

## Dataset (breast.txt)

### Dataset description

10 attribute(s)  
699 example(s)

Attribute	Category	Informations
clump	Continue	-
ucellsize	Continue	-
ucellshape	Continue	-
mgadhesion	Continue	-
sepics	Continue	-
bnuclei	Continue	-
bchromatin	Continue	-
normnucl	Continue	-
mitoses	Continue	-
class	Discrete	2 values

Computation time : 0 ms.  
Created at 1/25/2019 4:35:58 PM

## Supervised Learning 1 (C4.5)

### Parameters

#### Decision tree (C4.5) parameters

Min size of leaves	5
Confidence-level for pessimistic	0.25

### Results

## Classifier performances

Error rate			0.0344			
Values prediction			Confusion matrix			
Value	Recall	1-Precision		begin	malignant	Sum
begin	0.9507	0.0047	begin	212	11	223
malignant	0.9921	0.0809	malignant	1	125	126
			Sum	213	136	349

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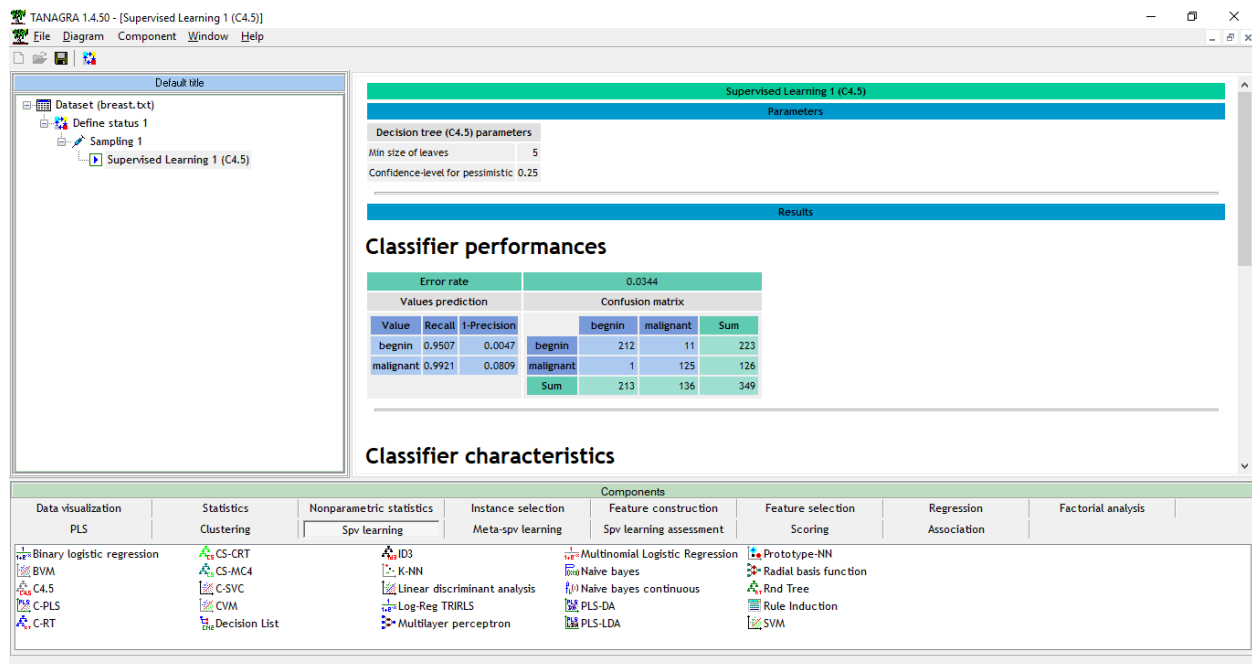
## Classifier characteristics

### Data description

Target attribute	class (2 values)
# descriptors	9

### Tree description

Number of nodes	13
Number of leaves	7

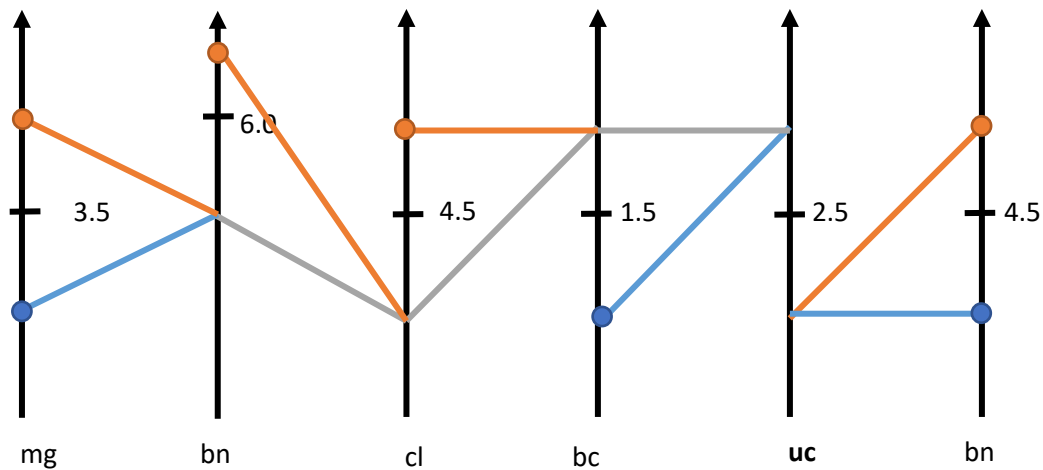


## Decision tree

- $ucellsize < 2.5000$ 
  - $bnuclei < 4.5000$  then class = **begin** (100.00 % of 200 examples)
  - $bnuclei \geq 4.5000$  then class = **malignant** (66.67 % of 6 examples)
- $ucellsize \geq 2.5000$ 
  - $bchromatin < 1.5000$  then class = **begin** (87.50 % of 8 examples)
  - $bchromatin \geq 1.5000$ 
    - $clump < 4.5000$ 
      - $bnuclei < 6.0000$ 
        - $mgadhesion < 3.5000$  then class = **begin** (100.00 % of 5 examples)
        - $mgadhesion \geq 3.5000$  then class = **malignant** (66.67 % of 6 examples)
      - $bnuclei \geq 6.0000$  then class = **malignant** (100.00 % of 8 examples)
    - $clump \geq 4.5000$  then class = **malignant** (93.97 % of 116 examples)

## Decision tree

- $uc < 2.5$ 
  - $bn < 4.5$  then class = **benign** (100.00 % of 200 examples)
  - $bn \geq 4.5$  then class = **malignant** (66.67 % of 6 examples)
- $uc \geq 2.5$ 
  - $bc < 1.5$  then class = **benign** (87.50 % of 8 examples)
  - $bc \geq 1.5$ 
    - $cl < 4.5$ 
      - $bn < 6.0$ 
        - $mg < 3.5$  then class = **benign** (100.00 % of 5 examples)
        - $mg \geq 3.5$  then class = **malignant** (66.67 % of 6 examples)
      - $bn \geq 6.0$  then class = **malignant** (100.00 % of 8 examples)
    - $cl \geq 4.5$  then class = **malignant** (93.97 % of 116 examples)



UC is a root

Grey lines are used for both classes before split

Grey lines show overlap of lines from different classes. We cannot draw lines of two classes without line overlap. We need to show them in grey color.

