node 14   0.3834012865725182
Node 15   −0.429063197957358
Node 16   −6.639292407294156
Node 17   4.650970549830089
Node 18   4.7779581373290725
Node 19   −10.864787371012913
Node 20   −4.9344083083375025
Node 21   4.600329225944872
Sigmoid Node 1
Inputs   Weights
Threshold   −5.162160220758245
Node 4   −1.0873726524050962
Node 5   5.571856249396677
Node 6   −0.820051883157158
Node 7   −7.5671431821772845
Node 8   −1.9833580496880256
Node 9   −5.439367995099706
Node 10   −7.885160316834742

272

```
Node  11      4.508317408556839
Node  12     −5.011436814221905
Node  13     −4.091350156439105
Node  14      9.622286676634818
Node  15     −3.638348994256512
Node  16      7.435748858054065
Node  17      4.909835029902936
Node  18      3.136158041724084
Node  19      4.807422089338749
Node  20     −8.231967108648833
Node  21     −5.209069519844378
Sigmoid  Node  2
Inputs       Weights
Threshold      0.6981724490723457
Node  4      2.321317696893557
Node  5     −0.7276206023516536
Node  6     −0.6097398259514346
Node  7      2.967269455094596
Node  8     −2.5539711010395623
Node  9      5.009819338960217
Node  10     −0.08801782714692671
Node  11     −1.521111471824076
Node  12     −1.5553119745669346
Node  13      0.9142441249786116
Node  14    −11.303793406109978
Node  15      7.7808477263686635
Node  16     −2.010939538375753
Node  17    −10.782655971282264
Node  18     −4.5796169295976386
Node  19      6.380403409062514
Node  20     −2.3776934159866125
Node  21      0.6316467996114632
Sigmoid  Node  3
Inputs       Weights
Threshold     −5.88035931935124
Node  4     −0.6749698528103808
Node  5      3.1122115888395636
Node  6     −1.9587832242741112
Node  7     −1.732103802318559
Node  8      2.4638189742303167
Node  9     −5.831288363521608
Node  10      6.532724807174919
Node  11     −0.8571346281539416
Node  12     −1.585272080824154
Node  13     −1.7077393266662162
Node  14     −0.36235994547383116
Node  15     −1.082247285688802
Node  16      0.5402200976540098
Node  17      1.5071554750385727
```

Node 18   −1.6656625067553656
Node 19   −1.7928408283738957
Node 20   10.510954357536525
Node 21   −3.3205954984879287
Sigmoid Node 4
Inputs   Weights
Threshold   −0.6747639705884066
Attrib COMPACTNESS   2.2509682977048615
Attrib CIRCULARITY   −0.9567029546531116
Attrib DISTANCE CIRCULARITY   −0.9718343300605105
Attrib RADIUS RATIO   −1.6676679606413332
Attrib PR.AXIS ASPECT RATIO   0.4037709788177621
Attrib MAX.LENGTH ASPECT RATIO   −0.4425540120325239
Attrib SCATTER RATIO   0.6076726290929371
Attrib ELONGATEDNESS   −0.9826455277601326
Attrib PR.AXIS RECTANGULARITY   0.7753258121793609
Attrib MAX.LENGTH RECTANGULARITY   −0.1104831912404895
Attrib SCALED VARIANCE_MAJOR   1.0327329364882696
Attrib SCALED VARIANCE_MINOR   0.5574499196313242
Attrib SCALED RADIUS OF GYRATION   1.1412742379781635
Attrib SKEWNESS ABOUT_MAJOR   2.2024631843787525
Attrib SKEWNESS ABOUT_MINOR   0.01380420349269981
Attrib KURTOSIS ABOUT_MAJOR   1.5513930916231098
Attrib KURTOSIS ABOUT_MINOR   1.2543379468527271
Attrib HOLLOWS RATIO   −4.154752009006539
Sigmoid Node 5
Inputs   Weights
Threshold   −1.558856219031484
Attrib COMPACTNESS   0.8590425143762707
Attrib CIRCULARITY   −4.205412301227368
Attrib DISTANCE CIRCULARITY   6.412495311766933
Attrib RADIUS RATIO   −3.047360960016779
Attrib PR.AXIS ASPECT RATIO   0.3976208743578445
Attrib MAX.LENGTH ASPECT RATIO   3.4497942876525327
Attrib SCATTER RATIO   −1.5580824866751894
Attrib ELONGATEDNESS   3.3361303980664356
Attrib PR.AXIS RECTANGULARITY   0.3500806277796151
Attrib MAX.LENGTH RECTANGULARITY   2.0911178469389555
Attrib SCALED VARIANCE_MAJOR   1.005175129070407
Attrib SCALED VARIANCE_MINOR   −2.6402282299693676
Attrib SCALED RADIUS OF GYRATION   6.200128194561823
Attrib SKEWNESS ABOUT_MAJOR   1.8381593221331476
Attrib SKEWNESS ABOUT_MINOR   −0.5148461216700011
Attrib KURTOSIS ABOUT_MAJOR   −4.826675115736962
Attrib KURTOSIS ABOUT_MINOR   −6.234795587473527
Attrib HOLLOWS RATIO   14.12656156283867
Sigmoid Node 6
Inputs   Weights
Threshold   −3.031473787948206

274

Attrib COMPACTNESS   −2.49758845380309
Attrib CIRCULARITY   −1.8294165134397566
Attrib DISTANCE CIRCULARITY   0.8164863850347789
Attrib RADIUS RATIO   2.3176960830410933
Attrib PR.AXIS ASPECT RATIO   0.9210826036066859
Attrib MAX.LENGTH ASPECT RATIO   2.236462370882992
Attrib SCATTER RATIO   1.854736645755806
Attrib ELONGATEDNESS   −0.5389884820675321
Attrib PR.AXIS RECTANGULARITY   −1.543509101808241
Attrib MAX.LENGTH RECTANGULARITY   −5.480192790352243
Attrib SCALED VARIANCE_MAJOR   1.0464938798822114
Attrib SCALED VARIANCE_MINOR   2.11119599141239
Attrib SCALED RADIUS OF GYRATION   −1.334202091041522
Attrib SKEWNESS ABOUT_MAJOR   0.7195628697563519
Attrib SKEWNESS ABOUT_MINOR   −6.692793812469213
Attrib KURTOSIS ABOUT_MAJOR   2.30168977691968
Attrib KURTOSIS ABOUT_MINOR   −3.0152666964636543
Attrib HOLLOWS RATIO   0.2037006768682198
Sigmoid Node 7
Inputs   Weights
Threshold   −1.435962356705481
Attrib COMPACTNESS   −2.790458704976964
Attrib CIRCULARITY   8.529745421968077
Attrib DISTANCE CIRCULARITY   −4.222734502087211
Attrib RADIUS RATIO   −0.692929353596132
Attrib PR.AXIS ASPECT RATIO   −1.1357926695145937
Attrib MAX.LENGTH ASPECT RATIO   −3.338733043044793
Attrib SCATTER RATIO   1.331848360933579
Attrib ELONGATEDNESS   −3.445595974553367
Attrib PR.AXIS RECTANGULARITY   4.092258746110636
Attrib MAX.LENGTH RECTANGULARITY   −1.2366586821859897
Attrib SCALED VARIANCE_MAJOR   −0.4308358800791659
Attrib SCALED VARIANCE_MINOR   3.9899845190355916
Attrib SCALED RADIUS OF GYRATION   −3.1232270413031773
Attrib SKEWNESS ABOUT_MAJOR   −2.603325760858461
Attrib SKEWNESS ABOUT_MINOR   4.107043874875964
Attrib KURTOSIS ABOUT_MAJOR   1.2398993916939254
Attrib KURTOSIS ABOUT_MINOR   20.94949153149319
Attrib HOLLOWS RATIO   −16.17374773108816
Sigmoid Node 8
Inputs   Weights
Threshold   −1.1422699132191436
Attrib COMPACTNESS   4.908271637760583
Attrib CIRCULARITY   −1.7588333780064556
Attrib DISTANCE CIRCULARITY   −3.065622565203293
Attrib RADIUS RATIO   1.138060379956383
Attrib PR.AXIS ASPECT RATIO   3.0162644554878693
Attrib MAX.LENGTH ASPECT RATIO   1.4191985497986503
Attrib SCATTER RATIO   −1.403304587404426

Attrib ELONGATEDNESS   1.3538599359808305
Attrib PR.AXIS RECTANGULARITY   −1.8083974820078657
Attrib MAX.LENGTH RECTANGULARITY   1.2716916838009185
Attrib SCALED VARIANCE_MAJOR   −0.505255797651223
Attrib SCALED VARIANCE_MINOR   −0.9129647460002989
Attrib SCALED RADIUS OF GYRATION   −1.5406776937877145
Attrib SKEWNESS ABOUT_MAJOR   0.9575333278321427
Attrib SKEWNESS ABOUT_MINOR   −0.9593888462311294
Attrib KURTOSIS ABOUT_MAJOR   −0.33529721100586835
Attrib KURTOSIS ABOUT_MINOR   1.6357772172345584
Attrib HOLLOWS RATIO   0.8861585568822615
Sigmoid Node 9
Inputs   Weights
Threshold   0.76074251916718
Attrib COMPACTNESS   −4.906869836983502
Attrib CIRCULARITY   3.8081359586137524
Attrib DISTANCE CIRCULARITY   −2.3457386219866776
Attrib RADIUS RATIO   −0.2481166929429816
Attrib PR.AXIS ASPECT RATIO   7.62131635769405
Attrib MAX.LENGTH ASPECT RATIO   −4.041530280737406
Attrib SCATTER RATIO   0.36737688168179367
Attrib ELONGATEDNESS   −6.025726994711125
Attrib PR.AXIS RECTANGULARITY   −1.0346109729809405
Attrib MAX.LENGTH RECTANGULARITY   −2.563885033801802
Attrib SCALED VARIANCE_MAJOR   −2.3851676158296957
Attrib SCALED VARIANCE_MINOR   0.9902831618975189
Attrib SCALED RADIUS OF GYRATION   −0.15894749781548315
Attrib SKEWNESS ABOUT_MAJOR   3.665506286470586
Attrib SKEWNESS ABOUT_MINOR   0.8838848052543947
Attrib KURTOSIS ABOUT_MAJOR   −1.3081474633330086
Attrib KURTOSIS ABOUT_MINOR   6.852559428809092
Attrib HOLLOWS RATIO   −2.611463469918461
Sigmoid Node 10
Inputs   Weights
Threshold   1.746555356404537
Attrib COMPACTNESS   3.9003475998648858
Attrib CIRCULARITY   0.23521385091041974
Attrib DISTANCE CIRCULARITY   6.413264859514988
Attrib RADIUS RATIO   −2.1769648308178726
Attrib PR.AXIS ASPECT RATIO   2.520408945082408
Attrib MAX.LENGTH ASPECT RATIO   6.099947186321264
Attrib SCATTER RATIO   −1.6018317142014784
Attrib ELONGATEDNESS   2.597238203847436
Attrib PR.AXIS RECTANGULARITY   −2.055445294345397
Attrib MAX.LENGTH RECTANGULARITY   6.976542721499556
Attrib SCALED VARIANCE_MAJOR   −1.8614871536902136
Attrib SCALED VARIANCE_MINOR   −2.0051816679548256
Attrib SCALED RADIUS OF GYRATION   −8.660072440897938
Attrib SKEWNESS ABOUT_MAJOR   8.70194477373586

Attrib SKEWNESS ABOUT_MINOR   −0.8638725496844202
Attrib KURTOSIS ABOUT_MAJOR   −4.25943543953797
Attrib KURTOSIS ABOUT_MINOR   −6.184012660486166
Attrib HOLLOWS RATIO   2.9953207724788524
Sigmoid Node 11
Inputs   Weights
Threshold   −0.8595751270296209
Attrib COMPACTNESS   3.8250449977433445
Attrib CIRCULARITY   −5.3766199272804
Attrib DISTANCE CIRCULARITY   1.3226779063852168
Attrib RADIUS RATIO   0.5928849873623112
Attrib PR.AXIS ASPECT RATIO   1.7580838641299872
Attrib MAX.LENGTH ASPECT RATIO   −0.2890721396492935
Attrib SCATTER RATIO   −0.2669609768093273
Attrib ELONGATEDNESS   1.6874079407963782
Attrib PR.AXIS RECTANGULARITY   2.501674083358783
Attrib MAX.LENGTH RECTANGULARITY   −3.13949996003203
Attrib SCALED VARIANCE_MAJOR   −1.5324823298641106
Attrib SCALED VARIANCE_MINOR   −0.818854597904911
Attrib SCALED RADIUS OF GYRATION   1.0417221150319023
Attrib SKEWNESS ABOUT_MAJOR   1.3470062389972666
Attrib SKEWNESS ABOUT_MINOR   7.122507875643384
Attrib KURTOSIS ABOUT_MAJOR   −0.7182327602027347
Attrib KURTOSIS ABOUT_MINOR   −6.252520212280283
Attrib HOLLOWS RATIO   −3.3575155836510326
Sigmoid Node 12
Inputs   Weights
Threshold   −0.917062751312022
Attrib COMPACTNESS   −3.0336794483074443
Attrib CIRCULARITY   −1.80478615684558
Attrib DISTANCE CIRCULARITY   2.8489905381985747
Attrib RADIUS RATIO   2.324022547328897
Attrib PR.AXIS ASPECT RATIO   2.10776943932248
Attrib MAX.LENGTH ASPECT RATIO   2.7238193116516767
Attrib SCATTER RATIO   1.2764911987428225
Attrib ELONGATEDNESS   −0.7660964365604443
Attrib PR.AXIS RECTANGULARITY   −1.9036995193917665
Attrib MAX.LENGTH RECTANGULARITY   −4.671216895427027
Attrib SCALED VARIANCE_MAJOR   0.8069356578686573
Attrib SCALED VARIANCE_MINOR   1.3839049212129653
Attrib SCALED RADIUS OF GYRATION   −0.696891190049735
Attrib SKEWNESS ABOUT_MAJOR   0.21998228183054327
Attrib SKEWNESS ABOUT_MINOR   −1.927100832770432
Attrib KURTOSIS ABOUT_MAJOR   7.189562766992872
Attrib KURTOSIS ABOUT_MINOR   −1.3442462822499164
Attrib HOLLOWS RATIO   0.1195164790636015
Sigmoid Node 13
Inputs   Weights
Threshold   −0.7717752216614225

Attrib COMPACTNESS   1.7610886117101314
Attrib CIRCULARITY   0.20181262854117668
Attrib DISTANCE CIRCULARITY   3.258367525604711
Attrib RADIUS RATIO   1.1911973973125252
Attrib PR.AXIS ASPECT RATIO   0.5692607336248068
Attrib MAX.LENGTH ASPECT RATIO   2.9207164350864514
Attrib SCATTER RATIO   2.142221605526497
Attrib ELONGATEDNESS   −3.6331325069004268
Attrib PR.AXIS RECTANGULARITY   −1.4492108649169926
Attrib MAX.LENGTH RECTANGULARITY   −1.0316549929702545
Attrib SCALED VARIANCE_MAJOR   1.9132256724676315
Attrib SCALED VARIANCE_MINOR   2.7135532880823354
Attrib SCALED RADIUS OF GYRATION   −5.22574815484327
Attrib SKEWNESS ABOUT_MAJOR   1.0397150779424353
Attrib SKEWNESS ABOUT_MINOR   −2.2797162823448067
Attrib KURTOSIS ABOUT_MAJOR   −2.2029045907998124
Attrib KURTOSIS ABOUT_MINOR   3.6294972317977026
Attrib HOLLOWS RATIO   −4.467035815491317
Sigmoid Node 14
Inputs   Weights
Threshold   −1.8871417672689534
Attrib COMPACTNESS   −2.9227001064505935
Attrib CIRCULARITY   2.0970572296184553
Attrib DISTANCE CIRCULARITY   0.35996039335725627
Attrib RADIUS RATIO   3.0220184500549525
Attrib PR.AXIS ASPECT RATIO   −8.952512608775638
Attrib MAX.LENGTH ASPECT RATIO   1.2316369953387118
Attrib SCATTER RATIO   2.6979804435971753
Attrib ELONGATEDNESS   −1.382688970528517
Attrib PR.AXIS RECTANGULARITY   3.0425404668107756
Attrib MAX.LENGTH RECTANGULARITY   11.629841576016187
Attrib SCALED VARIANCE_MAJOR   6.306406695529147
Attrib SCALED VARIANCE_MINOR   2.056533891236219
Attrib SCALED RADIUS OF GYRATION   −3.8424500547978813
Attrib SKEWNESS ABOUT_MAJOR   −7.450237641988229
Attrib SKEWNESS ABOUT_MINOR   −2.8786916658820836
Attrib KURTOSIS ABOUT_MAJOR   2.434557109584292
Attrib KURTOSIS ABOUT_MINOR   0.7033897384234011
Attrib HOLLOWS RATIO   2.310234283154766
Sigmoid Node 15
Inputs   Weights
Threshold   −3.104025159077415
Attrib COMPACTNESS   −1.9734985814071577
Attrib CIRCULARITY   4.688627972277516
Attrib DISTANCE CIRCULARITY   −1.7005945006551575
Attrib RADIUS RATIO   −3.146178472583482
Attrib PR.AXIS ASPECT RATIO   −0.5005926875374085
Attrib MAX.LENGTH ASPECT RATIO   1.872919112890228
Attrib SCATTER RATIO   0.031275883476999236

Attrib ELONGATEDNESS   2.1640423706271346
Attrib PR.AXIS RECTANGULARITY   −0.5094466969964423
Attrib MAX.LENGTH RECTANGULARITY   2.9738101844350067
Attrib SCALED VARIANCE_MAJOR   −0.14626459707619066
Attrib SCALED VARIANCE_MINOR   0.8642409459514211
Attrib SCALED RADIUS OF GYRATION   0.5707546154258757
Attrib SKEWNESS ABOUT_MAJOR   2.431738962455697
Attrib SKEWNESS ABOUT_MINOR   0.38151653597072943
Attrib KURTOSIS ABOUT_MAJOR   2.001676067246061
Attrib KURTOSIS ABOUT_MINOR   −2.6873871094860613
Attrib HOLLOWS RATIO   −4.220123122730717
Sigmoid Node 16
Inputs   Weights
Threshold   0.020176400970739916
Attrib COMPACTNESS   5.989004929768877
Attrib CIRCULARITY   −2.5688094793410756
Attrib DISTANCE CIRCULARITY   3.3614630973597976
Attrib RADIUS RATIO   2.43471264566323
Attrib PR.AXIS ASPECT RATIO   4.5756982178878065
Attrib MAX.LENGTH ASPECT RATIO   1.7118722970027422
Attrib SCATTER RATIO   1.9922303906232421
Attrib ELONGATEDNESS   −0.3905315399764128
Attrib PR.AXIS RECTANGULARITY   −0.9744791170398253
Attrib MAX.LENGTH RECTANGULARITY   −1.983434743862241
Attrib SCALED VARIANCE_MAJOR   0.8081128102923758
Attrib SCALED VARIANCE_MINOR   0.44658695217370686
Attrib SCALED RADIUS OF GYRATION   3.6150585259721026
Attrib SKEWNESS ABOUT_MAJOR   3.549401323959444
Attrib SKEWNESS ABOUT_MINOR   6.968893857062657
Attrib KURTOSIS ABOUT_MAJOR   0.19589669183101996
Attrib KURTOSIS ABOUT_MINOR   −8.397097985322281
Attrib HOLLOWS RATIO   1.7197814191989038
Sigmoid Node 17
Inputs   Weights
Threshold   −9.554805685539325
Attrib COMPACTNESS   3.554856300654174
Attrib CIRCULARITY   −9.133227502022104
Attrib DISTANCE CIRCULARITY   −1.1025909462645749
Attrib RADIUS RATIO   0.7101350198384799
Attrib PR.AXIS ASPECT RATIO   −6.788915868608362
Attrib MAX.LENGTH ASPECT RATIO   −2.190252768702892
Attrib SCATTER RATIO   −0.33917474926190916
Attrib ELONGATEDNESS   8.261506910374338
Attrib PR.AXIS RECTANGULARITY   2.3855889460220006
Attrib MAX.LENGTH RECTANGULARITY   −6.777007193991807
Attrib SCALED VARIANCE_MAJOR   2.616103394107949
Attrib SCALED VARIANCE_MINOR   2.038045165217848
Attrib SCALED RADIUS OF GYRATION   −2.743187637616746
Attrib SKEWNESS ABOUT_MAJOR   −3.53536865618637

Attrib SKEWNESS ABOUT_MINOR   7.09982655945382
Attrib KURTOSIS ABOUT_MAJOR   −1.260275791139078
Attrib KURTOSIS ABOUT_MINOR   0.13668212123755094
Attrib HOLLOWS RATIO   −7.049518679747923
Sigmoid Node 18
Inputs   Weights
Threshold   −4.323046143493172
Attrib COMPACTNESS   2.4816468740789794
Attrib CIRCULARITY   −4.066055289549153
Attrib DISTANCE CIRCULARITY   −3.465106424930421
Attrib RADIUS RATIO   2.7336957894709273
Attrib PR.AXIS ASPECT RATIO   1.435452571324809
Attrib MAX.LENGTH ASPECT RATIO   −0.6555298538305677
Attrib SCATTER RATIO   −0.5480913747315461
Attrib ELONGATEDNESS   2.6995832084134226
Attrib PR.AXIS RECTANGULARITY   0.30727405646381645
Attrib MAX.LENGTH RECTANGULARITY   −6.170375410732273
Attrib SCALED VARIANCE_MAJOR   −0.007575745845368105
Attrib SCALED VARIANCE_MINOR   0.7990466937627374
Attrib SCALED RADIUS OF GYRATION   1.4958654225440329
Attrib SKEWNESS ABOUT_MAJOR   2.209643309437829
Attrib SKEWNESS ABOUT_MINOR   −2.532906995757778
Attrib KURTOSIS ABOUT_MAJOR   1.3106118069056139
Attrib KURTOSIS ABOUT_MINOR   −3.1265643973612223
Attrib HOLLOWS RATIO   −0.8732916647771941
Sigmoid Node 19
Inputs   Weights
Threshold   0.1252205004509926
Attrib COMPACTNESS   1.3485986582610552
Attrib CIRCULARITY   −5.067256366574567
Attrib DISTANCE CIRCULARITY   −15.254805526837815
Attrib RADIUS RATIO   −2.6072884307697044
Attrib PR.AXIS ASPECT RATIO   7.936104792325355
Attrib MAX.LENGTH ASPECT RATIO   −6.9194085208740095
Attrib SCATTER RATIO   2.3310159166359696
Attrib ELONGATEDNESS   −7.64423765481767
Attrib PR.AXIS RECTANGULARITY   1.4285624872540892
Attrib MAX.LENGTH RECTANGULARITY   0.8469111294171885
Attrib SCALED VARIANCE_MAJOR   0.0017802101766029566
Attrib SCALED VARIANCE_MINOR   2.173308037688275
Attrib SCALED RADIUS OF GYRATION   0.677228013106402
Attrib SKEWNESS ABOUT_MAJOR   4.343811838185186
Attrib SKEWNESS ABOUT_MINOR   −7.415168018130518
Attrib KURTOSIS ABOUT_MAJOR   2.0665653745527788
Attrib KURTOSIS ABOUT_MINOR   10.835957559188776
Attrib HOLLOWS RATIO   −12.527627847743112
Sigmoid Node 20
Inputs   Weights
Threshold   1.5852521817471459

Attrib COMPACTNESS   9.478377243035853
Attrib CIRCULARITY   2.032985366864482
Attrib DISTANCE CIRCULARITY   5.895355302907899
Attrib RADIUS RATIO   −5.747829084778827
Attrib PR.AXIS ASPECT RATIO   4.4822315218311495
Attrib MAX.LENGTH ASPECT RATIO   8.135621683682011
Attrib SCATTER RATIO   −5.10805248048681
Attrib ELONGATEDNESS   8.129850448600859
Attrib PR.AXIS RECTANGULARITY   −4.982002532330347
Attrib MAX.LENGTH RECTANGULARITY   11.828710315864802
Attrib SCALED VARIANCE_MAJOR   −4.560079879441926
Attrib SCALED VARIANCE_MINOR   −4.9414364599776395
Attrib SCALED RADIUS OF GYRATION   −6.125098493531587
Attrib SKEWNESS ABOUT_MAJOR   10.73316044611331
Attrib SKEWNESS ABOUT_MINOR   −2.072113991434307
Attrib KURTOSIS ABOUT_MAJOR   −1.381106976562548
Attrib KURTOSIS ABOUT_MINOR   −3.3941750291521076
Attrib HOLLOWS RATIO   5.6419681151235075
Sigmoid Node 21
Inputs   Weights
Threshold   −0.704875108403057
Attrib COMPACTNESS   −10.374168867106937
Attrib CIRCULARITY   2.2510564840373015
Attrib DISTANCE CIRCULARITY   1.4788651779909137
Attrib RADIUS RATIO   3.493264576360435
Attrib PR.AXIS ASPECT RATIO   2.254655379818794
Attrib MAX.LENGTH ASPECT RATIO   0.309781044318456
Attrib SCATTER RATIO   1.3652478826408714
Attrib ELONGATEDNESS   0.7292621326497136
Attrib PR.AXIS RECTANGULARITY   0.910874764819999
Attrib MAX.LENGTH RECTANGULARITY   −1.9393927300218317
Attrib SCALED VARIANCE_MAJOR   0.35021473551116084
Attrib SCALED VARIANCE_MINOR   2.771677526423289
Attrib SCALED RADIUS OF GYRATION   4.929879726872876
Attrib SKEWNESS ABOUT_MAJOR   1.249401200387061
Attrib SKEWNESS ABOUT_MINOR   0.5722875780759757
Attrib KURTOSIS ABOUT_MAJOR   5.505264438194682
Attrib KURTOSIS ABOUT_MINOR   −8.42187906627676
Attrib HOLLOWS RATIO   −5.429218607875532
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van

Input
Node 3

Time taken to build model: 2.46 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   713   84.279 %
Incorrectly Classified Instances   133   15.721 %
Kappa statistic   0.7902
Mean absolute error   0.0969
Root mean squared error   0.2484
Relative absolute error   25.8429 %
Root relative squared error   57.3736 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,816	0,098	0,736	0,816	0,774	0,695	0,911	0,775	opel
0,696	0,070	0,774	0,696	0,733	0,649	0,914	0,780	saab
1,000	0,037	0,905	1,000	0,950	0,934	0,997	0,989	bus
0,859	0,006	0,977	0,859	0,914	0,893	0,992	0,982	van
Weighted Avg.	0,843	0,053	0,846	0,843	0,842	0,791	0,953	0,880

=== Confusion Matrix ===

```
  a   b   c   d   <-- classified as
173  31   6   2 |   a = opel
 58 151   6   2 |   b = saab
  0   0 218   0 |   c = bus
  4  13  11 171 |   d = van
```

19   19ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.3 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.45101808143104904
Node 4   9.808265105681182
Node 5   −8.576838232382084
Node 6   13.622858125334254
Node 7   −9.906334008576684
Node 8   −20.737023341746056
Node 9   −11.516760420162688
Node 10   −5.131774438555767
Node 11   9.070843047360936
Node 12   0.5936866601933816
Node 13   −2.8500141557559786
Node 14   1.4910609203393372
Sigmoid Node 1
Inputs   Weights
Threshold   −5.280010761589177
Node 4   −9.415846976792144
Node 5   −10.826570755095887

283

```
Node  6      −12.914848224513547
Node  7       8.008470138944181
Node  8       8.622762737801528
Node  9       9.388479168676492
Node  10      −6.847332936668434
Node  11      −6.597023901359095
Node  12     −17.85034367500895
Node  13      11.700146684740425
Node  14      16.255365987545993
Sigmoid  Node  2
Inputs      Weights
Threshold      2.218251444515336
Node  4       2.4280669513264024
Node  5       5.87913749864501
Node  6      −0.2725078761438608
Node  7       1.785039890324014
Node  8       7.386132872593098
Node  9      −5.6917640129381635
Node  10      5.604135487159798
Node  11     −0.8620688423399407
Node  12     −9.54170384233056
Node  13     −15.587721822185781
Node  14     −14.4476787749948
Sigmoid  Node  3
Inputs      Weights
Threshold     −6.756473263142466
Node  4      −5.743335152055298
Node  5       2.495917922529472
Node  6      −1.5299054257706841
Node  7      −3.088166525569866
Node  8      −3.2216972085427713
Node  9       4.0819446304133375
Node  10     −4.792085194616431
Node  11     −5.67353589735355
Node  12      16.457447764934457
Node  13      1.6881276186142964
Node  14      2.4284146596485736
Sigmoid  Node  4
Inputs      Weights
Threshold     −2.691824514544485
Attrib  COMPACTNESS      −6.3255859897695625
Attrib  CIRCULARITY      5.027066722014777
Attrib  DISTANCE CIRCULARITY      −3.266555908144096
Attrib  RADIUS RATIO      −2.783463759681511
Attrib  PR.AXIS ASPECT RATIO      −3.719711845532369
Attrib  MAX.LENGTH ASPECT RATIO      4.192934735293756
Attrib  SCATTER RATIO      1.4000515187355358
Attrib  ELONGATEDNESS      3.955034984421508
Attrib  PR.AXIS RECTANGULARITY      6.5304374998759975
```

Attrib MAX.LENGTH RECTANGULARITY   1.2348338908096406
Attrib SCALED VARIANCE_MAJOR   −0.9739318691907357
Attrib SCALED VARIANCE_MINOR   4.960542128705011
Attrib SCALED RADIUS OF GYRATION   3.872738045222828
Attrib SKEWNESS ABOUT_MAJOR   −0.04660801137479597
Attrib SKEWNESS ABOUT_MINOR   2.641492273609164
Attrib KURTOSIS ABOUT_MAJOR   1.5516418914159804
Attrib KURTOSIS ABOUT_MINOR   −13.394683320184281
Attrib HOLLOWS RATIO   −3.9163834635406394
Sigmoid Node 5
Inputs   Weights
Threshold   2.247632345218041
Attrib COMPACTNESS   5.025646417145672
Attrib CIRCULARITY   0.37163620820043924
Attrib DISTANCE CIRCULARITY   −2.1426564037642564
Attrib RADIUS RATIO   1.957194117270415
Attrib PR.AXIS ASPECT RATIO   12.15565676342995
Attrib MAX.LENGTH ASPECT RATIO   2.591346790837402
Attrib SCATTER RATIO   −4.076795017229489
Attrib ELONGATEDNESS   −2.16100005183082
Attrib PR.AXIS RECTANGULARITY   −5.01124583605576
Attrib MAX.LENGTH RECTANGULARITY   2.291624837985834
Attrib SCALED VARIANCE_MAJOR   0.35894497222916444
Attrib SCALED VARIANCE_MINOR   −3.5559297196064428
Attrib SCALED RADIUS OF GYRATION   −4.649894130639622
Attrib SKEWNESS ABOUT_MAJOR   4.187525270751066
Attrib SKEWNESS ABOUT_MINOR   −1.094199372083056
Attrib KURTOSIS ABOUT_MAJOR   −4.757010498810346
Attrib KURTOSIS ABOUT_MINOR   4.10203088920615
Attrib HOLLOWS RATIO   −1.4173341060095583
Sigmoid Node 6
Inputs   Weights
Threshold   1.1437710479060654
Attrib COMPACTNESS   −2.1810315359474877
Attrib CIRCULARITY   7.564607376688799
Attrib DISTANCE CIRCULARITY   −1.4582434732081102
Attrib RADIUS RATIO   −1.4451614046675327
Attrib PR.AXIS ASPECT RATIO   0.19170701252444575
Attrib MAX.LENGTH ASPECT RATIO   −5.8055081403725275
Attrib SCATTER RATIO   4.004982381405682
Attrib ELONGATEDNESS   1.39945506784528
Attrib PR.AXIS RECTANGULARITY   4.8765125494965815
Attrib MAX.LENGTH RECTANGULARITY   −5.2016658701515075
Attrib SCALED VARIANCE_MAJOR   0.13666212434993644
Attrib SCALED VARIANCE_MINOR   8.86513082677276
Attrib SCALED RADIUS OF GYRATION   −0.6876779057629322
Attrib SKEWNESS ABOUT_MAJOR   −1.600856327471927
Attrib SKEWNESS ABOUT_MINOR   4.360535469203715
Attrib KURTOSIS ABOUT_MAJOR   3.2261820633088756

Attrib KURTOSIS ABOUT_MINOR   25.41547959896961
Attrib HOLLOWS RATIO   −21.2948585458031
Sigmoid Node 7
Inputs   Weights
Threshold   2.3843955910481407
Attrib COMPACTNESS   9.632821220384516
Attrib CIRCULARITY   −0.8497540152202252
Attrib DISTANCE CIRCULARITY   −3.3345153827324117
Attrib RADIUS RATIO   −5.829226368442724
Attrib PR.AXIS ASPECT RATIO   −0.19130571181831182
Attrib MAX.LENGTH ASPECT RATIO   2.381211897855329
Attrib SCATTER RATIO   3.8714465568101457
Attrib ELONGATEDNESS   2.266871787296444
Attrib PR.AXIS RECTANGULARITY   0.038099366704150615
Attrib MAX.LENGTH RECTANGULARITY   −0.4145322989034906
Attrib SCALED VARIANCE_MAJOR   −0.3437908461255358
Attrib SCALED VARIANCE_MINOR   3.826235638167751
Attrib SCALED RADIUS OF GYRATION   4.089430176488705
Attrib SKEWNESS ABOUT_MAJOR   1.4752314775022684
Attrib SKEWNESS ABOUT_MINOR   7.111395739823702
Attrib KURTOSIS ABOUT_MAJOR   4.564636213194228
Attrib KURTOSIS ABOUT_MINOR   −6.458814594404419
Attrib HOLLOWS RATIO   −2.733100468261425
Sigmoid Node 8
Inputs   Weights
Threshold   −1.7779764668512468
Attrib COMPACTNESS   −5.153732853971927
Attrib CIRCULARITY   −4.48562799310374242
Attrib DISTANCE CIRCULARITY   −11.951132524957584
Attrib RADIUS RATIO   −5.653076589651818
Attrib PR.AXIS ASPECT RATIO   4.871472731159518
Attrib MAX.LENGTH ASPECT RATIO   −1.8582653899170485
Attrib SCATTER RATIO   0.09077186704047148
Attrib ELONGATEDNESS   −13.244287196522313
Attrib PR.AXIS RECTANGULARITY   −0.19935329489476916
Attrib MAX.LENGTH RECTANGULARITY   7.696519437572258
Attrib SCALED VARIANCE_MAJOR   1.7949704882662127
Attrib SCALED VARIANCE_MINOR   −1.9245192503576452
Attrib SCALED RADIUS OF GYRATION   1.831633950423218
Attrib SKEWNESS ABOUT_MAJOR   2.469001420894988
Attrib SKEWNESS ABOUT_MINOR   −3.2997413420148964
Attrib KURTOSIS ABOUT_MAJOR   2.55729178465954
Attrib KURTOSIS ABOUT_MINOR   13.759725029888797
Attrib HOLLOWS RATIO   −13.373141384108845
Sigmoid Node 9
Inputs   Weights
Threshold   −0.9654487920751307
Attrib COMPACTNESS   −4.408228161799323
Attrib CIRCULARITY   −5.035214396999458

Attrib DISTANCE CIRCULARITY   9.20220705020345
Attrib RADIUS RATIO   −3.375985299702563
Attrib PR.AXIS ASPECT RATIO   5.877828926604394
Attrib MAX.LENGTH ASPECT RATIO   −0.26801061180000263
Attrib SCATTER RATIO   −1.9422817263559364
Attrib ELONGATEDNESS   −0.03087245822882186
Attrib PR.AXIS RECTANGULARITY   −2.717879247806169
Attrib MAX.LENGTH RECTANGULARITY   4.712576457857456
Attrib SCALED VARIANCE_MAJOR   1.3494215740148645
Attrib SCALED VARIANCE_MINOR   −5.938287740189291
Attrib SCALED RADIUS OF GYRATION   12.888359022873908
Attrib SKEWNESS ABOUT_MAJOR   4.0486912669943464
Attrib SKEWNESS ABOUT_MINOR   3.087580239546576
Attrib KURTOSIS ABOUT_MAJOR   0.2734598933685528
Attrib KURTOSIS ABOUT_MINOR   −11.957358778136488
Attrib HOLLOWS RATIO   15.17466219020653
Sigmoid Node 10
Inputs   Weights
Threshold   3.469953094371017
Attrib COMPACTNESS   2.714596778345701
Attrib CIRCULARITY   −0.990656905440032
Attrib DISTANCE CIRCULARITY   1.3131724785264525
Attrib RADIUS RATIO   −0.6911506226009614
Attrib PR.AXIS ASPECT RATIO   3.6611011845749957
Attrib MAX.LENGTH ASPECT RATIO   1.14757675937839
Attrib SCATTER RATIO   1.2473983855453985
Attrib ELONGATEDNESS   −2.697880118560687
Attrib PR.AXIS RECTANGULARITY   1.3153824368304923
Attrib MAX.LENGTH RECTANGULARITY   −2.4979566055707263
Attrib SCALED VARIANCE_MAJOR   −0.5196845114428277
Attrib SCALED VARIANCE_MINOR   2.0318736397973405
Attrib SCALED RADIUS OF GYRATION   0.7176014825557375
Attrib SKEWNESS ABOUT_MAJOR   2.143929221346863
Attrib SKEWNESS ABOUT_MINOR   −3.3174810048172514
Attrib KURTOSIS ABOUT_MAJOR   −0.327256956833833
Attrib KURTOSIS ABOUT_MINOR   4.844455563343866
Attrib HOLLOWS RATIO   1.2833523216760614
Sigmoid Node 11
Inputs   Weights
Threshold   0.8904137523073976
Attrib COMPACTNESS   −10.389884854386814
Attrib CIRCULARITY   3.81146584366851
Attrib DISTANCE CIRCULARITY   −2.934417847782351
Attrib RADIUS RATIO   4.41962442491707
Attrib PR.AXIS ASPECT RATIO   0.5057517672902163
Attrib MAX.LENGTH ASPECT RATIO   4.9795300605822925
Attrib SCATTER RATIO   3.557299250577868
Attrib ELONGATEDNESS   −8.217141679513626
Attrib PR.AXIS RECTANGULARITY   −14.324225649278544

Attrib MAX.LENGTH RECTANGULARITY   −4.058621341026877
Attrib SCALED VARIANCE_MAJOR   2.188447734377029
Attrib SCALED VARIANCE_MINOR   1.6868553022063162
Attrib SCALED RADIUS OF GYRATION   6.582128695718032
Attrib SKEWNESS ABOUT_MAJOR   −1.2020188777979912
Attrib SKEWNESS ABOUT_MINOR   −4.339476600708723
Attrib KURTOSIS ABOUT_MAJOR   8.10043187366717
Attrib KURTOSIS ABOUT_MINOR   2.742575826214872
Attrib HOLLOWS RATIO   −4.510881043360613
Sigmoid Node 12
Inputs   Weights
Threshold   4.607535214532962
Attrib COMPACTNESS   8.95317641484776
Attrib CIRCULARITY   1.4353805667725008
Attrib DISTANCE CIRCULARITY   7.480240354004986
Attrib RADIUS RATIO   −8.853617388776083
Attrib PR.AXIS ASPECT RATIO   3.937328338841786
Attrib MAX.LENGTH ASPECT RATIO   7.984752578548545
Attrib SCATTER RATIO   −4.7877408780237305
Attrib ELONGATEDNESS   7.6728208252197785
Attrib PR.AXIS RECTANGULARITY   −3.9096420035351795
Attrib MAX.LENGTH RECTANGULARITY   12.1414837312998
Attrib SCALED VARIANCE_MAJOR   −4.821753309395207
Attrib SCALED VARIANCE_MINOR   −4.102955889945623
Attrib SCALED RADIUS OF GYRATION   −6.273973457269012
Attrib SKEWNESS ABOUT_MAJOR   15.105216408884992
Attrib SKEWNESS ABOUT_MINOR   −2.8707087858005758
Attrib KURTOSIS ABOUT_MAJOR   −1.1452863783443423
Attrib KURTOSIS ABOUT_MINOR   −5.106287513956369
Attrib HOLLOWS RATIO   7.798212312280585
Sigmoid Node 13
Inputs   Weights
Threshold   −12.02478904776815
Attrib COMPACTNESS   4.827141285290946
Attrib CIRCULARITY   −5.603623390317729
Attrib DISTANCE CIRCULARITY   4.191238180928496
Attrib RADIUS RATIO   7.940621627482844
Attrib PR.AXIS ASPECT RATIO   −6.048603216404124
Attrib MAX.LENGTH ASPECT RATIO   −6.048804274607317
Attrib SCATTER RATIO   −2.705243436025527
Attrib ELONGATEDNESS   8.96203060256381
Attrib PR.AXIS RECTANGULARITY   4.351037389021498
Attrib MAX.LENGTH RECTANGULARITY   −12.09371277740493
Attrib SCALED VARIANCE_MAJOR   2.837807182374902
Attrib SCALED VARIANCE_MINOR   0.12064111133625867
Attrib SCALED RADIUS OF GYRATION   1.4986548057349907
Attrib SKEWNESS ABOUT_MAJOR   −6.816279394122172
Attrib SKEWNESS ABOUT_MINOR   1.9461993806930946
Attrib KURTOSIS ABOUT_MAJOR   −0.05816769818498028

Attrib KURTOSIS ABOUT_MINOR   −1.781502056619209
Attrib HOLLOWS RATIO   −5.98227048390757
Sigmoid Node 14
Inputs   Weights
Threshold   −2.7776462781104088
Attrib COMPACTNESS   −1.690041056838537
Attrib CIRCULARITY   4.405847588473657
Attrib DISTANCE CIRCULARITY   1.7858845572105884
Attrib RADIUS RATIO   5.238207326270703
Attrib PR.AXIS ASPECT RATIO   −11.507766934590945
Attrib MAX.LENGTH ASPECT RATIO   5.997069179091769
Attrib SCATTER RATIO   −0.13711451754367643
Attrib ELONGATEDNESS   5.204602549964056
Attrib PR.AXIS RECTANGULARITY   3.264704548491093
Attrib MAX.LENGTH RECTANGULARITY   0.5011017141385777
Attrib SCALED VARIANCE_MAJOR   9.788668335910293
Attrib SCALED VARIANCE_MINOR   −3.3522829800441825
Attrib SCALED RADIUS OF GYRATION   −1.9559094943645678
Attrib SKEWNESS ABOUT_MAJOR   −6.48817196856551
Attrib SKEWNESS ABOUT_MINOR   −1.7978773281756828
Attrib KURTOSIS ABOUT_MAJOR   −0.9802846120570566
Attrib KURTOSIS ABOUT_MINOR   1.4070156250117185
Attrib HOLLOWS RATIO   2.321172561753785
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 4.94 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   407   96.6746 %
Incorrectly Classified Instances   14   3.3254 %
Kappa statistic   0.9556
Mean absolute error   0.0338

```
Root mean squared error                    0.1264
Relative absolute error                    9.0203 %
Root relative squared error               29.1876 %
Total Number of Instances          421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,905	0,013	0,960	0,905	0,931	0,910	0,956	0,940	opel
0,963	0,022	0,937	0,963	0,950	0,932	0,987	0,958	saab
1,000	0,003	0,991	1,000	0,995	0,994	1,000	1,000	bus
1,000	0,006	0,980	1,000	0,990	0,987	1,000	1,000	van
Weighted Avg.	0,967	0,011	0,967	0,967	0,966	0,956	0,986	0,974

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
95   7    1    2 |   a = opel
 4 104    0    0 |   b = saab
 0   0  109    0 |   c = bus
 0   0    0   99 |   d = van
```

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron −L 0.3 −M 0.2 −N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
```

MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −0.45101808143104904
Node 4   9.808265105681182
Node 5   −8.576838232382084
Node 6   13.622858125334254
Node 7   −9.906334008576684
Node 8   −20.737023341746056
Node 9   −11.516760420162688
Node 10   −5.131774438555767
Node 11   9.070843047360936
Node 12   0.5936866601933816
Node 13   −2.8500141557559786
Node 14   1.4910609203393372
Sigmoid Node 1
Inputs   Weights
Threshold   −5.280010761589177
Node 4   −9.415846976792144
Node 5   −10.826570755095887
Node 6   −12.914848224513547
Node 7   8.008470138944181
Node 8   8.622762737801528
Node 9   9.388479168676492
Node 10   −6.847332936668434
Node 11   −6.597023901359095
Node 12   −17.85034367500895
Node 13   11.700146684740425
Node 14   16.255365987545993
Sigmoid Node 2
Inputs   Weights
Threshold   2.218251444515336
Node 4   2.4280669513264024
Node 5   5.87913749864501
Node 6   −0.2725078761438608
Node 7   1.785039890324014

291

