



UNIVERSIDAD NACIONAL DE LOJA

FACULTAD DE LA ENERGÍA, LAS INDUSTRIAS Y LOS RECURSOS NATURALES NO RENOVABLES

CARRERA EN COMPUTACIÓN

PASOS PARA LA APLICACIÓN DEL ALGORITMO DECISION STUMP EN WEKA

Carrera: Ingeniería en Sistemas “A”

Fecha: 6 de febrero de 2022

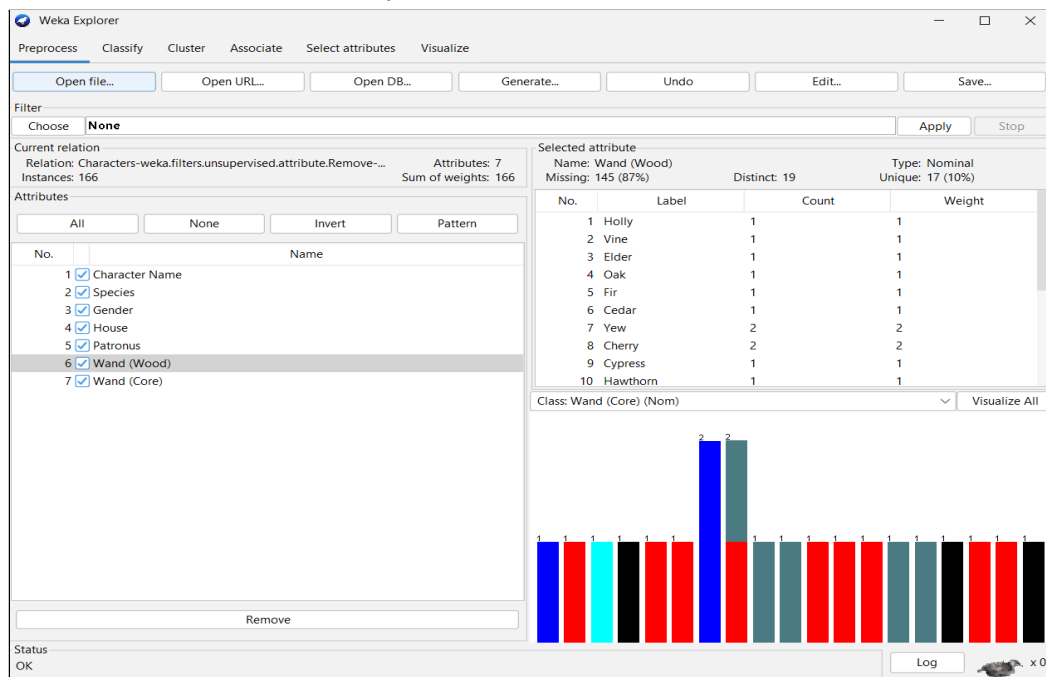
Materia: Inteligencia Artificial

Integrantes:

- Francisco Agreda Sánchez
- Israel Campoverde Peñaherrera
- Eduardo Leon Castillo
- Josué Ortega Jaramillo

Preprocess:

Para abrir el archivo seleccionamos el archivo con extensión .arff. Nos mostrará los atributos que consta nuestra base de datos como: Species, Gender, Patronus, Character name, Etc.



Classification:

Nos permite seleccionar el algoritmo, el cual hemos visto conveniente utilizar el algoritmo **OneR**. Luego en Test options hemos escogido Use training set porque nos permite utilizar todos los registros que se cargaron en WEKA.

El (Nom) House nos ayuda a que el atributo según su clasificación, en este caso estoy escogiendo que haga el proceso de clasificado según las casas.

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The classifier is set to 'OneR -B 6'. Under 'Test options', 'Use training set' is selected. The 'Result list' on the left shows a series of operations, with '13:07:40 - rules.OneR' selected. The 'Classifier output' pane on the right displays the following information:

```
=== Run information ===

Scheme:      weka.classifiers.rules.OneR -B 6
Relation:    Characters-weka.filters.unsupervised.attribute.Remove-R1
Instances:   166
Attributes:  7
             Character Name
             Species
             Gender
             House
             Patronus
             Wand (Wood)
             Wand (Core)

Test mode:   evaluate on training data

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

Character Name:
  Harry Potter    -> Gryffindor
  Ron Weasley     -> Gryffindor
  Hermione Granger-> Gryffindor
  Albus Dumbledore-> Gryffindor
  Rubeus Hagrid   -> Gryffindor
  Severus Snape    -> Slytherin
  Minerva McGonagall -> Gryffindor
  Horace Slughorn -> Slytherin
  Voldemort       -> Slytherin
  Neville Longbottom -> Gryffindor
  Remus Lupin     -> Gryffindor
  Draco Malfoy    -> Slytherin
  Alastor Moody   -> Gryffindor
  Fred Weasley    -> Gryffindor
  Dolores Umbridge-> Slytherin
```

