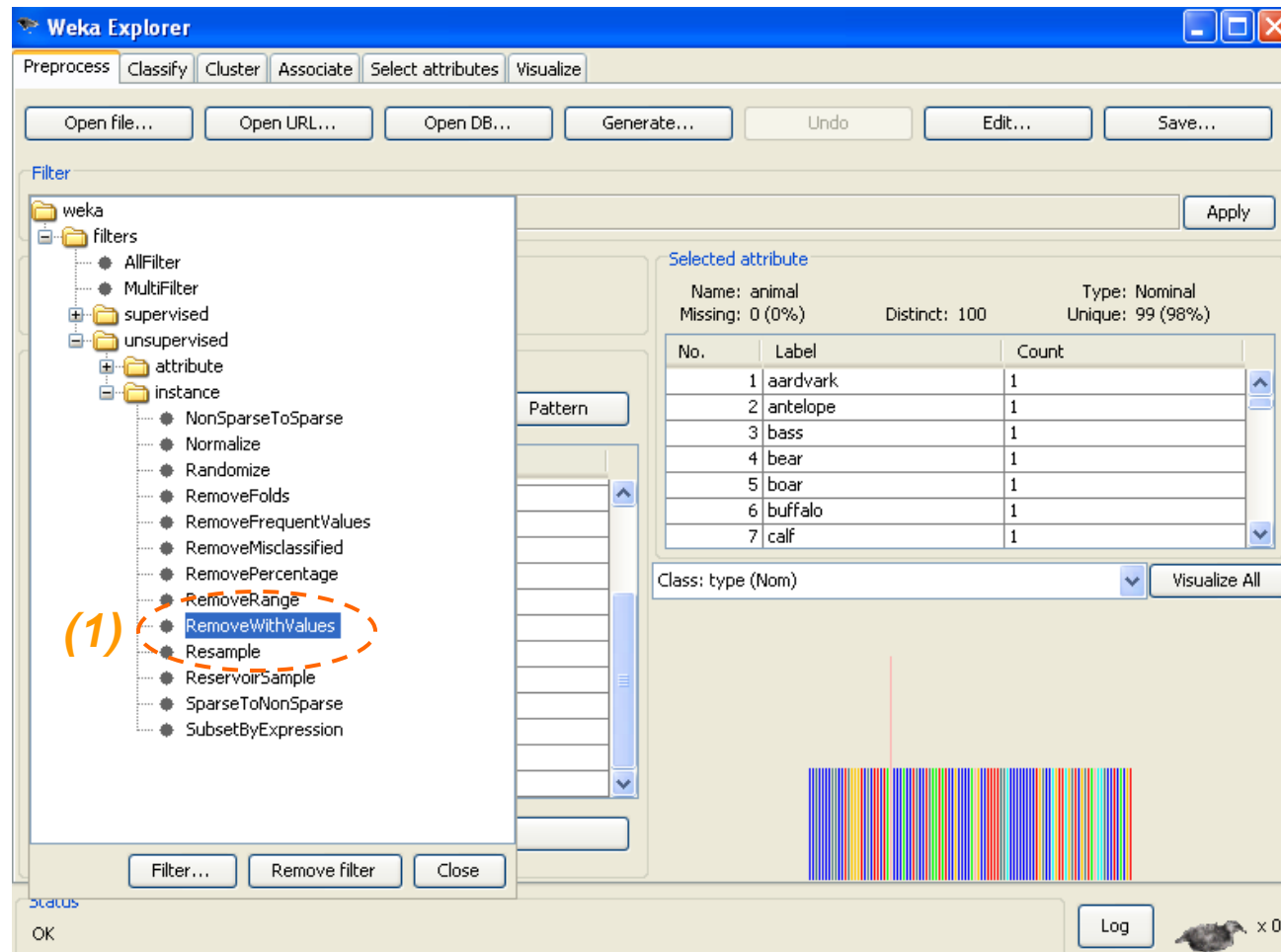
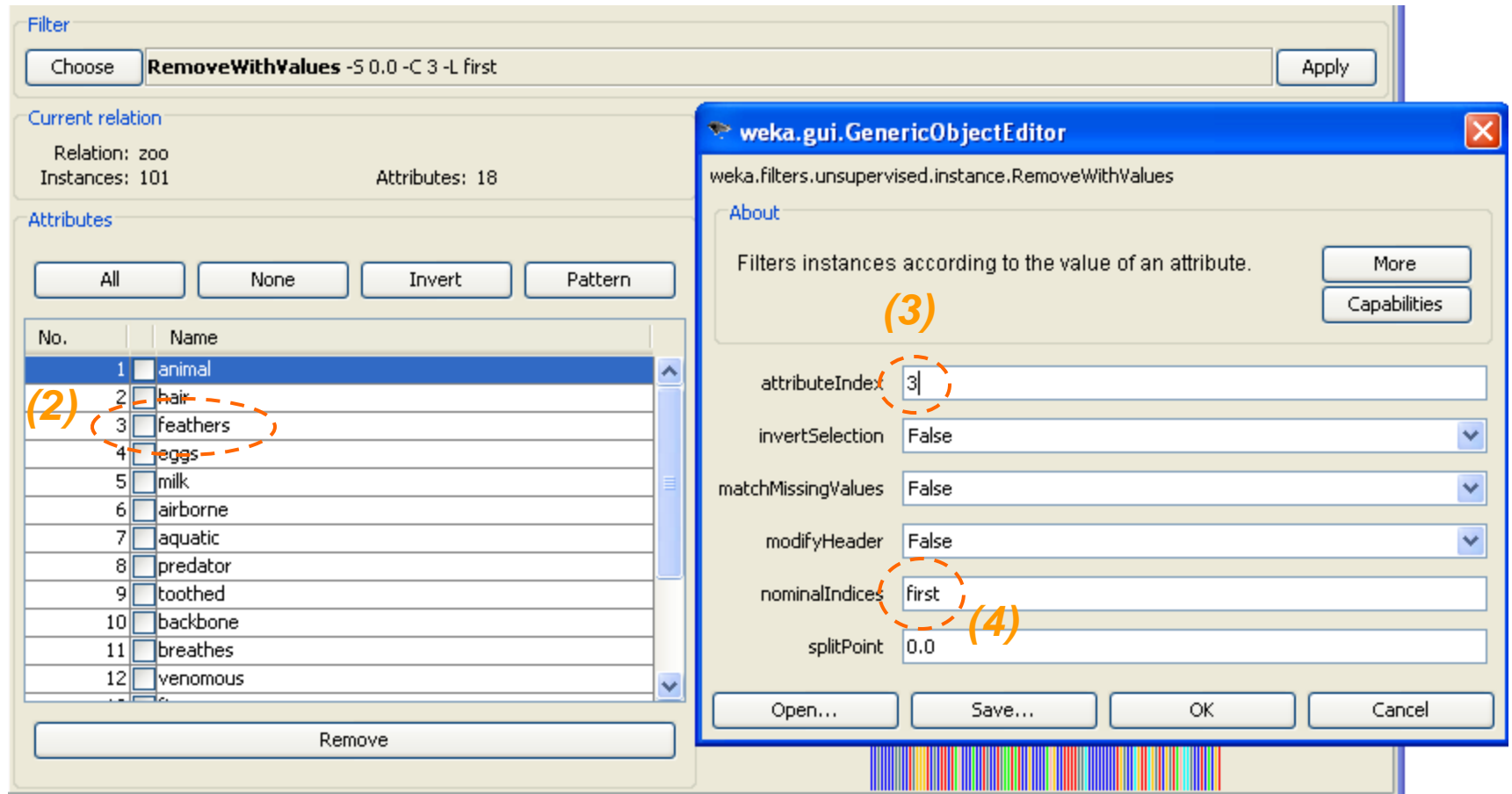


Q1:

For each of the attributes feathers, predators, tail, and domestic, report on the types and numbers of animals having the attribute true.



step1: choose the RemoveWithValues filter



step2: check out which attribute you want to filter

step3: the index of feather is 3 so attributeIndex is set to 3

step4: the feather attribute has two values:1 (False) and 2 (True); to keep the instances with true value, we set nominalIndices to first (False)

(1) Feather:

Filter

Choose **RemoveWithValues** -S 0.0 -C 3 -L first Apply

Current relation

Relation: zoo-weka.filters.unsupervised.instance.RemoveWithValues-...
Instances: 20 Attributes: 18

Attributes

All None Invert Pattern

No.	Name
7	<input type="checkbox"/> aquatic
8	<input type="checkbox"/> predator
9	<input type="checkbox"/> toothed
10	<input type="checkbox"/> backbone
11	<input type="checkbox"/> breathes
12	<input type="checkbox"/> venomous
13	<input type="checkbox"/> fins
14	<input type="checkbox"/> legs
15	<input type="checkbox"/> tail
16	<input type="checkbox"/> domestic
17	<input type="checkbox"/> catsize
18	<input type="checkbox"/> type

Remove

Selected attribute

Name: type
Missing: 0 (0%) Distinct: 1 Type: Nominal
Unique: 0 (0%)

No.	Label	Count
1	mammal	0
2	bird	20
3	reptile	0
4	fish	0
5	amphibian	0
6	insect	0
7	invertebrate	0

Class: type (Nom) Visualize All

Label	Count
mammal	0
bird	20
reptile	0
fish	0
amphibian	0
insect	0
invertebrate	0

(2) Predators:

Filter
 RemoveWithValues -S 0.0 -C 8 -L first

Current relation
Relation: zoo-weka.filters.unsupervised.instance.RemoveWithValues-...
Instances: 56 Attributes: 18

Attributes

No.	Name
7	<input type="checkbox"/> aquatic
8	<input type="checkbox"/> predator
9	<input type="checkbox"/> toothed
10	<input type="checkbox"/> backbone
11	<input type="checkbox"/> breathes
12	<input type="checkbox"/> venomous
13	<input type="checkbox"/> fins
14	<input type="checkbox"/> legs
15	<input type="checkbox"/> tail
16	<input type="checkbox"/> domestic
17	<input type="checkbox"/> catsize
18	<input checked="" type="checkbox"/> type

Selected attribute
Name: type Type: Nominal
Missing: 0 (0%) Distinct: 7 Unique: 1 (2%)

No.	Label	Count
1	mammal	22
2	bird	9
3	reptile	4
4	fish	9
5	amphibian	3
6	insect	1
7	invertebrate	8

Class: type (Nom)

Label	Count
mammal	22
bird	9
reptile	4
fish	9
amphibian	3
insect	1
invertebrate	8

(3) Tail:

Filter

Choose **RemoveWithValues** -S 0.0 -C 15 -L first Apply

Current relation

Relation: zoo-weka.filters.unsupervised.instance.RemoveWithValues-...
Instances: 75 Attributes: 18

Attributes

All None Invert Pattern

No.	Name
7	<input type="checkbox"/> aquatic
8	<input type="checkbox"/> predator
9	<input type="checkbox"/> toothed
10	<input type="checkbox"/> backbone
11	<input type="checkbox"/> breathes
12	<input type="checkbox"/> venomous
13	<input type="checkbox"/> fins
14	<input type="checkbox"/> legs
15	<input type="checkbox"/> tail
16	<input type="checkbox"/> domestic
17	<input type="checkbox"/> catsize
18	<input checked="" type="checkbox"/> type

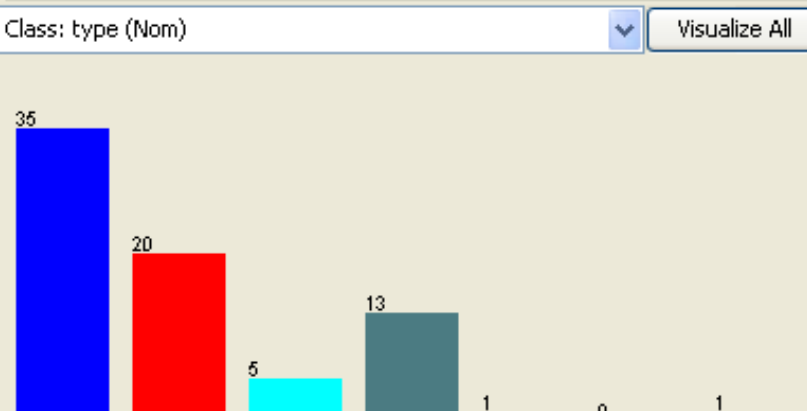
Remove

Selected attribute

Name: type
Missing: 0 (0%) Distinct: 6 Type: Nominal
Unique: 2 (3%)

No.	Label	Count
1	mammal	35
2	bird	20
3	reptile	5
4	fish	13
5	amphibian	1
6	insect	0
7	invertebrate	1

Class: type (Nom) Visualize All



Label	Count
mammal	35
bird	20
reptile	5
fish	13
amphibian	1
insect	0
invertebrate	1

(4) Domestic:

Filter

Choose **RemoveWithValues** -S 0.0 -C 16 -L first Apply

Current relation

Relation: zoo-weka.filters.unsupervised.instance.RemoveWithValues-...
Instances: 13 Attributes: 18

Attributes

All None Invert Pattern

No.	Name
7	<input type="checkbox"/> aquatic
8	<input type="checkbox"/> predator
9	<input type="checkbox"/> toothed
10	<input type="checkbox"/> backbone
11	<input type="checkbox"/> breathes
12	<input type="checkbox"/> venomous
13	<input type="checkbox"/> fins
14	<input type="checkbox"/> legs
15	<input type="checkbox"/> tail
16	<input type="checkbox"/> domestic
17	<input type="checkbox"/> catsize
18	<input checked="" type="checkbox"/> type

Remove

Selected attribute

Name: type
Missing: 0 (0%)
Distinct: 4
Type: Nominal
Unique: 2 (15%)

No.	Label	Count
1	mammal	8
2	bird	3
3	reptile	0
4	fish	1
5	amphibian	0
6	insect	1
7	invertebrate	0

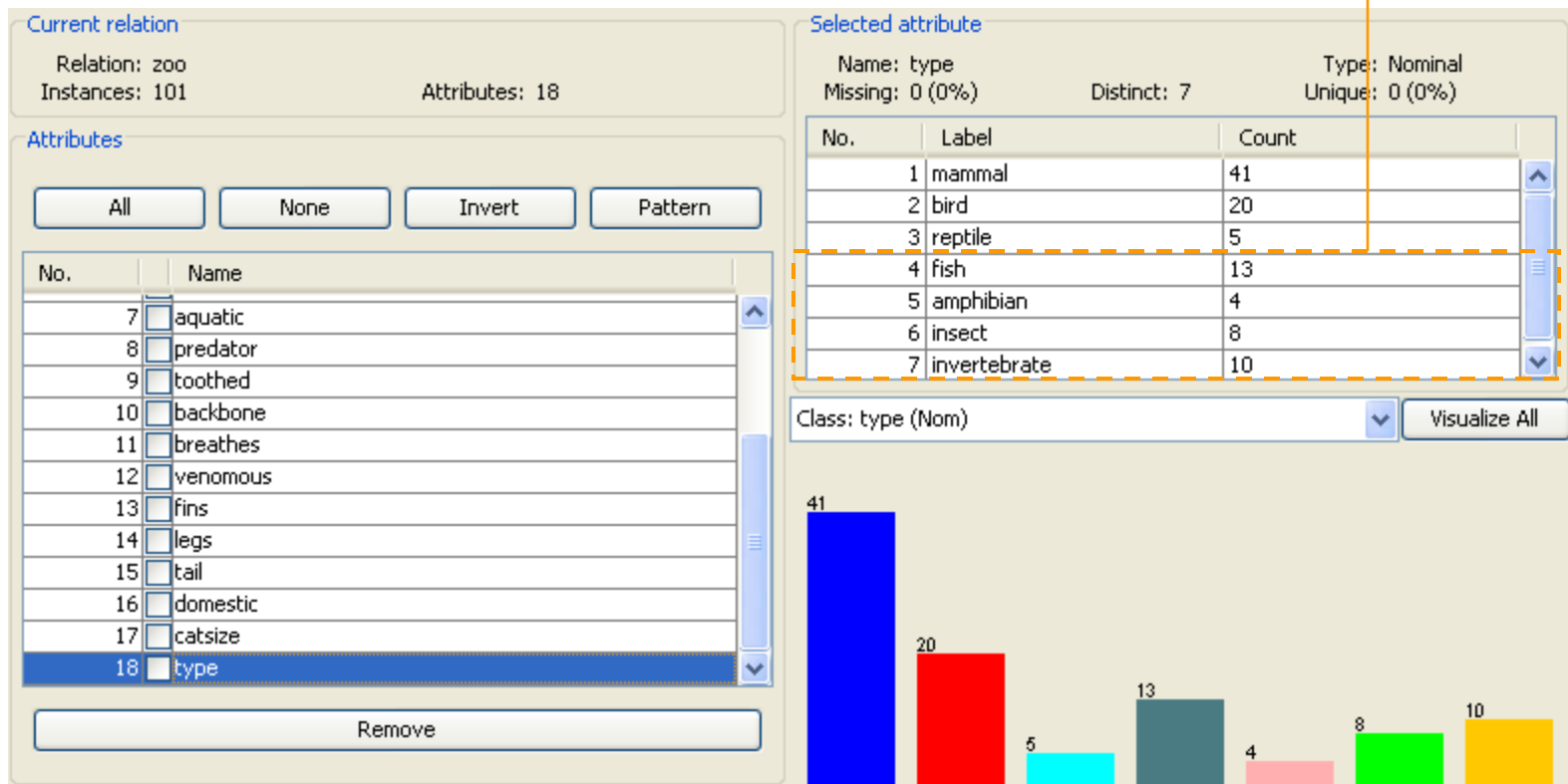
Class: type (Nom) Visualize All

Label	Count
mammal	8
bird	3
reptile	0
fish	1
amphibian	0
insect	1
invertebrate	0

Q2:

**Remove instances whose “type” attribute is larger than or equal to 4.
Use the classifier J48graft to derive the corresponding decision tree.
Draw the corresponding tree.**

type attribute larger than or equal to 4



Filter

Choose **RemoveWithValues** -S 0.0 -C 18 -L 4-7 Apply

Current relation

Relation: zoo
Instances: 101
Attributes: 18

Attributes

All None Invert Pattern

No.	Name
7	aquatic
8	predator
9	toothed
10	backbone
11	breathes
12	venomous
13	fins
14	legs
15	tail
16	domestic
17	catsize
18	type

Remove

weka.gui.GenericObjectEditor

weka.filters.unsupervised.instance.RemoveWithValues

About

Filters instances according to the value of an attribute.

More
Capabilities

attributeIndex 18

invertSelection False

matchMissingValues False

modifyHeader False

nominalIndices 4-7

splitPoint 0.0

Open... Save... OK Cancel

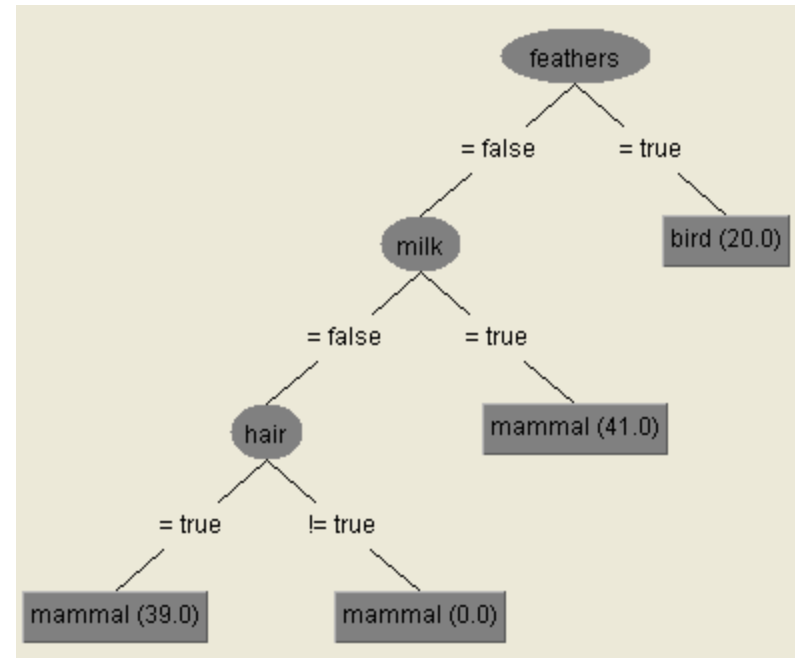
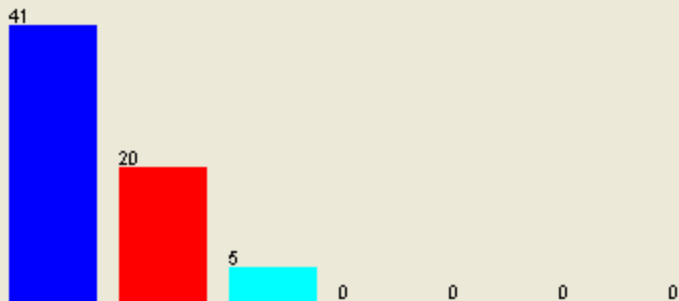
Selected attribute

Name: type
Missing: 0 (0%)
Distinct: 3
Type: Nominal
Unique: 0 (0%)

No.	Label	Count
1	mammal	41
2	bird	20
3	reptile	5
4	fish	0
5	amphibian	0
6	insect	0
7	invertebrate	0

Class: type (Nom)

Visualize All



Q3:

**Use the rules classifier PART to derive the rules on the zoo dataset.
List the rules obtained.**

```
PART decision list
-----

feathers = false AND
milk = true: mammal (41.0)

feathers = true: bird (20.0)

backbone = false AND
airborne = false AND
predator = true: invertebrate (8.0)

backbone = false AND
legs > 2: insect (8.0)

fins = true: fish (13.0)

backbone = true AND
tail = true: reptile (6.0/1.0)

aquatic = true: amphibian (3.0)

: invertebrate (2.0)

Number of Rules :      8
```

Q4:

Remove the “type” attribute from the dataset and run the default clustering algorithm SimpleKMeans. How many clusters do you obtain? Can you relate these clusters to the initial class values

The screenshot shows the Weka Explorer interface with the 'Cluster' tab selected. The 'Clusterer' dropdown is set to 'SimpleKMeans -N 2 -A "weka.core.EuclideanDistance -R first-last" -I 500 -S 10'. The 'Cluster mode' section has 'Classes to clusters evaluation' selected, with '(Nom) type' chosen from the dropdown. The 'Clusterer output' pane displays the following text:

```
0      41 ( 41%)
1      60 ( 59%)

Class attribute: type
Classes to Clusters:

 0 1 <-- assigned to cluster
41 0 | mammal
0 20 | bird
0 5 | reptile
0 13 | fish
0 4 | amphibian
0 8 | insect
0 10 | invertebrate

Cluster 0 <-- mammal
Cluster 1 <-- bird

Incorrectly clustered instances
```

	Cluster 0	Cluster 1
mammal	41	0
bird	0	20
reptile	0	5
fish	0	13
amphibian	0	4
insect	0	8
invertebrate	0	10