```
Node  8      7.386132872593098
Node  9     −5.6917640129381635
Node  10     5.604135487159798
Node  11    −0.8620688423399407
Node  12    −9.54170384233056
Node  13    −15.587721822185781
Node  14    −14.4476787749948
Sigmoid  Node  3
Inputs      Weights
Threshold      −6.756473263142466
Node  4     −5.743335152055298
Node  5     2.495917922529472
Node  6     −1.5299054257706841
Node  7     −3.088166525569866
Node  8     −3.2216972085427713
Node  9     4.0819446304133375
Node  10    −4.792085194616431
Node  11    −5.67353589735355
Node  12     16.457447764934457
Node  13     1.6881276186142964
Node  14     2.4284146596485736
Sigmoid  Node  4
Inputs      Weights
Threshold      −2.691824514544485
Attrib  COMPACTNESS      −6.3255859897695625
Attrib  CIRCULARITY      5.027066722014777
Attrib  DISTANCE  CIRCULARITY      −3.266555908144096
Attrib  RADIUS  RATIO      −2.783463759681511
Attrib  PR.AXIS  ASPECT  RATIO      −3.719711845532369
Attrib  MAX.LENGTH  ASPECT  RATIO      4.192934735293756
Attrib  SCATTER  RATIO      1.4000515187355358
Attrib  ELONGATEDNESS      3.955034984421508
Attrib  PR.AXIS  RECTANGULARITY      6.5304374998759975
Attrib  MAX.LENGTH  RECTANGULARITY      1.2348338908096406
Attrib  SCALED  VARIANCE_MAJOR      −0.9739318691907357
Attrib  SCALED  VARIANCE_MINOR      4.960542128705011
Attrib  SCALED  RADIUS  OF  GYRATION      3.872738045222828
Attrib  SKEWNESS  ABOUT_MAJOR      −0.04660801137479597
Attrib  SKEWNESS  ABOUT_MINOR      2.641492273609164
Attrib  KURTOSIS  ABOUT_MAJOR      1.5516418914159804
Attrib  KURTOSIS  ABOUT_MINOR      −13.394683320184281
Attrib  HOLLOWS  RATIO      −3.9163834635406394
Sigmoid  Node  5
Inputs      Weights
Threshold      2.247632345218041
Attrib  COMPACTNESS      5.025646417145672
Attrib  CIRCULARITY      0.37163620820043924
Attrib  DISTANCE  CIRCULARITY      −2.1426564037642564
Attrib  RADIUS  RATIO      1.95719411727Ø0415
```

Attrib PR.AXIS ASPECT RATIO   12.15565676342995
Attrib MAX.LENGTH ASPECT RATIO   2.591346790837402
Attrib SCATTER RATIO   −4.076795017229489
Attrib ELONGATEDNESS   −2.16100005183082
Attrib PR.AXIS RECTANGULARITY   −5.01124583605576
Attrib MAX.LENGTH RECTANGULARITY   2.291624837985834
Attrib SCALED VARIANCE_MAJOR   0.358944972222916444
Attrib SCALED VARIANCE_MINOR   −3.5559297196064428
Attrib SCALED RADIUS OF GYRATION   −4.649894130639622
Attrib SKEWNESS ABOUT_MAJOR   4.187525270751066
Attrib SKEWNESS ABOUT_MINOR   −1.094199372083056
Attrib KURTOSIS ABOUT_MAJOR   −4.757010498810346
Attrib KURTOSIS ABOUT_MINOR   4.10203088920615
Attrib HOLLOWS RATIO   −1.4173341060095583
Sigmoid Node 6
Inputs   Weights
Threshold   1.1437710479060654
Attrib COMPACTNESS   −2.1810315359474877
Attrib CIRCULARITY   7.564607376688799
Attrib DISTANCE CIRCULARITY   −1.4582434732081102
Attrib RADIUS RATIO   −1.4451614046675327
Attrib PR.AXIS ASPECT RATIO   0.19170701252444575
Attrib MAX.LENGTH ASPECT RATIO   −5.8055081403725275
Attrib SCATTER RATIO   4.004982381405682
Attrib ELONGATEDNESS   1.39945506784528
Attrib PR.AXIS RECTANGULARITY   4.8765125494965815
Attrib MAX.LENGTH RECTANGULARITY   −5.2016658701515075
Attrib SCALED VARIANCE_MAJOR   0.13666212434993644
Attrib SCALED VARIANCE_MINOR   8.86513082677276
Attrib SCALED RADIUS OF GYRATION   −0.6876779057629322
Attrib SKEWNESS ABOUT_MAJOR   −1.600856327471927
Attrib SKEWNESS ABOUT_MINOR   4.360535469203715
Attrib KURTOSIS ABOUT_MAJOR   3.2261820633088756
Attrib KURTOSIS ABOUT_MINOR   25.41547959896961
Attrib HOLLOWS RATIO   −21.2948585458031
Sigmoid Node 7
Inputs   Weights
Threshold   2.3843955910481407
Attrib COMPACTNESS   9.632821220384516
Attrib CIRCULARITY   −0.8497540152202252
Attrib DISTANCE CIRCULARITY   −3.3345153827324117
Attrib RADIUS RATIO   −5.829226368442724
Attrib PR.AXIS ASPECT RATIO   −0.19130571181831182
Attrib MAX.LENGTH ASPECT RATIO   2.381211897855329
Attrib SCATTER RATIO   3.8714465568101457
Attrib ELONGATEDNESS   2.266871787296444
Attrib PR.AXIS RECTANGULARITY   0.038099366704150615
Attrib MAX.LENGTH RECTANGULARITY   −0.4145322989034906
Attrib SCALED VARIANCE_MAJOR   −0.3437908461255358

Attrib SCALED VARIANCE_MINOR   3.826235638167751
Attrib SCALED RADIUS OF GYRATION   4.089430176488705
Attrib SKEWNESS ABOUT_MAJOR   1.4752314775022684
Attrib SKEWNESS ABOUT_MINOR   7.111395739823702
Attrib KURTOSIS ABOUT_MAJOR   4.564636213194228
Attrib KURTOSIS ABOUT_MINOR   −6.458814594404419
Attrib HOLLOWS RATIO   −2.733100468261425
Sigmoid Node 8
Inputs   Weights
Threshold   −1.7779764668512468
Attrib COMPACTNESS   −5.153732853971927
Attrib CIRCULARITY   −4.485627993103742
Attrib DISTANCE CIRCULARITY   −11.951132524957584
Attrib RADIUS RATIO   −5.653076589651818
Attrib PR.AXIS ASPECT RATIO   4.871472731159518
Attrib MAX.LENGTH ASPECT RATIO   −1.8582653899170485
Attrib SCATTER RATIO   0.09077186704047148
Attrib ELONGATEDNESS   −13.244287196522313
Attrib PR.AXIS RECTANGULARITY   −0.19935329489476916
Attrib MAX.LENGTH RECTANGULARITY   7.696519437572258
Attrib SCALED VARIANCE_MAJOR   1.7949704882662127
Attrib SCALED VARIANCE_MINOR   −1.9245192503576452
Attrib SCALED RADIUS OF GYRATION   1.831633950423218
Attrib SKEWNESS ABOUT_MAJOR   2.469001420894988
Attrib SKEWNESS ABOUT_MINOR   −3.2997413420148964
Attrib KURTOSIS ABOUT_MAJOR   2.55729178465954
Attrib KURTOSIS ABOUT_MINOR   13.759725029888797
Attrib HOLLOWS RATIO   −13.373141384108845
Sigmoid Node 9
Inputs   Weights
Threshold   −0.9654487920751307
Attrib COMPACTNESS   −4.408228161799323
Attrib CIRCULARITY   −5.035214396999458
Attrib DISTANCE CIRCULARITY   9.20220705020345
Attrib RADIUS RATIO   −3.375985299702563
Attrib PR.AXIS ASPECT RATIO   5.877828926604394
Attrib MAX.LENGTH ASPECT RATIO   −0.26801061180000263
Attrib SCATTER RATIO   −1.9422817263559364
Attrib ELONGATEDNESS   −0.03087245822882186
Attrib PR.AXIS RECTANGULARITY   −2.717879247806169
Attrib MAX.LENGTH RECTANGULARITY   4.712576457857456
Attrib SCALED VARIANCE_MAJOR   1.3494215740148645
Attrib SCALED VARIANCE_MINOR   −5.938287740189291
Attrib SCALED RADIUS OF GYRATION   12.888359022873908
Attrib SKEWNESS ABOUT_MAJOR   4.0486912669943464
Attrib SKEWNESS ABOUT_MINOR   3.087580239546576
Attrib KURTOSIS ABOUT_MAJOR   0.2734598933685528
Attrib KURTOSIS ABOUT_MINOR   −11.957358778136488
Attrib HOLLOWS RATIO   15.17466219020653

Sigmoid Node 10
Inputs   Weights
Threshold   3.469953094371017
Attrib COMPACTNESS   2.714596778345701
Attrib CIRCULARITY   −0.990656905440032
Attrib DISTANCE CIRCULARITY   1.3131724785264525
Attrib RADIUS RATIO   −0.6911506226009614
Attrib PR.AXIS ASPECT RATIO   3.6611011845749957
Attrib MAX.LENGTH ASPECT RATIO   1.14757675937839
Attrib SCATTER RATIO   1.2473983855453985
Attrib ELONGATEDNESS   −2.697880118560687
Attrib PR.AXIS RECTANGULARITY   1.3153824368304923
Attrib MAX.LENGTH RECTANGULARITY   −2.4979566055707263
Attrib SCALED VARIANCE_MAJOR   −0.5196845114428277
Attrib SCALED VARIANCE_MINOR   2.0318736397973405
Attrib SCALED RADIUS OF GYRATION   0.7176014825557375
Attrib SKEWNESS ABOUT_MAJOR   2.143929221346863
Attrib SKEWNESS ABOUT_MINOR   −3.3174810048172514
Attrib KURTOSIS ABOUT_MAJOR   −0.327256956833833
Attrib KURTOSIS ABOUT_MINOR   4.844455563343866
Attrib HOLLOWS RATIO   1.2833523216760614
Sigmoid Node 11
Inputs   Weights
Threshold   0.8904137523073976
Attrib COMPACTNESS   −10.389884854386814
Attrib CIRCULARITY   3.811465843668513
Attrib DISTANCE CIRCULARITY   −2.934417847782351
Attrib RADIUS RATIO   4.41962442491707
Attrib PR.AXIS ASPECT RATIO   0.5057517672902163
Attrib MAX.LENGTH ASPECT RATIO   4.9795300605822925
Attrib SCATTER RATIO   3.557299250577868
Attrib ELONGATEDNESS   −8.217141679513626
Attrib PR.AXIS RECTANGULARITY   −14.324225649278544
Attrib MAX.LENGTH RECTANGULARITY   −4.058621341026877
Attrib SCALED VARIANCE_MAJOR   2.188447734377029
Attrib SCALED VARIANCE_MINOR   1.6868553022063162
Attrib SCALED RADIUS OF GYRATION   6.582128695718032
Attrib SKEWNESS ABOUT_MAJOR   −1.2020188777979912
Attrib SKEWNESS ABOUT_MINOR   −4.339476600708723
Attrib KURTOSIS ABOUT_MAJOR   8.10043187366717
Attrib KURTOSIS ABOUT_MINOR   2.742575826214872
Attrib HOLLOWS RATIO   −4.510881043360613
Sigmoid Node 12
Inputs   Weights
Threshold   4.607535214532962
Attrib COMPACTNESS   8.95317641484776
Attrib CIRCULARITY   1.435805667725008
Attrib DISTANCE CIRCULARITY   7.480240354004986
Attrib RADIUS RATIO   −8.853617388776083

Attrib PR.AXIS ASPECT RATIO   3.937328338841786
Attrib MAX.LENGTH ASPECT RATIO   7.984752578548545
Attrib SCATTER RATIO   −4.7877408780237305
Attrib ELONGATEDNESS   7.6728208252197785
Attrib PR.AXIS RECTANGULARITY   −3.9096420035351795
Attrib MAX.LENGTH RECTANGULARITY   12.1414837312998
Attrib SCALED VARIANCE_MAJOR   −4.821753309395207
Attrib SCALED VARIANCE_MINOR   −4.102955889945623
Attrib SCALED RADIUS OF GYRATION   −6.273973457269012
Attrib SKEWNESS ABOUT_MAJOR   15.105216408884992
Attrib SKEWNESS ABOUT_MINOR   −2.8707087858005758
Attrib KURTOSIS ABOUT_MAJOR   −1.1452863783443423
Attrib KURTOSIS ABOUT_MINOR   −5.106287513956369
Attrib HOLLOWS RATIO   7.798212312280585
Sigmoid Node 13
Inputs   Weights
Threshold   −12.02478904776815
Attrib COMPACTNESS   4.827141285290946
Attrib CIRCULARITY   −5.603623390317729
Attrib DISTANCE CIRCULARITY   4.191238180928496
Attrib RADIUS RATIO   7.940621627482844
Attrib PR.AXIS ASPECT RATIO   −6.048603216404124
Attrib MAX.LENGTH ASPECT RATIO   −6.048804274607317
Attrib SCATTER RATIO   −2.705243436025527
Attrib ELONGATEDNESS   8.96203060256381
Attrib PR.AXIS RECTANGULARITY   4.351037389021498
Attrib MAX.LENGTH RECTANGULARITY   −12.09371277740493
Attrib SCALED VARIANCE_MAJOR   2.837807182374902
Attrib SCALED VARIANCE_MINOR   0.12064111133625867
Attrib SCALED RADIUS OF GYRATION   1.4986548057349907
Attrib SKEWNESS ABOUT_MAJOR   −6.816279394122172
Attrib SKEWNESS ABOUT_MINOR   1.9461993806930946
Attrib KURTOSIS ABOUT_MAJOR   −0.05816769818498028
Attrib KURTOSIS ABOUT_MINOR   −1.781502056619209
Attrib HOLLOWS RATIO   −5.98227048390757
Sigmoid Node 14
Inputs   Weights
Threshold   −2.7776462781104088
Attrib COMPACTNESS   −1.690041056838537
Attrib CIRCULARITY   4.40847588473657
Attrib DISTANCE CIRCULARITY   1.7858845572105884
Attrib RADIUS RATIO   5.238207326270703
Attrib PR.AXIS ASPECT RATIO   −11.507766934590945
Attrib MAX.LENGTH ASPECT RATIO   5.997069179091769
Attrib SCATTER RATIO   −0.13711451754367643
Attrib ELONGATEDNESS   5.204602549964056
Attrib PR.AXIS RECTANGULARITY   3.264704548491093
Attrib MAX.LENGTH RECTANGULARITY   0.5011017141385777
Attrib SCALED VARIANCE_MAJOR   9.788668335910293

Attrib SCALED VARIANCE_MINOR   −3.3522829800441825
Attrib SCALED RADIUS OF GYRATION   −1.9559094943645678
Attrib SKEWNESS ABOUT_MAJOR   −6.48817196856551
Attrib SKEWNESS ABOUT_MINOR   −1.7978773281756828
Attrib KURTOSIS ABOUT_MAJOR   −0.9802846120570566
Attrib KURTOSIS ABOUT_MINOR   1.4070156250117185
Attrib HOLLOWS RATIO   2.321172561753785
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3.53 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   737   87.1158 %
Incorrectly Classified Instances   109   12.8842 %
Kappa statistic   0.8281
Mean absolute error   0.0756
Root mean squared error   0.2292
Relative absolute error   20.1615 %
Root relative squared error   52.9328 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,759	0,066	0,793	0,759	0,776	0,703	0,899	0,796	opel
0,788	0,068	0,799	0,788	0,794	0,723	0,941	0,826	saab
0,982	0,021	0,943	0,982	0,962	0,949	0,999	0,998	bus

0,960	0,017	0,946	0,960	0,953	0,938	0,994
0,979	van					
Weighted Avg.	0,871	0,043	0,869	0,871	0,870	
0,827	0,958	0,899				

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
161  39   3    9 |    a = opel
38  171   6    2 |    b = saab
4    0  214    0 |    c = bus
0    4    4  191 |    d = van
```

20 20ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.8167359042624716

Node 4   0.7201679423174366
Node 5   1.3841951966322563
Node 6   −7.130128778016128
Node 7   −3.380685862136203
Sigmoid Node 1
Inputs   Weights
Threshold   −14.746290748965537
Node 4   13.625090249344636
Node 5   9.56256693837647
Node 6   −3.294491885139672
Node 7   3.0503440794488244
Sigmoid Node 2
Inputs   Weights
Threshold   1.5137249974078937
Node 4   −5.919640913139517
Node 5   −17.155541465210195
Node 6   13.196800892476722
Node 7   −16.788803544690825
Sigmoid Node 3
Inputs   Weights
Threshold   −1.6351603368330205
Node 4   −20.661720187730882
Node 5   −1.9049500444717893
Node 6   0.004367919628349551
Node 7   10.087056114197022
Sigmoid Node 4
Inputs   Weights
Threshold   −8.824829910474444
Attrib COMPACTNESS   −3.2648125444764413
Attrib CIRCULARITY   −7.324538748815495
Attrib DISTANCE CIRCULARITY   −7.223619393861229
Attrib RADIUS RATIO   13.635492256743454
Attrib PR.AXIS ASPECT RATIO   −14.024473879857291
Attrib MAX.LENGTH ASPECT RATIO   −10.532742133491197
Attrib SCATTER RATIO   1.4756441176277426
Attrib ELONGATEDNESS   −3.35305407882857
Attrib PR.AXIS RECTANGULARITY   4.596795607920066
Attrib MAX.LENGTH RECTANGULARITY   −11.86207805018274
Attrib SCALED VARIANCE_MAJOR   12.990726818040491
Attrib SCALED VARIANCE_MINOR   2.33855184128498
Attrib SCALED RADIUS OF GYRATION   12.039713922208474
Attrib SKEWNESS ABOUT_MAJOR   −15.135555454071532
Attrib SKEWNESS ABOUT_MINOR   2.9212207047355627
Attrib KURTOSIS ABOUT_MAJOR   0.4675455678447934
Attrib KURTOSIS ABOUT_MINOR   1.3269322444574214
Attrib HOLLOWS RATIO   −4.795185534015492
Sigmoid Node 5
Inputs   Weights
Threshold   −12.139526558988322

Attrib COMPACTNESS   −1.335834929511513
Attrib CIRCULARITY   −7.368456497787665
Attrib DISTANCE CIRCULARITY   −13.893600271108797
Attrib RADIUS RATIO   9.503386698198355
Attrib PR.AXIS ASPECT RATIO   −4.279488815874942
Attrib MAX.LENGTH ASPECT RATIO   −4.005777437237249
Attrib SCATTER RATIO   3.00396547524985
Attrib ELONGATEDNESS   −0.03159070628926462
Attrib PR.AXIS RECTANGULARITY   10.087399132052933
Attrib MAX.LENGTH RECTANGULARITY   −3.845976177988714
Attrib SCALED VARIANCE_MAJOR   −3.4933180474529344
Attrib SCALED VARIANCE_MINOR   2.6652789144883156
Attrib SCALED RADIUS OF GYRATION   1.7484397090094452
Attrib SKEWNESS ABOUT_MAJOR   −12.05095606445499
Attrib SKEWNESS ABOUT_MINOR   −1.6111091780790519
Attrib KURTOSIS ABOUT_MAJOR   1.110987968120228
Attrib KURTOSIS ABOUT_MINOR   −5.990076090182615
Attrib HOLLOWS RATIO   −0.6591350628183765
Sigmoid Node 6
Inputs   Weights
Threshold   5.50871245825465
Attrib COMPACTNESS   0.16808739237612014
Attrib CIRCULARITY   1.1531386308385776
Attrib DISTANCE CIRCULARITY   −8.442926947763256
Attrib RADIUS RATIO   −13.705162762141581
Attrib PR.AXIS ASPECT RATIO   20.612399513199055
Attrib MAX.LENGTH ASPECT RATIO   −8.189150403963088
Attrib SCATTER RATIO   −0.7114802970118079
Attrib ELONGATEDNESS   −11.01478483747883
Attrib PR.AXIS RECTANGULARITY   −0.7784966395991829
Attrib MAX.LENGTH RECTANGULARITY   −1.495056402395307
Attrib SCALED VARIANCE_MAJOR   2.1958882458877533
Attrib SCALED VARIANCE_MINOR   2.9890215882895332
Attrib SCALED RADIUS OF GYRATION   −0.5069750049212839
Attrib SKEWNESS ABOUT_MAJOR   8.340083751842915
Attrib SKEWNESS ABOUT_MINOR   −1.3645401057046107
Attrib KURTOSIS ABOUT_MAJOR   0.08743644127248132
Attrib KURTOSIS ABOUT_MINOR   5.104510642215371
Attrib HOLLOWS RATIO   −2.0317457386395787
Sigmoid Node 7
Inputs   Weights
Threshold   −3.0605305012601076
Attrib COMPACTNESS   10.627045973810715
Attrib CIRCULARITY   −17.53148686633405
Attrib DISTANCE CIRCULARITY   10.882098068295024
Attrib RADIUS RATIO   1.4984845310564177
Attrib PR.AXIS ASPECT RATIO   −3.9461548098044874
Attrib MAX.LENGTH ASPECT RATIO   −0.27327386889533856
Attrib SCATTER RATIO   −5.4314619166725295

Attrib ELONGATEDNESS   17.17808334195522
Attrib PR.AXIS RECTANGULARITY   6.251901261057587
Attrib MAX.LENGTH RECTANGULARITY   11.216754592132794
Attrib SCALED VARIANCE_MAJOR   5.2805393342113085
Attrib SCALED VARIANCE_MINOR   −10.237270782312455
Attrib SCALED RADIUS OF GYRATION   8.453586179135767
Attrib SKEWNESS ABOUT_MAJOR   0.7809782739305624
Attrib SKEWNESS ABOUT_MINOR   −0.6088055872274021
Attrib KURTOSIS ABOUT_MAJOR   −2.215594243039829
Attrib KURTOSIS ABOUT_MINOR   −11.916098692316424
Attrib HOLLOWS RATIO   10.506367538931604
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.92 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   363   86.2233 %
Incorrectly Classified Instances   58   13.7767 %
Kappa statistic   0.8164
Mean absolute error   0.1105
Root mean squared error   0.2243
Relative absolute error   29.4913 %
Root relative squared error   51.8039 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,895	0,149	0,667	0,895	0,764	0,684	0,927	0,729	opel

0,583	0,032	0,863	0,583	0,696	0,636	0,933
0,846	saab					
0,982	0,000	1,000	0,982	0,991	0,988	0,997
0,996	bus					
1,000	0,003	0,990	1,000	0,995	0,993	1,000
1,000	van					
Weighted Avg.	0,862	0,046	0,879	0,862	0,860	
0,823	0,964	0,892				

=== Confusion Matrix ===

```
 a   b   c   d   <-- classified as
94  10   0   1 |   a = opel
45  63   0   0 |   b = saab
 2   0 107   0 |   c = bus
 0   0   0  99 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   0.8167359042624716
Node 4   0.7201679423174366
Node 5   1.3841951966322563
Node 6   −7.130128778016128
Node 7   −3.380685862136203
Sigmoid Node 1
Inputs   Weights
Threshold   −14.746290748965537
Node 4   13.625090249344636
Node 5   9.56256693837647
Node 6   −3.294491885139672
Node 7   3.0503440794488244
Sigmoid Node 2
Inputs   Weights
Threshold   1.5137249974078937
Node 4   −5.919640913139517
Node 5   −17.155541465210195
Node 6   13.196800892476722
Node 7   −16.788803544690825
Sigmoid Node 3
Inputs   Weights
Threshold   −1.6351603368330205
Node 4   −20.661720187730882
Node 5   −1.9049500444717893
Node 6   0.004367919628349551
Node 7   10.087056114197022
Sigmoid Node 4
Inputs   Weights
Threshold   −8.824829910474444
Attrib COMPACTNESS   −3.2648125444764413
Attrib CIRCULARITY   −7.324538748815495
Attrib DISTANCE CIRCULARITY   −7.223619393861229
Attrib RADIUS RATIO   13.635492256743454
Attrib PR.AXIS ASPECT RATIO   −14.024473879857291
Attrib MAX.LENGTH ASPECT RATIO   −10.532742133491197
Attrib SCATTER RATIO   1.4756441176277426
Attrib ELONGATEDNESS   −3.35305407882857
Attrib PR.AXIS RECTANGULARITY   4.596795607920066
Attrib MAX.LENGTH RECTANGULARITY   −11.86207805018274
Attrib SCALED VARIANCE_MAJOR   12.990726818040491
Attrib SCALED VARIANCE_MINOR   2.33855184128498
Attrib SCALED RADIUS OF GYRATION   12.039713922208474
Attrib SKEWNESS ABOUT_MAJOR   −15.135555454071532
Attrib SKEWNESS ABOUT_MINOR   2.9212207047355627

Attrib KURTOSIS ABOUT_MAJOR   0.4675455678447934
Attrib KURTOSIS ABOUT_MINOR   1.3269322444574214
Attrib HOLLOWS RATIO   −4.795185534015492
Sigmoid Node 5
Inputs   Weights
Threshold   −12.139526558988322
Attrib COMPACTNESS   −1.335834929511513
Attrib CIRCULARITY   −7.368456497787665
Attrib DISTANCE CIRCULARITY   −13.893600271108797
Attrib RADIUS RATIO   9.503386698198355
Attrib PR.AXIS ASPECT RATIO   −4.279488815874942
Attrib MAX.LENGTH ASPECT RATIO   −4.005777437237249
Attrib SCATTER RATIO   3.00396547524985
Attrib ELONGATEDNESS   −0.03159070628926462
Attrib PR.AXIS RECTANGULARITY   10.087399132052933
Attrib MAX.LENGTH RECTANGULARITY   −3.845976177988714
Attrib SCALED VARIANCE_MAJOR   −3.4933180474529344
Attrib SCALED VARIANCE_MINOR   2.6652789144883156
Attrib SCALED RADIUS OF GYRATION   1.7484397090094452
Attrib SKEWNESS ABOUT_MAJOR   −12.05095606445499
Attrib SKEWNESS ABOUT_MINOR   −1.6111091780790519
Attrib KURTOSIS ABOUT_MAJOR   1.110987968120228
Attrib KURTOSIS ABOUT_MINOR   −5.990076090182615
Attrib HOLLOWS RATIO   −0.6591350628183765
Sigmoid Node 6
Inputs   Weights
Threshold   5.50871245825465
Attrib COMPACTNESS   0.16808739237612014
Attrib CIRCULARITY   1.1531386308385776
Attrib DISTANCE CIRCULARITY   −8.442926947763256
Attrib RADIUS RATIO   −13.705162762141581
Attrib PR.AXIS ASPECT RATIO   20.612399513199055
Attrib MAX.LENGTH ASPECT RATIO   −8.189150403963088
Attrib SCATTER RATIO   −0.7114802970118079
Attrib ELONGATEDNESS   −11.01478483747883
Attrib PR.AXIS RECTANGULARITY   −0.7784966395991829
Attrib MAX.LENGTH RECTANGULARITY   −1.495056402395307
Attrib SCALED VARIANCE_MAJOR   2.1958882458877533
Attrib SCALED VARIANCE_MINOR   2.9890215882895332
Attrib SCALED RADIUS OF GYRATION   −0.5069750049212839
Attrib SKEWNESS ABOUT_MAJOR   8.340083751842915
Attrib SKEWNESS ABOUT_MINOR   −1.3645401057046107
Attrib KURTOSIS ABOUT_MAJOR   0.08743644127248132
Attrib KURTOSIS ABOUT_MINOR   5.104510642215371
Attrib HOLLOWS RATIO   −2.0317457386395787
Sigmoid Node 7
Inputs   Weights
Threshold   −3.0605305012601076
Attrib COMPACTNESS   10.627045973810715

```
Attrib CIRCULARITY        −17.53148686633405
Attrib DISTANCE CIRCULARITY       10.882098068295024
Attrib RADIUS RATIO       1.4984845310564177
Attrib PR.AXIS ASPECT RATIO       −3.9461548098044874
Attrib MAX.LENGTH ASPECT RATIO       −0.27327386889533856
Attrib SCATTER RATIO       −5.4314619166725295
Attrib ELONGATEDNESS      17.17808334195522
Attrib PR.AXIS RECTANGULARITY       6.251901261057587
Attrib MAX.LENGTH RECTANGULARITY       11.216754592132794
Attrib SCALED VARIANCE_MAJOR       5.2805393342113085
Attrib SCALED VARIANCE_MINOR       −10.237270782312455
Attrib SCALED RADIUS OF GYRATION       8.453586179135767
Attrib SKEWNESS ABOUT_MAJOR       0.7809782739305624
Attrib SKEWNESS ABOUT_MINOR       −0.6088055872274021
Attrib KURTOSIS ABOUT_MAJOR       −2.215594243039829
Attrib KURTOSIS ABOUT_MINOR       −11.916098692316424
Attrib HOLLOWS RATIO       10.506367538931604
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3
```

Time taken to build model: 3.03 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

```
Correctly Classified Instances         685               80.9693 %
Incorrectly Classified Instances       161               19.0307 %
Kappa statistic                          0.7463
Mean absolute error                      0.1283
Root mean squared error                  0.2586
Relative absolute error                 34.2365 %
Root relative squared error             59.7309 %
Total Number of Instances              846
```

=== Detailed Accuracy By Class ===

```
TP Rate   FP Rate   Precision   Recall    F-Measure   MCC       ROC Area
PRC Area   Class
0,830     0,183     0,603       0,830     0,698       0,590     0,884
0,621       opel
0,521     0,046     0,796       0,521     0,630       0,555     0,918
0,773       saab
0,968     0,011     0,968       0,968     0,968       0,957     0,997
0,993       bus
0,930     0,014     0,954       0,930     0,941       0,924     0,993
0,965       van
Weighted Avg.       0,810     0,064     0,829       0,810     0,807
0,754     0,947       0,837
```

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
176   26    3    7 |    a = opel
101  113    1    2 |    b = saab
6     1  211    0 |    c = bus
9     2    3  185 |    d = van
```

21 21ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:          weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:        vehicle
Instances:       421
Attributes:      19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
```

HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   5.118457226217541
Node 4   −9.453736821856069
Node 5   −10.575897496545954
Node 6   3.220179551181998
Node 7   14.020100756258401
Node 8   −4.937847456738676
Node 9   5.430343039540839
Node 10   −1.1079869518408303
Node 11   −4.461995493966521
Node 12   7.668195452010802
Node 13   −7.424606608747503
Node 14   −3.3202991752495765
Node 15   −4.784097548298071
Node 16   −5.994168457812842
Node 17   0.5367467577372094
Node 18   16.863805558248405
Node 19   −18.528572795551472
Node 20   −8.197882854998028
Node 21   8.20103715690704
Sigmoid Node 1
Inputs   Weights
Threshold   0.5200977882627926
Node 4   7.914492351067302
Node 5   7.482733232412428
Node 6   −7.40215291487444
Node 7   −17.52605352412097
Node 8   −1.781253513005057
Node 9   −9.838775504149316
Node 10   −11.51792733113211
Node 11   0.11518456611418791
Node 12   −3.7087578626430884
Node 13   −0.1609813361090018
Node 14   13.837071281215554
Node 15   −5.043183118240201
Node 16   7.14945845604571
Node 17   10.220309092853181
Node 18   1.7386371422502183
Node 19   6.331430963371826
Node 20   −13.85348695113393
Node 21   −9.50848880855153
Sigmoid Node 2

307

Inputs   Weights
Threshold   −3.5751803153144954
Node 4   0.8772072074178143
Node 5   −3.1041128818714427
Node 6   1.824968144597458
Node 7   4.960031955812628
Node 8   −4.190879566670431
Node 9   0.5475683941215556
Node 10   −5.837025795191339
Node 11   −4.595517598868664
Node 12   −0.3398973059211303
Node 13   3.043677878307701
Node 14   −12.418945491419997
Node 15   7.843948445308788
Node 16   −4.726493766730796
Node 17   −12.637380923817817
Node 18   −7.465619327586651
Node 19   7.102652405138661
Node 20   0.8709431228702262
Node 21   7.200561101470899
Sigmoid Node 3
Inputs   Weights
Threshold   −2.765598851192274
Node 4   2.4271592230798547
Node 5   3.2974150752626357
Node 6   −7.4253910438106585
Node 7   −3.2012627198224863
Node 8   6.810853468545203
Node 9   −5.738536064493615
Node 10   9.742372940568371
Node 11   −3.654291090141927
Node 12   −5.7480273494142
Node 13   −0.10014208582138645
Node 14   −1.3178381713745755
Node 15   1.7691408964425495
Node 16   −0.8971903304097508
Node 17   1.2985328301824142
Node 18   −2.072757188484465
Node 19   −2.239576689731523
Node 20   8.014970531145778
Node 21   −6.137035381485096
Sigmoid Node 4
Inputs   Weights
Threshold   2.332142202420157
Attrib COMPACTNESS   9.493484019505123
Attrib CIRCULARITY   −4.263148066830872
Attrib DISTANCE CIRCULARITY   −5.172627487241854
Attrib RADIUS RATIO   1.5484435253492694
Attrib PR.AXIS ASPECT RATIO   2.9055185533320294

Attrib MAX.LENGTH ASPECT RATIO   −2.7841529917877597
Attrib SCATTER RATIO   2.6147496663664485
Attrib ELONGATEDNESS   1.2748310537601546
Attrib PR.AXIS RECTANGULARITY   3.6597982814337437
Attrib MAX.LENGTH RECTANGULARITY   0.1621106885371905
Attrib SCALED VARIANCE_MAJOR   −3.8528056041336805
Attrib SCALED VARIANCE_MINOR   2.5010397915984646
Attrib SCALED RADIUS OF GYRATION   0.42274497442840553
Attrib SKEWNESS ABOUT_MAJOR   0.4782894934439875
Attrib SKEWNESS ABOUT_MINOR   4.753552647800254
Attrib KURTOSIS ABOUT_MAJOR   2.601743068430645
Attrib KURTOSIS ABOUT_MINOR   −3.5639525529278684
Attrib HOLLOWS RATIO   −5.310498480791305
Sigmoid Node 5
Inputs   Weights
Threshold   0.031963455480263823
Attrib COMPACTNESS   6.640506178540579
Attrib CIRCULARITY   −5.075626257159464
Attrib DISTANCE CIRCULARITY   10.24872608998464
Attrib RADIUS RATIO   −3.38506019426243
Attrib PR.AXIS ASPECT RATIO   3.19613091726294
Attrib MAX.LENGTH ASPECT RATIO   −3.1891965323877534
Attrib SCATTER RATIO   −3.5558719226128868
Attrib ELONGATEDNESS   8.916440297622431
Attrib PR.AXIS RECTANGULARITY   3.09406101864555
Attrib MAX.LENGTH RECTANGULARITY   1.7777205820020574
Attrib SCALED VARIANCE_MAJOR   2.431913961103184
Attrib SCALED VARIANCE_MINOR   −5.565386509447588
Attrib SCALED RADIUS OF GYRATION   3.7683294100215683
Attrib SKEWNESS ABOUT_MAJOR   7.288618871143263
Attrib SKEWNESS ABOUT_MINOR   −1.8889537642000993
Attrib KURTOSIS ABOUT_MAJOR   1.2378805955406935
Attrib KURTOSIS ABOUT_MINOR   −7.522154937581681
Attrib HOLLOWS RATIO   10.649013084736362
Sigmoid Node 6
Inputs   Weights
Threshold   1.6917552260218596
Attrib COMPACTNESS   0.05660846644072747
Attrib CIRCULARITY   −0.3215934133833412
Attrib DISTANCE CIRCULARITY   −2.9831217151773326
Attrib RADIUS RATIO   1.3966488463225797
Attrib PR.AXIS ASPECT RATIO   0.2835714542853603
Attrib MAX.LENGTH ASPECT RATIO   1.8939212906133653
Attrib SCATTER RATIO   1.8126816608109002
Attrib ELONGATEDNESS   −6.002013143501743
Attrib PR.AXIS RECTANGULARITY   −2.043343901043002
Attrib MAX.LENGTH RECTANGULARITY   −2.662540987343915
Attrib SCALED VARIANCE_MAJOR   2.180447810879724
Attrib SCALED VARIANCE_MINOR   1.7484150719671359

Attrib SCALED RADIUS OF GYRATION   0.7328762826815887
Attrib SKEWNESS ABOUT_MAJOR   −1.8480396757811346
Attrib SKEWNESS ABOUT_MINOR   2.284100714555352
Attrib KURTOSIS ABOUT_MAJOR   −3.875993947203483
Attrib KURTOSIS ABOUT_MINOR   7.1001162443902945
Attrib HOLLOWS RATIO   −0.11605214177386622
Sigmoid Node 7
Inputs   Weights
Threshold   −2.5810116058820407
Attrib COMPACTNESS   0.6057145868246075
Attrib CIRCULARITY   4.8289090828216725
Attrib DISTANCE CIRCULARITY   −2.271634283997203
Attrib RADIUS RATIO   3.44479023210901
Attrib PR.AXIS ASPECT RATIO   2.7616681784995136
Attrib MAX.LENGTH ASPECT RATIO   −3.5168960320973004
Attrib SCATTER RATIO   1.8727549334241889
Attrib ELONGATEDNESS   −4.393602434693566
Attrib PR.AXIS RECTANGULARITY   3.6908267880142764
Attrib MAX.LENGTH RECTANGULARITY   1.7834943521568696
Attrib SCALED VARIANCE_MAJOR   0.30416411206500216
Attrib SCALED VARIANCE_MINOR   4.203035623433049
Attrib SCALED RADIUS OF GYRATION   −2.9921319637184647
Attrib SKEWNESS ABOUT_MAJOR   −1.5484754191650911
Attrib SKEWNESS ABOUT_MINOR   −1.511620954710763
Attrib KURTOSIS ABOUT_MAJOR   2.490937565680682
Attrib KURTOSIS ABOUT_MINOR   16.72909601236827
Attrib HOLLOWS RATIO   −13.086239875717284
Sigmoid Node 8
Inputs   Weights
Threshold   −3.691394838832959
Attrib COMPACTNESS   5.469068955615409
Attrib CIRCULARITY   −1.20139448034875
Attrib DISTANCE CIRCULARITY   −1.1924856335187306
Attrib RADIUS RATIO   −1.0713467412029318
Attrib PR.AXIS ASPECT RATIO   2.2005998632259374
Attrib MAX.LENGTH ASPECT RATIO   2.0273760721821543
Attrib SCATTER RATIO   −2.4895758585733816
Attrib ELONGATEDNESS   5.363161069580836
Attrib PR.AXIS RECTANGULARITY   −1.9422579488628744
Attrib MAX.LENGTH RECTANGULARITY   6.153507092570232
Attrib SCALED VARIANCE_MAJOR   −1.5568950374651365
Attrib SCALED VARIANCE_MINOR   −1.1301390245862828
Attrib SCALED RADIUS OF GYRATION   −3.919783241362421
Attrib SKEWNESS ABOUT_MAJOR   1.4954149178082743
Attrib SKEWNESS ABOUT_MINOR   −2.492637882282362
Attrib KURTOSIS ABOUT_MAJOR   0.2999101688801812
Attrib KURTOSIS ABOUT_MINOR   2.148193104658438
Attrib HOLLOWS RATIO   −0.4362494551544635
Sigmoid Node 9

Inputs   Weights
Threshold   2.4253839046879464
Attrib COMPACTNESS   −8.812878974969413
Attrib CIRCULARITY   −0.8977665778723908
Attrib DISTANCE CIRCULARITY   −4.3483081426065775
Attrib RADIUS RATIO   −1.47999416416773
Attrib PR.AXIS ASPECT RATIO   3.087743719988619
Attrib MAX.LENGTH ASPECT RATIO   −7.966042978378059
Attrib SCATTER RATIO   −0.21650569451639964
Attrib ELONGATEDNESS   −2.9501021216256604
Attrib PR.AXIS RECTANGULARITY   0.9776010348468162
Attrib MAX.LENGTH RECTANGULARITY   −6.154513834197398
Attrib SCALED VARIANCE_MAJOR   −1.5223223490861173
Attrib SCALED VARIANCE_MINOR   1.1665187350171042
Attrib SCALED RADIUS OF GYRATION   6.971106195175817
Attrib SKEWNESS ABOUT_MAJOR   4.319869160710674
Attrib SKEWNESS ABOUT_MINOR   −0.9332974077179708
Attrib KURTOSIS ABOUT_MAJOR   4.940299660975712
Attrib KURTOSIS ABOUT_MINOR   1.1314651277851167
Attrib HOLLOWS RATIO   −9.311166319786746
Sigmoid Node 10
Inputs   Weights
Threshold   3.292006087789625
Attrib COMPACTNESS   4.568634017619092
Attrib CIRCULARITY   2.050866216304043
Attrib DISTANCE CIRCULARITY   3.6444808470492904
Attrib RADIUS RATIO   −5.551779337184537
Attrib PR.AXIS ASPECT RATIO   3.9089357582152644
Attrib MAX.LENGTH ASPECT RATIO   4.78542293195425265
Attrib SCATTER RATIO   −2.377384470672765
Attrib ELONGATEDNESS   4.935201850868347
Attrib PR.AXIS RECTANGULARITY   −3.532909065316866
Attrib MAX.LENGTH RECTANGULARITY   9.59566493562626
Attrib SCALED VARIANCE_MAJOR   −4.67120760605103
Attrib SCALED VARIANCE_MINOR   −1.856271732122562
Attrib SCALED RADIUS OF GYRATION   −4.445084058996748
Attrib SKEWNESS ABOUT_MAJOR   9.24544289694658
Attrib SKEWNESS ABOUT_MINOR   −2.797665678386482
Attrib KURTOSIS ABOUT_MAJOR   0.6483250621303646
Attrib KURTOSIS ABOUT_MINOR   −1.4288363747447148
Attrib HOLLOWS RATIO   4.620381403676079
Sigmoid Node 11
Inputs   Weights
Threshold   −2.430160989619863
Attrib COMPACTNESS   0.5877820004169807
Attrib CIRCULARITY   −3.632772551997888
Attrib DISTANCE CIRCULARITY   0.21076909437708521
Attrib RADIUS RATIO   0.7557076566230594
Attrib PR.AXIS ASPECT RATIO   −1.7346873541514274

Attrib MAX.LENGTH ASPECT RATIO   0.5570573687498038
Attrib SCATTER RATIO   0.8508123944192286
Attrib ELONGATEDNESS   0.2706993812193435
Attrib PR.AXIS RECTANGULARITY   1.1885244391243523
Attrib MAX.LENGTH RECTANGULARITY   −3.7747263380140397
Attrib SCALED VARIANCE_MAJOR   0.9914299245249216
Attrib SCALED VARIANCE_MINOR   1.0491560638487283
Attrib SCALED RADIUS OF GYRATION   −2.2912465669455093
Attrib SKEWNESS ABOUT_MAJOR   −0.23071288665173956
Attrib SKEWNESS ABOUT_MINOR   4.255475540090962
Attrib KURTOSIS ABOUT_MAJOR   2.842797582395609
Attrib KURTOSIS ABOUT_MINOR   −0.12572014657973857
Attrib HOLLOWS RATIO   −1.7131034198889388
Sigmoid Node 12
Inputs   Weights
Threshold   −0.4708938003342683
Attrib COMPACTNESS   −5.1905674462932145
Attrib CIRCULARITY   −3.234383343485024
Attrib DISTANCE CIRCULARITY   2.3718060079638335
Attrib RADIUS RATIO   3.1862160572461846
Attrib PR.AXIS ASPECT RATIO   2.869887070321149
Attrib MAX.LENGTH ASPECT RATIO   2.186337149789569
Attrib SCATTER RATIO   1.8051537129008188
Attrib ELONGATEDNESS   −2.0368630728013373
Attrib PR.AXIS RECTANGULARITY   −1.111249318430818
Attrib MAX.LENGTH RECTANGULARITY   −2.336050548162867
Attrib SCALED VARIANCE_MAJOR   0.84257151662765
Attrib SCALED VARIANCE_MINOR   1.5656965540246026
Attrib SCALED RADIUS OF GYRATION   −0.9363718042599412
Attrib SKEWNESS ABOUT_MAJOR   1.0945995804797863
Attrib SKEWNESS ABOUT_MINOR   −1.1095435394179431
Attrib KURTOSIS ABOUT_MAJOR   7.753295370673281
Attrib KURTOSIS ABOUT_MINOR   −0.9501389262557575
Attrib HOLLOWS RATIO   1.0152732757983984
Sigmoid Node 13
Inputs   Weights
Threshold   1.9829501987098057
Attrib COMPACTNESS   −2.7248149658725302
Attrib CIRCULARITY   −4.301670590662812
Attrib DISTANCE CIRCULARITY   4.268227652677465
Attrib RADIUS RATIO   1.1412992525812078
Attrib PR.AXIS ASPECT RATIO   2.8420804729389024
Attrib MAX.LENGTH ASPECT RATIO   0.6609329521509546
Attrib SCATTER RATIO   2.4149252326064894
Attrib ELONGATEDNESS   −7.397121162278261
Attrib PR.AXIS RECTANGULARITY   −1.9507954292096286
Attrib MAX.LENGTH RECTANGULARITY   −2.69077483619389
Attrib SCALED VARIANCE_MAJOR   0.43474360062922546
Attrib SCALED VARIANCE_MINOR   1.7369510366900842

Attrib SCALED RADIUS OF GYRATION   −3.160595040627237
Attrib SKEWNESS ABOUT_MAJOR   0.764049263153913
Attrib SKEWNESS ABOUT_MINOR   −1.530874034804505
Attrib KURTOSIS ABOUT_MAJOR   −3.1499837423584394
Attrib KURTOSIS ABOUT_MINOR   1.6185862349528652
Attrib HOLLOWS RATIO   −3.3089207259308173
Sigmoid Node 14
Inputs   Weights
Threshold   −2.0491987942914056
Attrib COMPACTNESS   −5.6204423936250105
Attrib CIRCULARITY   4.05951006681975
Attrib DISTANCE CIRCULARITY   0.5805218065508474
Attrib RADIUS RATIO   4.329960848024632
Attrib PR.AXIS ASPECT RATIO   −7.716135978986286
Attrib MAX.LENGTH ASPECT RATIO   2.1539285353513393
Attrib SCATTER RATIO   3.899494181637537
Attrib ELONGATEDNESS   −4.167157515834326
Attrib PR.AXIS RECTANGULARITY   2.5028095922233398
Attrib MAX.LENGTH RECTANGULARITY   8.046761431068791
Attrib SCALED VARIANCE_MAJOR   4.374359509568649
Attrib SCALED VARIANCE_MINOR   3.038247613404235
Attrib SCALED RADIUS OF GYRATION   −10.855868265123128
Attrib SKEWNESS ABOUT_MAJOR   −7.1308105007142935
Attrib SKEWNESS ABOUT_MINOR   −0.13331702587653632
Attrib KURTOSIS ABOUT_MAJOR   1.122249478434759
Attrib KURTOSIS ABOUT_MINOR   −1.138595343171828
Attrib HOLLOWS RATIO   2.616996215224413
Sigmoid Node 15
Inputs   Weights
Threshold   2.00790430915046
Attrib COMPACTNESS   2.873966829554006
Attrib CIRCULARITY   −1.0218018901495798
Attrib DISTANCE CIRCULARITY   −2.525080610921382
Attrib RADIUS RATIO   −1.531904374625518
Attrib PR.AXIS ASPECT RATIO   7.38431084658971
Attrib MAX.LENGTH ASPECT RATIO   −1.601659741240027
Attrib SCATTER RATIO   −0.36956008516717614
Attrib ELONGATEDNESS   −5.141380511293039
Attrib PR.AXIS RECTANGULARITY   −1.7357628335497064
Attrib MAX.LENGTH RECTANGULARITY   3.398484452879619
Attrib SCALED VARIANCE_MAJOR   −3.787718332407829
Attrib SCALED VARIANCE_MINOR   −0.45988868152469875
Attrib SCALED RADIUS OF GYRATION   −4.358909778601137
Attrib SKEWNESS ABOUT_MAJOR   4.223627815606749
Attrib SKEWNESS ABOUT_MINOR   1.1200599432124703
Attrib KURTOSIS ABOUT_MAJOR   −0.9162360561904549
Attrib KURTOSIS ABOUT_MINOR   2.1469668649804867
Attrib HOLLOWS RATIO   −2.194009330152434
Sigmoid Node 16

Inputs   Weights
Threshold   1.275746327202593
Attrib COMPACTNESS   −0.9817029272365889
Attrib CIRCULARITY   3.689868342189374
Attrib DISTANCE CIRCULARITY   −2.6463859954580835
Attrib RADIUS RATIO   2.0402243807500056
Attrib PR.AXIS ASPECT RATIO   2.964243512788723
Attrib MAX.LENGTH ASPECT RATIO   −1.5084613330201058
Attrib SCATTER RATIO   0.18388807750976593
Attrib ELONGATEDNESS   −0.19249553456558907
Attrib PR.AXIS RECTANGULARITY   −1.9021550531043336
Attrib MAX.LENGTH RECTANGULARITY   3.4266635798886926
Attrib SCALED VARIANCE_MAJOR   2.1102112334526724
Attrib SCALED VARIANCE_MINOR   −1.381061462067494
Attrib SCALED RADIUS OF GYRATION   10.419083188140466
Attrib SKEWNESS ABOUT_MAJOR   3.652089962278239
Attrib SKEWNESS ABOUT_MINOR   −0.0970775212007002
Attrib KURTOSIS ABOUT_MAJOR   2.503731290663612
Attrib KURTOSIS ABOUT_MINOR   −9.068258882252593
Attrib HOLLOWS RATIO   3.1223719182790903
Sigmoid Node 17
Inputs   Weights
Threshold   −7.698429174475319
Attrib COMPACTNESS   5.29728748638659
Attrib CIRCULARITY   −4.716955465907489
Attrib DISTANCE CIRCULARITY   −2.8994886729663527
Attrib RADIUS RATIO   2.501632512243214
Attrib PR.AXIS ASPECT RATIO   −6.654745937547549
Attrib MAX.LENGTH ASPECT RATIO   −2.4790357218590087
Attrib SCATTER RATIO   0.3313873120174889
Attrib ELONGATEDNESS   6.978891353697193
Attrib PR.AXIS RECTANGULARITY   1.9057503467726093
Attrib MAX.LENGTH RECTANGULARITY   −4.937685607212176
Attrib SCALED VARIANCE_MAJOR   1.4915127777917794
Attrib SCALED VARIANCE_MINOR   2.4656297607209456
Attrib SCALED RADIUS OF GYRATION   −2.622416905572014
Attrib SKEWNESS ABOUT_MAJOR   −3.948062124810612
Attrib SKEWNESS ABOUT_MINOR   5.128539252079002
Attrib KURTOSIS ABOUT_MAJOR   −1.8840805405974186
Attrib KURTOSIS ABOUT_MINOR   −0.36121557076017674
Attrib HOLLOWS RATIO   −5.241946950177729
Sigmoid Node 18
Inputs   Weights
Threshold   −3.421644765938923
Attrib COMPACTNESS   1.5216086377407338
Attrib CIRCULARITY   −5.824217369320129
Attrib DISTANCE CIRCULARITY   −4.002246732248774
Attrib RADIUS RATIO   6.592764656869814
Attrib PR.AXIS ASPECT RATIO   3.034424234880992

Attrib MAX.LENGTH ASPECT RATIO   −1.838686615522489
Attrib SCATTER RATIO   0.6403358551964227
Attrib ELONGATEDNESS   1.2753995979727335
Attrib PR.AXIS RECTANGULARITY   −3.6997416160083794
Attrib MAX.LENGTH RECTANGULARITY   −9.923156750653092
Attrib SCALED VARIANCE_MAJOR   0.9429057781953369
Attrib SCALED VARIANCE_MINOR   2.2147191369566235
Attrib SCALED RADIUS OF GYRATION   5.268106028870351
Attrib SKEWNESS ABOUT_MAJOR   0.6224173129820171
Attrib SKEWNESS ABOUT_MINOR   −1.9613607924240388
Attrib KURTOSIS ABOUT_MAJOR   1.6260297218500501
Attrib KURTOSIS ABOUT_MINOR   −6.788107076587967
Attrib HOLLOWS RATIO   0.6090795953981081
Sigmoid Node 19
Inputs   Weights
Threshold   2.4372898789223
Attrib COMPACTNESS   0.3604652560856213
Attrib CIRCULARITY   −3.144105429151165
Attrib DISTANCE CIRCULARITY   −14.457536866550122
Attrib RADIUS RATIO   −1.7352974276867335
Attrib PR.AXIS ASPECT RATIO   6.213150117698054
Attrib MAX.LENGTH ASPECT RATIO   −5.305808169481304
Attrib SCATTER RATIO   −0.20641022983417512
Attrib ELONGATEDNESS   −5.8076426031088175
Attrib PR.AXIS RECTANGULARITY   4.423302502877774
Attrib MAX.LENGTH RECTANGULARITY   −0.30071426413093477
Attrib SCALED VARIANCE_MAJOR   1.475424586197155
Attrib SCALED VARIANCE_MINOR   −0.21246860036481804
Attrib SCALED RADIUS OF GYRATION   4.671001133213339
Attrib SKEWNESS ABOUT_MAJOR   3.4954869811781717
Attrib SKEWNESS ABOUT_MINOR   −5.973417967786627
Attrib KURTOSIS ABOUT_MAJOR   3.327548154728104
Attrib KURTOSIS ABOUT_MINOR   12.369811076452695
Attrib HOLLOWS RATIO   −13.195810338645341
Sigmoid Node 20
Inputs   Weights
Threshold   0.3592361584991362
Attrib COMPACTNESS   4.422701262399372
Attrib CIRCULARITY   1.815193348537384
Attrib DISTANCE CIRCULARITY   5.095522096960199
Attrib RADIUS RATIO   −6.786410064589317
Attrib PR.AXIS ASPECT RATIO   5.229959347058389
Attrib MAX.LENGTH ASPECT RATIO   4.133895862872354
Attrib SCATTER RATIO   −4.239990093429385
Attrib ELONGATEDNESS   2.584867743125364
Attrib PR.AXIS RECTANGULARITY   −5.273176295597297
Attrib MAX.LENGTH RECTANGULARITY   10.570893462699512
Attrib SCALED VARIANCE_MAJOR   −3.0324041430721755
Attrib SCALED VARIANCE_MINOR   −3.958294274254455

Attrib SCALED RADIUS OF GYRATION   −4.161193589980389
Attrib SKEWNESS ABOUT_MAJOR   11.412914748695929
Attrib SKEWNESS ABOUT_MINOR   0.9769219154790738
Attrib KURTOSIS ABOUT_MAJOR   −5.64347524686428
Attrib KURTOSIS ABOUT_MINOR   −1.5717342431283068
Attrib HOLLOWS RATIO   2.6158920715253333
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7443725678013738
Attrib COMPACTNESS   −8.100188734786629
Attrib CIRCULARITY   1.4561500629927393
Attrib DISTANCE CIRCULARITY   2.7793801187931257
Attrib RADIUS RATIO   −1.6467431491535094
Attrib PR.AXIS ASPECT RATIO   −0.43707122898936035
Attrib MAX.LENGTH ASPECT RATIO   3.3319254319376097
Attrib SCATTER RATIO   3.394493641711231
Attrib ELONGATEDNESS   −1.3252258051876877
Attrib PR.AXIS RECTANGULARITY   1.7078074400702719
Attrib MAX.LENGTH RECTANGULARITY   −0.2454161548089168
Attrib SCALED VARIANCE_MAJOR   1.3357274663046697
Attrib SCALED VARIANCE_MINOR   4.0306854732912685
Attrib SCALED RADIUS OF GYRATION   −1.2516161823736494
Attrib SKEWNESS ABOUT_MAJOR   3.4103929939445474
Attrib SKEWNESS ABOUT_MINOR   1.4849922690236468
Attrib KURTOSIS ABOUT_MAJOR   6.990110577113154
Attrib KURTOSIS ABOUT_MINOR   −11.020656698778552
Attrib HOLLOWS RATIO   −6.93533168661615
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 10.03 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

```
Correctly Classified Instances          410                 97.3872 %
Incorrectly Classified Instances          11                  2.6128 %
Kappa statistic                        0.9651
Mean absolute error                    0.0234
Root mean squared error                0.1088
Relative absolute error                6.2383 %
Root relative squared error           25.1337 %
Total Number of Instances               421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,943	0,006	0,980	0,943	0,961	0,949	0,973	0,936	opel
0,954	0,013	0,963	0,954	0,958	0,944	0,979	0,973	saab
1,000	0,010	0,973	1,000	0,986	0,982	1,000	1,000	bus
1,000	0,006	0,980	1,000	0,990	0,987	1,000	1,000	van
Weighted Avg.	0,974	0,009	0,974	0,974	0,974	0,965	0,988	0,977

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
99   4    1    1  |    a = opel
 2  103   2    1  |    b = saab
 0    0  109   0  |    c = bus
 0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
```

MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   5.118457226217541
Node 4   −9.453736821856069
Node 5   −10.575897496545954
Node 6   3.220179551181998
Node 7   14.020100756258401
Node 8   −4.937847456738676
Node 9   5.430343039540839
Node 10   −1.1079869518408303
Node 11   −4.461995493966521
Node 12   7.668195452010802
Node 13   −7.424606608747503
Node 14   −3.3202991752495765
Node 15   −4.784097548298071
Node 16   −5.994168457812842
Node 17   0.5367467577372094
Node 18   16.863805558248405
Node 19   −18.528572795551472
Node 20   −8.197882854998028
Node 21   8.20103715690704
Sigmoid Node 1
Inputs   Weights
Threshold   0.5200977882627926
Node 4   7.914492351067302
Node 5   7.482733232412428
Node 6   −7.40215291487444
Node 7   −17.52605352412097
Node 8   −1.781253513005057
Node 9   −9.838775504149316
Node 10   −11.51792733113211

```
Node  11       0.11518456611418791
Node  12      −3.7087578626430884
Node  13      −0.16098133611090018
Node  14       13.837071281215554
Node  15      −5.043183118240201
Node  16       7.14945845604571
Node  17       10.220309092853181
Node  18       1.7386371422502183
Node  19       6.331430963371826
Node  20      −13.853488695113393
Node  21      −9.50848880855153
Sigmoid  Node  2
Inputs       Weights
Threshold      −3.5751803153144954
Node  4      0.8772072074178143
Node  5     −3.1041128818714427
Node  6      1.824968144597458
Node  7      4.960031955812628
Node  8     −4.190879566670431
Node  9      0.5475683941215556
Node  10     −5.837025795191339
Node  11     −4.595517598868664
Node  12     −0.3398973059211303
Node  13      3.043677878307701
Node  14     −12.418945491419997
Node  15      7.843948445308788
Node  16     −4.726493766730796
Node  17     −12.637380923817817
Node  18     −7.465619327586651
Node  19      7.102652405138661
Node  20      0.8709431228702262
Node  21      7.200561101470899
Sigmoid  Node  3
Inputs       Weights
Threshold      −2.765598851192274
Node  4      2.4271592230798547
Node  5      3.2974150752626357
Node  6     −7.4253910438106585
Node  7     −3.2012627198224863
Node  8      6.81085346854520
Node  9     −5.738536064493615
Node  10      9.742372940568371
Node  11     −3.654291090141927
Node  12     −5.7480273494142
Node  13     −0.10014208582138645
Node  14     −1.3178381713745755
Node  15      1.7691408964425495
Node  16     −0.8971903304097508
Node  17      1.2985328301824142
```

Node 18   −2.07275188484465
Node 19   −2.239576689731523
Node 20   8.014970531145778
Node 21   −6.137035381485096
Sigmoid Node 4
Inputs   Weights
Threshold   2.332142202420157
Attrib COMPACTNESS   9.493484019505123
Attrib CIRCULARITY   −4.263148066830872
Attrib DISTANCE CIRCULARITY   −5.172627487241854
Attrib RADIUS RATIO   1.5484435253492694
Attrib PR.AXIS ASPECT RATIO   2.9055185533320294
Attrib MAX.LENGTH ASPECT RATIO   −2.7841529917877597
Attrib SCATTER RATIO   2.6147496663664485
Attrib ELONGATEDNESS   1.2748310537601546
Attrib PR.AXIS RECTANGULARITY   3.6597982814337437
Attrib MAX.LENGTH RECTANGULARITY   0.1621106885371905
Attrib SCALED VARIANCE_MAJOR   −3.8528056041336805
Attrib SCALED VARIANCE_MINOR   2.5010397915984646
Attrib SCALED RADIUS OF GYRATION   0.42274497442840553
Attrib SKEWNESS ABOUT_MAJOR   0.4782894934439875
Attrib SKEWNESS ABOUT_MINOR   4.753552647800254
Attrib KURTOSIS ABOUT_MAJOR   2.601743068430645
Attrib KURTOSIS ABOUT_MINOR   −3.5639525529278684
Attrib HOLLOWS RATIO   −5.310498480791305
Sigmoid Node 5
Inputs   Weights
Threshold   0.031963455480263823
Attrib COMPACTNESS   6.640506178540579
Attrib CIRCULARITY   −5.075626257159464
Attrib DISTANCE CIRCULARITY   10.24872608998464
Attrib RADIUS RATIO   −3.38506019426243
Attrib PR.AXIS ASPECT RATIO   3.19613091726294
Attrib MAX.LENGTH ASPECT RATIO   −3.1891965323877534
Attrib SCATTER RATIO   −3.5558719226128868
Attrib ELONGATEDNESS   8.916440297622431
Attrib PR.AXIS RECTANGULARITY   3.09406101864555
Attrib MAX.LENGTH RECTANGULARITY   1.7777205820020574
Attrib SCALED VARIANCE_MAJOR   2.431913961103184
Attrib SCALED VARIANCE_MINOR   −5.565386509447588
Attrib SCALED RADIUS OF GYRATION   3.7683294100215683
Attrib SKEWNESS ABOUT_MAJOR   7.288618871143263
Attrib SKEWNESS ABOUT_MINOR   −1.8889537642000993
Attrib KURTOSIS ABOUT_MAJOR   1.2378805955406935
Attrib KURTOSIS ABOUT_MINOR   −7.522154937581681
Attrib HOLLOWS RATIO   10.649013084736362
Sigmoid Node 6
Inputs   Weights
Threshold   1.6917552260218596

320

Attrib COMPACTNESS   0.05660846644072747
Attrib CIRCULARITY   −0.321593413383412
Attrib DISTANCE CIRCULARITY   −2.9831217151773326
Attrib RADIUS RATIO   1.3966488463225797
Attrib PR.AXIS ASPECT RATIO   0.2835714542853603
Attrib MAX.LENGTH ASPECT RATIO   1.8939212906133653
Attrib SCATTER RATIO   1.8126816608109002
Attrib ELONGATEDNESS   −6.002013143501743
Attrib PR.AXIS RECTANGULARITY   −2.043343901043002
Attrib MAX.LENGTH RECTANGULARITY   −2.662540987343915
Attrib SCALED VARIANCE_MAJOR   2.180447810879724
Attrib SCALED VARIANCE_MINOR   1.7484150719671359
Attrib SCALED RADIUS OF GYRATION   0.7328762826815887
Attrib SKEWNESS ABOUT_MAJOR   −1.8480396757811346
Attrib SKEWNESS ABOUT_MINOR   2.284100714555352
Attrib KURTOSIS ABOUT_MAJOR   −3.875993947203483
Attrib KURTOSIS ABOUT_MINOR   7.1001162443902945
Attrib HOLLOWS RATIO   −0.11605214177386622
Sigmoid Node 7
Inputs   Weights
Threshold   −2.5810116058820407
Attrib COMPACTNESS   0.6057145868246075
Attrib CIRCULARITY   4.8289090828216725
Attrib DISTANCE CIRCULARITY   −2.271634283997203
Attrib RADIUS RATIO   3.44479023210901
Attrib PR.AXIS ASPECT RATIO   2.7616681784995136
Attrib MAX.LENGTH ASPECT RATIO   −3.5168960320973004
Attrib SCATTER RATIO   1.8727549334241889
Attrib ELONGATEDNESS   −4.393602434693566
Attrib PR.AXIS RECTANGULARITY   3.6908267880142764
Attrib MAX.LENGTH RECTANGULARITY   1.7834943521568696
Attrib SCALED VARIANCE_MAJOR   0.30416411206500216
Attrib SCALED VARIANCE_MINOR   4.203035623433049
Attrib SCALED RADIUS OF GYRATION   −2.9921319637184647
Attrib SKEWNESS ABOUT_MAJOR   −1.5484754191650911
Attrib SKEWNESS ABOUT_MINOR   −1.511620954710763
Attrib KURTOSIS ABOUT_MAJOR   2.490937565680682
Attrib KURTOSIS ABOUT_MINOR   16.72909601236827
Attrib HOLLOWS RATIO   −13.086239875717284
Sigmoid Node 8
Inputs   Weights
Threshold   −3.691394838832959
Attrib COMPACTNESS   5.469068955615409
Attrib CIRCULARITY   −1.203139448034875
Attrib DISTANCE CIRCULARITY   −1.1924856335187306
Attrib RADIUS RATIO   −1.0713467412029318
Attrib PR.AXIS ASPECT RATIO   2.2005998632259374
Attrib MAX.LENGTH ASPECT RATIO   2.0273760721821543
Attrib SCATTER RATIO   −2.4895758585733816

Attrib ELONGATEDNESS   5.363161069580836
Attrib PR.AXIS RECTANGULARITY   −1.9422579488628744
Attrib MAX.LENGTH RECTANGULARITY   6.153507092570232
Attrib SCALED VARIANCE_MAJOR   −1.5568950374651365
Attrib SCALED VARIANCE_MINOR   −1.1301390245862828
Attrib SCALED RADIUS OF GYRATION   −3.919783241362421
Attrib SKEWNESS ABOUT_MAJOR   1.4954149178082743
Attrib SKEWNESS ABOUT_MINOR   −2.492637882282362
Attrib KURTOSIS ABOUT_MAJOR   0.2999101688801812
Attrib KURTOSIS ABOUT_MINOR   2.148193104658438
Attrib HOLLOWS RATIO   −0.43624945515444635
Sigmoid Node 9
Inputs   Weights
Threshold   2.4253839046879464
Attrib COMPACTNESS   −8.812878974969413
Attrib CIRCULARITY   −0.8977665778723908
Attrib DISTANCE CIRCULARITY   −4.3483081426065775
Attrib RADIUS RATIO   −1.47999416416773
Attrib PR.AXIS ASPECT RATIO   3.087743719988619
Attrib MAX.LENGTH ASPECT RATIO   −7.966042978378059
Attrib SCATTER RATIO   −0.21650569451639964
Attrib ELONGATEDNESS   −2.9501021216256604
Attrib PR.AXIS RECTANGULARITY   0.9776010348468162
Attrib MAX.LENGTH RECTANGULARITY   −6.154513834197398
Attrib SCALED VARIANCE_MAJOR   −1.5223223490861173
Attrib SCALED VARIANCE_MINOR   1.1665187350171042
Attrib SCALED RADIUS OF GYRATION   6.971106195175817
Attrib SKEWNESS ABOUT_MAJOR   4.319869160710674
Attrib SKEWNESS ABOUT_MINOR   −0.9332974077179708
Attrib KURTOSIS ABOUT_MAJOR   4.940299660975712
Attrib KURTOSIS ABOUT_MINOR   1.1314651277851167
Attrib HOLLOWS RATIO   −9.311166319786746
Sigmoid Node 10
Inputs   Weights
Threshold   3.292006087789625
Attrib COMPACTNESS   4.568634017619092
Attrib CIRCULARITY   2.050866216304043
Attrib DISTANCE CIRCULARITY   3.6444808470492904
Attrib RADIUS RATIO   −5.551779337184537
Attrib PR.AXIS ASPECT RATIO   3.9089357582152644
Attrib MAX.LENGTH ASPECT RATIO   4.7854229319542565
Attrib SCATTER RATIO   −2.377384470672765
Attrib ELONGATEDNESS   4.935201850868347
Attrib PR.AXIS RECTANGULARITY   −3.532909065316866
Attrib MAX.LENGTH RECTANGULARITY   9.59566493562626
Attrib SCALED VARIANCE_MAJOR   −4.67120760605103
Attrib SCALED VARIANCE_MINOR   −1.856271732122562
Attrib SCALED RADIUS OF GYRATION   −4.445084058996748
Attrib SKEWNESS ABOUT_MAJOR   9.24544289694658

Attrib SKEWNESS ABOUT_MINOR   −2.797665678386482
Attrib KURTOSIS ABOUT_MAJOR   0.6483250621303646
Attrib KURTOSIS ABOUT_MINOR   −1.4288363747447148
Attrib HOLLOWS RATIO   4.620381403676079
Sigmoid Node 11
Inputs   Weights
Threshold   −2.430160989619863
Attrib COMPACTNESS   0.5877820004169807
Attrib CIRCULARITY   −3.632772551997888
Attrib DISTANCE CIRCULARITY   0.21076909437708521
Attrib RADIUS RATIO   0.7557076566230594
Attrib PR.AXIS ASPECT RATIO   −1.7346873541514274
Attrib MAX.LENGTH ASPECT RATIO   0.5570573687498038
Attrib SCATTER RATIO   0.8508123944192286
Attrib ELONGATEDNESS   0.2706993812193435
Attrib PR.AXIS RECTANGULARITY   1.1885244391243523
Attrib MAX.LENGTH RECTANGULARITY   −3.7747263380140397
Attrib SCALED VARIANCE_MAJOR   0.9914299245249216
Attrib SCALED VARIANCE_MINOR   1.0491560638487283
Attrib SCALED RADIUS OF GYRATION   −2.2912465669455093
Attrib SKEWNESS ABOUT_MAJOR   −0.23071288665173956
Attrib SKEWNESS ABOUT_MINOR   4.255475540090962
Attrib KURTOSIS ABOUT_MAJOR   2.842797582395609
Attrib KURTOSIS ABOUT_MINOR   −0.12572014657973857
Attrib HOLLOWS RATIO   −1.7131034198889388
Sigmoid Node 12
Inputs   Weights
Threshold   −0.4708938003342683
Attrib COMPACTNESS   −5.1905674462932145
Attrib CIRCULARITY   −3.234383343485024
Attrib DISTANCE CIRCULARITY   2.3718060079638335
Attrib RADIUS RATIO   3.1862160572461846
Attrib PR.AXIS ASPECT RATIO   2.869887070321149
Attrib MAX.LENGTH ASPECT RATIO   2.186337149789569
Attrib SCATTER RATIO   1.8051537129008188
Attrib ELONGATEDNESS   −2.0368630728013373
Attrib PR.AXIS RECTANGULARITY   −1.111249318430818
Attrib MAX.LENGTH RECTANGULARITY   −2.336050548162867
Attrib SCALED VARIANCE_MAJOR   0.84257151662765
Attrib SCALED VARIANCE_MINOR   1.5656965540246026
Attrib SCALED RADIUS OF GYRATION   −0.9363718042599412
Attrib SKEWNESS ABOUT_MAJOR   1.0945995804797863
Attrib SKEWNESS ABOUT_MINOR   −1.1095435394179431
Attrib KURTOSIS ABOUT_MAJOR   7.753295370673281
Attrib KURTOSIS ABOUT_MINOR   −0.9501389262557575
Attrib HOLLOWS RATIO   1.0152732757983984
Sigmoid Node 13
Inputs   Weights
Threshold   1.9829501987098057

Attrib COMPACTNESS   −2.7248149658725302
Attrib CIRCULARITY   −4.301670590662812
Attrib DISTANCE CIRCULARITY   4.268227652677465
Attrib RADIUS RATIO   1.1412992525812078
Attrib PR.AXIS ASPECT RATIO   2.8420804729389024
Attrib MAX.LENGTH ASPECT RATIO   0.6609329521509546
Attrib SCATTER RATIO   2.4149252326064894
Attrib ELONGATEDNESS   −7.397121162278261
Attrib PR.AXIS RECTANGULARITY   −1.9507954292096286
Attrib MAX.LENGTH RECTANGULARITY   −2.690777483619389
Attrib SCALED VARIANCE_MAJOR   0.43474360062922546
Attrib SCALED VARIANCE_MINOR   1.7369510366900842
Attrib SCALED RADIUS OF GYRATION   −3.160595040627237
Attrib SKEWNESS ABOUT_MAJOR   0.764049263153913
Attrib SKEWNESS ABOUT_MINOR   −1.530874034804505
Attrib KURTOSIS ABOUT_MAJOR   −3.1499837423584394
Attrib KURTOSIS ABOUT_MINOR   1.6185862349528652
Attrib HOLLOWS RATIO   −3.3089207259308173
Sigmoid Node 14
Inputs   Weights
Threshold   −2.0491987942914056
Attrib COMPACTNESS   −5.6204423936250105
Attrib CIRCULARITY   4.05951006681975
Attrib DISTANCE CIRCULARITY   0.5805218065508474
Attrib RADIUS RATIO   4.329960848024632
Attrib PR.AXIS ASPECT RATIO   −7.716135978986286
Attrib MAX.LENGTH ASPECT RATIO   2.1539285353513393
Attrib SCATTER RATIO   3.899494181637537
Attrib ELONGATEDNESS   −4.167157515834326
Attrib PR.AXIS RECTANGULARITY   2.5028095922233398
Attrib MAX.LENGTH RECTANGULARITY   8.046761431068791
Attrib SCALED VARIANCE_MAJOR   4.374359509568649
Attrib SCALED VARIANCE_MINOR   3.038247613404235
Attrib SCALED RADIUS OF GYRATION   −10.855868265123128
Attrib SKEWNESS ABOUT_MAJOR   −7.1308105007142935
Attrib SKEWNESS ABOUT_MINOR   −0.13331702587653632
Attrib KURTOSIS ABOUT_MAJOR   1.122249478434759
Attrib KURTOSIS ABOUT_MINOR   −1.138595343171828
Attrib HOLLOWS RATIO   2.616996215224413
Sigmoid Node 15
Inputs   Weights
Threshold   2.00790430915046
Attrib COMPACTNESS   2.873966829554006
Attrib CIRCULARITY   −1.021801890105798
Attrib DISTANCE CIRCULARITY   −2.525080610921382
Attrib RADIUS RATIO   −1.5319043746256518
Attrib PR.AXIS ASPECT RATIO   7.38431084658971
Attrib MAX.LENGTH ASPECT RATIO   −1.601659741240027
Attrib SCATTER RATIO   −0.36956008516717614

Attrib ELONGATEDNESS   −5.141380511293039
Attrib PR.AXIS RECTANGULARITY   −1.7357628335497064
Attrib MAX.LENGTH RECTANGULARITY   3.398484452879619
Attrib SCALED VARIANCE_MAJOR   −3.787718332407829
Attrib SCALED VARIANCE_MINOR   −0.45988868152469875
Attrib SCALED RADIUS OF GYRATION   −4.358909778601137
Attrib SKEWNESS ABOUT_MAJOR   4.223627815606749
Attrib SKEWNESS ABOUT_MINOR   1.1200599432124703
Attrib KURTOSIS ABOUT_MAJOR   −0.9162360561904549
Attrib KURTOSIS ABOUT_MINOR   2.1469668649804867
Attrib HOLLOWS RATIO   −2.194009330152434
Sigmoid Node 16
Inputs   Weights
Threshold   1.275746327202593
Attrib COMPACTNESS   −0.9817029272365889
Attrib CIRCULARITY   3.689868342189374
Attrib DISTANCE CIRCULARITY   −2.6463859954580835
Attrib RADIUS RATIO   2.0402243807500056
Attrib PR.AXIS ASPECT RATIO   2.964243512788723
Attrib MAX.LENGTH ASPECT RATIO   −1.5084613330201058
Attrib SCATTER RATIO   0.18388807750976593
Attrib ELONGATEDNESS   −0.19249553456558907
Attrib PR.AXIS RECTANGULARITY   −1.9021550531043336
Attrib MAX.LENGTH RECTANGULARITY   3.4266635798886926
Attrib SCALED VARIANCE_MAJOR   2.1102112334526724
Attrib SCALED VARIANCE_MINOR   −1.381061462067494
Attrib SCALED RADIUS OF GYRATION   10.419083188140466
Attrib SKEWNESS ABOUT_MAJOR   3.652089962278239
Attrib SKEWNESS ABOUT_MINOR   −0.0970775212007002
Attrib KURTOSIS ABOUT_MAJOR   2.503731290663612
Attrib KURTOSIS ABOUT_MINOR   −9.068258882252593
Attrib HOLLOWS RATIO   3.1223719182790903
Sigmoid Node 17
Inputs   Weights
Threshold   −7.698429174475319
Attrib COMPACTNESS   5.29728748638659
Attrib CIRCULARITY   −4.716955465907489
Attrib DISTANCE CIRCULARITY   −2.8994886729663527
Attrib RADIUS RATIO   2.501632512243214
Attrib PR.AXIS ASPECT RATIO   −6.654745937547549
Attrib MAX.LENGTH ASPECT RATIO   −2.4790357218590087
Attrib SCATTER RATIO   0.3313873120174889
Attrib ELONGATEDNESS   6.978891353697193
Attrib PR.AXIS RECTANGULARITY   1.9057503467726093
Attrib MAX.LENGTH RECTANGULARITY   −4.937685607212176
Attrib SCALED VARIANCE_MAJOR   1.4915127777917794
Attrib SCALED VARIANCE_MINOR   2.4656297607209456
Attrib SCALED RADIUS OF GYRATION   −2.622416905572014
Attrib SKEWNESS ABOUT_MAJOR   −3.948062124810612

Attrib SKEWNESS ABOUT_MINOR   5.128539252079002
Attrib KURTOSIS ABOUT_MAJOR   −1.8840805405974186
Attrib KURTOSIS ABOUT_MINOR   −0.36121557076017674
Attrib HOLLOWS RATIO   −5.241946950177729
Sigmoid Node 18
Inputs   Weights
Threshold   −3.421644765938923
Attrib COMPACTNESS   1.5216086377407338
Attrib CIRCULARITY   −5.824217369320129
Attrib DISTANCE CIRCULARITY   −4.002246732248774
Attrib RADIUS RATIO   6.592764656869814
Attrib PR.AXIS ASPECT RATIO   3.0334424234880992
Attrib MAX.LENGTH ASPECT RATIO   −1.838686615522489
Attrib SCATTER RATIO   0.6403358551964227
Attrib ELONGATEDNESS   1.2753995979727335
Attrib PR.AXIS RECTANGULARITY   −3.6997416160083794
Attrib MAX.LENGTH RECTANGULARITY   −9.923156750653092
Attrib SCALED VARIANCE_MAJOR   0.9429057781953369
Attrib SCALED VARIANCE_MINOR   2.2147191369566235
Attrib SCALED RADIUS OF GYRATION   5.268106028870351
Attrib SKEWNESS ABOUT_MAJOR   0.6224173129820171
Attrib SKEWNESS ABOUT_MINOR   −1.9613607924240388
Attrib KURTOSIS ABOUT_MAJOR   1.6260297218500501
Attrib KURTOSIS ABOUT_MINOR   −6.788107076587967
Attrib HOLLOWS RATIO   0.6090795953981081
Sigmoid Node 19
Inputs   Weights
Threshold   2.4372898789223
Attrib COMPACTNESS   0.3604652560856213
Attrib CIRCULARITY   −3.144105429151165
Attrib DISTANCE CIRCULARITY   −14.457536866550122
Attrib RADIUS RATIO   −1.7352974276867335
Attrib PR.AXIS ASPECT RATIO   6.213150117698054
Attrib MAX.LENGTH ASPECT RATIO   −5.305808169481304
Attrib SCATTER RATIO   −0.20641022983417512
Attrib ELONGATEDNESS   −5.807626031088175
Attrib PR.AXIS RECTANGULARITY   4.423302502877774
Attrib MAX.LENGTH RECTANGULARITY   −0.30071426413093477
Attrib SCALED VARIANCE_MAJOR   1.475424586197155
Attrib SCALED VARIANCE_MINOR   −0.21246860036481804
Attrib SCALED RADIUS OF GYRATION   4.671001133213339
Attrib SKEWNESS ABOUT_MAJOR   3.4954869811781717
Attrib SKEWNESS ABOUT_MINOR   −5.973417967786627
Attrib KURTOSIS ABOUT_MAJOR   3.327548154728104
Attrib KURTOSIS ABOUT_MINOR   12.369811076452695
Attrib HOLLOWS RATIO   −13.195810338645341
Sigmoid Node 20
Inputs   Weights
Threshold   0.3592361584991362

Attrib COMPACTNESS   4.422701262399372
Attrib CIRCULARITY   1.815193348537384
Attrib DISTANCE CIRCULARITY   5.095522096960199
Attrib RADIUS RATIO   −6.786410064589317
Attrib PR.AXIS ASPECT RATIO   5.229959347058389
Attrib MAX.LENGTH ASPECT RATIO   4.133895862872354
Attrib SCATTER RATIO   −4.239990093429385
Attrib ELONGATEDNESS   2.584867743125364
Attrib PR.AXIS RECTANGULARITY   −5.273176295597297
Attrib MAX.LENGTH RECTANGULARITY   10.570893462699512
Attrib SCALED VARIANCE_MAJOR   −3.024041430721755
Attrib SCALED VARIANCE_MINOR   −3.958294274254455
Attrib SCALED RADIUS OF GYRATION   −4.161193589980389
Attrib SKEWNESS ABOUT_MAJOR   11.412914748695929
Attrib SKEWNESS ABOUT_MINOR   0.9769219154790738
Attrib KURTOSIS ABOUT_MAJOR   −5.64347524686428
Attrib KURTOSIS ABOUT_MINOR   −1.5717342431283068
Attrib HOLLOWS RATIO   2.6158920715253333
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7443725678013738
Attrib COMPACTNESS   −8.100188734786629
Attrib CIRCULARITY   1.4561500629927393
Attrib DISTANCE CIRCULARITY   2.7793801187931257
Attrib RADIUS RATIO   −1.6467431491535094
Attrib PR.AXIS ASPECT RATIO   −0.43707122898936035
Attrib MAX.LENGTH ASPECT RATIO   3.3319254319376097
Attrib SCATTER RATIO   3.394493641711231
Attrib ELONGATEDNESS   −1.3252258051876877
Attrib PR.AXIS RECTANGULARITY   1.7078074400702719
Attrib MAX.LENGTH RECTANGULARITY   −0.2454161548089168
Attrib SCALED VARIANCE_MAJOR   1.3357274663046697
Attrib SCALED VARIANCE_MINOR   4.0306854732912685
Attrib SCALED RADIUS OF GYRATION   −1.2516161823736494
Attrib SKEWNESS ABOUT_MAJOR   3.4103929939445474
Attrib SKEWNESS ABOUT_MINOR   1.4849922690236468
Attrib KURTOSIS ABOUT_MAJOR   6.990110577113154
Attrib KURTOSIS ABOUT_MINOR   −11.020656698778552
Attrib HOLLOWS RATIO   −6.93533168661615
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van

Input
Node 3

Time taken to build model: 4.7 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   748   88.4161 %
Incorrectly Classified Instances   98   11.5839 %
Kappa statistic   0.8455
Mean absolute error   0.0671
Root mean squared error   0.2228
Relative absolute error   17.9009 %
Root relative squared error   51.4543 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,769	0,063	0,803	0,769	0,786	0,716	0,915	0,811	opel
0,820	0,065	0,813	0,820	0,817	0,753	0,941	0,854	saab
0,991	0,011	0,969	0,991	0,980	0,973	0,999	0,998	bus
0,960	0,015	0,950	0,960	0,955	0,941	0,994	0,984	van
Weighted Avg.	0,884	0,039	0,883	0,884	0,883	0,845	0,962	0,911

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
163   39    3    7 |    a = opel
33  178    3    3 |    b = saab
2    0  216    0 |    c = bus
5    2    1  191 |    d = van
```

22   22ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs      Weights
Threshold      -3.10301120442098
Node 4     5.553519309830549
Node 5     -0.7485802135520715
Node 6     6.682622385593986
Node 7     -5.532702572233768
Node 8     -12.820036483071146
Node 9     -8.471675501080169
Node 10     -8.61247395379862
Node 11     5.048707681927275
Node 12     -5.280063867373717
Node 13     6.251651821595949
Node 14     2.8564789022669324
Sigmoid Node 1
Inputs      Weights
Threshold      -2.588453046830002
Node 4     -6.164843373498811
Node 5     -6.191079225393911
Node 6     -9.464205611054783
Node 7     5.629313162244739
```

Node 8   3.1656050222780814
Node 9   8.048543435977873
Node 10   7.341135102429864
Node 11   −3.991022440298591
Node 12   −10.89083733813842
Node 13   3.5663569880222385
Node 14   4.698131811404694
Sigmoid Node 2
Inputs   Weights
Threshold   −0.3191243470793256
Node 4   −0.34996433439146307
Node 5   5.881692477774772
Node 6   3.201784417851295
Node 7   −0.1301354754843589
Node 8   8.505782720555466
Node 9   −1.4027439782499427
Node 10   0.8696389272085867
Node 11   3.6256431876059003
Node 12   −3.8751973624323766
Node 13   −13.636629018933412
Node 14   −10.182416087396215
Sigmoid Node 3
Inputs   Weights
Threshold   −0.3347286345878733
Node 4   −4.334709690134385
Node 5   3.7207105320344818
Node 6   −3.187625732757103
Node 7   −1.6186091977503443
Node 8   −5.008681378958966
Node 9   3.9667916056290164
Node 10   0.1566241269474591
Node 11   −8.087567039937559
Node 12   10.754244760887078
Node 13   0.14863253424299716
Node 14   0.14753998433223123
Sigmoid Node 4
Inputs   Weights
Threshold   −0.06533414046652432
Attrib COMPACTNESS   −8.82935767374655
Attrib CIRCULARITY   −0.0024412301357151734
Attrib DISTANCE CIRCULARITY   2.049719828727891
Attrib RADIUS RATIO   2.3191927604005063
Attrib PR.AXIS ASPECT RATIO   0.030061764950667988
Attrib MAX.LENGTH ASPECT RATIO   1.0871505948457534
Attrib SCATTER RATIO   2.3544309972794624
Attrib ELONGATEDNESS   −1.899710646792559
Attrib PR.AXIS RECTANGULARITY   −2.431184355063277
Attrib MAX.LENGTH RECTANGULARITY   −1.7180398239513346
Attrib SCALED VARIANCE_MAJOR   2.3781451346066653

Attrib SCALED VARIANCE_MINOR   3.949948612861791
Attrib SCALED RADIUS OF GYRATION   1.942945090386214
Attrib SKEWNESS ABOUT_MAJOR   1.6271761686858752
Attrib SKEWNESS ABOUT_MINOR   1.4485394480035503
Attrib KURTOSIS ABOUT_MAJOR   2.930701380425746
Attrib KURTOSIS ABOUT_MINOR   −2.8618919354294308
Attrib HOLLOWS RATIO   −4.292733377166853
Sigmoid Node 5
Inputs   Weights
Threshold   2.6948705769177157
Attrib COMPACTNESS   0.5537680021294296
Attrib CIRCULARITY   −0.703724081658186
Attrib DISTANCE CIRCULARITY   3.3835041609208703
Attrib RADIUS RATIO   −2.8105533253465014
Attrib PR.AXIS ASPECT RATIO   6.723684103200118
Attrib MAX.LENGTH ASPECT RATIO   2.335150804311906
Attrib SCATTER RATIO   −1.754789825402443
Attrib ELONGATEDNESS   −2.523203525472695
Attrib PR.AXIS RECTANGULARITY   −3.7034076577260047
Attrib MAX.LENGTH RECTANGULARITY   0.3774460438374256
Attrib SCALED VARIANCE_MAJOR   −1.5709981748091137
Attrib SCALED VARIANCE_MINOR   −2.6573880093929496
Attrib SCALED RADIUS OF GYRATION   −0.17759852272339374
Attrib SKEWNESS ABOUT_MAJOR   5.271786364288374
Attrib SKEWNESS ABOUT_MINOR   −0.6095879473739745
Attrib KURTOSIS ABOUT_MAJOR   0.4854830534315979
Attrib KURTOSIS ABOUT_MINOR   0.3766628131328188
Attrib HOLLOWS RATIO   1.6362933132014625
Sigmoid Node 6
Inputs   Weights
Threshold   0.17761787290698255
Attrib COMPACTNESS   −0.7350508122323416
Attrib CIRCULARITY   3.2305119309065793
Attrib DISTANCE CIRCULARITY   0.08442199433087628
Attrib RADIUS RATIO   2.591990726093657
Attrib PR.AXIS ASPECT RATIO   1.866760017411217
Attrib MAX.LENGTH ASPECT RATIO   1.7486921648831388
Attrib SCATTER RATIO   1.9228845516965662
Attrib ELONGATEDNESS   −4.920250090997213
Attrib PR.AXIS RECTANGULARITY   −0.30503428848235875
Attrib MAX.LENGTH RECTANGULARITY   −1.2297904928988976
Attrib SCALED VARIANCE_MAJOR   3.501244557241865
Attrib SCALED VARIANCE_MINOR   3.893817538501313
Attrib SCALED RADIUS OF GYRATION   −3.0640905741095574
Attrib SKEWNESS ABOUT_MAJOR   −0.9218431448170541
Attrib SKEWNESS ABOUT_MINOR   −0.469750989999869
Attrib KURTOSIS ABOUT_MAJOR   0.37790886389926226
Attrib KURTOSIS ABOUT_MINOR   10.06113376423875
Attrib HOLLOWS RATIO   −7.836556923021466

Sigmoid Node 7
Inputs   Weights
Threshold   2.844272257946893
Attrib COMPACTNESS   2.296377086714859
Attrib CIRCULARITY   −8.361576903689432
Attrib DISTANCE CIRCULARITY   1.4173534852146277
Attrib RADIUS RATIO   −0.9799730343274405
Attrib PR.AXIS ASPECT RATIO   −0.24895619433074645
Attrib MAX.LENGTH ASPECT RATIO   1.314232316918746
Attrib SCATTER RATIO   1.9226071137404832
Attrib ELONGATEDNESS   −1.4808300762974513
Attrib PR.AXIS RECTANGULARITY   0.20895632681365758
Attrib MAX.LENGTH RECTANGULARITY   −2.708730888968191
Attrib SCALED VARIANCE_MAJOR   3.2832400084218025
Attrib SCALED VARIANCE_MINOR   1.7205467470357843
Attrib SCALED RADIUS OF GYRATION   2.291715004001476
Attrib SKEWNESS ABOUT_MAJOR   −0.028724352679645078
Attrib SKEWNESS ABOUT_MINOR   −5.146362616085329
Attrib KURTOSIS ABOUT_MAJOR   7.244472738491507
Attrib KURTOSIS ABOUT_MINOR   0.2829583714763012
Attrib HOLLOWS RATIO   −2.5115706914908746
Sigmoid Node 8
Inputs   Weights
Threshold   −0.4282255326228543
Attrib COMPACTNESS   −4.57399795654235
Attrib CIRCULARITY   0.2990405044179512
Attrib DISTANCE CIRCULARITY   −6.769378655858518
Attrib RADIUS RATIO   −5.263226021471387
Attrib PR.AXIS ASPECT RATIO   6.236677264145417
Attrib MAX.LENGTH ASPECT RATIO   −1.4475006291639692
Attrib SCATTER RATIO   0.75252891771964
Attrib ELONGATEDNESS   −8.247584946732568
Attrib PR.AXIS RECTANGULARITY   −0.012712137502435421
Attrib MAX.LENGTH RECTANGULARITY   2.4258170096147613
Attrib SCALED VARIANCE_MAJOR   1.1582231914824788
Attrib SCALED VARIANCE_MINOR   1.0325609599473884
Attrib SCALED RADIUS OF GYRATION   −0.6440776254493021
Attrib SKEWNESS ABOUT_MAJOR   1.2707215788958623
Attrib SKEWNESS ABOUT_MINOR   0.002349393102389162
Attrib KURTOSIS ABOUT_MAJOR   0.6964786648561702
Attrib KURTOSIS ABOUT_MINOR   7.825435647775559
Attrib HOLLOWS RATIO   −6.9719848339492785
Sigmoid Node 9
Inputs   Weights
Threshold   −1.3507098798114396
Attrib COMPACTNESS   0.03973661245701799
Attrib CIRCULARITY   −2.7070722930994546
Attrib DISTANCE CIRCULARITY   2.9150845777957843
Attrib RADIUS RATIO   0.4013836507970233

Attrib PR.AXIS ASPECT RATIO   2.4381697398626176
Attrib MAX.LENGTH ASPECT RATIO   0.8912980374885289
Attrib SCATTER RATIO   −0.08214633087913985
Attrib ELONGATEDNESS   −0.778063939490144
Attrib PR.AXIS RECTANGULARITY   0.612169220928972
Attrib MAX.LENGTH RECTANGULARITY   2.17145365003707
Attrib SCALED VARIANCE_MAJOR   0.44407402718603456
Attrib SCALED VARIANCE_MINOR   −3.9294583348353638
Attrib SCALED RADIUS OF GYRATION   3.36096169693006
Attrib SKEWNESS ABOUT_MAJOR   1.3483553603687235
Attrib SKEWNESS ABOUT_MINOR   0.9139919401107768
Attrib KURTOSIS ABOUT_MAJOR   −3.6959110779144453
Attrib KURTOSIS ABOUT_MINOR   −9.264676452288594
Attrib HOLLOWS RATIO   12.456078342998035
Sigmoid Node 10
Inputs   Weights
Threshold   1.5005556069234545
Attrib COMPACTNESS   5.343563337733253
Attrib CIRCULARITY   −2.6214180845482025
Attrib DISTANCE CIRCULARITY   0.7053366672443103
Attrib RADIUS RATIO   0.36891463167163735
Attrib PR.AXIS ASPECT RATIO   3.183340971666785
Attrib MAX.LENGTH ASPECT RATIO   0.49767111767263456
Attrib SCATTER RATIO   0.7590969763110423
Attrib ELONGATEDNESS   2.9621049636030627
Attrib PR.AXIS RECTANGULARITY   2.579727563225742
Attrib MAX.LENGTH RECTANGULARITY   −2.3560321066381005
Attrib SCALED VARIANCE_MAJOR   −3.1946268967157536
Attrib SCALED VARIANCE_MINOR   1.3101509393367885
Attrib SCALED RADIUS OF GYRATION   1.7258346075498352
Attrib SKEWNESS ABOUT_MAJOR   −0.4451108840209162
Attrib SKEWNESS ABOUT_MINOR   4.07159445113378
Attrib KURTOSIS ABOUT_MAJOR   0.895477640079327
Attrib KURTOSIS ABOUT_MINOR   −1.2994426837579194
Attrib HOLLOWS RATIO   −4.631866503566425
Sigmoid Node 11
Inputs   Weights
Threshold   4.863140872941937
Attrib COMPACTNESS   −4.288515374597033
Attrib CIRCULARITY   2.207213494656278
Attrib DISTANCE CIRCULARITY   −1.7611934033153482
Attrib RADIUS RATIO   2.45302351587128
Attrib PR.AXIS ASPECT RATIO   −0.5241520386537487
Attrib MAX.LENGTH ASPECT RATIO   −2.1902843078135246
Attrib SCATTER RATIO   3.611625642426434
Attrib ELONGATEDNESS   −7.566006357636495
Attrib PR.AXIS RECTANGULARITY   −1.5079581791025176
Attrib MAX.LENGTH RECTANGULARITY   −7.022464944856437
Attrib SCALED VARIANCE_MAJOR   0.18996491850870495

Attrib SCALED VARIANCE_MINOR   2.1814231889281723
Attrib SCALED RADIUS OF GYRATION   2.3572860627702714
Attrib SKEWNESS ABOUT_MAJOR   −0.4692001538590081
Attrib SKEWNESS ABOUT_MINOR   2.99070552905881
Attrib KURTOSIS ABOUT_MAJOR   1.2263070686098918
Attrib KURTOSIS ABOUT_MINOR   −1.8850386591215835
Attrib HOLLOWS RATIO   0.11831237140107867
Sigmoid Node 12
Inputs   Weights
Threshold   0.47251912776696314
Attrib COMPACTNESS   7.388778752600962
Attrib CIRCULARITY   −0.9199195541600896
Attrib DISTANCE CIRCULARITY   4.67178981140488
Attrib RADIUS RATIO   −6.756955242572351
Attrib PR.AXIS ASPECT RATIO   2.6878100778477223
Attrib MAX.LENGTH ASPECT RATIO   5.748220603233549
Attrib SCATTER RATIO   −4.154896460138308
Attrib ELONGATEDNESS   4.634040422322541
Attrib PR.AXIS RECTANGULARITY   −3.3411875328601446
Attrib MAX.LENGTH RECTANGULARITY   8.590380518070187
Attrib SCALED VARIANCE_MAJOR   −1.353332087258909
Attrib SCALED VARIANCE_MINOR   −3.881650273408011
Attrib SCALED RADIUS OF GYRATION   −2.087498313217709
Attrib SKEWNESS ABOUT_MAJOR   6.689071515606382
Attrib SKEWNESS ABOUT_MINOR   −0.9163050991321713
Attrib KURTOSIS ABOUT_MAJOR   −1.454690321078501
Attrib KURTOSIS ABOUT_MINOR   −3.10563657659043
Attrib HOLLOWS RATIO   3.420712487024481
Sigmoid Node 13
Inputs   Weights
Threshold   −4.54492388377184
Attrib COMPACTNESS   0.35514787098212053
Attrib CIRCULARITY   −4.8493283503093005
Attrib DISTANCE CIRCULARITY   0.3059374483313187
Attrib RADIUS RATIO   5.541433718694546
Attrib PR.AXIS ASPECT RATIO   −1.01826028862323
Attrib MAX.LENGTH ASPECT RATIO   −2.111304297397454
Attrib SCATTER RATIO   −0.6396914799818427
Attrib ELONGATEDNESS   4.166082914412572
Attrib PR.AXIS RECTANGULARITY   −1.266811148571904
Attrib MAX.LENGTH RECTANGULARITY   −6.705803383295358
Attrib SCALED VARIANCE_MAJOR   2.227909299170681
Attrib SCALED VARIANCE_MINOR   0.5286879961139749
Attrib SCALED RADIUS OF GYRATION   0.6783161769169747
Attrib SKEWNESS ABOUT_MAJOR   −1.0812358588150444
Attrib SKEWNESS ABOUT_MINOR   2.2402575533867433
Attrib KURTOSIS ABOUT_MAJOR   −0.28173990850973357
Attrib KURTOSIS ABOUT_MINOR   −2.0335499301783417
Attrib HOLLOWS RATIO   −2.5166325054590843

Sigmoid Node 14
Inputs   Weights
Threshold   −0.3468986459288604
Attrib COMPACTNESS   0.7996297624498377
Attrib CIRCULARITY   2.862753292441655
Attrib DISTANCE CIRCULARITY   2.9753144704676817
Attrib RADIUS RATIO   0.5766005763476618
Attrib PR.AXIS ASPECT RATIO   −8.276336916338515
Attrib MAX.LENGTH ASPECT RATIO   4.17125219947582
Attrib SCATTER RATIO   −0.7540069730207759
Attrib ELONGATEDNESS   2.653944429609217
Attrib PR.AXIS RECTANGULARITY   −0.20843569850078944
Attrib MAX.LENGTH RECTANGULARITY   5.143004439769593
Attrib SCALED VARIANCE_MAJOR   6.0195268397227135
Attrib SCALED VARIANCE_MINOR   −1.431254436415702
Attrib SCALED RADIUS OF GYRATION   −0.49356504562327247
Attrib SKEWNESS ABOUT_MAJOR   −3.017613596159251
Attrib SKEWNESS ABOUT_MINOR   −1.5872010229263123
Attrib KURTOSIS ABOUT_MAJOR   1.400064230734404
Attrib KURTOSIS ABOUT_MINOR   0.7065208370511661
Attrib HOLLOWS RATIO   2.3098106931593763
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.79 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   401   95.2494 %
Incorrectly Classified Instances   20   4.7506 %
Kappa statistic   0.9366
Mean absolute error   0.0596
Root mean squared error   0.1464
Relative absolute error   15.89   %

```
Root relative squared error             33.8226 %
Total Number of Instances               421


=== Detailed Accuracy By Class ===

TP Rate   FP Rate   Precision   Recall   F-Measure   MCC       ROC Area
PRC Area   Class
0,924     0,038     0,890       0,924    0,907       0,875     0,988
0,962       opel
0,889     0,026     0,923       0,889    0,906       0,874     0,974
0,957       saab
1,000     0,000     1,000       1,000    1,000       1,000     1,000
1,000       bus
1,000     0,000     1,000       1,000    1,000       1,000     1,000
1,000       van
Weighted Avg.    0,952     0,016     0,953     0,952     0,952
0,937     0,990       0,980


=== Confusion Matrix ===

a    b    c    d    <-- classified as
97   8    0    0  |   a = opel
12   96   0    0  |   b = saab
0    0   109   0  |   c = bus
0    0    0   99  |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
```

SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −3.10301120442098
Node 4   5.553519309830549
Node 5   −0.7485802135520715
Node 6   6.682622385593986
Node 7   −5.532702572233768
Node 8   −12.820036483071146
Node 9   −8.471675501080169
Node 10   −8.61247395379862
Node 11   5.048707681927275
Node 12   −5.28006386737371
Node 13   6.251651821595949
Node 14   2.8564789022669324
Sigmoid Node 1
Inputs   Weights
Threshold   −2.588453046830002
Node 4   −6.164843373498811
Node 5   −6.191079225393911
Node 6   −9.464205611054783
Node 7   5.629313162244739
Node 8   3.1656050222780814
Node 9   8.048543435977873
Node 10   7.341135102429864
Node 11   −3.991022440298591
Node 12   −10.89083733813842
Node 13   3.5663569880222385
Node 14   4.698131811404694
Sigmoid Node 2
Inputs   Weights
Threshold   −0.3191243470793256
Node 4   −0.34996433439146307
Node 5   5.881692477774772
Node 6   3.201784417851295
Node 7   −0.130135474843589
Node 8   8.505782720555466
Node 9   −1.4027439782499427

337

```
Node 10      0.8696389272085867
Node 11      3.6256431876059003
Node 12      −3.8751973624323766
Node 13      −13.636629018933412
Node 14      −10.182416087396215
Sigmoid Node 3
Inputs      Weights
Threshold      −0.3347286345878733
Node 4      −4.334709690134385
Node 5      3.7207105320344818
Node 6      −3.187625732757103
Node 7      −1.6186091977503443
Node 8      −5.008681378958966
Node 9      3.9667916056290164
Node 10      0.1566241269474591
Node 11      −8.087567039937559
Node 12      10.754244760887078
Node 13      0.14863253424299716
Node 14      0.14753998433223123
Sigmoid Node 4
Inputs      Weights
Threshold      −0.06533414046652432
Attrib COMPACTNESS      −8.82935767374655
Attrib CIRCULARITY      −0.0024412301357151734
Attrib DISTANCE CIRCULARITY      2.049719828727891
Attrib RADIUS RATIO      2.3191927604005063
Attrib PR.AXIS ASPECT RATIO      0.03006176495067988
Attrib MAX.LENGTH ASPECT RATIO      1.0871505948457534
Attrib SCATTER RATIO      2.3544309972794624
Attrib ELONGATEDNESS      −1.899710646792559
Attrib PR.AXIS RECTANGULARITY      −2.431184355063277
Attrib MAX.LENGTH RECTANGULARITY      −1.7180398239513346
Attrib SCALED VARIANCE_MAJOR      2.3781451346066653
Attrib SCALED VARIANCE_MINOR      3.949948612861791
Attrib SCALED RADIUS OF GYRATION      1.942945090386214
Attrib SKEWNESS ABOUT_MAJOR      1.6271761686858752
Attrib SKEWNESS ABOUT_MINOR      1.4485394480035503
Attrib KURTOSIS ABOUT_MAJOR      2.930701380425746
Attrib KURTOSIS ABOUT_MINOR      −2.8618919354294308
Attrib HOLLOWS RATIO      −4.292733377166853
Sigmoid Node 5
Inputs      Weights
Threshold      2.6948705769177157
Attrib COMPACTNESS      0.5537680021294296
Attrib CIRCULARITY      −0.703724081658186
Attrib DISTANCE CIRCULARITY      3.3835041609208703
Attrib RADIUS RATIO      −2.8105533253465014
Attrib PR.AXIS ASPECT RATIO      6.723684103200118
Attrib MAX.LENGTH ASPECT RATIO      2.335150804311906
```

Attrib SCATTER RATIO   −1.754789825402443
Attrib ELONGATEDNESS   −2.523203525472695
Attrib PR.AXIS RECTANGULARITY   −3.7034076577260047
Attrib MAX.LENGTH RECTANGULARITY   0.3774460438374256
Attrib SCALED VARIANCE_MAJOR   −1.5709981748091137
Attrib SCALED VARIANCE_MINOR   −2.6573880093929496
Attrib SCALED RADIUS OF GYRATION   −0.17759852272339374
Attrib SKEWNESS ABOUT_MAJOR   5.271786364288374
Attrib SKEWNESS ABOUT_MINOR   −0.6095879473739745
Attrib KURTOSIS ABOUT_MAJOR   0.4854830534315979
Attrib KURTOSIS ABOUT_MINOR   0.3766628131328188
Attrib HOLLOWS RATIO   1.6362933132014625
Sigmoid Node 6
Inputs   Weights
Threshold   0.17761787290698255
Attrib COMPACTNESS   −0.7350508122323416
Attrib CIRCULARITY   3.2305119309065793
Attrib DISTANCE CIRCULARITY   0.08442199433087628
Attrib RADIUS RATIO   2.591990726093657
Attrib PR.AXIS ASPECT RATIO   1.866760017411217
Attrib MAX.LENGTH ASPECT RATIO   1.7486921648831388
Attrib SCATTER RATIO   1.9228845516965662
Attrib ELONGATEDNESS   −4.920250090997213
Attrib PR.AXIS RECTANGULARITY   −0.30503428848235875
Attrib MAX.LENGTH RECTANGULARITY   −1.2297904928988976
Attrib SCALED VARIANCE_MAJOR   3.501244557241865
Attrib SCALED VARIANCE_MINOR   3.893817538501313
Attrib SCALED RADIUS OF GYRATION   −3.0640905741095574
Attrib SKEWNESS ABOUT_MAJOR   −0.9218431448170541
Attrib SKEWNESS ABOUT_MINOR   −0.469750989999869
Attrib KURTOSIS ABOUT_MAJOR   0.37790886389926226
Attrib KURTOSIS ABOUT_MINOR   10.06113376423875
Attrib HOLLOWS RATIO   −7.836556923021466
Sigmoid Node 7
Inputs   Weights
Threshold   2.844272257946893
Attrib COMPACTNESS   2.296377086714859
Attrib CIRCULARITY   −8.361576903689432
Attrib DISTANCE CIRCULARITY   1.4173534852146277
Attrib RADIUS RATIO   −0.9799730343274405
Attrib PR.AXIS ASPECT RATIO   −0.24895619433074645
Attrib MAX.LENGTH ASPECT RATIO   1.314232316918746
Attrib SCATTER RATIO   1.9226071137404832
Attrib ELONGATEDNESS   −1.4808300762974513
Attrib PR.AXIS RECTANGULARITY   0.20895632681365758
Attrib MAX.LENGTH RECTANGULARITY   −2.708730888968191
Attrib SCALED VARIANCE_MAJOR   3.2832400084218025
Attrib SCALED VARIANCE_MINOR   1.7205467470357843
Attrib SCALED RADIUS OF GYRATION   2.291715004001476

Attrib SKEWNESS ABOUT_MAJOR   −0.028724352679645078
Attrib SKEWNESS ABOUT_MINOR   −5.146362616085329
Attrib KURTOSIS ABOUT_MAJOR   7.244472738491507
Attrib KURTOSIS ABOUT_MINOR   0.2829583714763012
Attrib HOLLOWS RATIO   −2.5115706914908746
Sigmoid Node 8
Inputs   Weights
Threshold   −0.4282255326228543
Attrib COMPACTNESS   −4.57399795654235
Attrib CIRCULARITY   0.2990405044179512
Attrib DISTANCE CIRCULARITY   −6.769378655858518
Attrib RADIUS RATIO   −5.263226021471387
Attrib PR.AXIS ASPECT RATIO   6.236677264145417
Attrib MAX.LENGTH ASPECT RATIO   −1.4475006291639692
Attrib SCATTER RATIO   0.75252891771964
Attrib ELONGATEDNESS   −8.247584946732568
Attrib PR.AXIS RECTANGULARITY   −0.012712137502435421
Attrib MAX.LENGTH RECTANGULARITY   2.4258170096147613
Attrib SCALED VARIANCE_MAJOR   1.1582231914824788
Attrib SCALED VARIANCE_MINOR   1.0325609599473884
Attrib SCALED RADIUS OF GYRATION   −0.6440776254493021
Attrib SKEWNESS ABOUT_MAJOR   1.2707215788958623
Attrib SKEWNESS ABOUT_MINOR   0.002349393102389162
Attrib KURTOSIS ABOUT_MAJOR   0.6964786648561702
Attrib KURTOSIS ABOUT_MINOR   7.825435647775559
Attrib HOLLOWS RATIO   −6.9719848339492785
Sigmoid Node 9
Inputs   Weights
Threshold   −1.3507098798114396
Attrib COMPACTNESS   0.03973661245701799
Attrib CIRCULARITY   −2.7070722930994546
Attrib DISTANCE CIRCULARITY   2.9150845777957843
Attrib RADIUS RATIO   0.4013836507970233
Attrib PR.AXIS ASPECT RATIO   2.4381697398626176
Attrib MAX.LENGTH ASPECT RATIO   0.8912980374885289
Attrib SCATTER RATIO   −0.08214633087913985
Attrib ELONGATEDNESS   −0.778063939490144
Attrib PR.AXIS RECTANGULARITY   0.612169220928972
Attrib MAX.LENGTH RECTANGULARITY   2.17145365003707
Attrib SCALED VARIANCE_MAJOR   0.44407402718603456
Attrib SCALED VARIANCE_MINOR   −3.9294583348353638
Attrib SCALED RADIUS OF GYRATION   3.36096169693006
Attrib SKEWNESS ABOUT_MAJOR   1.3483553603687235
Attrib SKEWNESS ABOUT_MINOR   0.913991940107768
Attrib KURTOSIS ABOUT_MAJOR   −3.6959110779144453
Attrib KURTOSIS ABOUT_MINOR   −9.264676452288594
Attrib HOLLOWS RATIO   12.456078342998035
Sigmoid Node 10
Inputs   Weights

```
Threshold       1.5005556069234545
Attrib COMPACTNESS       5.343563337733253
Attrib CIRCULARITY       −2.6214180845482025
Attrib DISTANCE CIRCULARITY       0.7053366672443103
Attrib RADIUS RATIO       0.36891463167163735
Attrib PR.AXIS ASPECT RATIO       3.183340971666785
Attrib MAX.LENGTH ASPECT RATIO       0.49767111767263456
Attrib SCATTER RATIO       0.7590969763110423
Attrib ELONGATEDNESS       2.9621049636030627
Attrib PR.AXIS RECTANGULARITY       2.579727563225742
Attrib MAX.LENGTH RECTANGULARITY       −2.3560321066381005
Attrib SCALED VARIANCE_MAJOR       −3.1946268967157536
Attrib SCALED VARIANCE_MINOR       1.3101509393367885
Attrib SCALED RADIUS OF GYRATION       1.7258346075498352
Attrib SKEWNESS ABOUT_MAJOR       −0.4451108840209162
Attrib SKEWNESS ABOUT_MINOR       4.07159445113378
Attrib KURTOSIS ABOUT_MAJOR       0.895477640079327
Attrib KURTOSIS ABOUT_MINOR       −1.2994426837579194
Attrib HOLLOWS RATIO       −4.631866503566425
Sigmoid Node 11
Inputs       Weights
Threshold       4.863140872941937
Attrib COMPACTNESS       −4.288515374597033
Attrib CIRCULARITY       2.207213494656278
Attrib DISTANCE CIRCULARITY       −1.7611934033153482
Attrib RADIUS RATIO       2.45302351587128
Attrib PR.AXIS ASPECT RATIO       −0.5241520386537487
Attrib MAX.LENGTH ASPECT RATIO       −2.1902843078135246
Attrib SCATTER RATIO       3.611625642426434
Attrib ELONGATEDNESS       −7.566006357636495
Attrib PR.AXIS RECTANGULARITY       −1.5079581791025176
Attrib MAX.LENGTH RECTANGULARITY       −7.022464944856437
Attrib SCALED VARIANCE_MAJOR       0.18996491850870495
Attrib SCALED VARIANCE_MINOR       2.1814231889281723
Attrib SCALED RADIUS OF GYRATION       2.3572860627702714
Attrib SKEWNESS ABOUT_MAJOR       −0.4692001538590081
Attrib SKEWNESS ABOUT_MINOR       2.99070552905881
Attrib KURTOSIS ABOUT_MAJOR       1.2263070686098918
Attrib KURTOSIS ABOUT_MINOR       −1.8850386591215835
Attrib HOLLOWS RATIO       0.1183123714010787
Sigmoid Node 12
Inputs       Weights
Threshold       0.47251912776696314
Attrib COMPACTNESS       7.388778752600962
Attrib CIRCULARITY       −0.9199195541600896
Attrib DISTANCE CIRCULARITY       4.67178981140488
Attrib RADIUS RATIO       −6.756955242572351
Attrib PR.AXIS ASPECT RATIO       2.6878100778477223
Attrib MAX.LENGTH ASPECT RATIO       5.748220603233549
```

Attrib SCATTER RATIO   −4.154896460138308
Attrib ELONGATEDNESS   4.634040422322541
Attrib PR.AXIS RECTANGULARITY   −3.3411875328601446
Attrib MAX.LENGTH RECTANGULARITY   8.590380518070187
Attrib SCALED VARIANCE_MAJOR   −1.353332087258909
Attrib SCALED VARIANCE_MINOR   −3.881650273408011
Attrib SCALED RADIUS OF GYRATION   −2.087498313217709
Attrib SKEWNESS ABOUT_MAJOR   6.689071515606382
Attrib SKEWNESS ABOUT_MINOR   −0.9163050991321713
Attrib KURTOSIS ABOUT_MAJOR   −1.454690321078501
Attrib KURTOSIS ABOUT_MINOR   −3.10563657659043
Attrib HOLLOWS RATIO   3.420712487024481
Sigmoid Node 13
Inputs   Weights
Threshold   −4.54492388377184
Attrib COMPACTNESS   0.35514787098212053
Attrib CIRCULARITY   −4.8493283503093005
Attrib DISTANCE CIRCULARITY   0.3059374483313187
Attrib RADIUS RATIO   5.541433718694546
Attrib PR.AXIS ASPECT RATIO   −1.01826028862323
Attrib MAX.LENGTH ASPECT RATIO   −2.111304297397454
Attrib SCATTER RATIO   −0.6396914799818427
Attrib ELONGATEDNESS   4.166082914412572
Attrib PR.AXIS RECTANGULARITY   −1.266811148571904
Attrib MAX.LENGTH RECTANGULARITY   −6.705803383295358
Attrib SCALED VARIANCE_MAJOR   2.227909299170681
Attrib SCALED VARIANCE_MINOR   0.5286879961139749
Attrib SCALED RADIUS OF GYRATION   0.6783161769169747
Attrib SKEWNESS ABOUT_MAJOR   −1.0812358588150444
Attrib SKEWNESS ABOUT_MINOR   2.2402575533867433
Attrib KURTOSIS ABOUT_MAJOR   −0.28173990850973357
Attrib KURTOSIS ABOUT_MINOR   −2.0335499301783417
Attrib HOLLOWS RATIO   −2.5166325054590843
Sigmoid Node 14
Inputs   Weights
Threshold   −0.3468986459288604
Attrib COMPACTNESS   0.7996297624498377
Attrib CIRCULARITY   2.862753292441655
Attrib DISTANCE CIRCULARITY   2.9753144704676817
Attrib RADIUS RATIO   0.5766005763476618
Attrib PR.AXIS ASPECT RATIO   −8.276336916338515
Attrib MAX.LENGTH ASPECT RATIO   4.17125219947582
Attrib SCATTER RATIO   −0.7540069730207759
Attrib ELONGATEDNESS   2.653944429609217
Attrib PR.AXIS RECTANGULARITY   −0.20843569850078944
Attrib MAX.LENGTH RECTANGULARITY   5.143004439769593
Attrib SCALED VARIANCE_MAJOR   6.0195268397227135
Attrib SCALED VARIANCE_MINOR   −1.431254436415702
Attrib SCALED RADIUS OF GYRATION   −0.49356504562327247

Attrib SKEWNESS ABOUT_MAJOR   −3.017613596159251
Attrib SKEWNESS ABOUT_MINOR   −1.5872010229263123
Attrib KURTOSIS ABOUT_MAJOR   1.400064230734404
Attrib KURTOSIS ABOUT_MINOR   0.7065208370511661
Attrib HOLLOWS RATIO   2.3098106931593763
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   744   87.9433 %
Incorrectly Classified Instances   102   12.0567 %
Kappa statistic   0.8392
Mean absolute error   0.0874
Root mean squared error   0.2155
Relative absolute error   23.3144 %
Root relative squared error   49.7825 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,802	0,082	0,766	0,802	0,783	0,709	0,940	0,829	opel
0,770	0,059	0,819	0,770	0,793	0,726	0,940	0,860	saab
0,986	0,006	0,982	0,986	0,984	0,978	1,000	0,999	bus
0,965	0,014	0,955	0,965	0,960	0,948	0,997	0,989	van

```
Weighted  Avg.      0,879      0,041      0,880        0,879      0,879
0,839      0,969      0,919
```

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
170   35    2    5 |   a = opel
46  167    0    4 |   b = saab
3    0  215    0 |   c = bus
3    2    2  192 |   d = van
```

23 23ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set:  size unknown (reading incrementally)
```

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

```
Sigmoid Node 0
Inputs    Weights
Threshold    3.086159615365314
Node 4     -0.9083003096948727
Node 5      6.230420678876154
```

Node 6   −7.82465848871773
Node 7   −6.434934147033133
Sigmoid Node 1
Inputs   Weights
Threshold   −10.879337210212968
Node 4   9.516680702034249
Node 5   7.40313669948394
Node 6   −2.352550314970882
Node 7   4.683523990032254
Sigmoid Node 2
Inputs   Weights
Threshold   −2.9728065810858912
Node 4   −1.9263514216871047
Node 5   −14.342212290979147
Node 6   12.95489919105067
Node 7   −7.105805503950985
Sigmoid Node 3
Inputs   Weights
Threshold   −0.2167696098941619
Node 4   −13.984572530669366
Node 5   −0.1392054942614224
Node 6   −1.0462870790898928
Node 7   6.743468599817289
Sigmoid Node 4
Inputs   Weights
Threshold   −3.09426981416273
Attrib COMPACTNESS   −2.4634276432356437
Attrib CIRCULARITY   −2.358391389142763
Attrib DISTANCE CIRCULARITY   −7.147735496456225
Attrib RADIUS RATIO   6.796844811457042
Attrib PR.AXIS ASPECT RATIO   −6.529631982150022
Attrib MAX.LENGTH ASPECT RATIO   −6.5043451643731105
Attrib SCATTER RATIO   3.2811039202168413
Attrib ELONGATEDNESS   −2.54210688228144
Attrib PR.AXIS RECTANGULARITY   5.786346062115777
Attrib MAX.LENGTH RECTANGULARITY   −6.417306035137443
Attrib SCALED VARIANCE_MAJOR   4.421113503088882
Attrib SCALED VARIANCE_MINOR   4.345557570679689
Attrib SCALED RADIUS OF GYRATION   4.942947843140911
Attrib SKEWNESS ABOUT_MAJOR   −11.08450769021356
Attrib SKEWNESS ABOUT_MINOR   1.4808004752615445
Attrib KURTOSIS ABOUT_MAJOR   1.1152322436448439
Attrib KURTOSIS ABOUT_MINOR   2.3452724151949993
Attrib HOLLOWS RATIO   −4.647926465889429
Sigmoid Node 5
Inputs   Weights
Threshold   −6.142608481321098
Attrib COMPACTNESS   −0.7037906497605124
Attrib CIRCULARITY   −3.618179652522819

Attrib DISTANCE CIRCULARITY   −3.919613946203963
Attrib RADIUS RATIO   6.699795790940304
Attrib PR.AXIS ASPECT RATIO   −2.433797305726848
Attrib MAX.LENGTH ASPECT RATIO   −1.0844972417472423
Attrib SCATTER RATIO   0.5561175910801821
Attrib ELONGATEDNESS   3.0109703981576756
Attrib PR.AXIS RECTANGULARITY   0.5802946664637576
Attrib MAX.LENGTH RECTANGULARITY   −4.352723019914313
Attrib SCALED VARIANCE_MAJOR   1.3480819344713826
Attrib SCALED VARIANCE_MINOR   2.503216851337714
Attrib SCALED RADIUS OF GYRATION   1.0369579181132542
Attrib SKEWNESS ABOUT_MAJOR   −5.084209303889758
Attrib SKEWNESS ABOUT_MINOR   −0.8419349507092605
Attrib KURTOSIS ABOUT_MAJOR   −0.40119862787257354
Attrib KURTOSIS ABOUT_MINOR   −2.852802831862913
Attrib HOLLOWS RATIO   −1.7143189702674722
Sigmoid Node 6
Inputs   Weights
Threshold   5.295321640765123
Attrib COMPACTNESS   −0.22461157554081976
Attrib CIRCULARITY   −1.1583060440822484
Attrib DISTANCE CIRCULARITY   −7.127208466908793
Attrib RADIUS RATIO   −6.264051272625261
Attrib PR.AXIS ASPECT RATIO   10.798747197342827
Attrib MAX.LENGTH ASPECT RATIO   −3.3091750148207764
Attrib SCATTER RATIO   2.0135741563439393
Attrib ELONGATEDNESS   −4.290566420374537
Attrib PR.AXIS RECTANGULARITY   2.763408748411743
Attrib MAX.LENGTH RECTANGULARITY   −2.6328250774897395
Attrib SCALED VARIANCE_MAJOR   −4.81127873759244
Attrib SCALED VARIANCE_MINOR   4.214303796090753
Attrib SCALED RADIUS OF GYRATION   0.5729146982194148
Attrib SKEWNESS ABOUT_MAJOR   4.958933393819533
Attrib SKEWNESS ABOUT_MINOR   −0.7778621877440056
Attrib KURTOSIS ABOUT_MAJOR   −0.7294240229317518
Attrib KURTOSIS ABOUT_MINOR   2.4435640377885752
Attrib HOLLOWS RATIO   −1.5381696025706928
Sigmoid Node 7
Inputs   Weights
Threshold   −2.1092584594007753
Attrib COMPACTNESS   5.775116688155672
Attrib CIRCULARITY   −11.001096602180242
Attrib DISTANCE CIRCULARITY   4.237849796223415
Attrib RADIUS RATIO   0.2687738901819278
Attrib PR.AXIS ASPECT RATIO   −2.36695420612043
Attrib MAX.LENGTH ASPECT RATIO   0.053102049231102136
Attrib SCATTER RATIO   −2.510081943362368
Attrib ELONGATEDNESS   6.422866527567278
Attrib PR.AXIS RECTANGULARITY   3.7495588357815484

Attrib MAX.LENGTH RECTANGULARITY   6.987817162675528
Attrib SCALED VARIANCE_MAJOR   1.0702997609928495
Attrib SCALED VARIANCE_MINOR   −6.255528862260254
Attrib SCALED RADIUS OF GYRATION   4.999672460423063
Attrib SKEWNESS ABOUT_MAJOR   1.9010985839626897
Attrib SKEWNESS ABOUT_MINOR   −0.5520604431023302
Attrib KURTOSIS ABOUT_MAJOR   −1.138727075024662
Attrib KURTOSIS ABOUT_MINOR   −5.817081505760164
Attrib HOLLOWS RATIO   6.403346685856795
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 11.69 seconds

═══ Evaluation on test set ═══

Time taken to test model on supplied test set: 0 seconds

═══ Summary ═══

Correctly Classified Instances   354   84.0855 %
Incorrectly Classified Instances   67   15.9145 %
Kappa statistic   0.7878
Mean absolute error   0.1155
Root mean squared error   0.2301
Relative absolute error   30.8126 %
Root relative squared error   53.1534 %
Total Number of Instances   421

═══ Detailed Accuracy By Class ═══

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,829	0,152	0,644	0,829	0,725	0,627	0,919	0,785	opel
0,565	0,042	0,824	0,565	0,670	0,600	0,931	0,800	saab

1,000	0,013	0,965	1,000	0,982	0,976	1,000
0,999	bus					
0,980	0,006	0,980	0,980	0,980	0,974	1,000
0,999	van					
Weighted Avg.	0,841	0,053	0,852	0,841	0,837	
0,792	0,962	0,894				

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
87   13   3    2 |   a = opel
46   61   1    0 |   b = saab
 0    0 109    0 |   c = bus
 2    0    0   97 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.1 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   3.086159615365314
Node 4   −0.9083003096948727
Node 5   6.230420678876154
Node 6   −7.82465848871773
Node 7   −6.434934147033133
Sigmoid Node 1
Inputs   Weights
Threshold   −10.879337210212968
Node 4   9.516680702034249
Node 5   7.40313669948394
Node 6   −2.352550314970882
Node 7   4.683523990032254
Sigmoid Node 2
Inputs   Weights
Threshold   −2.9728065810858912
Node 4   −1.9263514216871047
Node 5   −14.342212290979147
Node 6   12.95489919105067
Node 7   −7.105805503950985
Sigmoid Node 3
Inputs   Weights
Threshold   −0.2167696098941619
Node 4   −13.984572530669366
Node 5   −0.1392054942614224
Node 6   −1.0462870790898928
Node 7   6.743468599817289
Sigmoid Node 4
Inputs   Weights
Threshold   −3.09426981416273
Attrib COMPACTNESS   −2.4634276432356437
Attrib CIRCULARITY   −2.358391389142763
Attrib DISTANCE CIRCULARITY   −7.147735496456225
Attrib RADIUS RATIO   6.796844811457042
Attrib PR.AXIS ASPECT RATIO   −6.529631982150022
Attrib MAX.LENGTH ASPECT RATIO   −6.5043451643731105
Attrib SCATTER RATIO   3.2811039202168413
Attrib ELONGATEDNESS   −2.54210688228144
Attrib PR.AXIS RECTANGULARITY   5.786346062115777
Attrib MAX.LENGTH RECTANGULARITY   −6.417306035137443
Attrib SCALED VARIANCE_MAJOR   4.421113503088882
Attrib SCALED VARIANCE_MINOR   4.345557570679689
Attrib SCALED RADIUS OF GYRATION   4.942947843140911
Attrib SKEWNESS ABOUT_MAJOR   −11.08450769021356
Attrib SKEWNESS ABOUT_MINOR   1.4808004752615445
Attrib KURTOSIS ABOUT_MAJOR   1.1152322436448439
Attrib KURTOSIS ABOUT_MINOR   2.3452724151949993

Attrib HOLLOWS RATIO   −4.647926465889429
Sigmoid Node 5
Inputs   Weights
Threshold   −6.142608481321098
Attrib COMPACTNESS   −0.7037906497605124
Attrib CIRCULARITY   −3.618179652522819
Attrib DISTANCE CIRCULARITY   −3.919613946203963
Attrib RADIUS RATIO   6.699795790940304
Attrib PR.AXIS ASPECT RATIO   −2.433797305726848
Attrib MAX.LENGTH ASPECT RATIO   −1.0844972417472423
Attrib SCATTER RATIO   0.5561175910801821
Attrib ELONGATEDNESS   3.0109703981576756
Attrib PR.AXIS RECTANGULARITY   0.5802946664637576
Attrib MAX.LENGTH RECTANGULARITY   −4.352723019914313
Attrib SCALED VARIANCE_MAJOR   1.3480819344713826
Attrib SCALED VARIANCE_MINOR   2.503216851337714
Attrib SCALED RADIUS OF GYRATION   1.0369579181132542
Attrib SKEWNESS ABOUT_MAJOR   −5.084209303889758
Attrib SKEWNESS ABOUT_MINOR   −0.8419349507092605
Attrib KURTOSIS ABOUT_MAJOR   −0.40119862787257354
Attrib KURTOSIS ABOUT_MINOR   −2.852802831862913
Attrib HOLLOWS RATIO   −1.7143189702674722
Sigmoid Node 6
Inputs   Weights
Threshold   5.295321640765123
Attrib COMPACTNESS   −0.22461157554081976
Attrib CIRCULARITY   −1.1583060440822484
Attrib DISTANCE CIRCULARITY   −7.127208466908793
Attrib RADIUS RATIO   −6.264051272625261
Attrib PR.AXIS ASPECT RATIO   10.798747197342827
Attrib MAX.LENGTH ASPECT RATIO   −3.3091750148207764
Attrib SCATTER RATIO   2.0135741563439393
Attrib ELONGATEDNESS   −4.290566420374537
Attrib PR.AXIS RECTANGULARITY   2.763408748411743
Attrib MAX.LENGTH RECTANGULARITY   −2.6328250774897395
Attrib SCALED VARIANCE_MAJOR   −4.81127873759244
Attrib SCALED VARIANCE_MINOR   4.214303796090753
Attrib SCALED RADIUS OF GYRATION   0.5729146982194148
Attrib SKEWNESS ABOUT_MAJOR   4.958933393819533
Attrib SKEWNESS ABOUT_MINOR   −0.7778621877440056
Attrib KURTOSIS ABOUT_MAJOR   −0.7294240229317518
Attrib KURTOSIS ABOUT_MINOR   2.4435640377885752
Attrib HOLLOWS RATIO   −1.5381696025706928
Sigmoid Node 7
Inputs   Weights
Threshold   −2.1092584594007753
Attrib COMPACTNESS   5.775116688155672
Attrib CIRCULARITY   −11.001096602180242
Attrib DISTANCE CIRCULARITY   4.237849796223415

Attrib RADIUS RATIO   0.2687738901819278
Attrib PR.AXIS ASPECT RATIO   −2.36695420612043
Attrib MAX.LENGTH ASPECT RATIO   0.053102049231102136
Attrib SCATTER RATIO   −2.510081943362368
Attrib ELONGATEDNESS   6.422866527567278
Attrib PR.AXIS RECTANGULARITY   3.7495588357815484
Attrib MAX.LENGTH RECTANGULARITY   6.987817162675528
Attrib SCALED VARIANCE_MAJOR   1.0702997609928495
Attrib SCALED VARIANCE_MINOR   −6.255528862260254
Attrib SCALED RADIUS OF GYRATION   4.999672460423063
Attrib SKEWNESS ABOUT_MAJOR   1.9010985839626897
Attrib SKEWNESS ABOUT_MINOR   −0.5520604431023302
Attrib KURTOSIS ABOUT_MAJOR   −1.138727075024662
Attrib KURTOSIS ABOUT_MINOR   −5.817081505760164
Attrib HOLLOWS RATIO   6.403346685856795
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.86 seconds

══ Evaluation on test set ══

Time taken to test model on supplied test set: 0 seconds

══ Summary ══

Correctly Classified Instances   689   81.4421 %
Incorrectly Classified Instances   157   18.5579 %
Kappa statistic   0.7526
Mean absolute error   0.1269
Root mean squared error   0.2489
Relative absolute error   33.8498 %
Root relative squared error   57.492 %
Total Number of Instances   846

══ Detailed Accuracy By Class ══

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,792	0,161	0,622	0,792	0,697	0,587	0,896	0,708	opel
0,539	0,049	0,791	0,539	0,641	0,563	0,923	0,780	saab
0,995	0,024	0,935	0,995	0,964	0,952	0,998	0,987	bus
0,940	0,014	0,954	0,940	0,947	0,931	0,996	0,987	van
Weighted Avg.	0,814	0,062	0,824	0,814	0,810	0,756	0,953	0,864

=== Confusion Matrix ===

```
a   b   c   d   <-- classified as
168  29   8   7 |   a = opel
95 117   3   2 |   b = saab
1   0 217   0 |   c = bus
6   2   4 187 |   d = van
```

24 24ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO

Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   1.3685741363244253
Node 4   −8.781203341498962
Node 5   −7.009645690987552
Node 6   −6.39554202934158
Node 7   8.527581231061953
Node 8   −3.7267455171400417
Node 9   3.2217934741219576
Node 10   −2.803017769784152
Node 11   10.386324267270272
Node 12   0.800361203464229
Node 13   6.786951176266081
Node 14   2.6735419692657194
Node 15   −0.46134732397270045
Node 16   4.2174036423816315
Node 17   −2.9996003588696656
Node 18   4.186725014219235
Node 19   −12.294359807187355
Node 20   −2.6334390751239907
Node 21   −3.7862873126806837
Sigmoid Node 1
Inputs   Weights
Threshold   −1.1743683604755961
Node 4   9.668546268585015
Node 5   7.651155497711282
Node 6   5.812686405445172
Node 7   −10.172840657488498
Node 8   −0.1600475415313047
Node 9   −7.1195765560094735
Node 10   −7.824754019965551
Node 11   −3.0488656243146943
Node 12   −5.06149020322939
Node 13   −6.057954980551595
Node 14   6.4543531296837475
Node 15   −4.0791637146503215
Node 16   −0.3546400646231494
Node 17   5.106972389152336
Node 18   6.435665800224981
Node 19   4.956058257563061
Node 20   −7.442456209652782
Node 21   −4.718437253434535
Sigmoid Node 2
Inputs   Weights

353

```
Threshold        −0.5026399761487234
Node 4      0.6608364216028486
Node 5     −3.5542185167393665
Node 6      1.3275668839365995
Node 7      2.562080834050557
Node 8     −2.065228336946426
Node 9      5.822544108144396
Node 10      −2.269420376244059
Node 11      −4.820015256291183
Node 12      1.3158031493592657
Node 13      3.449247788398064
Node 14      −8.48495809825956
Node 15      5.236683600310986
Node 16      −7.691002149479901
Node 17      −7.142415581610012
Node 18      −7.995132473742198
Node 19      5.741799067142503
Node 20      −0.7666942171882208
Node 21      0.8133839835349844
Sigmoid Node 3
Inputs      Weights
Threshold        −0.5571753852916902
Node 4     −1.1630094464981795
Node 5      2.9291694287803924
Node 6     −4.1687036041501795
Node 7     −3.0799200241930187
Node 8      4.91498432727807
Node 9     −5.715789016596528
Node 10      8.096958885760483
Node 11      −2.274240570159879
Node 12      −4.349592512248861
Node 13      −3.526542133215699
Node 14      −0.6855166552189895
Node 15      1.6898308623148814
Node 16      −0.732045370133443
Node 17      1.4776701323467074
Node 18      0.07539941445689644
Node 19      −1.9843692255192649
Node 20      7.792313867045245
Node 21      −3.23680113454584
Sigmoid Node 4
Inputs      Weights
Threshold      0.428264489539902
Attrib COMPACTNESS      7.047083792700057
Attrib CIRCULARITY       −1.481516451269427
Attrib DISTANCE CIRCULARITY       −0.6926664693898026
Attrib RADIUS RATIO      −0.21547868162009864
Attrib PR.AXIS ASPECT RATIO      2.0366530145633592
Attrib MAX.LENGTH ASPECT RATIO       −2.018456065589316
```

354

Attrib SCATTER RATIO   2.2745594043768507
Attrib ELONGATEDNESS   −1.4062230409584173
Attrib PR.AXIS RECTANGULARITY   −1.6716550201966955
Attrib MAX.LENGTH RECTANGULARITY   −1.3542464933054656
Attrib SCALED VARIANCE_MAJOR   0.3350547575315538
Attrib SCALED VARIANCE_MINOR   1.2566665028043011
Attrib SCALED RADIUS OF GYRATION   3.3251457770005053
Attrib SKEWNESS ABOUT_MAJOR   5.116146186957754
Attrib SKEWNESS ABOUT_MINOR   4.114595042464366
Attrib KURTOSIS ABOUT_MAJOR   1.8917417619017523
Attrib KURTOSIS ABOUT_MINOR   −0.8781404076151388
Attrib HOLLOWS RATIO   −2.551642234647048
Sigmoid Node 5
Inputs   Weights
Threshold   −1.2692159790347268
Attrib COMPACTNESS   1.56661844467427
Attrib CIRCULARITY   −4.084620796615177
Attrib DISTANCE CIRCULARITY   3.305942352145087
Attrib RADIUS RATIO   −0.3339824605786318
Attrib PR.AXIS ASPECT RATIO   0.36281012632628823
Attrib MAX.LENGTH ASPECT RATIO   2.4190260130103263
Attrib SCATTER RATIO   −0.39160649802651853
Attrib ELONGATEDNESS   3.0014402500991544
Attrib PR.AXIS RECTANGULARITY   1.6375950615978145
Attrib MAX.LENGTH RECTANGULARITY   0.4004500292647886
Attrib SCALED VARIANCE_MAJOR   1.8267224633027113
Attrib SCALED VARIANCE_MINOR   −2.225480528263952
Attrib SCALED RADIUS OF GYRATION   3.0842064523882318
Attrib SKEWNESS ABOUT_MAJOR   0.14182774120559685
Attrib SKEWNESS ABOUT_MINOR   −0.9219963858118542
Attrib KURTOSIS ABOUT_MAJOR   −3.783878570835589
Attrib KURTOSIS ABOUT_MINOR   −8.7766166111212
Attrib HOLLOWS RATIO   11.996580143725927
Sigmoid Node 6
Inputs   Weights
Threshold   3.8830815093534965
Attrib COMPACTNESS   −6.048538041268007
Attrib CIRCULARITY   −1.2429319277025523
Attrib DISTANCE CIRCULARITY   −1.3995179740254884
Attrib RADIUS RATIO   2.0791705628483235
Attrib PR.AXIS ASPECT RATIO   2.8939631786901843
Attrib MAX.LENGTH ASPECT RATIO   −1.9196902394945032
Attrib SCATTER RATIO   0.751792899660978
Attrib ELONGATEDNESS   −2.562255536599246
Attrib PR.AXIS RECTANGULARITY   −0.6304840410959633
Attrib MAX.LENGTH RECTANGULARITY   −1.7355004971150594
Attrib SCALED VARIANCE_MAJOR   0.24958904424507913
Attrib SCALED VARIANCE_MINOR   0.10402792860673135
Attrib SCALED RADIUS OF GYRATION   3.2655871658993396

Attrib SKEWNESS ABOUT_MAJOR   −3.179926774622905
Attrib SKEWNESS ABOUT_MINOR   −0.9241467203959012
Attrib KURTOSIS ABOUT_MAJOR   5.841570408261643
Attrib KURTOSIS ABOUT_MINOR   0.9548016109618224
Attrib HOLLOWS RATIO   −0.19002478060504888
Sigmoid Node 7
Inputs   Weights
Threshold   −2.015065514751055
Attrib COMPACTNESS   −1.079381323683851
Attrib CIRCULARITY   3.135187346727612
Attrib DISTANCE CIRCULARITY   0.025697428306998456
Attrib RADIUS RATIO   2.3732177156703367
Attrib PR.AXIS ASPECT RATIO   1.3204973637518163
Attrib MAX.LENGTH ASPECT RATIO   1.154531213679553
Attrib SCATTER RATIO   2.202352077759905
Attrib ELONGATEDNESS   −5.139646588132731
Attrib PR.AXIS RECTANGULARITY   3.6851166379883877
Attrib MAX.LENGTH RECTANGULARITY   −0.4368574170279013
Attrib SCALED VARIANCE_MAJOR   2.5350560405398883
Attrib SCALED VARIANCE_MINOR   3.707129686372514
Attrib SCALED RADIUS OF GYRATION   −3.304609617883728
Attrib SKEWNESS ABOUT_MAJOR   −1.47382185259453
Attrib SKEWNESS ABOUT_MINOR   −0.399741992640793
Attrib KURTOSIS ABOUT_MAJOR   0.9045622403565075
Attrib KURTOSIS ABOUT_MINOR   12.701730360067582
Attrib HOLLOWS RATIO   −8.36314925595053
Sigmoid Node 8
Inputs   Weights
Threshold   −2.5182028819396924
Attrib COMPACTNESS   2.8445395123887334
Attrib CIRCULARITY   −2.8186795771856508
Attrib DISTANCE CIRCULARITY   2.803701726320019
Attrib RADIUS RATIO   −1.359367160857711
Attrib PR.AXIS ASPECT RATIO   1.2924838722834966
Attrib MAX.LENGTH ASPECT RATIO   0.9478386892984001
Attrib SCATTER RATIO   −1.5212685494658063
Attrib ELONGATEDNESS   3.699161159073622
Attrib PR.AXIS RECTANGULARITY   −0.1565430481641542
Attrib MAX.LENGTH RECTANGULARITY   2.632992021029427
Attrib SCALED VARIANCE_MAJOR   −1.5181853981291358
Attrib SCALED VARIANCE_MINOR   −0.7989214978873459
Attrib SCALED RADIUS OF GYRATION   −3.5833538309672814
Attrib SKEWNESS ABOUT_MAJOR   1.3758771178394469
Attrib SKEWNESS ABOUT_MINOR   1.468755650813504
Attrib KURTOSIS ABOUT_MAJOR   −0.30389213658409425
Attrib KURTOSIS ABOUT_MINOR   −0.26810953535762433
Attrib HOLLOWS RATIO   −0.3588953387240746
Sigmoid Node 9
Inputs   Weights

Threshold   0.730312160490962
Attrib COMPACTNESS   −1.6672964111084754
Attrib CIRCULARITY   −0.4324208657285606
Attrib DISTANCE CIRCULARITY   −4.996483289445128
Attrib RADIUS RATIO   0.040809353446019166
Attrib PR.AXIS ASPECT RATIO   2.9032192888580566
Attrib MAX.LENGTH ASPECT RATIO   −5.033468965957076
Attrib SCATTER RATIO   −0.18269281591121414
Attrib ELONGATEDNESS   −1.503438912644407
Attrib PR.AXIS RECTANGULARITY   0.5915779225188744
Attrib MAX.LENGTH RECTANGULARITY   −5.816068743145224
Attrib SCALED VARIANCE_MAJOR   −1.1971379171210925
Attrib SCALED VARIANCE_MINOR   0.9126101861511675
Attrib SCALED RADIUS OF GYRATION   2.5532698132525096
Attrib SKEWNESS ABOUT_MAJOR   1.5045399978521246
Attrib SKEWNESS ABOUT_MINOR   −2.3843398074976925
Attrib KURTOSIS ABOUT_MAJOR   −0.7021310757964541
Attrib KURTOSIS ABOUT_MINOR   2.627709685658006
Attrib HOLLOWS RATIO   −6.287458974188882
Sigmoid Node 10
Inputs   Weights
Threshold   1.6547359911186188
Attrib COMPACTNESS   3.9713616311767534
Attrib CIRCULARITY   −0.06324365768077264
Attrib DISTANCE CIRCULARITY   2.7198892859267105
Attrib RADIUS RATIO   −3.969490216424161
Attrib PR.AXIS ASPECT RATIO   3.9208537997764155
Attrib MAX.LENGTH ASPECT RATIO   3.210595482281495
Attrib SCATTER RATIO   −2.7801425849450565
Attrib ELONGATEDNESS   2.195861666489374
Attrib PR.AXIS RECTANGULARITY   −1.4450293223697097
Attrib MAX.LENGTH RECTANGULARITY   6.960255304373263
Attrib SCALED VARIANCE_MAJOR   −3.0728214697248744
Attrib SCALED VARIANCE_MINOR   −2.9679940572579158
Attrib SCALED RADIUS OF GYRATION   −2.292644410338748
Attrib SKEWNESS ABOUT_MAJOR   5.49483903645521
Attrib SKEWNESS ABOUT_MINOR   −1.9010761191052583
Attrib KURTOSIS ABOUT_MAJOR   0.2412670084407876
Attrib KURTOSIS ABOUT_MINOR   −0.7430929418913151
Attrib HOLLOWS RATIO   2.2019419023699953
Sigmoid Node 11
Inputs   Weights
Threshold   −2.7517701595317474
Attrib COMPACTNESS   −1.6649610821139378
Attrib CIRCULARITY   −2.3160006846052457
Attrib DISTANCE CIRCULARITY   1.51691668551762
Attrib RADIUS RATIO   5.372967858556994
Attrib PR.AXIS ASPECT RATIO   1.3170671509300353
Attrib MAX.LENGTH ASPECT RATIO   0.7039289383083396

Attrib SCATTER RATIO   0.5717814824617362
Attrib ELONGATEDNESS   0.2470980629768123
Attrib PR.AXIS RECTANGULARITY   −3.520628928945903
Attrib MAX.LENGTH RECTANGULARITY   −5.34401787728652
Attrib SCALED VARIANCE_MAJOR   3.377503023018696
Attrib SCALED VARIANCE_MINOR   1.0493240967715731
Attrib SCALED RADIUS OF GYRATION   1.6302552031049968
Attrib SKEWNESS ABOUT_MAJOR   −0.02894116371768232
Attrib SKEWNESS ABOUT_MINOR   −2.6723043395010904
Attrib KURTOSIS ABOUT_MAJOR   −1.7160165935748906
Attrib KURTOSIS ABOUT_MINOR   −4.192582174551403
Attrib HOLLOWS RATIO   0.27107309609417013
Sigmoid Node 12
Inputs   Weights
Threshold   2.0981892534547937
Attrib COMPACTNESS   −2.1638653099269267
Attrib CIRCULARITY   0.9287289816254224
Attrib DISTANCE CIRCULARITY   0.880483962141283
Attrib RADIUS RATIO   1.0898538300530944
Attrib PR.AXIS ASPECT RATIO   1.1453957392581946
Attrib MAX.LENGTH ASPECT RATIO   0.6948073933720571
Attrib SCATTER RATIO   0.2553176989525934
Attrib ELONGATEDNESS   −2.2579303001841793
Attrib PR.AXIS RECTANGULARITY   −0.16490782509832144
Attrib MAX.LENGTH RECTANGULARITY   −3.7496794368372566
Attrib SCALED VARIANCE_MAJOR   1.152406628532488
Attrib SCALED VARIANCE_MINOR   0.5413527183685911
Attrib SCALED RADIUS OF GYRATION   1.155985593266781
Attrib SKEWNESS ABOUT_MAJOR   −1.0370113574216444
Attrib SKEWNESS ABOUT_MINOR   5.5752350364579195
Attrib KURTOSIS ABOUT_MAJOR   −0.6833894628622282
Attrib KURTOSIS ABOUT_MINOR   2.8659784205476666
Attrib HOLLOWS RATIO   −1.245353181 8503059
Sigmoid Node 13
Inputs   Weights
Threshold   −0.650904751314771
Attrib COMPACTNESS   −5.801276727662393
Attrib CIRCULARITY   1.4576046094626967
Attrib DISTANCE CIRCULARITY   0.8444863148104754
Attrib RADIUS RATIO   −0.3578566000098056
Attrib PR.AXIS ASPECT RATIO   0.10975110404288739
Attrib MAX.LENGTH ASPECT RATIO   1.4231961295395334
Attrib SCATTER RATIO   2.546568235619958
Attrib ELONGATEDNESS   −0.3010724016606206
Attrib PR.AXIS RECTANGULARITY   1.6570720897914435
Attrib MAX.LENGTH RECTANGULARITY   0.24754982672333645
Attrib SCALED VARIANCE_MAJOR   0.9829095859163405
Attrib SCALED VARIANCE_MINOR   3.2461342216670688
Attrib SCALED RADIUS OF GYRATION   −1.7721203731751207

358

Attrib SKEWNESS ABOUT_MAJOR   3.24066028667416
Attrib SKEWNESS ABOUT_MINOR   0.32934037845167335
Attrib KURTOSIS ABOUT_MAJOR   5.380424619837339
Attrib KURTOSIS ABOUT_MINOR   −7.653887086686204
Attrib HOLLOWS RATIO   −5.90675346295832
Sigmoid Node 14
Inputs   Weights
Threshold   −1.552842395425246
Attrib COMPACTNESS   −1.9768731066636975
Attrib CIRCULARITY   1.258201399718224
Attrib DISTANCE CIRCULARITY   3.4576468013030537
Attrib RADIUS RATIO   1.165793940966413
Attrib PR.AXIS ASPECT RATIO   −7.750239415624187
Attrib MAX.LENGTH ASPECT RATIO   −0.6274884377913283
Attrib SCATTER RATIO   2.971271684276683
Attrib ELONGATEDNESS   −2.4671648524318757
Attrib PR.AXIS RECTANGULARITY   1.0340307837323706
Attrib MAX.LENGTH RECTANGULARITY   2.591241699994126
Attrib SCALED VARIANCE_MAJOR   4.600648497730822
Attrib SCALED VARIANCE_MINOR   2.7354648219475126
Attrib SCALED RADIUS OF GYRATION   −2.031800132369989
Attrib SKEWNESS ABOUT_MAJOR   −4.161658859971872
Attrib SKEWNESS ABOUT_MINOR   0.900975743893243
Attrib KURTOSIS ABOUT_MAJOR   1.6224114178800013
Attrib KURTOSIS ABOUT_MINOR   1.5515766126312327
Attrib HOLLOWS RATIO   −0.8411892339522785
Sigmoid Node 15
Inputs   Weights
Threshold   1.7783193445034682
Attrib COMPACTNESS   2.2935848886440358
Attrib CIRCULARITY   −0.5384942658871277
Attrib DISTANCE CIRCULARITY   0.7969423294767263
Attrib RADIUS RATIO   −2.0417997619190804
Attrib PR.AXIS ASPECT RATIO   3.725901881141226
Attrib MAX.LENGTH ASPECT RATIO   0.9943579508103979
Attrib SCATTER RATIO   −1.0938656584106703
Attrib ELONGATEDNESS   −1.294726011667859
Attrib PR.AXIS RECTANGULARITY   −1.1184447496758982
Attrib MAX.LENGTH RECTANGULARITY   1.6516453344994644
Attrib SCALED VARIANCE_MAJOR   −1.9739344345979462
Attrib SCALED VARIANCE_MINOR   −1.301624270519064
Attrib SCALED RADIUS OF GYRATION   −1.166516863728584
Attrib SKEWNESS ABOUT_MAJOR   3.0584755564036983
Attrib SKEWNESS ABOUT_MINOR   −1.0949620035883896
Attrib KURTOSIS ABOUT_MAJOR   0.2118768906803274
Attrib KURTOSIS ABOUT_MINOR   1.8809999696476363
Attrib HOLLOWS RATIO   0.47636858859803133
Sigmoid Node 16
Inputs   Weights

```
Threshold      −1.6056757802187005
Attrib COMPACTNESS      −0.15942384402536872
Attrib CIRCULARITY      1.3642152410740598
Attrib DISTANCE CIRCULARITY      1.263809658583451
Attrib RADIUS RATIO      2.510629416937561
Attrib PR.AXIS ASPECT RATIO      −4.8290845393607755
Attrib MAX.LENGTH ASPECT RATIO      1.3899870694781757
Attrib SCATTER RATIO      −1.303104271385012
Attrib ELONGATEDNESS      3.576260814066372
Attrib PR.AXIS RECTANGULARITY      −1.081854543981672
Attrib MAX.LENGTH RECTANGULARITY      −0.7275106383228177
Attrib SCALED VARIANCE_MAJOR      2.757382753847427
Attrib SCALED VARIANCE_MINOR      −1.139508763636654
Attrib SCALED RADIUS OF GYRATION      2.6075905065854963
Attrib SKEWNESS ABOUT_MAJOR      −2.694863011279094
Attrib SKEWNESS ABOUT_MINOR      −2.1079229998607674
Attrib KURTOSIS ABOUT_MAJOR      2.091089483997471
Attrib KURTOSIS ABOUT_MINOR      −0.931751228O482808
Attrib HOLLOWS RATIO      0.48332428647978914
Sigmoid Node 17
Inputs      Weights
Threshold      −2.496690966175742
Attrib COMPACTNESS      4.2327625251376
Attrib CIRCULARITY      −4.454587626699807
Attrib DISTANCE CIRCULARITY      −1.1001447331223437
Attrib RADIUS RATIO      3.647052670940023
Attrib PR.AXIS ASPECT RATIO      −1.0312156999982365
Attrib MAX.LENGTH ASPECT RATIO      −2.9209589142782746
Attrib SCATTER RATIO      0.24658040307575996
Attrib ELONGATEDNESS      4.190039371939881
Attrib PR.AXIS RECTANGULARITY      4.326478505147671
Attrib MAX.LENGTH RECTANGULARITY      −1.9898037330380673
Attrib SCALED VARIANCE_MAJOR      −0.7700241572777087
Attrib SCALED VARIANCE_MINOR      1.4315832821393917
Attrib SCALED RADIUS OF GYRATION      −3.119219892663373
Attrib SKEWNESS ABOUT_MAJOR      −1.2059285425318045
Attrib SKEWNESS ABOUT_MINOR      3.2487706017752562
Attrib KURTOSIS ABOUT_MAJOR      −2.589112966178785
Attrib KURTOSIS ABOUT_MINOR      0.04751639479563466
Attrib HOLLOWS RATIO      −4.011305457876173
Sigmoid Node 18
Inputs      Weights
Threshold      −4.3965440728097
Attrib COMPACTNESS      2.340649440771
Attrib CIRCULARITY      −1.8510371430327044
Attrib DISTANCE CIRCULARITY      −1.9767546907758549
Attrib RADIUS RATIO      2.5917298093551873
Attrib PR.AXIS ASPECT RATIO      −0.8475248511045902
Attrib MAX.LENGTH ASPECT RATIO      −2.2277161974539577
```

Attrib SCATTER RATIO   −2.319945013995247
Attrib ELONGATEDNESS   6.361875762551616
Attrib PR.AXIS RECTANGULARITY   −1.1981417296658328
Attrib MAX.LENGTH RECTANGULARITY   −4.061634898359224
Attrib SCALED VARIANCE_MAJOR   0.04953469904678163
Attrib SCALED VARIANCE_MINOR   −0.7385629841116939
Attrib SCALED RADIUS OF GYRATION   2.1312959009347097
Attrib SKEWNESS ABOUT_MAJOR   0.9438639926279592
Attrib SKEWNESS ABOUT_MINOR   1.1240816211736162
Attrib KURTOSIS ABOUT_MAJOR   2.0922166806055174
Attrib KURTOSIS ABOUT_MINOR   −1.668801000617819
Attrib HOLLOWS RATIO   −1.549008718484978
Sigmoid Node 19
Inputs   Weights
Threshold   0.16891678276779354
Attrib COMPACTNESS   −0.998990045913316
Attrib CIRCULARITY   −0.8525130628166788
Attrib DISTANCE CIRCULARITY   −6.554253980135104
Attrib RADIUS RATIO   −4.215675932507834
Attrib PR.AXIS ASPECT RATIO   4.256701448779665
Attrib MAX.LENGTH ASPECT RATIO   −3.0206720719574287
Attrib SCATTER RATIO   −0.038429806191596354
Attrib ELONGATEDNESS   −5.668425015016808
Attrib PR.AXIS RECTANGULARITY   3.4383138787442498
Attrib MAX.LENGTH RECTANGULARITY   −0.27626473431756715
Attrib SCALED VARIANCE_MAJOR   0.3075964652230453
Attrib SCALED VARIANCE_MINOR   −0.5730802579926162
Attrib SCALED RADIUS OF GYRATION   1.3208903854527603
Attrib SKEWNESS ABOUT_MAJOR   5.050186069087841
Attrib SKEWNESS ABOUT_MINOR   −4.976707474112267
Attrib KURTOSIS ABOUT_MAJOR   2.245561097595957
Attrib KURTOSIS ABOUT_MINOR   6.339322898380591
Attrib HOLLOWS RATIO   −8.09390844572533
Sigmoid Node 20
Inputs   Weights
Threshold   1.2783303810746678
Attrib COMPACTNESS   1.2369153430692565
Attrib CIRCULARITY   0.8456894050664102
Attrib DISTANCE CIRCULARITY   2.303453348275108
Attrib RADIUS RATIO   −4.269284434993415
Attrib PR.AXIS ASPECT RATIO   3.54381342687164
Attrib MAX.LENGTH ASPECT RATIO   3.6829583613645647
Attrib SCATTER RATIO   −2.717284594416116
Attrib ELONGATEDNESS   1.6001605576592361
Attrib PR.AXIS RECTANGULARITY   −1.7295702529349557
Attrib MAX.LENGTH RECTANGULARITY   6.936316634229035
Attrib SCALED VARIANCE_MAJOR   −2.679684317650806
Attrib SCALED VARIANCE_MINOR   −3.1264024485905533
Attrib SCALED RADIUS OF GYRATION   −2.1618478909394105

361

Attrib SKEWNESS ABOUT_MAJOR   6.259963641902985
Attrib SKEWNESS ABOUT_MINOR   −0.6134056048805775
Attrib KURTOSIS ABOUT_MAJOR   −1.2354060877610018
Attrib KURTOSIS ABOUT_MINOR   −0.9973363266271067
Attrib HOLLOWS RATIO   1.7950619847208387
Sigmoid Node 21
Inputs   Weights
Threshold   0.6408915763767689
Attrib COMPACTNESS   −7.690008610582998E−4
Attrib CIRCULARITY   0.0012466433629041978
Attrib DISTANCE CIRCULARITY   2.5510816364849607
Attrib RADIUS RATIO   0.18087593203895672
Attrib PR.AXIS ASPECT RATIO   1.8991865306561924
Attrib MAX.LENGTH ASPECT RATIO   0.26545654169422844
Attrib SCATTER RATIO   0.20163896697346412
Attrib ELONGATEDNESS   −2.207442887693771
Attrib PR.AXIS RECTANGULARITY   −0.6877638649313761
Attrib MAX.LENGTH RECTANGULARITY   −2.0784657942888405
Attrib SCALED VARIANCE_MAJOR   1.0169384710640628
Attrib SCALED VARIANCE_MINOR   0.4431347314375862
Attrib SCALED RADIUS OF GYRATION   1.4718381460527175
Attrib SKEWNESS ABOUT_MAJOR   1.0970346217453606
Attrib SKEWNESS ABOUT_MINOR   −1.0663717404049786
Attrib KURTOSIS ABOUT_MAJOR   −0.039188428570831
Attrib KURTOSIS ABOUT_MINOR   1.9133669052856082
Attrib HOLLOWS RATIO   −2.5047444695381893
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 8.09 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   409   97.1496 %

```
Incorrectly Classified Instances        12               2.8504 %
Kappa statistic                        0.962
Mean absolute error                    0.0433
Root mean squared error                0.1176
Relative absolute error               11.562  %
Root relative squared error           27.167  %
Total Number of Instances              421
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,952	0,016	0,952	0,952	0,952	0,937	0,987	0,970	opel
0,935	0,016	0,953	0,935	0,944	0,925	0,986	0,978	saab
1,000	0,003	0,991	1,000	0,995	0,994	1,000	1,000	bus
1,000	0,003	0,990	1,000	0,995	0,993	1,000	1,000	van
Weighted Avg.	0,971	0,010	0,971	0,971	0,971	0,962	0,993	0,987

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
100   5    0    0 |   a = opel
5  101    1    1 |   b = saab
0    0  109    0 |   c = bus
0    0    0   99 |   d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.1 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
```

SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   1.3685741363244253
Node 4   −8.781203341498962
Node 5   −7.009645690987552
Node 6   −6.39554202934158
Node 7   8.527581231061953
Node 8   −3.7267455171400417
Node 9   3.2217934741219576
Node 10   −2.803017769784152
Node 11   10.386324267270272
Node 12   0.800361203464229
Node 13   6.786951176266081
Node 14   2.6735419692657194
Node 15   −0.46134732397270045
Node 16   4.2174036423816315
Node 17   −2.9996003588696656
Node 18   4.186725014219235
Node 19   −12.294359807187355
Node 20   −2.6334390751239907
Node 21   −3.7862873126806837
Sigmoid Node 1
Inputs   Weights
Threshold   −1.1743683604755961
Node 4   9.668546268585015
Node 5   7.651155497711282
Node 6   5.812686405445172
Node 7   −10.172840657488498
Node 8   −0.1600475415313047
Node 9   −7.1195765560094735
Node 10   −7.824754019965551
Node 11   −3.0488656243146943

364

```
Node  12        −5.06149020322939
Node  13        −6.057954980551595
Node  14        6.4543531296837475
Node  15        −4.0791637146503215
Node  16        −0.3546400646231494
Node  17        5.106972389152336
Node  18        6.435665800224981
Node  19        4.956058257563061
Node  20        −7.442456209652782
Node  21        −4.7184437253434535
Sigmoid  Node  2
Inputs       Weights
Threshold        −0.5026399761487234
Node  4      0.6608364216028486
Node  5      −3.5542185167393665
Node  6      1.3275668839365995
Node  7      2.562080834050557
Node  8      −2.065228336946426
Node  9      5.822544108144396
Node  10        −2.269420376244059
Node  11        −4.820015256291183
Node  12        1.3158031493592657
Node  13        3.449247788398064
Node  14        −8.48495809825956
Node  15        5.236683600310986
Node  16        −7.691002149479901
Node  17        −7.142415581610012
Node  18        −7.995132473742198
Node  19        5.741799067142503
Node  20        −0.7666942171882208
Node  21        0.8133839835349844
Sigmoid  Node  3
Inputs       Weights
Threshold        −0.5571753852916902
Node  4      −1.1630094464981795
Node  5      2.9291694287803924
Node  6      −4.168703604150179 5
Node  7      −3.0799200241930187
Node  8      4.91498432727807
Node  9      −5.715789016596528
Node  10        8.096958885760483
Node  11        −2.274240570159879
Node  12        −4.349592512248861
Node  13        −3.526542133215699
Node  14        −0.6855166552189895
Node  15        1.6898308623148814
Node  16        −0.732045370133443
Node  17        1.4776701323467074
Node  18        0.07539941445689644
```

Node 19   −1.9843692255192649
Node 20   7.792313867045245
Node 21   −3.236802113454584
Sigmoid Node 4
Inputs   Weights
Threshold   0.428264489539902
Attrib COMPACTNESS   7.047083792700057
Attrib CIRCULARITY   −1.481516451269427
Attrib DISTANCE CIRCULARITY   −0.6926664693898026
Attrib RADIUS RATIO   −0.21547868162009864
Attrib PR.AXIS ASPECT RATIO   2.0366530145633592
Attrib MAX.LENGTH ASPECT RATIO   −2.018456065589316
Attrib SCATTER RATIO   2.2745594043768507
Attrib ELONGATEDNESS   −1.4062230409584173
Attrib PR.AXIS RECTANGULARITY   −1.6716550201966955
Attrib MAX.LENGTH RECTANGULARITY   −1.3542464933054656
Attrib SCALED VARIANCE_MAJOR   0.3350547575315538
Attrib SCALED VARIANCE_MINOR   1.2566665028043011
Attrib SCALED RADIUS OF GYRATION   3.3251457770005053
Attrib SKEWNESS ABOUT_MAJOR   5.116146186957754
Attrib SKEWNESS ABOUT_MINOR   4.114595042464366
Attrib KURTOSIS ABOUT_MAJOR   1.8917417619017523
Attrib KURTOSIS ABOUT_MINOR   −0.8781404076151388
Attrib HOLLOWS RATIO   −2.551642234647048
Sigmoid Node 5
Inputs   Weights
Threshold   −1.2692159790347268
Attrib COMPACTNESS   1.56661844467427
Attrib CIRCULARITY   −4.084620796615177
Attrib DISTANCE CIRCULARITY   3.305942352145087
Attrib RADIUS RATIO   −0.3339824605786318
Attrib PR.AXIS ASPECT RATIO   0.36281012632628823
Attrib MAX.LENGTH ASPECT RATIO   2.4190260130103263
Attrib SCATTER RATIO   −0.39160649802651853
Attrib ELONGATEDNESS   3.0014402500991544
Attrib PR.AXIS RECTANGULARITY   1.6375950615978145
Attrib MAX.LENGTH RECTANGULARITY   0.4004500292647886
Attrib SCALED VARIANCE_MAJOR   1.8267224633027113
Attrib SCALED VARIANCE_MINOR   −2.225480528263952
Attrib SCALED RADIUS OF GYRATION   3.0842064523882318
Attrib SKEWNESS ABOUT_MAJOR   0.14182774120559685
Attrib SKEWNESS ABOUT_MINOR   −0.9219963858118542
Attrib KURTOSIS ABOUT_MAJOR   −3.783878570835589
Attrib KURTOSIS ABOUT_MINOR   −8.7766166111212
Attrib HOLLOWS RATIO   11.996580143725927
Sigmoid Node 6
Inputs   Weights
Threshold   3.8830815093534965
Attrib COMPACTNESS   −6.048538041268007

Attrib CIRCULARITY   −1.2429319277025523
Attrib DISTANCE CIRCULARITY   −1.3995179740254884
Attrib RADIUS RATIO   2.0791705628483235
Attrib PR.AXIS ASPECT RATIO   2.8939631786901843
Attrib MAX.LENGTH ASPECT RATIO   −1.9196902394945032
Attrib SCATTER RATIO   0.751792899660978
Attrib ELONGATEDNESS   −2.562255536599246
Attrib PR.AXIS RECTANGULARITY   −0.6304840410959633
Attrib MAX.LENGTH RECTANGULARITY   −1.7355004971150594
Attrib SCALED VARIANCE_MAJOR   0.24958904424507913
Attrib SCALED VARIANCE_MINOR   0.10402792860673135
Attrib SCALED RADIUS OF GYRATION   3.2655871658993396
Attrib SKEWNESS ABOUT_MAJOR   −3.179926774622905
Attrib SKEWNESS ABOUT_MINOR   −0.9241467203959012
Attrib KURTOSIS ABOUT_MAJOR   5.841570408261643
Attrib KURTOSIS ABOUT_MINOR   0.9548016109618224
Attrib HOLLOWS RATIO   −0.19002478060504888
Sigmoid Node 7
Inputs   Weights
Threshold   −2.015065514751055
Attrib COMPACTNESS   −1.079381323683851
Attrib CIRCULARITY   3.135187346727612
Attrib DISTANCE CIRCULARITY   0.025697428306998456
Attrib RADIUS RATIO   2.3732177156703367
Attrib PR.AXIS ASPECT RATIO   1.3204973637518163
Attrib MAX.LENGTH ASPECT RATIO   1.154531213679553
Attrib SCATTER RATIO   2.202352077759905
Attrib ELONGATEDNESS   −5.139646588132731
Attrib PR.AXIS RECTANGULARITY   3.6851166379883877
Attrib MAX.LENGTH RECTANGULARITY   −0.4368574170279013
Attrib SCALED VARIANCE_MAJOR   2.5350560405398883
Attrib SCALED VARIANCE_MINOR   3.707129686372514
Attrib SCALED RADIUS OF GYRATION   −3.304609617883728
Attrib SKEWNESS ABOUT_MAJOR   −1.47382185259453
Attrib SKEWNESS ABOUT_MINOR   −0.399741992640793
Attrib KURTOSIS ABOUT_MAJOR   0.9045622403565075
Attrib KURTOSIS ABOUT_MINOR   12.701730360067582
Attrib HOLLOWS RATIO   −8.36314925595053
Sigmoid Node 8
Inputs   Weights
Threshold   −2.5182028819396924
Attrib COMPACTNESS   2.8445395123887334
Attrib CIRCULARITY   −2.8186795771856508
Attrib DISTANCE CIRCULARITY   2.803701726320019
Attrib RADIUS RATIO   −1.359367160857711
Attrib PR.AXIS ASPECT RATIO   1.2924838722834966
Attrib MAX.LENGTH ASPECT RATIO   0.9478386892984001
Attrib SCATTER RATIO   −1.5212685494658063
Attrib ELONGATEDNESS   3.699161159073622

Attrib PR.AXIS RECTANGULARITY   −0.1565430481641542
Attrib MAX.LENGTH RECTANGULARITY   2.632992021029427
Attrib SCALED VARIANCE_MAJOR   −1.5181853981291358
Attrib SCALED VARIANCE_MINOR   −0.7989214978873459
Attrib SCALED RADIUS OF GYRATION   −3.5833538309672814
Attrib SKEWNESS ABOUT_MAJOR   1.3758771178394469
Attrib SKEWNESS ABOUT_MINOR   1.468755650813504
Attrib KURTOSIS ABOUT_MAJOR   −0.30389213658409425
Attrib KURTOSIS ABOUT_MINOR   −0.26810953535762433
Attrib HOLLOWS RATIO   −0.35889533872408746
Sigmoid Node 9
Inputs   Weights
Threshold   0.730312160490962
Attrib COMPACTNESS   −1.6672964111084754
Attrib CIRCULARITY   −0.4324208657285606
Attrib DISTANCE CIRCULARITY   −4.996483289445128
Attrib RADIUS RATIO   0.040809353446019166
Attrib PR.AXIS ASPECT RATIO   2.9032192888580566
Attrib MAX.LENGTH ASPECT RATIO   −5.033468965957076
Attrib SCATTER RATIO   −0.18269281591121414
Attrib ELONGATEDNESS   −1.503438912644407
Attrib PR.AXIS RECTANGULARITY   0.5915779225188744
Attrib MAX.LENGTH RECTANGULARITY   −5.816068743145224
Attrib SCALED VARIANCE_MAJOR   −1.1971379171210925
Attrib SCALED VARIANCE_MINOR   0.9126101861511675
Attrib SCALED RADIUS OF GYRATION   2.5532698132525096
Attrib SKEWNESS ABOUT_MAJOR   1.5045399978521246
Attrib SKEWNESS ABOUT_MINOR   −2.3843398074976925
Attrib KURTOSIS ABOUT_MAJOR   −0.7021310757964541
Attrib KURTOSIS ABOUT_MINOR   2.627709685658006
Attrib HOLLOWS RATIO   −6.287458974188882
Sigmoid Node 10
Inputs   Weights
Threshold   1.6547359911186188
Attrib COMPACTNESS   3.9713616311767534
Attrib CIRCULARITY   −0.06324365768077264
Attrib DISTANCE CIRCULARITY   2.7198892859267105
Attrib RADIUS RATIO   −3.969490216424161
Attrib PR.AXIS ASPECT RATIO   3.9208537997764155
Attrib MAX.LENGTH ASPECT RATIO   3.210595482281495
Attrib SCATTER RATIO   −2.7801425849450565
Attrib ELONGATEDNESS   2.195861666489374
Attrib PR.AXIS RECTANGULARITY   −1.4450293223697097
Attrib MAX.LENGTH RECTANGULARITY   6.960255304373263
Attrib SCALED VARIANCE_MAJOR   −3.0728214697248744
Attrib SCALED VARIANCE_MINOR   −2.9679940572579158
Attrib SCALED RADIUS OF GYRATION   −2.292644410338748
Attrib SKEWNESS ABOUT_MAJOR   5.49483903645521
Attrib SKEWNESS ABOUT_MINOR   −1.9010761191052583

Attrib KURTOSIS ABOUT_MAJOR   0.2412670084407876
Attrib KURTOSIS ABOUT_MINOR   −0.7430929418913151
Attrib HOLLOWS RATIO   2.2019419023699953
Sigmoid Node 11
Inputs   Weights
Threshold   −2.7517701595317474
Attrib COMPACTNESS   −1.6649610821139378
Attrib CIRCULARITY   −2.3160006846052457
Attrib DISTANCE CIRCULARITY   1.51691668551762
Attrib RADIUS RATIO   5.372967858556994
Attrib PR.AXIS ASPECT RATIO   1.3170671509300353
Attrib MAX.LENGTH ASPECT RATIO   0.7039289383083396
Attrib SCATTER RATIO   0.5717814824617362
Attrib ELONGATEDNESS   0.2470980629768123
Attrib PR.AXIS RECTANGULARITY   −3.520628928945903
Attrib MAX.LENGTH RECTANGULARITY   −5.34401787728652
Attrib SCALED VARIANCE_MAJOR   3.377503023018696
Attrib SCALED VARIANCE_MINOR   1.0493240967715731
Attrib SCALED RADIUS OF GYRATION   1.6302552031049968
Attrib SKEWNESS ABOUT_MAJOR   −0.02894116371768232
Attrib SKEWNESS ABOUT_MINOR   −2.6723043395010904
Attrib KURTOSIS ABOUT_MAJOR   −1.7160165935748906
Attrib KURTOSIS ABOUT_MINOR   −4.192582174551403
Attrib HOLLOWS RATIO   0.27107309609417013
Sigmoid Node 12
Inputs   Weights
Threshold   2.0981892534547937
Attrib COMPACTNESS   −2.1638653099269267
Attrib CIRCULARITY   0.9287289816254224
Attrib DISTANCE CIRCULARITY   0.880483962141283
Attrib RADIUS RATIO   1.0898538300530944
Attrib PR.AXIS ASPECT RATIO   1.1453957392581946
Attrib MAX.LENGTH ASPECT RATIO   0.6948073933720571
Attrib SCATTER RATIO   0.2553176989525934
Attrib ELONGATEDNESS   −2.5793030001841793
Attrib PR.AXIS RECTANGULARITY   −0.16490782509832144
Attrib MAX.LENGTH RECTANGULARITY   −3.7496794368372566
Attrib SCALED VARIANCE_MAJOR   1.152406628532488
Attrib SCALED VARIANCE_MINOR   0.5413527183685911
Attrib SCALED RADIUS OF GYRATION   1.155985593266781
Attrib SKEWNESS ABOUT_MAJOR   −1.0370113574216444
Attrib SKEWNESS ABOUT_MINOR   5.5752350364579195
Attrib KURTOSIS ABOUT_MAJOR   −0.6833894628622282
Attrib KURTOSIS ABOUT_MINOR   2.8659784205476666
Attrib HOLLOWS RATIO   −1.245531818503059
Sigmoid Node 13
Inputs   Weights
Threshold   −0.650904751314771
Attrib COMPACTNESS   −5.801276727662393

Attrib CIRCULARITY   1.4576046094626967
Attrib DISTANCE CIRCULARITY   0.8444863148104754
Attrib RADIUS RATIO   −0.3578566000098056
Attrib PR.AXIS ASPECT RATIO   0.10975110404288739
Attrib MAX.LENGTH ASPECT RATIO   1.4231961295395334
Attrib SCATTER RATIO   2.546568235619958
Attrib ELONGATEDNESS   −0.3010724016606206
Attrib PR.AXIS RECTANGULARITY   1.6570720897914435
Attrib MAX.LENGTH RECTANGULARITY   0.24754982672333645
Attrib SCALED VARIANCE_MAJOR   0.9829095859163405
Attrib SCALED VARIANCE_MINOR   3.2461342216670688
Attrib SCALED RADIUS OF GYRATION   −1.7721203731751207
Attrib SKEWNESS ABOUT_MAJOR   3.24066028667416
Attrib SKEWNESS ABOUT_MINOR   0.32934037845167335
Attrib KURTOSIS ABOUT_MAJOR   5.380424619837339
Attrib KURTOSIS ABOUT_MINOR   −7.653887086686204
Attrib HOLLOWS RATIO   −5.90675346295832
Sigmoid Node 14
Inputs   Weights
Threshold   −1.552842395425246
Attrib COMPACTNESS   −1.9768731066636975
Attrib CIRCULARITY   1.258201399718224
Attrib DISTANCE CIRCULARITY   3.4576468013030537
Attrib RADIUS RATIO   1.165793940966413
Attrib PR.AXIS ASPECT RATIO   −7.750239415624187
Attrib MAX.LENGTH ASPECT RATIO   −0.6274884377913283
Attrib SCATTER RATIO   2.971271684276683
Attrib ELONGATEDNESS   −2.4671648524318757
Attrib PR.AXIS RECTANGULARITY   1.0340307837323706
Attrib MAX.LENGTH RECTANGULARITY   2.591241699994126
Attrib SCALED VARIANCE_MAJOR   4.600648497730822
Attrib SCALED VARIANCE_MINOR   2.7354648219475126
Attrib SCALED RADIUS OF GYRATION   −2.031800132369989
Attrib SKEWNESS ABOUT_MAJOR   −4.161658859971872
Attrib SKEWNESS ABOUT_MINOR   0.900975743893243
Attrib KURTOSIS ABOUT_MAJOR   1.6224114178800013
Attrib KURTOSIS ABOUT_MINOR   1.5515766126312327
Attrib HOLLOWS RATIO   −0.8411892339522785
Sigmoid Node 15
Inputs   Weights
Threshold   1.7783193445034682
Attrib COMPACTNESS   2.2935848886440358
Attrib CIRCULARITY   −0.5384942658871277
Attrib DISTANCE CIRCULARITY   0.7969423294767263
Attrib RADIUS RATIO   −2.0417997619190804
Attrib PR.AXIS ASPECT RATIO   3.725901881141226
Attrib MAX.LENGTH ASPECT RATIO   0.9943579508103979
Attrib SCATTER RATIO   −1.093656584106703
Attrib ELONGATEDNESS   −1.294726011667859

Attrib PR.AXIS RECTANGULARITY   −1.1184447496758982
Attrib MAX.LENGTH RECTANGULARITY   1.6516453344994644
Attrib SCALED VARIANCE_MAJOR   −1.9739344345979462
Attrib SCALED VARIANCE_MINOR   −1.301624270519064
Attrib SCALED RADIUS OF GYRATION   −1.166516863728584
Attrib SKEWNESS ABOUT_MAJOR   3.0584755564036983
Attrib SKEWNESS ABOUT_MINOR   −1.0949620035883896
Attrib KURTOSIS ABOUT_MAJOR   0.2118768906803274
Attrib KURTOSIS ABOUT_MINOR   1.8809999696476363
Attrib HOLLOWS RATIO   0.47636858859803133
Sigmoid Node 16
Inputs   Weights
Threshold   −1.6056757802187005
Attrib COMPACTNESS   −0.15942384402536872
Attrib CIRCULARITY   1.3642152410740598
Attrib DISTANCE CIRCULARITY   1.263809658583451
Attrib RADIUS RATIO   2.510629416937561
Attrib PR.AXIS ASPECT RATIO   −4.8290845393607755
Attrib MAX.LENGTH ASPECT RATIO   1.3899870694781757
Attrib SCATTER RATIO   −1.303104271385012
Attrib ELONGATEDNESS   3.576260814066372
Attrib PR.AXIS RECTANGULARITY   −1.081854543981672
Attrib MAX.LENGTH RECTANGULARITY   −0.7275106383228177
Attrib SCALED VARIANCE_MAJOR   2.757382753847427
Attrib SCALED VARIANCE_MINOR   −1.139508763636654
Attrib SCALED RADIUS OF GYRATION   2.6075905065854963
Attrib SKEWNESS ABOUT_MAJOR   −2.694863011279094
Attrib SKEWNESS ABOUT_MINOR   −2.1079229998607674
Attrib KURTOSIS ABOUT_MAJOR   2.091089483997471
Attrib KURTOSIS ABOUT_MINOR   −0.9317512280482808
Attrib HOLLOWS RATIO   0.48332428647978914
Sigmoid Node 17
Inputs   Weights
Threshold   −2.496690966175742
Attrib COMPACTNESS   4.2327625251376
Attrib CIRCULARITY   −4.454587626699807
Attrib DISTANCE CIRCULARITY   −1.1001447331223437
Attrib RADIUS RATIO   3.647052670940023
Attrib PR.AXIS ASPECT RATIO   −1.0312156999982365
Attrib MAX.LENGTH ASPECT RATIO   −2.9209589142782746
Attrib SCATTER RATIO   0.24658040307575996
Attrib ELONGATEDNESS   4.190039371939881
Attrib PR.AXIS RECTANGULARITY   4.326478505147671
Attrib MAX.LENGTH RECTANGULARITY   −1.9898037330380673
Attrib SCALED VARIANCE_MAJOR   −0.7700241572777087
Attrib SCALED VARIANCE_MINOR   1.4315832821393917
Attrib SCALED RADIUS OF GYRATION   −3.119219892663373
Attrib SKEWNESS ABOUT_MAJOR   −1.2059285425318045
Attrib SKEWNESS ABOUT_MINOR   3.2487706017752562

Attrib KURTOSIS ABOUT_MAJOR   −2.589112966178785
Attrib KURTOSIS ABOUT_MINOR   0.04751639479563466
Attrib HOLLOWS RATIO   −4.011305457876173
Sigmoid Node 18
Inputs   Weights
Threshold   −4.3965440728097
Attrib COMPACTNESS   2.340649440771
Attrib CIRCULARITY   −1.8510371430327044
Attrib DISTANCE CIRCULARITY   −1.9767546907758549
Attrib RADIUS RATIO   2.5917298093551873
Attrib PR.AXIS ASPECT RATIO   −0.8475248511045902
Attrib MAX.LENGTH ASPECT RATIO   −2.2277161974539577
Attrib SCATTER RATIO   −2.319945013995247
Attrib ELONGATEDNESS   6.361875762551616
Attrib PR.AXIS RECTANGULARITY   −1.1981417296658328
Attrib MAX.LENGTH RECTANGULARITY   −4.061634898359224
Attrib SCALED VARIANCE_MAJOR   0.04953469904678163
Attrib SCALED VARIANCE_MINOR   −0.7385629841116939
Attrib SCALED RADIUS OF GYRATION   2.1312959009347097
Attrib SKEWNESS ABOUT_MAJOR   0.9438639926279592
Attrib SKEWNESS ABOUT_MINOR   1.1240816211736162
Attrib KURTOSIS ABOUT_MAJOR   2.0922166806055174
Attrib KURTOSIS ABOUT_MINOR   −1.668801000617819
Attrib HOLLOWS RATIO   −1.549008718484978
Sigmoid Node 19
Inputs   Weights
Threshold   0.16891678276779354
Attrib COMPACTNESS   −0.998990045913316
Attrib CIRCULARITY   −0.8525130628166788
Attrib DISTANCE CIRCULARITY   −6.554253980135104
Attrib RADIUS RATIO   −4.215675932507834
Attrib PR.AXIS ASPECT RATIO   4.256701448779665
Attrib MAX.LENGTH ASPECT RATIO   −3.0206720719574287
Attrib SCATTER RATIO   −0.038429806191596354
Attrib ELONGATEDNESS   −5.668425015016808
Attrib PR.AXIS RECTANGULARITY   3.4383138787442498
Attrib MAX.LENGTH RECTANGULARITY   −0.27626473431756715
Attrib SCALED VARIANCE_MAJOR   0.3075964652230453
Attrib SCALED VARIANCE_MINOR   −0.5730802579926162
Attrib SCALED RADIUS OF GYRATION   1.3208903854527603
Attrib SKEWNESS ABOUT_MAJOR   5.050186069087841
Attrib SKEWNESS ABOUT_MINOR   −4.976707474112267
Attrib KURTOSIS ABOUT_MAJOR   2.245561097595957
Attrib KURTOSIS ABOUT_MINOR   6.339322898380591
Attrib HOLLOWS RATIO   −8.09390844572533
Sigmoid Node 20
Inputs   Weights
Threshold   1.2783303810746678
Attrib COMPACTNESS   1.2369153430692565

Attrib CIRCULARITY   0.845689405066410 2
Attrib DISTANCE CIRCULARITY   2.303453348275108
Attrib RADIUS RATIO   −4.269528443499341 5
Attrib PR.AXIS ASPECT RATIO   3.54381342687164
Attrib MAX.LENGTH ASPECT RATIO   3.6829583613645647
Attrib SCATTER RATIO   −2.717284594416116
Attrib ELONGATEDNESS   1.6001605576592361
Attrib PR.AXIS RECTANGULARITY   −1.7295702529349557
Attrib MAX.LENGTH RECTANGULARITY   6.936316634229035
Attrib SCALED VARIANCE_MAJOR   −2.679684317650806
Attrib SCALED VARIANCE_MINOR   −3.1264024485905533
Attrib SCALED RADIUS OF GYRATION   −2.1618478909394105
Attrib SKEWNESS ABOUT_MAJOR   6.259963641902985
Attrib SKEWNESS ABOUT_MINOR   −0.6134056048805775
Attrib KURTOSIS ABOUT_MAJOR   −1.2354060877610018
Attrib KURTOSIS ABOUT_MINOR   −0.9973363266271067
Attrib HOLLOWS RATIO   1.7950619847208387
Sigmoid Node 21
Inputs   Weights
Threshold   0.6408915763767689
Attrib COMPACTNESS   −7.690008610582998E−4
Attrib CIRCULARITY   0.0012466433629041978
Attrib DISTANCE CIRCULARITY   2.5510816364849607
Attrib RADIUS RATIO   0.18087593203895672
Attrib PR.AXIS ASPECT RATIO   1.8991865306561924
Attrib MAX.LENGTH ASPECT RATIO   0.26545654169422844
Attrib SCATTER RATIO   0.20163896697346412
Attrib ELONGATEDNESS   −2.207442887693771
Attrib PR.AXIS RECTANGULARITY   −0.6877638649313761
Attrib MAX.LENGTH RECTANGULARITY   −2.0784657942888405
Attrib SCALED VARIANCE_MAJOR   1.0169384710640628
Attrib SCALED VARIANCE_MINOR   0.4431347314375862
Attrib SCALED RADIUS OF GYRATION   1.4718381460527175
Attrib SKEWNESS ABOUT_MAJOR   1.0970346217453606
Attrib SKEWNESS ABOUT_MINOR   −1.0663717404049786
Attrib KURTOSIS ABOUT_MAJOR   −0.039188428570831
Attrib KURTOSIS ABOUT_MINOR   1.9133669052856082
Attrib HOLLOWS RATIO   −2.5047444695381893
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input

Node 3

Time taken to build model: 4.19 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

```
Correctly Classified Instances         748              88.4161 %
Incorrectly Classified Instances        98              11.5839 %
Kappa statistic                          0.8455
Mean absolute error                      0.0819
Root mean squared error                  0.2164
Relative absolute error                 21.8496 %
Root relative squared error             49.9846 %
Total Number of Instances              846
```

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F–Measure	MCC	ROC Area	PRC Area	Class
0,788	0,068	0,795	0,788	0,791	0,722	0,919	0,828	opel
0,793	0,064	0,811	0,793	0,802	0,735	0,943	0,837	saab
0,995	0,011	0,969	0,995	0,982	0,976	0,999	0,995	bus
0,965	0,012	0,960	0,965	0,962	0,951	0,997	0,989	van
Weighted Avg.	0,884	0,039	0,883	0,884	0,883	0,844	0,964	0,911

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
167  38    1    6 |    a = opel
40  172    3    2 |    b = saab
1    0  217    0 |    c = bus
2    2    3  192 |    d = van
```

25 25ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

Scheme: weka.classifiers.functions.MultilayerPerceptron –L 0.7 –M 0.2 –N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   4.5006463859195405
Node 4   9.716649000544326
Node 5   12.31022224140489
Node 6   12.191502836016374
Node 7   −13.957444549155248
Node 8   −24.34763513323707
Node 9   −12.64019527415427
Node 10   −7.090039997250543
Node 11   6.511866818960048
Node 12   −13.552826543516595
Node 13   −6.0006918890876975
Node 14   −9.449721730222606
Sigmoid Node 1
Inputs   Weights
Threshold   −8.627825084370533
Node 4   −12.578717078982267
Node 5   −14.020093100125525
Node 6   −6.812806779566591
Node 7   14.231426307539689
Node 8   2.7697678738673255

```
Node  9     14.193633149794252
Node  10     12.372597245655518
Node  11     −8.305476582154744
Node  12     −21.134434469406408
Node  13     10.09790531448074
Node  14     14.601275038850746
Sigmoid  Node  2
Inputs       Weights
Threshold       −1.4782470116240545
Node  4     1.5043841658426937
Node  5     5.813272853916081
Node  6     6.6326080857582745
Node  7     4.096010757014195
Node  8     17.140249842312826
Node  9     −2.699593727702793
Node  10     −5.729441944008937
Node  11     −1.1836248644696206
Node  12     −3.0867504808706476
Node  13     −19.19375156790489
Node  14     −20.4332750846067
Sigmoid  Node  3
Inputs       Weights
Threshold       −9.79109183458355
Node  4     −1.8333805809628796
Node  5     −1.1973443970859194
Node  6     −5.559713104104915
Node  7     −2.144255611075937
Node  8     −1.5396051166673381
Node  9     5.541347474983202
Node  10     1.9349645418477235
Node  11     −7.84908711840651
Node  12     15.565783833221285
Node  13     0.5715766829645851
Node  14     −0.17928537228722322
Sigmoid  Node  4
Inputs       Weights
Threshold       −5.663876767333876
Attrib  COMPACTNESS       −9.50899228006416
Attrib  CIRCULARITY       −5.0702355641833305
Attrib  DISTANCE CIRCULARITY       3.862838185940811
Attrib  RADIUS RATIO       −6.546330436189514
Attrib  PR.AXIS ASPECT RATIO       −6.286226047843595
Attrib  MAX.LENGTH ASPECT RATIO       4.186502770128371
Attrib  SCATTER RATIO       7.254921287489504
Attrib  ELONGATEDNESS       −7.737217053288406
Attrib  PR.AXIS RECTANGULARITY       0.4707616402485557
Attrib  MAX.LENGTH RECTANGULARITY       3.8159734048762437
Attrib  SCALED VARIANCE_MAJOR       5.27869227581772
Attrib  SCALED VARIANCE_MINOR       10.780395506408368
```

Attrib SCALED RADIUS OF GYRATION   −6.1091320211877385
Attrib SKEWNESS ABOUT_MAJOR   2.903117767805143
Attrib SKEWNESS ABOUT_MINOR   4.1950932217381895
Attrib KURTOSIS ABOUT_MAJOR   6.511407780839639
Attrib KURTOSIS ABOUT_MINOR   5.007925207130292
Attrib HOLLOWS RATIO   −6.090016984100247
Sigmoid Node 5
Inputs   Weights
Threshold   −0.5660507491690848
Attrib COMPACTNESS   −2.367260992714412
Attrib CIRCULARITY   7.955880860789396
Attrib DISTANCE CIRCULARITY   −7.285450693095994
Attrib RADIUS RATIO   10.5374660408747
Attrib PR.AXIS ASPECT RATIO   4.189526897330937
Attrib MAX.LENGTH ASPECT RATIO   −6.9845648185456355
Attrib SCATTER RATIO   6.698736108204164
Attrib ELONGATEDNESS   −8.809040856672267
Attrib PR.AXIS RECTANGULARITY   0.011132034560391493
Attrib MAX.LENGTH RECTANGULARITY   5.887515859230198
Attrib SCALED VARIANCE_MAJOR   2.7981731503786516
Attrib SCALED VARIANCE_MINOR   8.617566842218864
Attrib SCALED RADIUS OF GYRATION   −9.248732875135738
Attrib SKEWNESS ABOUT_MAJOR   −2.144878156582614
Attrib SKEWNESS ABOUT_MINOR   −0.9745842349955318
Attrib KURTOSIS ABOUT_MAJOR   2.3588774091645015
Attrib KURTOSIS ABOUT_MINOR   21.358527071673358
Attrib HOLLOWS RATIO   −20.275651414382537
Sigmoid Node 6
Inputs   Weights
Threshold   −3.5559558364158903
Attrib COMPACTNESS   −14.482267203339378
Attrib CIRCULARITY   14.373896062557579
Attrib DISTANCE CIRCULARITY   0.2867948856019659
Attrib RADIUS RATIO   −1.7297442293418435
Attrib PR.AXIS ASPECT RATIO   −1.504021836305804
Attrib MAX.LENGTH ASPECT RATIO   2.312483711571657
Attrib SCATTER RATIO   4.611440665201137
Attrib ELONGATEDNESS   5.293923085930862
Attrib PR.AXIS RECTANGULARITY   5.043419416926339
Attrib MAX.LENGTH RECTANGULARITY   −5.777805641305414
Attrib SCALED VARIANCE_MAJOR   −2.531025345032389
Attrib SCALED VARIANCE_MINOR   9.506020251197555
Attrib SCALED RADIUS OF GYRATION   3.933398833583294
Attrib SKEWNESS ABOUT_MAJOR   4.8309385107575356
Attrib SKEWNESS ABOUT_MINOR   4.182893408934736
Attrib KURTOSIS ABOUT_MAJOR   8.908330697975256
Attrib KURTOSIS ABOUT_MINOR   −21.87692480202411
Attrib HOLLOWS RATIO   −8.072473748744402
Sigmoid Node 7

Inputs   Weights
Threshold   −1.5518409518208265
Attrib COMPACTNESS   12.183638857908011
Attrib CIRCULARITY   −3.190294876668917
Attrib DISTANCE CIRCULARITY   −3.1529363606052483
Attrib RADIUS RATIO   −5.71131733436463
Attrib PR.AXIS ASPECT RATIO   0.4669243337472238
Attrib MAX.LENGTH ASPECT RATIO   −1.4612884905655905
Attrib SCATTER RATIO   6.071251329073678
Attrib ELONGATEDNESS   −2.9591734142645674
Attrib PR.AXIS RECTANGULARITY   1.0261461540429344
Attrib MAX.LENGTH RECTANGULARITY   2.327439736420993
Attrib SCALED VARIANCE_MAJOR   4.2520635219185206
Attrib SCALED VARIANCE_MINOR   4.606469035095866
Attrib SCALED RADIUS OF GYRATION   1.4248228221459822
Attrib SKEWNESS ABOUT_MAJOR   7.543885311398146
Attrib SKEWNESS ABOUT_MINOR   9.185181876821769
Attrib KURTOSIS ABOUT_MAJOR   4.016466816472886
Attrib KURTOSIS ABOUT_MINOR   −7.882607950081961
Attrib HOLLOWS RATIO   −3.41127323804073
Sigmoid Node 8
Inputs   Weights
Threshold   0.11226933925466923
Attrib COMPACTNESS   −1.480160555265383
Attrib CIRCULARITY   −0.5291961635155049
Attrib DISTANCE CIRCULARITY   −11.984756035451946
Attrib RADIUS RATIO   −22.299402417239087
Attrib PR.AXIS ASPECT RATIO   32.303291268411535
Attrib MAX.LENGTH ASPECT RATIO   −20.968824957838965
Attrib SCATTER RATIO   1.3449578656212946
Attrib ELONGATEDNESS   −22.027965922727226
Attrib PR.AXIS RECTANGULARITY   −1.4509188611885042
Attrib MAX.LENGTH RECTANGULARITY   3.8165614580659475
Attrib SCALED VARIANCE_MAJOR   −3.8172603596906827
Attrib SCALED VARIANCE_MINOR   2.2527176445801977
Attrib SCALED RADIUS OF GYRATION   −2.63001793511292
Attrib SKEWNESS ABOUT_MAJOR   15.724354285284061
Attrib SKEWNESS ABOUT_MINOR   −2.4662767486517683
Attrib KURTOSIS ABOUT_MAJOR   −0.16396600452178742
Attrib KURTOSIS ABOUT_MINOR   13.489291138108943
Attrib HOLLOWS RATIO   −9.17100589104136
Sigmoid Node 9
Inputs   Weights
Threshold   0.671704048434291
Attrib COMPACTNESS   3.2648333815028097
Attrib CIRCULARITY   −7.85340186138663
Attrib DISTANCE CIRCULARITY   13.556254286833312
Attrib RADIUS RATIO   −9.089990111252018
Attrib PR.AXIS ASPECT RATIO   3.6855128853071504

Attrib MAX.LENGTH ASPECT RATIO   2.0778253876076733
Attrib SCATTER RATIO   −1.4174970380092187
Attrib ELONGATEDNESS   1.9141941929480872
Attrib PR.AXIS RECTANGULARITY   2.728193997934812
Attrib MAX.LENGTH RECTANGULARITY   3.179805470702207
Attrib SCALED VARIANCE_MAJOR   4.665650461200153
Attrib SCALED VARIANCE_MINOR   −6.925428154662688
Attrib SCALED RADIUS OF GYRATION   7.211137738179693
Attrib SKEWNESS ABOUT_MAJOR   16.58102046655096
Attrib SKEWNESS ABOUT_MINOR   −3.010848055677665
Attrib KURTOSIS ABOUT_MAJOR   1.143775172540805
Attrib KURTOSIS ABOUT_MINOR   −12.40321753265412
Attrib HOLLOWS RATIO   20.100362727756924
Sigmoid Node 10
Inputs   Weights
Threshold   −1.9405810853706704
Attrib COMPACTNESS   8.020140239379726
Attrib CIRCULARITY   −12.492047546594868
Attrib DISTANCE CIRCULARITY   −9.118254728334016
Attrib RADIUS RATIO   0.35176650315258284
Attrib PR.AXIS ASPECT RATIO   1.1355119498964201
Attrib MAX.LENGTH ASPECT RATIO   −0.40463929668928206
Attrib SCATTER RATIO   0.7483804202870422
Attrib ELONGATEDNESS   2.7497603948472333
Attrib PR.AXIS RECTANGULARITY   12.71316335247695
Attrib MAX.LENGTH RECTANGULARITY   1.2565135357706199
Attrib SCALED VARIANCE_MAJOR   −3.2778957991297437
Attrib SCALED VARIANCE_MINOR   2.7240010642778736
Attrib SCALED RADIUS OF GYRATION   −6.179587239658386
Attrib SKEWNESS ABOUT_MAJOR   −3.455572265950415
Attrib SKEWNESS ABOUT_MINOR   2.74649552416965
Attrib KURTOSIS ABOUT_MAJOR   12.644653531769011
Attrib KURTOSIS ABOUT_MINOR   0.41063983926730335
Attrib HOLLOWS RATIO   −9.470060542549177
Sigmoid Node 11
Inputs   Weights
Threshold   0.33119758417929934
Attrib COMPACTNESS   −14.30165664030481
Attrib CIRCULARITY   −11.861728917570447
Attrib DISTANCE CIRCULARITY   6.792112168607434
Attrib RADIUS RATIO   8.656732585722152
Attrib PR.AXIS ASPECT RATIO   1.7756806717954348
Attrib MAX.LENGTH ASPECT RATIO   −0.42854773318452294
Attrib SCATTER RATIO   7.9694643400015135
Attrib ELONGATEDNESS   −6.81835784241585
Attrib PR.AXIS RECTANGULARITY   −4.537581684945381
Attrib MAX.LENGTH RECTANGULARITY   −15.028822463538383
Attrib SCALED VARIANCE_MAJOR   2.2875994593296047
Attrib SCALED VARIANCE_MINOR   5.381295761299757

```
Attrib SCALED RADIUS OF GYRATION      3.099441478343274
Attrib SKEWNESS ABOUT_MAJOR      8.03844292301587
Attrib SKEWNESS ABOUT_MINOR      −3.702860924258397
Attrib KURTOSIS ABOUT_MAJOR      13.165017710407062
Attrib KURTOSIS ABOUT_MINOR      −10.845753487478058
Attrib HOLLOWS RATIO      2.80317366133773
Sigmoid Node 12
Inputs      Weights
Threshold      11.233501395211157
Attrib COMPACTNESS      13.751897320233997
Attrib CIRCULARITY      4.296223213320597
Attrib DISTANCE CIRCULARITY      13.54695248555763
Attrib RADIUS RATIO      −15.700298505897228
Attrib PR.AXIS ASPECT RATIO      9.386033835838282
Attrib MAX.LENGTH ASPECT RATIO      19.191761724004262
Attrib SCATTER RATIO      −10.30740860914244
Attrib ELONGATEDNESS      13.088494770212025
Attrib PR.AXIS RECTANGULARITY      −9.007283044164245
Attrib MAX.LENGTH RECTANGULARITY      19.26696263093792
Attrib SCALED VARIANCE_MAJOR      −6.822685499380187
Attrib SCALED VARIANCE_MINOR      −9.814871640285252
Attrib SCALED RADIUS OF GYRATION      −12.164161167674195
Attrib SKEWNESS ABOUT_MAJOR      30.040784362296414
Attrib SKEWNESS ABOUT_MINOR      −3.873213324327231
Attrib KURTOSIS ABOUT_MAJOR      −4.634718288978503
Attrib KURTOSIS ABOUT_MINOR      −6.551024994118908
Attrib HOLLOWS RATIO      14.16679040423808
Sigmoid Node 13
Inputs      Weights
Threshold      −20.09723436850425
Attrib COMPACTNESS      6.610450241474021
Attrib CIRCULARITY      −10.646480437702182
Attrib DISTANCE CIRCULARITY      7.457900382264621
Attrib RADIUS RATIO      3.564690879302291
Attrib PR.AXIS ASPECT RATIO      −11.854342492189579
Attrib MAX.LENGTH ASPECT RATIO      1.4695857935383496
Attrib SCATTER RATIO      −1.9038621573869052
Attrib ELONGATEDNESS      9.868666645727613
Attrib PR.AXIS RECTANGULARITY      8.206918633442426
Attrib MAX.LENGTH RECTANGULARITY      −16.445960365019793
Attrib SCALED VARIANCE_MAJOR      2.6466604062968613
Attrib SCALED VARIANCE_MINOR      4.041238366562928
Attrib SCALED RADIUS OF GYRATION      −7.041144729413975
Attrib SKEWNESS ABOUT_MAJOR      −9.50231755121277
Attrib SKEWNESS ABOUT_MINOR      3.4925053022721
Attrib KURTOSIS ABOUT_MAJOR      −6.170824753202035
Attrib KURTOSIS ABOUT_MINOR      −2.8617486723620646
Attrib HOLLOWS RATIO      −14.539092432994842
Sigmoid Node 14
```

```
Inputs        Weights
Threshold        −7.094642670973695
Attrib COMPACTNESS        −14.911304927461472
Attrib CIRCULARITY        −2.517773916137635
Attrib DISTANCE CIRCULARITY        −2.614719031915788
Attrib RADIUS RATIO        11.658565211728998
Attrib PR.AXIS ASPECT RATIO        −23.11936209075653
Attrib MAX.LENGTH ASPECT RATIO        9.952397422194906
Attrib SCATTER RATIO        6.172814739439859
Attrib ELONGATEDNESS        −6.221590743428367
Attrib PR.AXIS RECTANGULARITY        6.24845780305285
Attrib MAX.LENGTH RECTANGULARITY        11.0846252433371
Attrib SCALED VARIANCE_MAJOR        12.883935182438973
Attrib SCALED VARIANCE_MINOR        2.032048235458545
Attrib SCALED RADIUS OF GYRATION        −8.293550705929123
Attrib SKEWNESS ABOUT_MAJOR        −14.88319713419296
Attrib SKEWNESS ABOUT_MINOR        −0.410553793328882
Attrib KURTOSIS ABOUT_MAJOR        1.7178617336472868
Attrib KURTOSIS ABOUT_MINOR        −8.785395293908833
Attrib HOLLOWS RATIO        10.328025090015071
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3


Time taken to build model: 3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances        409        97.1496 %
Incorrectly Classified Instances      12         2.8504 %
Kappa statistic                       0.962
Mean absolute error                   0.0241
Root mean squared error               0.1115
Relative absolute error               6.4325 %
Root relative squared error           25.7669 %
```

Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,924	0,009	0,970	0,924	0,946	0,930	0,967	0,965	opel
0,972	0,019	0,946	0,972	0,959	0,945	0,985	0,933	saab
0,991	0,006	0,982	0,991	0,986	0,982	0,996	0,987	bus
1,000	0,003	0,990	1,000	0,995	0,993	1,000	1,000	van
Weighted Avg.	0,971	0,010	0,972	0,971	0,971	0,962	0,987	0,971

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
97   6    2    0 |   a = opel
3  105    0    0 |   b = saab
0    0  108    1 |   c = bus
0    0    0   99 |   d = van
```

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR

SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   4.5006463859195405
Node 4   9.716649000544326
Node 5   12.31022224140489
Node 6   12.191502836016374
Node 7   −13.957444549155248
Node 8   −24.34763513323707
Node 9   −12.64019527415427
Node 10   −7.090039997250543
Node 11   6.511866818960048
Node 12   −13.552826543516595
Node 13   −6.0006918890876975
Node 14   −9.449721730222606
Sigmoid Node 1
Inputs   Weights
Threshold   −8.627825084370533
Node 4   −12.578717078982267
Node 5   −14.020093100125525
Node 6   −6.812806779566591
Node 7   14.231426307539689
Node 8   2.7697678738673255
Node 9   14.193633149794252
Node 10   12.372597245655518
Node 11   −8.305476582154744
Node 12   −21.134434469406408
Node 13   10.09790531448074
Node 14   14.601275038850746
Sigmoid Node 2
Inputs   Weights
Threshold   −1.4782470116240545
Node 4   1.5043841658426937
Node 5   5.813272853916081
Node 6   6.6326080857582745
Node 7   4.096010757014195
Node 8   17.140249842312826
Node 9   −2.699593727702793
Node 10   −5.729441944008937

383

```
Node  11      −1.1836248644696206
Node  12      −3.0867504808706476
Node  13      −19.19375156790489
Node  14      −20.4332508460672
Sigmoid  Node  3
Inputs      Weights
Threshold      −9.79109183458355
Node  4      −1.8333805809628796
Node  5      −1.1973443970859194
Node  6      −5.559713104104915
Node  7      −2.144255611075937
Node  8      −1.5396051166673381
Node  9      5.541347474983202
Node  10      1.9349645418477235
Node  11      −7.84908711840651
Node  12      15.565783833221285
Node  13      0.5715766829645851
Node  14      −0.17928537228722322
Sigmoid  Node  4
Inputs      Weights
Threshold      −5.663876767333876
Attrib  COMPACTNESS      −9.50899228006416
Attrib  CIRCULARITY      −5.0702355641833305
Attrib  DISTANCE  CIRCULARITY      3.862838185940811
Attrib  RADIUS  RATIO      −6.546330436189514
Attrib  PR.AXIS  ASPECT  RATIO      −6.286226047843595
Attrib  MAX.LENGTH  ASPECT  RATIO      4.186502770128371
Attrib  SCATTER  RATIO      7.254921287489504
Attrib  ELONGATEDNESS      −7.737217053288406
Attrib  PR.AXIS  RECTANGULARITY      0.4707616402485557
Attrib  MAX.LENGTH  RECTANGULARITY      3.8159734048762437
Attrib  SCALED  VARIANCE_MAJOR      5.27869227581772
Attrib  SCALED  VARIANCE_MINOR      10.780395506408368
Attrib  SCALED  RADIUS  OF  GYRATION      −6.1091320211877385
Attrib  SKEWNESS  ABOUT_MAJOR      2.903117767805143
Attrib  SKEWNESS  ABOUT_MINOR      4.1950932217381895
Attrib  KURTOSIS  ABOUT_MAJOR      6.511407780839639
Attrib  KURTOSIS  ABOUT_MINOR      5.007925207130292
Attrib  HOLLOWS  RATIO      −6.090016984100247
Sigmoid  Node  5
Inputs      Weights
Threshold      −0.5660507491690848
Attrib  COMPACTNESS      −2.367260992714412
Attrib  CIRCULARITY      7.955880860789396
Attrib  DISTANCE  CIRCULARITY      −7.285450693095994
Attrib  RADIUS  RATIO      10.5374660408747
Attrib  PR.AXIS  ASPECT  RATIO      4.189526897330937
Attrib  MAX.LENGTH  ASPECT  RATIO      −6.984564818545 6355
Attrib  SCATTER  RATIO      6.698736108204164
```

Attrib ELONGATEDNESS   −8.809040856672267
Attrib PR.AXIS RECTANGULARITY   0.011132034560391493
Attrib MAX.LENGTH RECTANGULARITY   5.887515859230198
Attrib SCALED VARIANCE_MAJOR   2.7981731503786516
Attrib SCALED VARIANCE_MINOR   8.617566842218864
Attrib SCALED RADIUS OF GYRATION   −9.248732875135738
Attrib SKEWNESS ABOUT_MAJOR   −2.144878156582614
Attrib SKEWNESS ABOUT_MINOR   −0.9745842349955318
Attrib KURTOSIS ABOUT_MAJOR   2.3588774091645015
Attrib KURTOSIS ABOUT_MINOR   21.358527071673358
Attrib HOLLOWS RATIO   −20.275651414382537
Sigmoid Node 6
Inputs   Weights
Threshold   −3.5559558364158903
Attrib COMPACTNESS   −14.482267203339378
Attrib CIRCULARITY   14.373896062557579
Attrib DISTANCE CIRCULARITY   0.2867948856019659
Attrib RADIUS RATIO   −1.7297442293418435
Attrib PR.AXIS ASPECT RATIO   −1.504021836305804
Attrib MAX.LENGTH ASPECT RATIO   2.312483711571657
Attrib SCATTER RATIO   4.611440665201137
Attrib ELONGATEDNESS   5.293923085930862
Attrib PR.AXIS RECTANGULARITY   5.043419416926339
Attrib MAX.LENGTH RECTANGULARITY   −5.777805641305414
Attrib SCALED VARIANCE_MAJOR   −2.531025345032389
Attrib SCALED VARIANCE_MINOR   9.506020251197555
Attrib SCALED RADIUS OF GYRATION   3.933398833583294
Attrib SKEWNESS ABOUT_MAJOR   4.8309385107575356
Attrib SKEWNESS ABOUT_MINOR   4.182893408934736
Attrib KURTOSIS ABOUT_MAJOR   8.908330697975256
Attrib KURTOSIS ABOUT_MINOR   −21.87692480202411
Attrib HOLLOWS RATIO   −8.072473748744402
Sigmoid Node 7
Inputs   Weights
Threshold   −1.5518409518208265
Attrib COMPACTNESS   12.183638857908011
Attrib CIRCULARITY   −3.190294876668917
Attrib DISTANCE CIRCULARITY   −3.1529363606052483
Attrib RADIUS RATIO   −5.71131733436463
Attrib PR.AXIS ASPECT RATIO   0.4669243337472238
Attrib MAX.LENGTH ASPECT RATIO   −1.4612884905655905
Attrib SCATTER RATIO   6.071251329073678
Attrib ELONGATEDNESS   −2.9591734142645674
Attrib PR.AXIS RECTANGULARITY   1.0261461540429344
Attrib MAX.LENGTH RECTANGULARITY   2.327439736420993
Attrib SCALED VARIANCE_MAJOR   4.2520635219185206
Attrib SCALED VARIANCE_MINOR   4.606469035095866
Attrib SCALED RADIUS OF GYRATION   1.4248228221459822
Attrib SKEWNESS ABOUT_MAJOR   7.543885311398146

Attrib SKEWNESS ABOUT_MINOR   9.185181876821769
Attrib KURTOSIS ABOUT_MAJOR   4.016466816472886
Attrib KURTOSIS ABOUT_MINOR   −7.882607950081961
Attrib HOLLOWS RATIO   −3.41127323804073
Sigmoid Node 8
Inputs   Weights
Threshold   0.11226933925466923
Attrib COMPACTNESS   −1.480160555265383
Attrib CIRCULARITY   −0.5291961635155049
Attrib DISTANCE CIRCULARITY   −11.984756035451946
Attrib RADIUS RATIO   −22.299402417239087
Attrib PR.AXIS ASPECT RATIO   32.303291268411535
Attrib MAX.LENGTH ASPECT RATIO   −20.968824957838965
Attrib SCATTER RATIO   1.3449578656212946
Attrib ELONGATEDNESS   −22.027965922727226
Attrib PR.AXIS RECTANGULARITY   −1.4509188611885042
Attrib MAX.LENGTH RECTANGULARITY   3.8165614580659475
Attrib SCALED VARIANCE_MAJOR   −3.8172603596906827
Attrib SCALED VARIANCE_MINOR   2.2527176445801977
Attrib SCALED RADIUS OF GYRATION   −2.63001793511292
Attrib SKEWNESS ABOUT_MAJOR   15.724354285284061
Attrib SKEWNESS ABOUT_MINOR   −2.4662767486517683
Attrib KURTOSIS ABOUT_MAJOR   −0.16396600452178742
Attrib KURTOSIS ABOUT_MINOR   13.489291138108943
Attrib HOLLOWS RATIO   −9.17100589104136
Sigmoid Node 9
Inputs   Weights
Threshold   0.671704048434291
Attrib COMPACTNESS   3.2648333815028097
Attrib CIRCULARITY   −7.85340186138663
Attrib DISTANCE CIRCULARITY   13.556254286833312
Attrib RADIUS RATIO   −9.089990111252018
Attrib PR.AXIS ASPECT RATIO   3.6855128853071504
Attrib MAX.LENGTH ASPECT RATIO   2.0778253876076733
Attrib SCATTER RATIO   −1.4174970380092187
Attrib ELONGATEDNESS   1.9141941929480872
Attrib PR.AXIS RECTANGULARITY   2.728193997934812
Attrib MAX.LENGTH RECTANGULARITY   3.179805470702207
Attrib SCALED VARIANCE_MAJOR   4.665650461200153
Attrib SCALED VARIANCE_MINOR   −6.925428154662688
Attrib SCALED RADIUS OF GYRATION   7.211137738179693
Attrib SKEWNESS ABOUT_MAJOR   16.58102046655096
Attrib SKEWNESS ABOUT_MINOR   −3.010848055677665
Attrib KURTOSIS ABOUT_MAJOR   1.143775172540805
Attrib KURTOSIS ABOUT_MINOR   −12.40321753265412
Attrib HOLLOWS RATIO   20.100362727756924
Sigmoid Node 10
Inputs   Weights
Threshold   −1.9405810853706704

Attrib COMPACTNESS   8.020140239379726
Attrib CIRCULARITY   −12.492047546594868
Attrib DISTANCE CIRCULARITY   −9.118254728334016
Attrib RADIUS RATIO   0.35176650315258284
Attrib PR.AXIS ASPECT RATIO   1.1355119498964201
Attrib MAX.LENGTH ASPECT RATIO   −0.40463929668928206
Attrib SCATTER RATIO   0.7483804202870422
Attrib ELONGATEDNESS   2.7497603948472333
Attrib PR.AXIS RECTANGULARITY   12.71316335247695
Attrib MAX.LENGTH RECTANGULARITY   1.2565135357706199
Attrib SCALED VARIANCE_MAJOR   −3.2778957991297437
Attrib SCALED VARIANCE_MINOR   2.7240010642778736
Attrib SCALED RADIUS OF GYRATION   −6.179587239658386
Attrib SKEWNESS ABOUT_MAJOR   −3.455572265950415
Attrib SKEWNESS ABOUT_MINOR   2.74649552416965
Attrib KURTOSIS ABOUT_MAJOR   12.644653531769011
Attrib KURTOSIS ABOUT_MINOR   0.41063983926730335
Attrib HOLLOWS RATIO   −9.470060542549177
Sigmoid Node 11
Inputs   Weights
Threshold   0.33119758417929934
Attrib COMPACTNESS   −14.30165664030481
Attrib CIRCULARITY   −11.861728917570447
Attrib DISTANCE CIRCULARITY   6.792112168607434
Attrib RADIUS RATIO   8.656732585722152
Attrib PR.AXIS ASPECT RATIO   1.7756806717954348
Attrib MAX.LENGTH ASPECT RATIO   −0.42854773318452294
Attrib SCATTER RATIO   7.9694643400015135
Attrib ELONGATEDNESS   −6.81835784241585
Attrib PR.AXIS RECTANGULARITY   −4.537581684945381
Attrib MAX.LENGTH RECTANGULARITY   −15.028822463538383
Attrib SCALED VARIANCE_MAJOR   2.2875994593296047
Attrib SCALED VARIANCE_MINOR   5.381295761299757
Attrib SCALED RADIUS OF GYRATION   3.099441478343274
Attrib SKEWNESS ABOUT_MAJOR   8.03844292301587
Attrib SKEWNESS ABOUT_MINOR   −3.702860924258397
Attrib KURTOSIS ABOUT_MAJOR   13.165017710407062
Attrib KURTOSIS ABOUT_MINOR   −10.845753487478058
Attrib HOLLOWS RATIO   2.80317366133773
Sigmoid Node 12
Inputs   Weights
Threshold   11.233501395211157
Attrib COMPACTNESS   13.751897320233997
Attrib CIRCULARITY   4.296223213320597
Attrib DISTANCE CIRCULARITY   13.54695248555763
Attrib RADIUS RATIO   −15.700298505897228
Attrib PR.AXIS ASPECT RATIO   9.386033835838282
Attrib MAX.LENGTH ASPECT RATIO   19.191761724004262
Attrib SCATTER RATIO   −10.30740860914244

Attrib ELONGATEDNESS   13.088494770212025
Attrib PR.AXIS RECTANGULARITY   −9.007283044164245
Attrib MAX.LENGTH RECTANGULARITY   19.26696263093792
Attrib SCALED VARIANCE_MAJOR   −6.822685499380187
Attrib SCALED VARIANCE_MINOR   −9.814871640285252
Attrib SCALED RADIUS OF GYRATION   −12.164161167674195
Attrib SKEWNESS ABOUT_MAJOR   30.040784362296414
Attrib SKEWNESS ABOUT_MINOR   −3.873213324327231
Attrib KURTOSIS ABOUT_MAJOR   −4.634718288978503
Attrib KURTOSIS ABOUT_MINOR   −6.551024994118908
Attrib HOLLOWS RATIO   14.16679040423808
Sigmoid Node 13
Inputs   Weights
Threshold   −20.09723436850425
Attrib COMPACTNESS   6.610450241474021
Attrib CIRCULARITY   −10.64648043770218 2
Attrib DISTANCE CIRCULARITY   7.457900382264621
Attrib RADIUS RATIO   3.564690879302291
Attrib PR.AXIS ASPECT RATIO   −11.854342492189579
Attrib MAX.LENGTH ASPECT RATIO   1.4695857935383496
Attrib SCATTER RATIO   −1.9038621573869052
Attrib ELONGATEDNESS   9.868666645727613
Attrib PR.AXIS RECTANGULARITY   8.206918633442426
Attrib MAX.LENGTH RECTANGULARITY   −16.445960365019793
Attrib SCALED VARIANCE_MAJOR   2.6466604062968613
Attrib SCALED VARIANCE_MINOR   4.041238366562928
Attrib SCALED RADIUS OF GYRATION   −7.041144729413975
Attrib SKEWNESS ABOUT_MAJOR   −9.50231755121277
Attrib SKEWNESS ABOUT_MINOR   3.4925053022721
Attrib KURTOSIS ABOUT_MAJOR   −6.170824753202035
Attrib KURTOSIS ABOUT_MINOR   −2.8617486723620646
Attrib HOLLOWS RATIO   −14.539092432994842
Sigmoid Node 14
Inputs   Weights
Threshold   −7.094642670973695
Attrib COMPACTNESS   −14.911304927461472
Attrib CIRCULARITY   −2.517773916137635
Attrib DISTANCE CIRCULARITY   −2.614719031915788
Attrib RADIUS RATIO   11.658565211728998
Attrib PR.AXIS ASPECT RATIO   −23.11936209075653
Attrib MAX.LENGTH ASPECT RATIO   9.952397422194906
Attrib SCATTER RATIO   6.172814739439859
Attrib ELONGATEDNESS   −6.221590743428367
Attrib PR.AXIS RECTANGULARITY   6.24845780305285
Attrib MAX.LENGTH RECTANGULARITY   11.0846252433371
Attrib SCALED VARIANCE_MAJOR   12.883935182438973
Attrib SCALED VARIANCE_MINOR   2.032048235458545
Attrib SCALED RADIUS OF GYRATION   −8.293550705929123
Attrib SKEWNESS ABOUT_MAJOR   −14.88319713419296

Attrib SKEWNESS ABOUT_MINOR   −0.410553793328882
Attrib KURTOSIS ABOUT_MAJOR   1.7178617336472868
Attrib KURTOSIS ABOUT_MINOR   −8.785395293908833
Attrib HOLLOWS RATIO   10.328025090015071
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.73 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances	742	87.7069 %
Incorrectly Classified Instances	104	12.2931 %
Kappa statistic	0.836	
Mean absolute error	0.0701	
Root mean squared error	0.2325	
Relative absolute error	18.6935 %	
Root relative squared error	53.7076 %	
Total Number of Instances	846	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F−Measure	MCC	ROC Area	PRC Area	Class
0,764	0,065	0,798	0,764	0,781	0,710	0,899	0,799	opel
0,816	0,070	0,801	0,816	0,808	0,741	0,924	0,776	saab
0,977	0,018	0,951	0,977	0,964	0,951	0,994	0,987	bus
0,955	0,012	0,960	0,955	0,957	0,944	0,991	0,966	van
Weighted Avg.		0,877	0,042	0,876	0,877	0,876	0,835	0,952	0,881

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
162  39   5    6  |    a = opel
38  177   1    1  |    b = saab
2    2   213   1  |    c = bus
1    3    5   190 |    d = van
```

26 26ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:          weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:        vehicle
Instances:       421
Attributes:      19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode:     user supplied test set:  size unknown (reading incrementally)
```

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

```
Sigmoid Node 0
Inputs      Weights
Threshold     4.5006463859195405
Node 4     9.716649000544326
Node 5     12.31022224140489
Node 6     12.191502836016374
Node 7    -13.957444549155248
```

```
Node  8      −24.34763513323707
Node  9      −12.64019527415427
Node  10       −7.090039997250543
Node  11        6.511866818960048
Node  12      −13.552826543516595
Node  13       −6.0006918890876975
Node  14       −9.449721730222606
Sigmoid Node 1
Inputs       Weights
Threshold        −8.627825084370533
Node  4      −12.578717078982267
Node  5      −14.020093100125525
Node  6       −6.812806779566591
Node  7       14.231426307539689
Node  8        2.7697678738673255
Node  9       14.193633149794252
Node  10       12.372597245655518
Node  11       −8.305476582154744
Node  12      −21.134434469406408
Node  13       10.09790531448074
Node  14       14.601275038850746
Sigmoid Node 2
Inputs       Weights
Threshold        −1.4782470116240545
Node  4       1.5043841658426937
Node  5       5.813272853916081
Node  6       6.6326080857582745
Node  7       4.096010757014195
Node  8       17.140249842312826
Node  9       −2.699593727702793
Node  10       −5.729441944008937
Node  11       −1.1836248644696206
Node  12       −3.0867504808706476
Node  13      −19.19375156790489
Node  14      −20.4332750846067 2
Sigmoid Node 3
Inputs       Weights
Threshold        −9.79109183458355
Node  4       −1.8333805809628796
Node  5       −1.1973443970859194
Node  6       −5.559713104104915
Node  7       −2.144255611075937
Node  8       −1.5396051166673381
Node  9       5.541347474983202
Node  10       1.9349645418477235
Node  11       −7.84908711840651
Node  12       15.565783833221285
Node  13       0.5715766829645851
Node  14       −0.17928537228722322
```

Sigmoid Node 4
Inputs   Weights
Threshold   −5.663876767333876
Attrib COMPACTNESS   −9.50899228006416
Attrib CIRCULARITY   −5.0702355641833305
Attrib DISTANCE CIRCULARITY   3.862838185940811
Attrib RADIUS RATIO   −6.546330436189514
Attrib PR.AXIS ASPECT RATIO   −6.286226047843595
Attrib MAX.LENGTH ASPECT RATIO   4.186502770128371
Attrib SCATTER RATIO   7.254921287489504
Attrib ELONGATEDNESS   −7.737217053288406
Attrib PR.AXIS RECTANGULARITY   0.4707616402485557
Attrib MAX.LENGTH RECTANGULARITY   3.8159734048762437
Attrib SCALED VARIANCE_MAJOR   5.27869227581772
Attrib SCALED VARIANCE_MINOR   10.780395506408368
Attrib SCALED RADIUS OF GYRATION   −6.1091320211877385
Attrib SKEWNESS ABOUT_MAJOR   2.903117767805143
Attrib SKEWNESS ABOUT_MINOR   4.1950932217381895
Attrib KURTOSIS ABOUT_MAJOR   6.511407780839639
Attrib KURTOSIS ABOUT_MINOR   5.007925207130292
Attrib HOLLOWS RATIO   −6.090016984100247
Sigmoid Node 5
Inputs   Weights
Threshold   −0.5660507491690848
Attrib COMPACTNESS   −2.367260992714412
Attrib CIRCULARITY   7.955880860789396
Attrib DISTANCE CIRCULARITY   −7.285450693095994
Attrib RADIUS RATIO   10.5374660408747
Attrib PR.AXIS ASPECT RATIO   4.189526897330937
Attrib MAX.LENGTH ASPECT RATIO   −6.9845648185456355
Attrib SCATTER RATIO   6.698736108204164
Attrib ELONGATEDNESS   −8.809040856672267
Attrib PR.AXIS RECTANGULARITY   0.011132034560391493
Attrib MAX.LENGTH RECTANGULARITY   5.887515859230198
Attrib SCALED VARIANCE_MAJOR   2.7981731503786516
Attrib SCALED VARIANCE_MINOR   8.617566842218864
Attrib SCALED RADIUS OF GYRATION   −9.248732875135738
Attrib SKEWNESS ABOUT_MAJOR   −2.144878156582614
Attrib SKEWNESS ABOUT_MINOR   −0.9745842349955318
Attrib KURTOSIS ABOUT_MAJOR   2.3588774091645015
Attrib KURTOSIS ABOUT_MINOR   21.358527071673358
Attrib HOLLOWS RATIO   −20.275651414382537
Sigmoid Node 6
Inputs   Weights
Threshold   −3.5559558364158903
Attrib COMPACTNESS   −14.482267203339378
Attrib CIRCULARITY   14.373896062557579
Attrib DISTANCE CIRCULARITY   0.2867948856019659
Attrib RADIUS RATIO   −1.7297442293418435

392

Attrib PR.AXIS ASPECT RATIO   −1.504021836305804
Attrib MAX.LENGTH ASPECT RATIO   2.312483711571657
Attrib SCATTER RATIO   4.611440665201137
Attrib ELONGATEDNESS   5.293923085930862
Attrib PR.AXIS RECTANGULARITY   5.043419416926339
Attrib MAX.LENGTH RECTANGULARITY   −5.777805641305414
Attrib SCALED VARIANCE_MAJOR   −2.531025345032389
Attrib SCALED VARIANCE_MINOR   9.506020251197555
Attrib SCALED RADIUS OF GYRATION   3.933398833583294
Attrib SKEWNESS ABOUT_MAJOR   4.8309385107575356
Attrib SKEWNESS ABOUT_MINOR   4.182893408934736
Attrib KURTOSIS ABOUT_MAJOR   8.908330697975256
Attrib KURTOSIS ABOUT_MINOR   −21.87692480202411
Attrib HOLLOWS RATIO   −8.072473748744402
Sigmoid Node 7
Inputs   Weights
Threshold   −1.5518409518208265
Attrib COMPACTNESS   12.183638857908011
Attrib CIRCULARITY   −3.190294876668917
Attrib DISTANCE CIRCULARITY   −3.1529363606052483
Attrib RADIUS RATIO   −5.71131733436463
Attrib PR.AXIS ASPECT RATIO   0.4669243337472238
Attrib MAX.LENGTH ASPECT RATIO   −1.4612884905655905
Attrib SCATTER RATIO   6.071251329073678
Attrib ELONGATEDNESS   −2.9591734142645674
Attrib PR.AXIS RECTANGULARITY   1.0261461540429344
Attrib MAX.LENGTH RECTANGULARITY   2.327439736420993
Attrib SCALED VARIANCE_MAJOR   4.2520635219185206
Attrib SCALED VARIANCE_MINOR   4.606469035095866
Attrib SCALED RADIUS OF GYRATION   1.4248228221459822
Attrib SKEWNESS ABOUT_MAJOR   7.543885311398146
Attrib SKEWNESS ABOUT_MINOR   9.185181876821769
Attrib KURTOSIS ABOUT_MAJOR   4.016466816472886
Attrib KURTOSIS ABOUT_MINOR   −7.882607950081961
Attrib HOLLOWS RATIO   −3.41127323804073
Sigmoid Node 8
Inputs   Weights
Threshold   0.11226933925466923
Attrib COMPACTNESS   −1.480160555265383
Attrib CIRCULARITY   −0.5291961635155049
Attrib DISTANCE CIRCULARITY   −11.984756035451946
Attrib RADIUS RATIO   −22.299402417239087
Attrib PR.AXIS ASPECT RATIO   32.303291268411535
Attrib MAX.LENGTH ASPECT RATIO   −20.968824957838965
Attrib SCATTER RATIO   1.3449578656212946
Attrib ELONGATEDNESS   −22.027965922727226
Attrib PR.AXIS RECTANGULARITY   −1.4509188611885042
Attrib MAX.LENGTH RECTANGULARITY   3.8165614580659475
Attrib SCALED VARIANCE_MAJOR   −3.8172603596906827

Attrib SCALED VARIANCE_MINOR   2.2527176445801977
Attrib SCALED RADIUS OF GYRATION   −2.63001793511292
Attrib SKEWNESS ABOUT_MAJOR   15.724354285284061
Attrib SKEWNESS ABOUT_MINOR   −2.4662767486517683
Attrib KURTOSIS ABOUT_MAJOR   −0.16396600452178742
Attrib KURTOSIS ABOUT_MINOR   13.489291138108943
Attrib HOLLOWS RATIO   −9.17100589104136
Sigmoid Node 9
Inputs   Weights
Threshold   0.671704048434291
Attrib COMPACTNESS   3.2648333815028097
Attrib CIRCULARITY   −7.85340186138663
Attrib DISTANCE CIRCULARITY   13.556254286833312
Attrib RADIUS RATIO   −9.089990111252018
Attrib PR.AXIS ASPECT RATIO   3.6855128853071504
Attrib MAX.LENGTH ASPECT RATIO   2.0778253876076733
Attrib SCATTER RATIO   −1.4174970380092187
Attrib ELONGATEDNESS   1.9141941929480872
Attrib PR.AXIS RECTANGULARITY   2.728193997934812
Attrib MAX.LENGTH RECTANGULARITY   3.179805470702207
Attrib SCALED VARIANCE_MAJOR   4.665650461200153
Attrib SCALED VARIANCE_MINOR   −6.925428154662688
Attrib SCALED RADIUS OF GYRATION   7.211137738179693
Attrib SKEWNESS ABOUT_MAJOR   16.58102046655096
Attrib SKEWNESS ABOUT_MINOR   −3.010848055677665
Attrib KURTOSIS ABOUT_MAJOR   1.143775172540805
Attrib KURTOSIS ABOUT_MINOR   −12.40321753265412
Attrib HOLLOWS RATIO   20.100362727756924
Sigmoid Node 10
Inputs   Weights
Threshold   −1.9405810853706704
Attrib COMPACTNESS   8.020140239379726
Attrib CIRCULARITY   −12.492047546594868
Attrib DISTANCE CIRCULARITY   −9.118254728334016
Attrib RADIUS RATIO   0.35176650315258284
Attrib PR.AXIS ASPECT RATIO   1.3551119498964201
Attrib MAX.LENGTH ASPECT RATIO   −0.40463929668928206
Attrib SCATTER RATIO   0.7483804202870422
Attrib ELONGATEDNESS   2.7497603948472333
Attrib PR.AXIS RECTANGULARITY   12.71316335247695
Attrib MAX.LENGTH RECTANGULARITY   1.2565135357706199
Attrib SCALED VARIANCE_MAJOR   −3.2778957991297437
Attrib SCALED VARIANCE_MINOR   2.7240010642778736
Attrib SCALED RADIUS OF GYRATION   −6.179587239658386
Attrib SKEWNESS ABOUT_MAJOR   −3.455572265950415
Attrib SKEWNESS ABOUT_MINOR   2.74649552416965
Attrib KURTOSIS ABOUT_MAJOR   12.644653531769011
Attrib KURTOSIS ABOUT_MINOR   0.41063983926730335
Attrib HOLLOWS RATIO   −9.470060542549177

Sigmoid Node 11
Inputs   Weights
Threshold   0.33119758417929934
Attrib COMPACTNESS   −14.30165664030481
Attrib CIRCULARITY   −11.861728917570447
Attrib DISTANCE CIRCULARITY   6.792112168607434
Attrib RADIUS RATIO   8.656732585722152
Attrib PR.AXIS ASPECT RATIO   1.7756806717954348
Attrib MAX.LENGTH ASPECT RATIO   −0.42854773318452294
Attrib SCATTER RATIO   7.9694643400015135
Attrib ELONGATEDNESS   −6.81835784241585
Attrib PR.AXIS RECTANGULARITY   −4.537581684945381
Attrib MAX.LENGTH RECTANGULARITY   −15.028822463538383
Attrib SCALED VARIANCE_MAJOR   2.2875994593296047
Attrib SCALED VARIANCE_MINOR   5.381295761299757
Attrib SCALED RADIUS OF GYRATION   3.099441478343274
Attrib SKEWNESS ABOUT_MAJOR   8.03844292301587
Attrib SKEWNESS ABOUT_MINOR   −3.702860924258397
Attrib KURTOSIS ABOUT_MAJOR   13.165017710407062
Attrib KURTOSIS ABOUT_MINOR   −10.845753487478058
Attrib HOLLOWS RATIO   2.80317366133773
Sigmoid Node 12
Inputs   Weights
Threshold   11.233501395211157
Attrib COMPACTNESS   13.751897320233997
Attrib CIRCULARITY   4.296223213320597
Attrib DISTANCE CIRCULARITY   13.54695248555763
Attrib RADIUS RATIO   −15.700298505897228
Attrib PR.AXIS ASPECT RATIO   9.386033835838282
Attrib MAX.LENGTH ASPECT RATIO   19.191761724004262
Attrib SCATTER RATIO   −10.30740860914244
Attrib ELONGATEDNESS   13.088494770212025
Attrib PR.AXIS RECTANGULARITY   −9.007283044164245
Attrib MAX.LENGTH RECTANGULARITY   19.26696263093792
Attrib SCALED VARIANCE_MAJOR   −6.822685499380187
Attrib SCALED VARIANCE_MINOR   −9.814871640285252
Attrib SCALED RADIUS OF GYRATION   −12.164161167674195
Attrib SKEWNESS ABOUT_MAJOR   30.040784362296414
Attrib SKEWNESS ABOUT_MINOR   −3.873213324327231
Attrib KURTOSIS ABOUT_MAJOR   −4.634718288978503
Attrib KURTOSIS ABOUT_MINOR   −6.551024994118908
Attrib HOLLOWS RATIO   14.16679040423808
Sigmoid Node 13
Inputs   Weights
Threshold   −20.09723436850425
Attrib COMPACTNESS   6.610450241474021
Attrib CIRCULARITY   −10.64680437702182
Attrib DISTANCE CIRCULARITY   7.457900382264621
Attrib RADIUS RATIO   3.564690879302291

Attrib PR.AXIS ASPECT RATIO   −11.854342492189579
Attrib MAX.LENGTH ASPECT RATIO   1.4695857935383496
Attrib SCATTER RATIO   −1.9038621573869052
Attrib ELONGATEDNESS   9.868666645727613
Attrib PR.AXIS RECTANGULARITY   8.206918633442426
Attrib MAX.LENGTH RECTANGULARITY   −16.445960365019793
Attrib SCALED VARIANCE_MAJOR   2.6466604062968613
Attrib SCALED VARIANCE_MINOR   4.041238366562928
Attrib SCALED RADIUS OF GYRATION   −7.041144729413975
Attrib SKEWNESS ABOUT_MAJOR   −9.50231755121277
Attrib SKEWNESS ABOUT_MINOR   3.4925053022721
Attrib KURTOSIS ABOUT_MAJOR   −6.170824753202035
Attrib KURTOSIS ABOUT_MINOR   −2.8617486723620646
Attrib HOLLOWS RATIO   −14.539092432994842
Sigmoid Node 14
Inputs   Weights
Threshold   −7.094642670973695
Attrib COMPACTNESS   −14.911304927461472
Attrib CIRCULARITY   −2.517773916137635
Attrib DISTANCE CIRCULARITY   −2.614719031915788
Attrib RADIUS RATIO   11.658565211728998
Attrib PR.AXIS ASPECT RATIO   −23.11936209075653
Attrib MAX.LENGTH ASPECT RATIO   9.952397422194906
Attrib SCATTER RATIO   6.172814739439859
Attrib ELONGATEDNESS   −6.221590743428367
Attrib PR.AXIS RECTANGULARITY   6.24845780305285
Attrib MAX.LENGTH RECTANGULARITY   11.0846252433371
Attrib SCALED VARIANCE_MAJOR   12.883935182438973
Attrib SCALED VARIANCE_MINOR   2.032048235458545
Attrib SCALED RADIUS OF GYRATION   −8.293550705929123
Attrib SKEWNESS ABOUT_MAJOR   −14.88319713419296
Attrib SKEWNESS ABOUT_MINOR   −0.410553793328882
Attrib KURTOSIS ABOUT_MAJOR   1.7178617336472868
Attrib KURTOSIS ABOUT_MINOR   −8.785395293908833
Attrib HOLLOWS RATIO   10.328025090015071
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 3 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances	409	97.1496 %
Incorrectly Classified Instances	12	2.8504 %
Kappa statistic	0.962	
Mean absolute error	0.0241	
Root mean squared error	0.1115	
Relative absolute error	6.4325 %	
Root relative squared error	25.7669 %	
Total Number of Instances	421	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,924	0,009	0,970	0,924	0,946	0,930	0,967	0,965	opel
0,972	0,019	0,946	0,972	0,959	0,945	0,985	0,933	saab
0,991	0,006	0,982	0,991	0,986	0,982	0,996	0,987	bus
1,000	0,003	0,990	1,000	0,995	0,993	1,000	1,000	van
Weighted Avg.	0,971	0,010	0,972	0,971	0,971	0,962	0,987	0,971

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
97   6    2    0 |    a = opel
3  105    0    0 |    b = saab
0    0  108    1 |    c = bus
0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N

Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
 Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   4.5006463859195405
Node 4   9.716649000544326
Node 5   12.31022224140489
Node 6   12.191502836016374
Node 7   −13.957444549155248
Node 8   −24.34763513323707
Node 9   −12.64019527415427
Node 10   −7.090039997250543
Node 11   6.511866818960048
Node 12   −13.552826543516595
Node 13   −6.0006918890876975
Node 14   −9.449721730222606
Sigmoid Node 1
Inputs   Weights
Threshold   −8.627825084370533
Node 4   −12.578717078982267
Node 5   −14.020093100125525
Node 6   −6.812806779566591
Node 7   14.231426307539689
Node 8   2.7697678738673255
Node 9   14.193633149794252

```
Node 10      12.372597245655518
Node 11      −8.305476582154744
Node 12      −21.134434469406408
Node 13      10.09790531448074
Node 14      14.601275038850746
Sigmoid Node 2
Inputs      Weights
Threshold      −1.4782470116240545
Node 4     1.5043841658426937
Node 5     5.813272853916081
Node 6     6.6326080857582745
Node 7     4.096010757014195
Node 8     17.140249842312826
Node 9     −2.699593727702793
Node 10      −5.729441944008937
Node 11      −1.1836248644696206
Node 12      −3.0867504808706476
Node 13      −19.19375156790489
Node 14      −20.4327508460672
Sigmoid Node 3
Inputs      Weights
Threshold      −9.79109183458355
Node 4     −1.8333805809628796
Node 5     −1.1973443970859194
Node 6     −5.559713104104915
Node 7     −2.144255611075937
Node 8     −1.5396051166673381
Node 9     5.541347474983202
Node 10      1.9349645418477235
Node 11      −7.84908711840651
Node 12      15.565783833221285
Node 13      0.5715766829645851
Node 14      −0.17928537228722322
Sigmoid Node 4
Inputs      Weights
Threshold      −5.663876767333876
Attrib COMPACTNESS      −9.50899228006416
Attrib CIRCULARITY      −5.0702355641833305
Attrib DISTANCE CIRCULARITY      3.862838185940811
Attrib RADIUS RATIO      −6.546330436189514
Attrib PR.AXIS ASPECT RATIO      −6.286226047843595
Attrib MAX.LENGTH ASPECT RATIO      4.186502770128371
Attrib SCATTER RATIO      7.254921287489504
Attrib ELONGATEDNESS      −7.737217053288406
Attrib PR.AXIS RECTANGULARITY      0.4707616402485557
Attrib MAX.LENGTH RECTANGULARITY      3.8159734048762437
Attrib SCALED VARIANCE_MAJOR      5.27869227581772
Attrib SCALED VARIANCE_MINOR      10.780395506408368
Attrib SCALED RADIUS OF GYRATION      −6.1091320211877385
```

```
Attrib SKEWNESS ABOUT_MAJOR     2.903117767805143
Attrib SKEWNESS ABOUT_MINOR     4.1950932217381895
Attrib KURTOSIS ABOUT_MAJOR     6.511407780839639
Attrib KURTOSIS ABOUT_MINOR     5.007925207130292
Attrib HOLLOWS RATIO     −6.090016984100247
Sigmoid Node 5
Inputs     Weights
Threshold     −0.5660507491690848
Attrib COMPACTNESS     −2.367260992714412
Attrib CIRCULARITY     7.955880860789396
Attrib DISTANCE CIRCULARITY     −7.285450693095994
Attrib RADIUS RATIO     10.5374660408747
Attrib PR.AXIS ASPECT RATIO     4.189526897330937
Attrib MAX.LENGTH ASPECT RATIO     −6.9845648185456355
Attrib SCATTER RATIO     6.698736108204164
Attrib ELONGATEDNESS     −8.809040856672267
Attrib PR.AXIS RECTANGULARITY     0.011132034560391493
Attrib MAX.LENGTH RECTANGULARITY     5.887515859230198
Attrib SCALED VARIANCE_MAJOR     2.7981731503786516
Attrib SCALED VARIANCE_MINOR     8.617566842218864
Attrib SCALED RADIUS OF GYRATION     −9.248732875135738
Attrib SKEWNESS ABOUT_MAJOR     −2.144878156582614
Attrib SKEWNESS ABOUT_MINOR     −0.9745842349955318
Attrib KURTOSIS ABOUT_MAJOR     2.3588774091645015
Attrib KURTOSIS ABOUT_MINOR     21.358527071673358
Attrib HOLLOWS RATIO     −20.275651414382537
Sigmoid Node 6
Inputs     Weights
Threshold     −3.5559558364158903
Attrib COMPACTNESS     −14.482267203339378
Attrib CIRCULARITY     14.373896062557579
Attrib DISTANCE CIRCULARITY     0.2867948856019659
Attrib RADIUS RATIO     −1.7297442293418435
Attrib PR.AXIS ASPECT RATIO     −1.504021836305804
Attrib MAX.LENGTH ASPECT RATIO     2.312483711571657
Attrib SCATTER RATIO     4.611440665201137
Attrib ELONGATEDNESS     5.293923085930862
Attrib PR.AXIS RECTANGULARITY     5.043419416926339
Attrib MAX.LENGTH RECTANGULARITY     −5.777805641305414
Attrib SCALED VARIANCE_MAJOR     −2.531025345032389
Attrib SCALED VARIANCE_MINOR     9.506020251197555
Attrib SCALED RADIUS OF GYRATION     3.933398833583294
Attrib SKEWNESS ABOUT_MAJOR     4.8309385107575356
Attrib SKEWNESS ABOUT_MINOR     4.182893408934736
Attrib KURTOSIS ABOUT_MAJOR     8.908330697975256
Attrib KURTOSIS ABOUT_MINOR     −21.87692480202411
Attrib HOLLOWS RATIO     −8.07247374874402
Sigmoid Node 7
Inputs     Weights
```

Threshold   −1.5518409518208265
Attrib COMPACTNESS   12.183638857908011
Attrib CIRCULARITY   −3.190294876668917
Attrib DISTANCE CIRCULARITY   −3.1529363606052483
Attrib RADIUS RATIO   −5.71131733436463
Attrib PR.AXIS ASPECT RATIO   0.4669243337472238
Attrib MAX.LENGTH ASPECT RATIO   −1.4612884905655905
Attrib SCATTER RATIO   6.071251329073678
Attrib ELONGATEDNESS   −2.9591734142645674
Attrib PR.AXIS RECTANGULARITY   1.0261461540429344
Attrib MAX.LENGTH RECTANGULARITY   2.327439736420993
Attrib SCALED VARIANCE_MAJOR   4.2520635219185206
Attrib SCALED VARIANCE_MINOR   4.606469035095866
Attrib SCALED RADIUS OF GYRATION   1.4248228221459822
Attrib SKEWNESS ABOUT_MAJOR   7.543885311398146
Attrib SKEWNESS ABOUT_MINOR   9.185181876821769
Attrib KURTOSIS ABOUT_MAJOR   4.016466816472886
Attrib KURTOSIS ABOUT_MINOR   −7.882607950081961
Attrib HOLLOWS RATIO   −3.41127323804073
Sigmoid Node 8
Inputs   Weights
Threshold   0.11226933925466923
Attrib COMPACTNESS   −1.480160555265383
Attrib CIRCULARITY   −0.5291961635155049
Attrib DISTANCE CIRCULARITY   −11.984756035451946
Attrib RADIUS RATIO   −22.299402417239087
Attrib PR.AXIS ASPECT RATIO   32.303291268411535
Attrib MAX.LENGTH ASPECT RATIO   −20.968824957838965
Attrib SCATTER RATIO   1.3449578656212946
Attrib ELONGATEDNESS   −22.027965922727226
Attrib PR.AXIS RECTANGULARITY   −1.4509188611885042
Attrib MAX.LENGTH RECTANGULARITY   3.8165614580659475
Attrib SCALED VARIANCE_MAJOR   −3.8172603596906827
Attrib SCALED VARIANCE_MINOR   2.2527176445801977
Attrib SCALED RADIUS OF GYRATION   −2.63001793511292
Attrib SKEWNESS ABOUT_MAJOR   15.724354285284061
Attrib SKEWNESS ABOUT_MINOR   −2.4662767486517683
Attrib KURTOSIS ABOUT_MAJOR   −0.16396600452178742
Attrib KURTOSIS ABOUT_MINOR   13.489291138108943
Attrib HOLLOWS RATIO   −9.17100589104136
Sigmoid Node 9
Inputs   Weights
Threshold   0.671704048434291
Attrib COMPACTNESS   3.2648333815028097
Attrib CIRCULARITY   −7.85340186138663
Attrib DISTANCE CIRCULARITY   13.556254286833312
Attrib RADIUS RATIO   −9.08990111252018
Attrib PR.AXIS ASPECT RATIO   3.6855128853071504
Attrib MAX.LENGTH ASPECT RATIO   2.0778253876076733

Attrib SCATTER RATIO   −1.4174970380092187
Attrib ELONGATEDNESS   1.9141941929480872
Attrib PR.AXIS RECTANGULARITY   2.728193997934812
Attrib MAX.LENGTH RECTANGULARITY   3.179805470702207
Attrib SCALED VARIANCE_MAJOR   4.665650461200153
Attrib SCALED VARIANCE_MINOR   −6.925428154662688
Attrib SCALED RADIUS OF GYRATION   7.211137738179693
Attrib SKEWNESS ABOUT_MAJOR   16.58102046655096
Attrib SKEWNESS ABOUT_MINOR   −3.010848055677665
Attrib KURTOSIS ABOUT_MAJOR   1.143775172540805
Attrib KURTOSIS ABOUT_MINOR   −12.40321753265412
Attrib HOLLOWS RATIO   20.100362727756924
Sigmoid Node 10
Inputs   Weights
Threshold   −1.9405810853706704
Attrib COMPACTNESS   8.020140239379726
Attrib CIRCULARITY   −12.492047546594868
Attrib DISTANCE CIRCULARITY   −9.118254728334016
Attrib RADIUS RATIO   0.35176650315258284
Attrib PR.AXIS ASPECT RATIO   1.1355119498964201
Attrib MAX.LENGTH ASPECT RATIO   −0.40463929668928206
Attrib SCATTER RATIO   0.7483804202870422
Attrib ELONGATEDNESS   2.7497603948472333
Attrib PR.AXIS RECTANGULARITY   12.71316335247695
Attrib MAX.LENGTH RECTANGULARITY   1.2565135357706199
Attrib SCALED VARIANCE_MAJOR   −3.2778957991297437
Attrib SCALED VARIANCE_MINOR   2.7240010642778736
Attrib SCALED RADIUS OF GYRATION   −6.179587239658386
Attrib SKEWNESS ABOUT_MAJOR   −3.455572265950415
Attrib SKEWNESS ABOUT_MINOR   2.74649552416965
Attrib KURTOSIS ABOUT_MAJOR   12.644653531769011
Attrib KURTOSIS ABOUT_MINOR   0.41063983926730335
Attrib HOLLOWS RATIO   −9.470060542549177
Sigmoid Node 11
Inputs   Weights
Threshold   0.33119758417929934
Attrib COMPACTNESS   −14.30165664030481
Attrib CIRCULARITY   −11.861728917570447
Attrib DISTANCE CIRCULARITY   6.792112168607434
Attrib RADIUS RATIO   8.656732585722152
Attrib PR.AXIS ASPECT RATIO   1.7756806717954348
Attrib MAX.LENGTH ASPECT RATIO   −0.42854773318452294
Attrib SCATTER RATIO   7.9694643400015135
Attrib ELONGATEDNESS   −6.81835784241585
Attrib PR.AXIS RECTANGULARITY   −4.537581684945381
Attrib MAX.LENGTH RECTANGULARITY   −15.028822463538383
Attrib SCALED VARIANCE_MAJOR   2.2875994593296047
Attrib SCALED VARIANCE_MINOR   5.381295761299757
Attrib SCALED RADIUS OF GYRATION   3.099441478343274

Attrib SKEWNESS ABOUT_MAJOR   8.03844292301587
Attrib SKEWNESS ABOUT_MINOR   −3.702860924258397
Attrib KURTOSIS ABOUT_MAJOR   13.165017710407062
Attrib KURTOSIS ABOUT_MINOR   −10.845753487478058
Attrib HOLLOWS RATIO   2.80317366133773
Sigmoid Node 12
Inputs   Weights
Threshold   11.233501395211157
Attrib COMPACTNESS   13.751897320233997
Attrib CIRCULARITY   4.296223213320597
Attrib DISTANCE CIRCULARITY   13.54695248555763
Attrib RADIUS RATIO   −15.700298505897228
Attrib PR.AXIS ASPECT RATIO   9.386033835838282
Attrib MAX.LENGTH ASPECT RATIO   19.191761724004262
Attrib SCATTER RATIO   −10.30740860914244
Attrib ELONGATEDNESS   13.088494770212025
Attrib PR.AXIS RECTANGULARITY   −9.007283044164245
Attrib MAX.LENGTH RECTANGULARITY   19.26696263093792
Attrib SCALED VARIANCE_MAJOR   −6.822685499380187
Attrib SCALED VARIANCE_MINOR   −9.814871640285252
Attrib SCALED RADIUS OF GYRATION   −12.164161167674195
Attrib SKEWNESS ABOUT_MAJOR   30.040784362296414
Attrib SKEWNESS ABOUT_MINOR   −3.873213324327231
Attrib KURTOSIS ABOUT_MAJOR   −4.634718288978503
Attrib KURTOSIS ABOUT_MINOR   −6.551024994118908
Attrib HOLLOWS RATIO   14.16679040423808
Sigmoid Node 13
Inputs   Weights
Threshold   −20.09723436850425
Attrib COMPACTNESS   6.610450241474021
Attrib CIRCULARITY   −10.646480437702182
Attrib DISTANCE CIRCULARITY   7.457900382264621
Attrib RADIUS RATIO   3.564690879302291
Attrib PR.AXIS ASPECT RATIO   −11.854342492189579
Attrib MAX.LENGTH ASPECT RATIO   1.4695857935383496
Attrib SCATTER RATIO   −1.9038621573869052
Attrib ELONGATEDNESS   9.868666645727613
Attrib PR.AXIS RECTANGULARITY   8.206918633442426
Attrib MAX.LENGTH RECTANGULARITY   −16.445960365019793
Attrib SCALED VARIANCE_MAJOR   2.6466604062968613
Attrib SCALED VARIANCE_MINOR   4.041238366562928
Attrib SCALED RADIUS OF GYRATION   −7.041144729413975
Attrib SKEWNESS ABOUT_MAJOR   −9.50231755121277
Attrib SKEWNESS ABOUT_MINOR   3.4925053022721
Attrib KURTOSIS ABOUT_MAJOR   −6.170824753202035
Attrib KURTOSIS ABOUT_MINOR   −2.8617486723620646
Attrib HOLLOWS RATIO   −14.539092432994842
Sigmoid Node 14
Inputs   Weights

Threshold -7.094642670973695
Attrib COMPACTNESS -14.911304927461472
Attrib CIRCULARITY -2.517773916137635
Attrib DISTANCE CIRCULARITY -2.614719031915788
Attrib RADIUS RATIO 11.658565211728998
Attrib PR.AXIS ASPECT RATIO -23.11936209075653
Attrib MAX.LENGTH ASPECT RATIO 9.952397422194906
Attrib SCATTER RATIO 6.172814739439859
Attrib ELONGATEDNESS -6.221590743428367
Attrib PR.AXIS RECTANGULARITY 6.24845780305285
Attrib MAX.LENGTH RECTANGULARITY 11.0846252433371
Attrib SCALED VARIANCE_MAJOR 12.883935182438973
Attrib SCALED VARIANCE_MINOR 2.032048235458545
Attrib SCALED RADIUS OF GYRATION -8.293550705929123
Attrib SKEWNESS ABOUT_MAJOR -14.88319713419296
Attrib SKEWNESS ABOUT_MINOR -0.410553793328882
Attrib KURTOSIS ABOUT_MAJOR 1.7178617336472868
Attrib KURTOSIS ABOUT_MINOR -8.785395293908833
Attrib HOLLOWS RATIO 10.328025090015071
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 2.73 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances   742   87.7069 %
Incorrectly Classified Instances   104   12.2931 %
Kappa statistic   0.836
Mean absolute error   0.0701
Root mean squared error   0.2325
Relative absolute error   18.6935 %
Root relative squared error   53.7076 %
Total Number of Instances   846

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,764	0,065	0,798	0,764	0,781	0,710	0,899	0,799	opel
0,816	0,070	0,801	0,816	0,808	0,741	0,924	0,776	saab
0,977	0,018	0,951	0,977	0,964	0,951	0,994	0,987	bus
0,955	0,012	0,960	0,955	0,957	0,944	0,991	0,966	van
Weighted Avg.	0,877	0,042	0,876	0,877	0,876	0,835	0,952	0,881

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
162   39    5    6 |    a = opel
 38  177    1    1 |    b = saab
  2    2  213    1 |    c = bus
  1    3    5  190 |    d = van
```

27 27ª tentativa

=== Run information ===

UTILIZANDO A BASE DE TREINAMENTO DE DADOS Nome: Bruno e Diego

```
Scheme:        weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation:      vehicle
Instances:     421
Attributes:    19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY
RADIUS RATIO
PR.AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR.AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
```

KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −6.144402049063557
Node 4   −10.576054413890542
Node 5   −8.285459715252737
Node 6   11.551273190185885
Node 7   12.833466705389814
Node 8   −8.202975811008763
Node 9   5.945327467677308
Node 10   9.101834765598912
Node 11   −9.945307358106097
Node 12   2.4697057741713584
Node 13   5.852312463644603
Node 14   −3.900131584193343
Node 15   −6.893407204424069
Node 16   −12.320488703251758
Node 17   9.603938695946622
Node 18   8.124404573047348
Node 19   −17.04619166636441
Node 20   −6.7476713856504285
Node 21   8.988620544525219
Sigmoid Node 1
Inputs   Weights
Threshold   −6.883382916945656
Node 4   6.821036377314135
Node 5   12.160627801620022
Node 6   −6.729349108116406
Node 7   −10.4420817512754
Node 8   −4.82916899703312
Node 9   −7.983203337452638
Node 10   −11.37331943767634
Node 11   10.25847125420072
Node 12   −6.605245298076736
Node 13   −9.733111839031935
Node 14   17.582611774104077
Node 15   −9.94683137893508
Node 16   10.245784859654563
Node 17   5.255561648557733
Node 18   3.2976449279062385
Node 19   6.983137663460456
Node 20   −18.488567397847326

406

Node 21   −9.08111531045523
Sigmoid Node 2
Inputs   Weights
Threshold   0.8556062239805189
Node 4   3.944139044851132
Node 5   −3.4048760235344355
Node 6   −0.48503292859198566
Node 7   1.0781092948756965
Node 8   −2.384396592737004
Node 9   8.01888259143274
Node 10   2.1222008389643774
Node 11   0.8280802723197355
Node 12   −1.5371360753034813
Node 13   0.18156020306278764
Node 14   −15.081634221936262
Node 15   9.859565964258016
Node 16   −2.442973341461243
Node 17   −13.853549113981657
Node 18   −6.105228634370469
Node 19   8.900306315384084
Node 20   −5.425249895730233
Node 21   0.5631929419118241
Sigmoid Node 3
Inputs   Weights
Threshold   −7.50567285502943
Node 4   −1.1531951330894836
Node 5   6.334372991614273
Node 6   −2.3372373874069132
Node 7   −2.140279626303267
Node 8   2.9813706390408528
Node 9   −8.159951680841665
Node 10   4.8306992910619195
Node 11   −0.5948980805535319
Node 12   −1.3348214863757277
Node 13   −3.4265123158814825
Node 14   −1.8344628012283395
Node 15   −1.7935098172451704
Node 16   0.2502242541805172
Node 17   0.1294287295761935
Node 18   −3.4664108904024338
Node 19   0.0734032352059364
Node 20   14.364805687818263
Node 21   −5.6712617666910985
Sigmoid Node 4
Inputs   Weights
Threshold   −0.024845239396153317
Attrib COMPACTNESS   5.981524977151319
Attrib CIRCULARITY   −4.937862461845557
Attrib DISTANCE CIRCULARITY   −3.697059227432537

Attrib RADIUS RATIO   −3.253894851166414
Attrib PR.AXIS ASPECT RATIO   1.0850063425110978
Attrib MAX.LENGTH ASPECT RATIO   −3.8054085307941774
Attrib SCATTER RATIO   1.4089232717980555
Attrib ELONGATEDNESS   −3.0911526806574963
Attrib PR.AXIS RECTANGULARITY   −0.92223717027111
Attrib MAX.LENGTH RECTANGULARITY   −1.2493602522027603
Attrib SCALED VARIANCE_MAJOR   1.9136030611896795
Attrib SCALED VARIANCE_MINOR   0.49241788467817876
Attrib SCALED RADIUS OF GYRATION   7.212664290923554
Attrib SKEWNESS ABOUT_MAJOR   5.6761439337391195
Attrib SKEWNESS ABOUT_MINOR   −1.0848604605434566
Attrib KURTOSIS ABOUT_MAJOR   3.773376989900767
Attrib KURTOSIS ABOUT_MINOR   5.19417358243441
Attrib HOLLOWS RATIO   −5.245985388700336
Sigmoid Node 5
Inputs   Weights
Threshold   −0.12910937175737047
Attrib COMPACTNESS   −6.4083110098291876
Attrib CIRCULARITY   −6.323333453466105
Attrib DISTANCE CIRCULARITY   4.738483124720115
Attrib RADIUS RATIO   −2.304976306778789
Attrib PR.AXIS ASPECT RATIO   3.5944854327423643
Attrib MAX.LENGTH ASPECT RATIO   3.9479189087084854
Attrib SCATTER RATIO   0.6008908866221145
Attrib ELONGATEDNESS   5.989493940416737
Attrib PR.AXIS RECTANGULARITY   2.1282024428291084
Attrib MAX.LENGTH RECTANGULARITY   0.11515551553442822
Attrib SCALED VARIANCE_MAJOR   3.4148817112327166
Attrib SCALED VARIANCE_MINOR   −0.7110543179319858
Attrib SCALED RADIUS OF GYRATION   11.865107799840581
Attrib SKEWNESS ABOUT_MAJOR   0.15479853856381134
Attrib SKEWNESS ABOUT_MINOR   0.8661970517072654
Attrib KURTOSIS ABOUT_MAJOR   −6.141008048877925
Attrib KURTOSIS ABOUT_MINOR   −11.32500970992412
Attrib HOLLOWS RATIO   25.679054454699855
Sigmoid Node 6
Inputs   Weights
Threshold   −3.804378991484553
Attrib COMPACTNESS   −3.162904882118917
Attrib CIRCULARITY   −7.696447824658089
Attrib DISTANCE CIRCULARITY   2.001874681530193
Attrib RADIUS RATIO   3.419731208831583
Attrib PR.AXIS ASPECT RATIO   1.275156404701793
Attrib MAX.LENGTH ASPECT RATIO   6.112065543478957
Attrib SCATTER RATIO   5.581178181877752
Attrib ELONGATEDNESS   −4.11967688755753
Attrib PR.AXIS RECTANGULARITY   −5.362897151967128
Attrib MAX.LENGTH RECTANGULARITY   −11.223721760048065

Attrib SCALED VARIANCE_MAJOR   2.985107705092045
Attrib SCALED VARIANCE_MINOR   4.786142234894776
Attrib SCALED RADIUS OF GYRATION   0.3155076436844553
Attrib SKEWNESS ABOUT_MAJOR   4.624687978171923
Attrib SKEWNESS ABOUT_MINOR -10.91775667623477
Attrib KURTOSIS ABOUT_MAJOR   4.392647109687928
Attrib KURTOSIS ABOUT_MINOR -8.232404560198164
Attrib HOLLOWS RATIO   4.497985103940508
Sigmoid Node 7
Inputs   Weights
Threshold -2.1286848717429527
Attrib COMPACTNESS -4.8241862866874206
Attrib CIRCULARITY   9.604255673658013
Attrib DISTANCE CIRCULARITY -7.441596857211634
Attrib RADIUS RATIO -1.4796459345117483
Attrib PR.AXIS ASPECT RATIO -7.376436125058812
Attrib MAX.LENGTH ASPECT RATIO -2.3980713922582946
Attrib SCATTER RATIO   2.773670814653783
Attrib ELONGATEDNESS -5.149810489805265
Attrib PR.AXIS RECTANGULARITY   8.17600512541881
Attrib MAX.LENGTH RECTANGULARITY -3.6430283675403645
Attrib SCALED VARIANCE_MAJOR -0.5608643158952793
Attrib SCALED VARIANCE_MINOR   5.819250105500484
Attrib SCALED RADIUS OF GYRATION -1.2473437705603936
Attrib SKEWNESS ABOUT_MAJOR -2.7336736045735637
Attrib SKEWNESS ABOUT_MINOR   4.060986041322638
Attrib KURTOSIS ABOUT_MAJOR   3.7332115596380597
Attrib KURTOSIS ABOUT_MINOR   30.114346421044257
Attrib HOLLOWS RATIO -24.424017291694522
Sigmoid Node 8
Inputs   Weights
Threshold -2.049611182806815
Attrib COMPACTNESS   9.755654973674604
Attrib CIRCULARITY -1.981657305238627
Attrib DISTANCE CIRCULARITY -6.4671267955482525
Attrib RADIUS RATIO   2.1365479346644314
Attrib PR.AXIS ASPECT RATIO   6.085535077219287
Attrib MAX.LENGTH ASPECT RATIO   0.22750579770916515
Attrib SCATTER RATIO -1.4237538116446107
Attrib ELONGATEDNESS   0.9006558719160098
Attrib PR.AXIS RECTANGULARITY -2.349133139307122
Attrib MAX.LENGTH RECTANGULARITY   1.9222762629260783
Attrib SCALED VARIANCE_MAJOR -1.0302490373521842
Attrib SCALED VARIANCE_MINOR -0.19145256498367821
Attrib SCALED RADIUS OF GYRATION -3.9688466104531566
Attrib SKEWNESS ABOUT_MAJOR   1.714589373449276
Attrib SKEWNESS ABOUT_MINOR -0.25808279399276673
Attrib KURTOSIS ABOUT_MAJOR -3.9473740585003507
Attrib KURTOSIS ABOUT_MINOR   3.9495263552465016

Attrib HOLLOWS RATIO   0.7669410356884998
Sigmoid Node 9
Inputs   Weights
Threshold   2.7098897701644753
Attrib COMPACTNESS   −4.428545149038369
Attrib CIRCULARITY   5.768813501800325
Attrib DISTANCE CIRCULARITY   −6.410545158704637
Attrib RADIUS RATIO   0.706360799085291
Attrib PR.AXIS ASPECT RATIO   13.514375868425478
Attrib MAX.LENGTH ASPECT RATIO   −8.0059693266333
Attrib SCATTER RATIO   1.0818027014602112
Attrib ELONGATEDNESS   −8.489131550771894
Attrib PR.AXIS RECTANGULARITY   0.5292663608379395
Attrib MAX.LENGTH RECTANGULARITY   −2.356096992565411
Attrib SCALED VARIANCE_MAJOR   −5.10260130011419
Attrib SCALED VARIANCE_MINOR   2.1974945506902337
Attrib SCALED RADIUS OF GYRATION   −1.8113430045581669
Attrib SKEWNESS ABOUT_MAJOR   4.68542638736333
Attrib SKEWNESS ABOUT_MINOR   1.3350882404021525
Attrib KURTOSIS ABOUT_MAJOR   −1.9142335814276046
Attrib KURTOSIS ABOUT_MINOR   11.6569397420666717
Attrib HOLLOWS RATIO   −3.965341841109116
Sigmoid Node 10
Inputs   Weights
Threshold   3.141072603347592
Attrib COMPACTNESS   7.007780095090177
Attrib CIRCULARITY   −0.8773663176194303
Attrib DISTANCE CIRCULARITY   7.0255190744176135
Attrib RADIUS RATIO   −2.09789147292675
Attrib PR.AXIS ASPECT RATIO   1.5345338626970608
Attrib MAX.LENGTH ASPECT RATIO   9.66928090394197
Attrib SCATTER RATIO   −2.7387090479695066
Attrib ELONGATEDNESS   4.082827303462793
Attrib PR.AXIS RECTANGULARITY   0.13281384907053523
Attrib MAX.LENGTH RECTANGULARITY   8.849137222965073
Attrib SCALED VARIANCE_MAJOR   −2.1276304065160785
Attrib SCALED VARIANCE_MINOR   −2.9739955006994228
Attrib SCALED RADIUS OF GYRATION   −14.36693834195386
Attrib SKEWNESS ABOUT_MAJOR   11.162378631693368
Attrib SKEWNESS ABOUT_MINOR   −0.06177907810655233
Attrib KURTOSIS ABOUT_MAJOR   −7.553619849901085
Attrib KURTOSIS ABOUT_MINOR   −10.070598221390703
Attrib HOLLOWS RATIO   5.407959271172108
Sigmoid Node 11
Inputs   Weights
Threshold   −0.671589214021003
Attrib COMPACTNESS   −1.973443853165995
Attrib CIRCULARITY   −5.773889361172282
Attrib DISTANCE CIRCULARITY   3.5324357926645336

Attrib RADIUS RATIO   5.62343508441401
Attrib PR.AXIS ASPECT RATIO   5.617418949197228
Attrib MAX.LENGTH ASPECT RATIO   −2.520469310501393
Attrib SCATTER RATIO   −0.8846830395153255
Attrib ELONGATEDNESS   2.4325141987517886
Attrib PR.AXIS RECTANGULARITY   4.487154820195494
Attrib MAX.LENGTH RECTANGULARITY   −1.1792469037440667
Attrib SCALED VARIANCE_MAJOR   −4.371788960331624
Attrib SCALED VARIANCE_MINOR   −1.4846233859917553
Attrib SCALED RADIUS OF GYRATION   −4.385554674513676
Attrib SKEWNESS ABOUT_MAJOR   0.9765635489883434
Attrib SKEWNESS ABOUT_MINOR   11.375016550222801
Attrib KURTOSIS ABOUT_MAJOR   −3.735080899761416
Attrib KURTOSIS ABOUT_MINOR   −6.161493277266252
Attrib HOLLOWS RATIO   −3.870409299945159
Sigmoid Node 12
Inputs   Weights
Threshold   0.5918164491215203
Attrib COMPACTNESS   −6.511641875869003
Attrib CIRCULARITY   −6.142725400224882
Attrib DISTANCE CIRCULARITY   6.881239092011735
Attrib RADIUS RATIO   2.6205088141063224
Attrib PR.AXIS ASPECT RATIO   0.9111813055330928
Attrib MAX.LENGTH ASPECT RATIO   3.111480124699629
Attrib SCATTER RATIO   3.7779475233406687
Attrib ELONGATEDNESS   −3.26769467347057
Attrib PR.AXIS RECTANGULARITY   −3.615362162691059
Attrib MAX.LENGTH RECTANGULARITY   −9.147317164187996
Attrib SCALED VARIANCE_MAJOR   2.448500727318776
Attrib SCALED VARIANCE_MINOR   3.6309546904785877
Attrib SCALED RADIUS OF GYRATION   4.399539711293662
Attrib SKEWNESS ABOUT_MAJOR   0.5583964871600778
Attrib SKEWNESS ABOUT_MINOR   2.0640290887716115
Attrib KURTOSIS ABOUT_MAJOR   6.844234242294669
Attrib KURTOSIS ABOUT_MINOR   −2.67570217668494
Attrib HOLLOWS RATIO   −0.014121323932196542
Sigmoid Node 13
Inputs   Weights
Threshold   0.4692009099168057
Attrib COMPACTNESS   −1.7281885090192994
Attrib CIRCULARITY   3.7369736745413222
Attrib DISTANCE CIRCULARITY   4.78436659036319
Attrib RADIUS RATIO   6.110405283119297
Attrib PR.AXIS ASPECT RATIO   0.8659008503658655
Attrib MAX.LENGTH ASPECT RATIO   6.762965553706719
Attrib SCATTER RATIO   2.8460357609580247
Attrib ELONGATEDNESS   −5.579411185240261
Attrib PR.AXIS RECTANGULARITY   −7.437799381869806
Attrib MAX.LENGTH RECTANGULARITY   −2.1150803468766504

Attrib SCALED VARIANCE_MAJOR   3.3436776797581427
Attrib SCALED VARIANCE_MINOR   3.885112863742937
Attrib SCALED RADIUS OF GYRATION   −3.0255623910019076
Attrib SKEWNESS ABOUT_MAJOR   0.705818777605492
Attrib SKEWNESS ABOUT_MINOR   −2.541802571466337
Attrib KURTOSIS ABOUT_MAJOR   −2.0170584839561783
Attrib KURTOSIS ABOUT_MINOR   11.207272989743027
Attrib HOLLOWS RATIO   −8.155837076166529
Sigmoid Node 14
Inputs   Weights
Threshold   −2.7241994596703303
Attrib COMPACTNESS   −2.5867201202829935
Attrib CIRCULARITY   1.218592865055811
Attrib DISTANCE CIRCULARITY   −1.8633669056210682
Attrib RADIUS RATIO   6.162609304353966
Attrib PR.AXIS ASPECT RATIO   −11.78050173282515
Attrib MAX.LENGTH ASPECT RATIO   2.7510325642586726
Attrib SCATTER RATIO   3.932610735820126
Attrib ELONGATEDNESS   −3.788607180089615
Attrib PR.AXIS RECTANGULARITY   3.621244884954997
Attrib MAX.LENGTH RECTANGULARITY   14.827201441523423
Attrib SCALED VARIANCE_MAJOR   8.790720131887712
Attrib SCALED VARIANCE_MINOR   3.1051965444797465
Attrib SCALED RADIUS OF GYRATION   −11.12270527135058
Attrib SKEWNESS ABOUT_MAJOR   −12.133718906656137
Attrib SKEWNESS ABOUT_MINOR   −2.055234809541244
Attrib KURTOSIS ABOUT_MAJOR   1.6823465158824702
Attrib KURTOSIS ABOUT_MINOR   −0.3866197083274803
Attrib HOLLOWS RATIO   1.2659199304560798
Sigmoid Node 15
Inputs   Weights
Threshold   −4.874575943275824
Attrib COMPACTNESS   −3.0718360776713043
Attrib CIRCULARITY   7.450897427226328
Attrib DISTANCE CIRCULARITY   −3.3985704965797523
Attrib RADIUS RATIO   −4.7535936504867635
Attrib PR.AXIS ASPECT RATIO   −8.514481985585174E−4
Attrib MAX.LENGTH ASPECT RATIO   2.657003196957333
Attrib SCATTER RATIO   −0.23697940093680708
Attrib ELONGATEDNESS   1.7785631731775282
Attrib PR.AXIS RECTANGULARITY   −2.0210941196969
Attrib MAX.LENGTH RECTANGULARITY   4.451050130236815
Attrib SCALED VARIANCE_MAJOR   0.577538182219264
Attrib SCALED VARIANCE_MINOR   0.6232211238812247
Attrib SCALED RADIUS OF GYRATION   3.877811088145367
Attrib SKEWNESS ABOUT_MAJOR   2.5818408412883715
Attrib SKEWNESS ABOUT_MINOR   0.08032534442210867
Attrib KURTOSIS ABOUT_MAJOR   1.6046011335481098
Attrib KURTOSIS ABOUT_MINOR   −2.1861004936263266

Attrib HOLLOWS RATIO   −6.69892111574653
Sigmoid Node 16
Inputs   Weights
Threshold   0.47578560366729067
Attrib COMPACTNESS   8.257773614839188
Attrib CIRCULARITY   −2.8061343635764624
Attrib DISTANCE CIRCULARITY   4.045777767937425
Attrib RADIUS RATIO   4.330923858358459
Attrib PR.AXIS ASPECT RATIO   6.930014171362838
Attrib MAX.LENGTH ASPECT RATIO   3.3050802524340512
Attrib SCATTER RATIO   2.5467947247764062
Attrib ELONGATEDNESS   −0.9385465638325421
Attrib PR.AXIS RECTANGULARITY   −1.8050213770966521
Attrib MAX.LENGTH RECTANGULARITY   −2.1446539725249303
Attrib SCALED VARIANCE_MAJOR   0.9024990745090662
Attrib SCALED VARIANCE_MINOR   0.540979403794428
Attrib SCALED RADIUS OF GYRATION   3.2901470318991586
Attrib SKEWNESS ABOUT_MAJOR   4.09445843090548
Attrib SKEWNESS ABOUT_MINOR   9.725491797019561
Attrib KURTOSIS ABOUT_MAJOR   −0.3779826555253902
Attrib KURTOSIS ABOUT_MINOR   −9.685514758107711
Attrib HOLLOWS RATIO   1.9215402012359695
Sigmoid Node 17
Inputs   Weights
Threshold   −14.212786374454716
Attrib COMPACTNESS   6.028977667322603
Attrib CIRCULARITY   −7.646008000382966
Attrib DISTANCE CIRCULARITY   0.9622605156682948
Attrib RADIUS RATIO   0.19348674137612543
Attrib PR.AXIS ASPECT RATIO   −11.230248953291708
Attrib MAX.LENGTH ASPECT RATIO   −3.2476136029122595
Attrib SCATTER RATIO   −1.5996787693481715
Attrib ELONGATEDNESS   13.186607582764045
Attrib PR.AXIS RECTANGULARITY   1.1713383239203567
Attrib MAX.LENGTH RECTANGULARITY   −8.244699272966313
Attrib SCALED VARIANCE_MAJOR   2.439218081879478
Attrib SCALED VARIANCE_MINOR   1.7419037934957635
Attrib SCALED RADIUS OF GYRATION   1.9547235353551276
Attrib SKEWNESS ABOUT_MAJOR   −6.80741780585333
Attrib SKEWNESS ABOUT_MINOR   5.377697580514314
Attrib KURTOSIS ABOUT_MAJOR   0.5145973573973756
Attrib KURTOSIS ABOUT_MINOR   1.2551783021826821
Attrib HOLLOWS RATIO   −7.074149427161119
Sigmoid Node 18
Inputs   Weights
Threshold   −5.662629108252382
Attrib COMPACTNESS   3.4525349141385293
Attrib CIRCULARITY   −5.004215317438148
Attrib DISTANCE CIRCULARITY   −4.665642507742035

Attrib RADIUS RATIO   4.310723186413212
Attrib PR.AXIS ASPECT RATIO   1.0201142896754756
Attrib MAX.LENGTH ASPECT RATIO   −1.3251295561467538
Attrib SCATTER RATIO   0.6915143991246149
Attrib ELONGATEDNESS   1.5314841874676524
Attrib PR.AXIS RECTANGULARITY   −0.39393405134294923
Attrib MAX.LENGTH RECTANGULARITY   −11.057384233566763
Attrib SCALED VARIANCE_MAJOR   −0.4197300442079061
Attrib SCALED VARIANCE_MINOR   2.02222461808375
Attrib SCALED RADIUS OF GYRATION   4.254281225044179
Attrib SKEWNESS ABOUT_MAJOR   1.1509987698982802
Attrib SKEWNESS ABOUT_MINOR   −3.348660587750956
Attrib KURTOSIS ABOUT_MAJOR   0.6328968678934859
Attrib KURTOSIS ABOUT_MINOR   −4.259264029762276
Attrib HOLLOWS RATIO   −0.5199917332882066
Sigmoid Node 19
Inputs   Weights
Threshold   −0.3625189695613844
Attrib COMPACTNESS   5.296853811294718
Attrib CIRCULARITY   −8.544688292582125
Attrib DISTANCE CIRCULARITY   −20.69421923417624
Attrib RADIUS RATIO   −6.404809367127814
Attrib PR.AXIS ASPECT RATIO   6.879998344348983
Attrib MAX.LENGTH ASPECT RATIO   −5.786216264458607
Attrib SCATTER RATIO   0.8186481759630634
Attrib ELONGATEDNESS   −9.91528410233482
Attrib PR.AXIS RECTANGULARITY   2.842401521652549
Attrib MAX.LENGTH RECTANGULARITY   2.1203484847939684
Attrib SCALED VARIANCE_MAJOR   3.897993131528398
Attrib SCALED VARIANCE_MINOR   0.8698233400774489
Attrib SCALED RADIUS OF GYRATION   0.5492736049272471
Attrib SKEWNESS ABOUT_MAJOR   3.289944867490091
Attrib SKEWNESS ABOUT_MINOR   −7.6734454386941096
Attrib KURTOSIS ABOUT_MAJOR   3.9385261727639316
Attrib KURTOSIS ABOUT_MINOR   18.642078075046008
Attrib HOLLOWS RATIO   −17.67711571514054
Sigmoid Node 20
Inputs   Weights
Threshold   3.607295458959723
Attrib COMPACTNESS   13.816591181043302
Attrib CIRCULARITY   3.3475901342376697
Attrib DISTANCE CIRCULARITY   6.2488480185052335
Attrib RADIUS RATIO   −9.345100845487337
Attrib PR.AXIS ASPECT RATIO   7.5252458664054425
Attrib MAX.LENGTH ASPECT RATIO   9.438780765964076
Attrib SCATTER RATIO   −6.351941448741179
Attrib ELONGATEDNESS   10.503253111698296
Attrib PR.AXIS RECTANGULARITY   −4.615020744090333
Attrib MAX.LENGTH RECTANGULARITY   17.300530197147772

Attrib SCALED VARIANCE_MAJOR −7.3565111215328365
Attrib SCALED VARIANCE_MINOR −6.451483577017934
Attrib SCALED RADIUS OF GYRATION −10.648251538085647
Attrib SKEWNESS ABOUT_MAJOR 15.725695336953597
Attrib SKEWNESS ABOUT_MINOR −2.673989642860789
Attrib KURTOSIS ABOUT_MAJOR −2.919120020368877
Attrib KURTOSIS ABOUT_MINOR −6.798734493325971
Attrib HOLLOWS RATIO 9.563924191381332
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7013659747800687
Attrib COMPACTNESS   −13.770213480920448
Attrib CIRCULARITY   1.1451359829885934
Attrib DISTANCE CIRCULARITY   −0.4536403298854014
Attrib RADIUS RATIO   4.787021627891756
Attrib PR.AXIS ASPECT RATIO   0.24876879891871126
Attrib MAX.LENGTH ASPECT RATIO   −1.2616046609712166
Attrib SCATTER RATIO   2.051637738630881
Attrib ELONGATEDNESS   0.4962535828709486
Attrib PR.AXIS RECTANGULARITY   6.235996899677364
Attrib MAX.LENGTH RECTANGULARITY   −5.641448629223522
Attrib SCALED VARIANCE_MAJOR   1.9735195508979386
Attrib SCALED VARIANCE_MINOR   4.417869545195972
Attrib SCALED RADIUS OF GYRATION   9.591009878229173
Attrib SKEWNESS ABOUT_MAJOR   0.7398648026784428
Attrib SKEWNESS ABOUT_MINOR   1.924997412117317
Attrib KURTOSIS ABOUT_MAJOR   7.532473534937831
Attrib KURTOSIS ABOUT_MINOR   −12.161093140035058
Attrib HOLLOWS RATIO   −7.253359974403125
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input
Node 2
Class van
Input
Node 3

Time taken to build model: 4.1 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0 seconds

=== Summary ===

Correctly Classified Instances   416   98.8124 %
Incorrectly Classified Instances   5   1.1876 %
Kappa statistic   0.9842
Mean absolute error   0.0112
Root mean squared error   0.0754
Relative absolute error   2.9786 %
Root relative squared error   17.4083 %
Total Number of Instances   421

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,962	0,003	0,990	0,962	0,976	0,968	0,983	0,942	opel
0,991	0,006	0,982	0,991	0,986	0,981	0,988	0,962	saab
1,000	0,006	0,982	1,000	0,991	0,988	1,000	1,000	bus
1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	van
Weighted Avg.	0,988	0,004	0,988	0,988	0,988	0,984	0,993	0,976

=== Confusion Matrix ===

```
a    b    c    d    <-- classified as
101    2    2    0 |    a = opel
1  107    0    0 |    b = saab
0    0  109    0 |    c = bus
0    0    0   99 |    d = van
```

_____

UTILIZANDO A BASE DE DADOS Nome: Bruno e Diego

_____

=== Run information ===

Scheme: weka.classifiers.functions.MultilayerPerceptron -L 0.7 -M 0.2 -N
Relation: vehicle
Instances: 421
Attributes: 19
COMPACTNESS
CIRCULARITY
DISTANCE CIRCULARITY

RADIUS RATIO
PR. AXIS ASPECT RATIO
MAX.LENGTH ASPECT RATIO
SCATTER RATIO
ELONGATEDNESS
PR. AXIS RECTANGULARITY
MAX.LENGTH RECTANGULARITY
SCALED VARIANCE_MAJOR
SCALED VARIANCE_MINOR
SCALED RADIUS OF GYRATION
SKEWNESS ABOUT_MAJOR
SKEWNESS ABOUT_MINOR
KURTOSIS ABOUT_MAJOR
KURTOSIS ABOUT_MINOR
HOLLOWS RATIO
Class
Test mode: user supplied test set: size unknown (reading incrementally)

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

Sigmoid Node 0
Inputs   Weights
Threshold   −6.144402049063557
Node 4   −10.576054413890542
Node 5   −8.285459715252737
Node 6   11.551273190185885
Node 7   12.833466705389814
Node 8   −8.202975811008763
Node 9   5.945327467677308
Node 10   9.101834765598912
Node 11   −9.945307358106097
Node 12   2.4697057741713584
Node 13   5.852312463644603
Node 14   −3.900131584193343
Node 15   −6.893407204424069
Node 16   −12.320488703251758
Node 17   9.603938695946622
Node 18   8.124404573047348
Node 19   −17.04619166636441
Node 20   −6.7476713856504285
Node 21   8.988620544525219
Sigmoid Node 1
Inputs   Weights
Threshold   −6.883382916945656
Node 4   6.821036377314135
Node 5   12.160627801620022
Node 6   −6.729349108116406
Node 7   −10.4420817512754
Node 8   −4.82916899703312

```
Node 9       −7.983203337452638
Node 10       −11.37331943767634
Node 11       10.25847125420072
Node 12       −6.605245298076736
Node 13       −9.733111839031935
Node 14       17.582611774104077
Node 15       −9.946831137893508
Node 16       10.245784859654563
Node 17       5.255561648557733
Node 18       3.2976449279062385
Node 19       6.983137663460456
Node 20       −18.488567397847326
Node 21       −9.08111531045523
Sigmoid Node 2
Inputs       Weights
Threshold      0.8556062239805189
Node 4       3.944139044851132
Node 5       −3.4048760235344355
Node 6       −0.48503292859198566
Node 7       1.0781092948756965
Node 8       −2.384396592737004
Node 9       8.01888259143274
Node 10       2.1222008389643774
Node 11       0.8280802723197355
Node 12       −1.5371360753034813
Node 13       0.18156020306278764
Node 14       −15.081634221936262
Node 15       9.859565964258016
Node 16       −2.442973341461243
Node 17       −13.853549113981657
Node 18       −6.105228634370469
Node 19       8.900306315384084
Node 20       −5.425249895730233
Node 21       0.5631929419118241
Sigmoid Node 3
Inputs       Weights
Threshold      −7.50567285502943
Node 4       −1.153195133094836
Node 5       6.334372991614273
Node 6       −2.3372373874069132
Node 7       −2.140279626303267
Node 8       2.9813706390408528
Node 9       −8.159951680841665
Node 10       4.8306992910619195
Node 11       −0.5948980805535319
Node 12       −1.3348214863757277
Node 13       −3.4265123158814825
Node 14       −1.8344628012283395
Node 15       −1.7935098172451704
```

```
Node  16      0.2502242541805172
Node  17      0.1294287295761935
Node  18     −3.4664108904024338
Node  19      0.073403235209364
Node  20      14.364805687818263
Node  21     −5.6712617666910985
Sigmoid  Node  4
Inputs      Weights
Threshold      −0.024845239396153317
Attrib  COMPACTNESS      5.981524977151319
Attrib  CIRCULARITY      −4.937862461845557
Attrib  DISTANCE CIRCULARITY      −3.697059227432537
Attrib  RADIUS RATIO      −3.253894851166414
Attrib  PR.AXIS ASPECT RATIO      1.0850063425110978
Attrib  MAX.LENGTH ASPECT RATIO      −3.8054085307941774
Attrib  SCATTER RATIO      1.4089232717980555
Attrib  ELONGATEDNESS      −3.0911526806574963
Attrib  PR.AXIS RECTANGULARITY      −0.92223717027111
Attrib  MAX.LENGTH RECTANGULARITY      −1.2493602522027603
Attrib  SCALED VARIANCE_MAJOR      1.9136030611896795
Attrib  SCALED VARIANCE_MINOR      0.49241788467817876
Attrib  SCALED RADIUS OF GYRATION      7.212664290923554
Attrib  SKEWNESS ABOUT_MAJOR      5.6761439337391195
Attrib  SKEWNESS ABOUT_MINOR      −1.0848604605434566
Attrib  KURTOSIS ABOUT_MAJOR      3.773376989900767
Attrib  KURTOSIS ABOUT_MINOR      5.19417358243441
Attrib  HOLLOWS RATIO      −5.245985388700336
Sigmoid  Node  5
Inputs      Weights
Threshold      −0.12910937175737047
Attrib  COMPACTNESS      −6.4083110098291876
Attrib  CIRCULARITY      −6.323333453466105
Attrib  DISTANCE CIRCULARITY      4.738483124720115
Attrib  RADIUS RATIO      −2.304976306778789
Attrib  PR.AXIS ASPECT RATIO      3.5944854327423643
Attrib  MAX.LENGTH ASPECT RATIO      3.9479189087084854
Attrib  SCATTER RATIO      0.6008908866221145
Attrib  ELONGATEDNESS      5.989493940416737
Attrib  PR.AXIS RECTANGULARITY      2.1282024428291084
Attrib  MAX.LENGTH RECTANGULARITY      0.11515551553442822
Attrib  SCALED VARIANCE_MAJOR      3.4148817112327166
Attrib  SCALED VARIANCE_MINOR      −0.7110543179319858
Attrib  SCALED RADIUS OF GYRATION      11.865107799840581
Attrib  SKEWNESS ABOUT_MAJOR      0.15479853856381134
Attrib  SKEWNESS ABOUT_MINOR      0.8661970517072654
Attrib  KURTOSIS ABOUT_MAJOR      −6.141008048877925
Attrib  KURTOSIS ABOUT_MINOR      −11.32500970992412
Attrib  HOLLOWS RATIO      25.679054454699855
Sigmoid  Node  6
```

Inputs   Weights
Threshold   −3.804378991484553
Attrib COMPACTNESS   −3.162904882118917
Attrib CIRCULARITY   −7.696447824658089
Attrib DISTANCE CIRCULARITY   2.001874681530193
Attrib RADIUS RATIO   3.419731208831583
Attrib PR.AXIS ASPECT RATIO   1.275156404701793
Attrib MAX.LENGTH ASPECT RATIO   6.112065543478957
Attrib SCATTER RATIO   5.581178181877752
Attrib ELONGATEDNESS   −4.117967688755753
Attrib PR.AXIS RECTANGULARITY   −5.362897151967128
Attrib MAX.LENGTH RECTANGULARITY   −11.223721760048065
Attrib SCALED VARIANCE_MAJOR   2.985107705092045
Attrib SCALED VARIANCE_MINOR   4.786142234894776
Attrib SCALED RADIUS OF GYRATION   0.3155076436844553
Attrib SKEWNESS ABOUT_MAJOR   4.624687978171923
Attrib SKEWNESS ABOUT_MINOR   −10.91775667623477
Attrib KURTOSIS ABOUT_MAJOR   4.392647109687928
Attrib KURTOSIS ABOUT_MINOR   −8.232404560198164
Attrib HOLLOWS RATIO   4.497985103940508
Sigmoid Node 7
Inputs   Weights
Threshold   −2.1286848717429527
Attrib COMPACTNESS   −4.8241862866874206
Attrib CIRCULARITY   9.604255673658013
Attrib DISTANCE CIRCULARITY   −7.441596857211634
Attrib RADIUS RATIO   −1.4796459345117483
Attrib PR.AXIS ASPECT RATIO   −7.376436125058812
Attrib MAX.LENGTH ASPECT RATIO   −2.3980713922582946
Attrib SCATTER RATIO   2.773670814653783
Attrib ELONGATEDNESS   −5.149810489805265
Attrib PR.AXIS RECTANGULARITY   8.17600512541881
Attrib MAX.LENGTH RECTANGULARITY   −3.6430283675403645
Attrib SCALED VARIANCE_MAJOR   −0.5608643158952793
Attrib SCALED VARIANCE_MINOR   5.819250105500484
Attrib SCALED RADIUS OF GYRATION   −1.2473437705603936
Attrib SKEWNESS ABOUT_MAJOR   −2.7336736045735637
Attrib SKEWNESS ABOUT_MINOR   4.060986041322638
Attrib KURTOSIS ABOUT_MAJOR   3.7332115596380597
Attrib KURTOSIS ABOUT_MINOR   30.114346421044257
Attrib HOLLOWS RATIO   −24.424017291694522
Sigmoid Node 8
Inputs   Weights
Threshold   −2.049611182806815
Attrib COMPACTNESS   9.755654973674604
Attrib CIRCULARITY   −1.981657305238627
Attrib DISTANCE CIRCULARITY   −6.4671267955482525
Attrib RADIUS RATIO   2.1365479346644314
Attrib PR.AXIS ASPECT RATIO   6.085535077219287

Attrib MAX.LENGTH ASPECT RATIO   0.22750579770916515
Attrib SCATTER RATIO   −1.4237538116446107
Attrib ELONGATEDNESS   0.9006558719160098
Attrib PR.AXIS RECTANGULARITY   −2.349133139307122
Attrib MAX.LENGTH RECTANGULARITY   1.9222762629260783
Attrib SCALED VARIANCE_MAJOR   −1.0302490373521842
Attrib SCALED VARIANCE_MINOR   −0.19145256498367821
Attrib SCALED RADIUS OF GYRATION   −3.9688466104531566
Attrib SKEWNESS ABOUT_MAJOR   1.714589373449276
Attrib SKEWNESS ABOUT_MINOR   −0.25808279399276673
Attrib KURTOSIS ABOUT_MAJOR   −3.9473740585003507
Attrib KURTOSIS ABOUT_MINOR   3.9495263552465016
Attrib HOLLOWS RATIO   0.7669410356884998
Sigmoid Node 9
Inputs   Weights
Threshold   2.7098897701644753
Attrib COMPACTNESS   −4.428545149038369
Attrib CIRCULARITY   5.768813501800325
Attrib DISTANCE CIRCULARITY   −6.410545158704637
Attrib RADIUS RATIO   0.706360799085291
Attrib PR.AXIS ASPECT RATIO   13.514375868425478
Attrib MAX.LENGTH ASPECT RATIO   −8.0059693266333
Attrib SCATTER RATIO   1.0818027014602112
Attrib ELONGATEDNESS   −8.489131550771894
Attrib PR.AXIS RECTANGULARITY   0.5292663608379395
Attrib MAX.LENGTH RECTANGULARITY   −2.356096992565411
Attrib SCALED VARIANCE_MAJOR   −5.10260130011419
Attrib SCALED VARIANCE_MINOR   2.1974945506902337
Attrib SCALED RADIUS OF GYRATION   −1.8113430045581669
Attrib SKEWNESS ABOUT_MAJOR   4.68542638736333
Attrib SKEWNESS ABOUT_MINOR   1.3350882404021525
Attrib KURTOSIS ABOUT_MAJOR   −1.9142335814276046
Attrib KURTOSIS ABOUT_MINOR   11.656939742066717
Attrib HOLLOWS RATIO   −3.965341841109116
Sigmoid Node 10
Inputs   Weights
Threshold   3.141072603347592
Attrib COMPACTNESS   7.007780095090177
Attrib CIRCULARITY   −0.8773663176194303
Attrib DISTANCE CIRCULARITY   7.0255190744176135
Attrib RADIUS RATIO   −2.09789147292675
Attrib PR.AXIS ASPECT RATIO   1.5345338626970608
Attrib MAX.LENGTH ASPECT RATIO   9.66928090394197
Attrib SCATTER RATIO   −2.7387090479695066
Attrib ELONGATEDNESS   4.082827303462793
Attrib PR.AXIS RECTANGULARITY   0.13281384907053523
Attrib MAX.LENGTH RECTANGULARITY   8.849137222965073
Attrib SCALED VARIANCE_MAJOR   −2.1276304065160785
Attrib SCALED VARIANCE_MINOR   −2.9739955006994228

Attrib SCALED RADIUS OF GYRATION   −14.36693834195386
Attrib SKEWNESS ABOUT_MAJOR   11.162378631693368
Attrib SKEWNESS ABOUT_MINOR   −0.06177907810655233
Attrib KURTOSIS ABOUT_MAJOR   −7.553619849901085
Attrib KURTOSIS ABOUT_MINOR   −10.070598221390703
Attrib HOLLOWS RATIO   5.407959271172108
Sigmoid Node 11
Inputs   Weights
Threshold   −0.671589214021003
Attrib COMPACTNESS   −1.973443853165995
Attrib CIRCULARITY   −5.773889361172282
Attrib DISTANCE CIRCULARITY   3.5324357926645336
Attrib RADIUS RATIO   5.62343508441401
Attrib PR.AXIS ASPECT RATIO   5.617418949197228
Attrib MAX.LENGTH ASPECT RATIO   −2.520469310501393
Attrib SCATTER RATIO   −0.8846830395153255
Attrib ELONGATEDNESS   2.4325141987517886
Attrib PR.AXIS RECTANGULARITY   4.487154820195494
Attrib MAX.LENGTH RECTANGULARITY   −1.1792469037440667
Attrib SCALED VARIANCE_MAJOR   −4.371788960331624
Attrib SCALED VARIANCE_MINOR   −1.4846233859917553
Attrib SCALED RADIUS OF GYRATION   −4.385554674513676
Attrib SKEWNESS ABOUT_MAJOR   0.9765635489883434
Attrib SKEWNESS ABOUT_MINOR   11.375016550222801
Attrib KURTOSIS ABOUT_MAJOR   −3.735080899761416
Attrib KURTOSIS ABOUT_MINOR   −6.161493277266252
Attrib HOLLOWS RATIO   −3.870409299945159
Sigmoid Node 12
Inputs   Weights
Threshold   0.5918164491215203
Attrib COMPACTNESS   −6.511641875869003
Attrib CIRCULARITY   −6.142725400224882
Attrib DISTANCE CIRCULARITY   6.881239092011735
Attrib RADIUS RATIO   2.6205088141063224
Attrib PR.AXIS ASPECT RATIO   0.9111813055330928
Attrib MAX.LENGTH ASPECT RATIO   3.111480124699629
Attrib SCATTER RATIO   3.7779475233406687
Attrib ELONGATEDNESS   −3.26769467347057
Attrib PR.AXIS RECTANGULARITY   −3.615362162691059
Attrib MAX.LENGTH RECTANGULARITY   −9.147317164187996
Attrib SCALED VARIANCE_MAJOR   2.448500727318776
Attrib SCALED VARIANCE_MINOR   3.6309546904785877
Attrib SCALED RADIUS OF GYRATION   4.399539711293662
Attrib SKEWNESS ABOUT_MAJOR   0.5583964871600778
Attrib SKEWNESS ABOUT_MINOR   2.0640290887716115
Attrib KURTOSIS ABOUT_MAJOR   6.844234242294669
Attrib KURTOSIS ABOUT_MINOR   −2.67570217668494
Attrib HOLLOWS RATIO   −0.014121323932196542
Sigmoid Node 13

Inputs   Weights
Threshold   0.46920090999168057
Attrib COMPACTNESS   −1.7281885090192994
Attrib CIRCULARITY   3.7369736745413222
Attrib DISTANCE CIRCULARITY   4.78436659036319
Attrib RADIUS RATIO   6.110405283119297
Attrib PR.AXIS ASPECT RATIO   0.8659008503658655
Attrib MAX.LENGTH ASPECT RATIO   6.762965553706719
Attrib SCATTER RATIO   2.8460357609580247
Attrib ELONGATEDNESS   −5.579411185240261
Attrib PR.AXIS RECTANGULARITY   −7.437799381869806
Attrib MAX.LENGTH RECTANGULARITY   −2.1150803468766504
Attrib SCALED VARIANCE_MAJOR   3.3436776797581427
Attrib SCALED VARIANCE_MINOR   3.885112863742937
Attrib SCALED RADIUS OF GYRATION   −3.0255623910019076
Attrib SKEWNESS ABOUT_MAJOR   0.705818777605492
Attrib SKEWNESS ABOUT_MINOR   −2.541802571466337
Attrib KURTOSIS ABOUT_MAJOR   −2.0170584839561783
Attrib KURTOSIS ABOUT_MINOR   11.207272989743027
Attrib HOLLOWS RATIO   −8.155837076166529
Sigmoid Node 14
Inputs   Weights
Threshold   −2.7241994596703303
Attrib COMPACTNESS   −2.5867201202829935
Attrib CIRCULARITY   1.218592865055811
Attrib DISTANCE CIRCULARITY   −1.8633669056210682
Attrib RADIUS RATIO   6.162609304353966
Attrib PR.AXIS ASPECT RATIO   −11.78050173282515
Attrib MAX.LENGTH ASPECT RATIO   2.7510325642586726
Attrib SCATTER RATIO   3.932610735820126
Attrib ELONGATEDNESS   −3.788607180089615
Attrib PR.AXIS RECTANGULARITY   3.621244884954997
Attrib MAX.LENGTH RECTANGULARITY   14.827201441523423
Attrib SCALED VARIANCE_MAJOR   8.790720131887712
Attrib SCALED VARIANCE_MINOR   3.1051965444797465
Attrib SCALED RADIUS OF GYRATION   −11.12270527135058
Attrib SKEWNESS ABOUT_MAJOR   −12.133718906656137
Attrib SKEWNESS ABOUT_MINOR   −2.055234809541244
Attrib KURTOSIS ABOUT_MAJOR   1.6823465158824702
Attrib KURTOSIS ABOUT_MINOR   −0.3866197083274803
Attrib HOLLOWS RATIO   1.2659199304560798
Sigmoid Node 15
Inputs   Weights
Threshold   −4.874575943275824
Attrib COMPACTNESS   −3.0718360776713043
Attrib CIRCULARITY   7.450897427226328
Attrib DISTANCE CIRCULARITY   −3.3985704965797523
Attrib RADIUS RATIO   −4.7535936504867635
Attrib PR.AXIS ASPECT RATIO   −8.514481985585174E−4

Attrib MAX.LENGTH ASPECT RATIO   2.657003196957333
Attrib SCATTER RATIO   −0.23697940093680708
Attrib ELONGATEDNESS   1.7785631731775282
Attrib PR.AXIS RECTANGULARITY   −2.0210941196969
Attrib MAX.LENGTH RECTANGULARITY   4.451050130236815
Attrib SCALED VARIANCE_MAJOR   0.577538182219264
Attrib SCALED VARIANCE_MINOR   0.6232211238812247
Attrib SCALED RADIUS OF GYRATION   3.877811088145367
Attrib SKEWNESS ABOUT_MAJOR   2.5818408412883715
Attrib SKEWNESS ABOUT_MINOR   0.08032534442210867
Attrib KURTOSIS ABOUT_MAJOR   1.6046011335481098
Attrib KURTOSIS ABOUT_MINOR   −2.1861004936263266
Attrib HOLLOWS RATIO   −6.69892111574653
Sigmoid Node 16
Inputs   Weights
Threshold   0.47578560366729067
Attrib COMPACTNESS   8.257773614839188
Attrib CIRCULARITY   −2.8061343635764624
Attrib DISTANCE CIRCULARITY   4.045777767937425
Attrib RADIUS RATIO   4.330923858358459
Attrib PR.AXIS ASPECT RATIO   6.930014171362838
Attrib MAX.LENGTH ASPECT RATIO   3.3050802524340512
Attrib SCATTER RATIO   2.5467947247764062
Attrib ELONGATEDNESS   −0.9385465638325421
Attrib PR.AXIS RECTANGULARITY   −1.8050213770966521
Attrib MAX.LENGTH RECTANGULARITY   −2.1446539725249303
Attrib SCALED VARIANCE_MAJOR   0.9024990745090662
Attrib SCALED VARIANCE_MINOR   0.540979403794428
Attrib SCALED RADIUS OF GYRATION   3.2901470318991586
Attrib SKEWNESS ABOUT_MAJOR   4.09445843090548
Attrib SKEWNESS ABOUT_MINOR   9.725491797019561
Attrib KURTOSIS ABOUT_MAJOR   −0.3779826555253902
Attrib KURTOSIS ABOUT_MINOR   −9.685514758107711
Attrib HOLLOWS RATIO   1.9215402012359695
Sigmoid Node 17
Inputs   Weights
Threshold   −14.212786374454716
Attrib COMPACTNESS   6.028977667322603
Attrib CIRCULARITY   −7.646008000382966
Attrib DISTANCE CIRCULARITY   0.9622605156682948
Attrib RADIUS RATIO   0.19348674137612543
Attrib PR.AXIS ASPECT RATIO   −11.230248953291708
Attrib MAX.LENGTH ASPECT RATIO   −3.2476136029122595
Attrib SCATTER RATIO   −1.5996787693481715
Attrib ELONGATEDNESS   13.186607582764045
Attrib PR.AXIS RECTANGULARITY   1.1713383239203567
Attrib MAX.LENGTH RECTANGULARITY   −8.244699272966313
Attrib SCALED VARIANCE_MAJOR   2.439218081879478
Attrib SCALED VARIANCE_MINOR   1.7419037934957635

Attrib SCALED RADIUS OF GYRATION   1.9547235353551276
Attrib SKEWNESS ABOUT_MAJOR   −6.80741780585333
Attrib SKEWNESS ABOUT_MINOR   5.377697580514314
Attrib KURTOSIS ABOUT_MAJOR   0.5145973573973756
Attrib KURTOSIS ABOUT_MINOR   1.2551783021826821
Attrib HOLLOWS RATIO   −7.074149427161119
Sigmoid Node 18
Inputs   Weights
Threshold   −5.662629108252382
Attrib COMPACTNESS   3.4525349141385293
Attrib CIRCULARITY   −5.004215317438148
Attrib DISTANCE CIRCULARITY   −4.665642507742035
Attrib RADIUS RATIO   4.310723186413212
Attrib PR.AXIS ASPECT RATIO   1.0201142896754756
Attrib MAX.LENGTH ASPECT RATIO   −1.3251295561467538
Attrib SCATTER RATIO   0.6915143991246149
Attrib ELONGATEDNESS   1.5314841874676524
Attrib PR.AXIS RECTANGULARITY   −0.39393405134294923
Attrib MAX.LENGTH RECTANGULARITY   −11.057384233566763
Attrib SCALED VARIANCE_MAJOR   −0.4197300442079061
Attrib SCALED VARIANCE_MINOR   2.02222461808375
Attrib SCALED RADIUS OF GYRATION   4.254281225044179
Attrib SKEWNESS ABOUT_MAJOR   1.1509987698982802
Attrib SKEWNESS ABOUT_MINOR   −3.348660587750956
Attrib KURTOSIS ABOUT_MAJOR   0.6328968678934859
Attrib KURTOSIS ABOUT_MINOR   −4.259264029762276
Attrib HOLLOWS RATIO   −0.5199917332882066
Sigmoid Node 19
Inputs   Weights
Threshold   −0.3625189695613844
Attrib COMPACTNESS   5.296853811294718
Attrib CIRCULARITY   −8.544688292582125
Attrib DISTANCE CIRCULARITY   −20.69421923417624
Attrib RADIUS RATIO   −6.404809367127814
Attrib PR.AXIS ASPECT RATIO   6.879998344348983
Attrib MAX.LENGTH ASPECT RATIO   −5.786216264458607
Attrib SCATTER RATIO   0.8186481759630634
Attrib ELONGATEDNESS   −9.91528410233482
Attrib PR.AXIS RECTANGULARITY   2.842401521652549
Attrib MAX.LENGTH RECTANGULARITY   2.1203484847939684
Attrib SCALED VARIANCE_MAJOR   3.897993131528398
Attrib SCALED VARIANCE_MINOR   0.8698233400774489
Attrib SCALED RADIUS OF GYRATION   0.5492736049272471
Attrib SKEWNESS ABOUT_MAJOR   3.289944867490091
Attrib SKEWNESS ABOUT_MINOR   −7.6734454386941096
Attrib KURTOSIS ABOUT_MAJOR   3.9385261727639316
Attrib KURTOSIS ABOUT_MINOR   18.642078075046008
Attrib HOLLOWS RATIO   −17.67711571514054
Sigmoid Node 20

Inputs   Weights
Threshold   3.607295458959723
Attrib COMPACTNESS   13.816591181043302
Attrib CIRCULARITY   3.3475901342376697
Attrib DISTANCE CIRCULARITY   6.2488480185052335
Attrib RADIUS RATIO   −9.345100845487337
Attrib PR.AXIS ASPECT RATIO   7.5252458664054425
Attrib MAX.LENGTH ASPECT RATIO   9.438780765964076
Attrib SCATTER RATIO   −6.351941448741179
Attrib ELONGATEDNESS   10.503253111698296
Attrib PR.AXIS RECTANGULARITY   −4.615020744090333
Attrib MAX.LENGTH RECTANGULARITY   17.300530197147772
Attrib SCALED VARIANCE_MAJOR   −7.3565111215328365
Attrib SCALED VARIANCE_MINOR   −6.451483577017934
Attrib SCALED RADIUS OF GYRATION   −10.648251538085647
Attrib SKEWNESS ABOUT_MAJOR   15.725695336953597
Attrib SKEWNESS ABOUT_MINOR   −2.673989642860789
Attrib KURTOSIS ABOUT_MAJOR   −2.919120020368877
Attrib KURTOSIS ABOUT_MINOR   −6.798734493325971
Attrib HOLLOWS RATIO   9.563924191381332
Sigmoid Node 21
Inputs   Weights
Threshold   −0.7013659747800687
Attrib COMPACTNESS   −13.770213480920448
Attrib CIRCULARITY   1.1451359829885934
Attrib DISTANCE CIRCULARITY   −0.4536403298854014
Attrib RADIUS RATIO   4.787021627891756
Attrib PR.AXIS ASPECT RATIO   0.24876879891871126
Attrib MAX.LENGTH ASPECT RATIO   −1.2616046609712166
Attrib SCATTER RATIO   2.051637738630881
Attrib ELONGATEDNESS   0.4962535828709486
Attrib PR.AXIS RECTANGULARITY   6.235996899677364
Attrib MAX.LENGTH RECTANGULARITY   −5.641448629223522
Attrib SCALED VARIANCE_MAJOR   1.9735195508979386
Attrib SCALED VARIANCE_MINOR   4.417869545195972
Attrib SCALED RADIUS OF GYRATION   9.591009878229173
Attrib SKEWNESS ABOUT_MAJOR   0.7398648026784428
Attrib SKEWNESS ABOUT_MINOR   1.924997412117317
Attrib KURTOSIS ABOUT_MAJOR   7.532473534937831
Attrib KURTOSIS ABOUT_MINOR   −12.161093140035058
Attrib HOLLOWS RATIO   −7.253359974403125
Class opel
Input
Node 0
Class saab
Input
Node 1
Class bus
Input

Node 2
Class van
Input
Node 3

Time taken to build model: 3.51 seconds

=== Evaluation on test set ===

Time taken to test model on supplied test set: 0.01 seconds

=== Summary ===

Correctly Classified Instances	755	89.2435 %
Incorrectly Classified Instances	91	10.7565 %
Kappa statistic	0.8565	
Mean absolute error	0.0592	
Root mean squared error	0.2111	
Relative absolute error	15.8056 %	
Root relative squared error	48.761 %	
Total Number of Instances	846	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0,825	0,065	0,810	0,825	0,818	0,756	0,928	0,818	opel
0,806	0,054	0,837	0,806	0,822	0,762	0,939	0,838	saab
0,991	0,013	0,964	0,991	0,977	0,970	0,999	0,998	bus
0,950	0,012	0,959	0,950	0,955	0,941	0,993	0,982	van
Weighted Avg.	0,892	0,036	0,892	0,892	0,892	0,856	0,964	0,908

=== Confusion Matrix ===

```
a    b    c    d   <-- classified as
175  28   4    5 |   a = opel
38  175   1    3 |   b = saab
1    1  216    0 |   c = bus
2    5    3  189 |   d = van
```