This block shows a detailed view of the 'Classifier output' pane, containing the same text as the previous screenshot:

```
=== Run information ===

Scheme:      weka.classifiers.rules.OneR -B 6
Relation:    Characters-weka.filters.unsupervised.attribute.Remove-R1
Instances:   166
Attributes:  7
             Character Name
             Species
             Gender
             House
             Patronus
             Wand (Wood)
             Wand (Core)

Test mode:   evaluate on training data

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

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

Character Name:

```

Harry Potter    -> Gryffindor
Ron Weasley     -> Gryffindor
Hermione Granger-> Gryffindor
Albus Dumbledore-> Gryffindor
Rubeus Hagrid   -> Gryffindor
Severus Snape    -> Slytherin
Minerva McGonagall -> Gryffindor
Horace Slughorn -> Slytherin
Voldemort       -> Slytherin
Neville Longbottom -> Gryffindor
Remus Lupin      -> Gryffindor
Draco Malfoy     -> Slytherin
Alastor Moody    -> Gryffindor
Fred Weasley     -> Gryffindor
Dolores Umbridge-> Slytherin
Arthur Weasley   -> Gryffindor
Cornelius Fudge  -> Gryffindor
Sirius Black     -> Gryffindor
George Weasley   -> Gryffindor
Ginny Weasley    -> Gryffindor
Vernon Dursley   -> Gryffindor
Bellatrix Lestrange -> Slytherin
Lucius Malfoy    -> Slytherin
Tom Riddle       -> Slytherin
Luna Lovegood    -> Ravenclaw
Molly Weasley    -> Gryffindor
Dobby            -> Gryffindor
Gilderoy Lockhart -> Ravenclaw
Seamus Finnigan -> Gryffindor

```

Classifier output

```
Time taken to build model: 0 seconds
```

```
=== Evaluation on training set ===
```

```
Time taken to test model on training data: 0 seconds
```

```
=== Summary ===
```

```

Correctly Classified Instances      75          100    %
Incorrectly Classified Instances    0           0    %
Kappa statistic                    1
Mean absolute error                 0
Root mean squared error             0
Relative absolute error             0    %
Root relative squared error         0    %
Total Number of Instances          75
Ignored Class Unknown Instances     91

```

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

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	1,000	0,000	1,000	1,000	1,000	1,000	0,663	0,254	Gryffind
	1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	Slytheri
	1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	Ravencla
	1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	Hufflepu
	1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	Beauxbat
	1,000	0,000	1,000	1,000	1,000	1,000	1,000	1,000	Durmstra
Weighted Avg.	1,000	0,000	1,000	1,000	1,000	1,000	0,861	0,692	

En los resultados de la Matriz de Confusión debemos tener en cuenta que la diagonal debe ser mayor

=== Confusion Matrix ===

```
a b c d e f <-- classified as
31 0 0 0 0 0 | a = Gryffindor
0 20 0 0 0 0 | b = Slytherin
0 0 12 0 0 0 | c = Ravenclaw
0 0 0 8 0 0 | d = Hufflepuff
0 0 0 0 2 0 | e = Beauxbatons Academy of Magic
0 0 0 0 0 2 | f = Durmstrang Institute
```

Cluster:

Aquí en el momento de darle Start nos permite mostrar el Número de Iteraciones que realiza

Weka Explorer

Preprocess Classify **Cluster** Associate Select attributes Visualize

Clusterer

Choose **SimpleKMeans** -init 0 -max-candidates 100 -periodic-pruning 10000 -min-density 2.0 -t1 -1.25 -t2 -1.0 -N 2 -A "weka.core.EuclideanDistance -R first-last" -I 500 -num-slots 1

Cluster mode

☒ Use training set

☐ Supplied test set Set...

☐ Percentage split % 66

☐ Classes to clusters evaluation (Nom) Wand (Core) v

☒ Store clusters for visualization

Ignore attributes

Start Stop

Result list (right-click for options)

14:24:09 - SimpleKMeans

Clusterer output

Initial starting points (random):

Cluster 0: Pixie,Human,Male,Gryffindor,Stag,Yew,'Dragon Heartstring'

Cluster 1: All,Human,Male,Gryffindor,Stag,Yew,'Dragon Heartstring'

Missing values globally replaced with mean/mode

Final cluster centroids:

Attribute	Full Data (166.0)	Cluster# 0 (165.0)	
Character Name	Harry Potter	Harry Potter	Al.
Species	Human	Human	Humai
Gender	Male	Male	Male
House	Gryffindor	Gryffindor	Gryffindo:
Patronus	Stag	Stag	Sta:
Wand (Wood)	Yew	Yew	Yet
Wand (Core)	Dragon Heartstring	Dragon Heartstring	Dragon Heartstrin:

Time taken to build model (full training data) : 0.01 seconds

=== Model and evaluation on training set ===

Clustered Instances

0	165 (99%)
1	1 (1%)

Status OK

Log x 0

Clusterer output

=== Run information ===

```

Scheme:      weka.clusterers.SimpleKMeans -init 0 -max-candidates 100 -periodic-pruning
Relation:    Characters-weka.filters.unsupervised.attribute.Remove-R1
Instances:   166
Attributes:  7
              Character Name
              Species
              Gender
              House
              Patronus
              Wand (Wood)
              Wand (Core)
Test mode:   evaluate on training data

```

=== Clustering model (full training set) ===

kMeans
=====

Number of iterations: 2
Within cluster sum of squared errors: 318.0

Clusterer output

Initial starting points (random):

Cluster 0: Pixie,Human,Male,Gryffindor,Stag,Yew,'Dragon Heartstring'
Cluster 1: All,Human,Male,Gryffindor,Stag,Yew,'Dragon Heartstring'

Missing values globally replaced with mean/mode

Final cluster centroids:

Attribute	Cluster#		
	Full Data	0	1
	(166.0)	(165.0)	(1.0)
=====			
Character Name	Harry Potter	Harry Potter	All
Species	Human	Human	Human
Gender	Male	Male	Male
House	Gryffindor	Gryffindor	Gryffindor
Patronus	Stag	Stag	Stag
Wand (Wood)	Yew	Yew	Yew
Wand (Core)	Dragon Heartstring	Dragon Heartstring	Dragon Heartstring

Time taken to build model (full training data) : 0.01 seconds

=== Model and evaluation on training set ===

Clustered Instances

```

0      165 ( 99%)
1       1 (  1%)

```

Associate:

Weka Explorer

Preprocess Classify Cluster **Associate** Select attributes Visualize

Associator

Choose **Apriori** -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1

Start Stop

Result list (right-click for ...)

14:42:52 - Apriori

Associator output

```

=== Run information ===

Scheme:      weka.associations.Apriori -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1
Relation:    Characters-weka.filters.unsupervised.attribute.Remove-R1
Instances:   166
Attributes:  7
             Character Name
             Species
             Gender
             House
             Patronus
             Wand (Wood)
             Wand (Core)

=== Associator model (full training set) ===

Apriori
=====

Minimum support: 0.1 (17 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 18

Generated sets of large itemsets:

Size of set of large itemsets L(1): 5

Size of set of large itemsets L(2): 5

Size of set of large itemsets L(3): 1

Best rules found:

1. House=Slytherin 20 ==> Species=Human 19   <conf:(0.95)> lift:(1.52) lev:(0.04) [6] conv:(3.73)

```

Status OK Log x 0

Select Attributes:

Weka Explorer

Preprocess Classify Cluster Associate **Select attributes** Visualize

Attribute Evaluator

Choose **CfsSubsetEval** -P 1 -E 1

Search Method

Choose **BestFirst** -D 1 -N 5

Attribute Selection Mode

☒ Use full training set

☐ Cross-validation

Folds 10

Seed 1

(Nom) Character Name

Start Stop

Result list (right-click for options)

14:46:09 - BestFirst + CfsSubsetEval

14:46:37 - BestFirst + CfsSubsetEval

Attribute selection output

```

Character Name
Species
Gender
House
Patronus
Wand (Wood)
Wand (Core)

Evaluation mode: evaluate on all training data

=== Attribute Selection on all input data ===

Search Method:
Best first.
Start set: no attributes
Search direction: forward
Stale search after 5 node expansions
Total number of subsets evaluated: 22
Merit of best subset found: 0.315

Attribute Subset Evaluator (supervised, Class (nominal): 1 Character Name):
CFS Subset Evaluator
Including locally predictive attributes

Selected attributes: 2,3,4 : 3
Species
Gender
House

```

Status OK Log x 0

Visualize:

