

# CS4445 B Term 2006 Homework 2 Solutions

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## 1 Prism Rule Generation

### 1.1 Rules for **recommendation=acc**

We start with all our initial instances:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>med</i>	2	<i>med</i>	<i>unacc</i>
<i>low</i>	<i>high</i>	2	<i>high</i>	<i>unacc</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	4	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	4	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>more</i>	<i>low</i>	<i>unacc</i>
<i>med</i>	<i>low</i>	4	<i>med</i>	<i>acc</i>
<i>high</i>	<i>med</i>	4	<i>low</i>	<i>unacc</i>
<i>low</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>low</i>	2	<i>high</i>	<i>unacc</i>

### 1.1.1 Rule 1

#### 1.1.1.1 IF ? THEN recommendation=*acc*

We are starting with IF  $\emptyset$  THEN **recommendation**=*acc*, that is a rule with no antecedent. We can extend this rule in the following ways:

- (0.00% ;  $\frac{0}{2}$ ) IF **buying-price**=*high* THEN **recommendation**=*acc*
- (20.00% ;  $\frac{1}{5}$ ) IF **buying-price**=*low* THEN **recommendation**=*acc*
- (75.00% ;  $\frac{3}{4}$ ) IF **buying-price**=*med* THEN **recommendation**=*acc*
- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price**=*vhigh* THEN **recommendation**=*acc*
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance**=*high* THEN **recommendation**=*acc*
- (50.00% ;  $\frac{1}{2}$ ) IF **maintenance**=*low* THEN **recommendation**=*acc*
- (20.00% ;  $\frac{1}{5}$ ) IF **maintenance**=*med* THEN **recommendation**=*acc*
- (50.00% ;  $\frac{2}{4}$ ) IF **maintenance**=*vhigh* THEN **recommendation**=*acc*
- (0.00% ;  $\frac{0}{3}$ ) IF **persons**=2 THEN **recommendation**=*acc*
- (33.33% ;  $\frac{2}{6}$ ) IF **persons**=4 THEN **recommendation**=*acc*
- (66.67% ;  $\frac{2}{3}$ ) IF **persons**=*more* THEN **recommendation**=*acc*
- (0.00% ;  $\frac{0}{4}$ ) IF **safety**=*high* THEN **recommendation**=*acc*
- (0.00% ;  $\frac{0}{2}$ ) IF **safety**=*low* THEN **recommendation**=*acc*
- (66.67% ;  $\frac{4}{6}$ ) IF **safety**=*med* THEN **recommendation**=*acc*

We see that our best choice is to add **buying-price**=*med* to the rule making it cover 4 instance(s) with accuracy of 75.00%. Since the rule is not 100% accurate yet and we still have some attributes to extend the rule with, we continue.

**1.1.1.2 IF buying-price=*med* AND ? THEN recommendation=*acc***

We are extending IF **buying-price=*med*** THEN **recommendation=*acc***. We have the following options:

- (0.00% ;  $\frac{0}{0}$ ) IF **buying-price=*med*** AND **maintenance=*high*** THEN **recommendation=*acc***
- (100.00% ;  $\frac{1}{1}$ ) IF **buying-price=*med*** AND **maintenance=*low*** THEN **recommendation=*acc***
- (100.00% ;  $\frac{1}{1}$ ) IF **buying-price=*med*** AND **maintenance=*med*** THEN **recommendation=*acc***
- (50.00% ;  $\frac{1}{2}$ ) IF **buying-price=*med*** AND **maintenance=*vhigh*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{0}$ ) IF **buying-price=*med*** AND **persons=2** THEN **recommendation=*acc***
- (100.00% ;  $\frac{2}{2}$ ) IF **buying-price=*med*** AND **persons=4** THEN **recommendation=*acc***
- (50.00% ;  $\frac{1}{2}$ ) IF **buying-price=*med*** AND **persons=*more*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{0}$ ) IF **buying-price=*med*** AND **safety=*high*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price=*med*** AND **safety=*low*** THEN **recommendation=*acc***
- (100.00% ;  $\frac{3}{3}$ ) IF **buying-price=*med*** AND **safety=*med*** THEN **recommendation=*acc***

We see that our best choice is to add **safety=*med*** to the rule making it cover 3 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>med</i>	2	<i>med</i>	<i>unacc</i>
<i>low</i>	<i>high</i>	2	<i>high</i>	<i>unacc</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	4	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>vhigh</i>	<i>more</i>	<i>low</i>	<i>unacc</i>
<i>high</i>	<i>med</i>	4	<i>low</i>	<i>unacc</i>
<i>low</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>low</i>	2	<i>high</i>	<i>unacc</i>

**1.1.2 Rule 2****1.1.2.1 IF ? THEN recommendation=*acc***

We are starting with IF  $\emptyset$  THEN **recommendation=*acc***, that is a rule with no antecedent. We can extend this rule in the following ways:

- (0.00% ;  $\frac{0}{2}$ ) IF **buying-price=*high*** THEN **recommendation=*acc***
- (20.00% ;  $\frac{1}{5}$ ) IF **buying-price=*low*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price=*med*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price=*vhigh*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance=*high*** THEN **recommendation=*acc***
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance=*low*** THEN **recommendation=*acc***

- (0.00% ;  $\frac{0}{4}$ ) IF **maintenance=med** THEN **recommendation=acc**
- (33.33% ;  $\frac{1}{3}$ ) IF **maintenance=vhigh** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{3}$ ) IF **persons=2** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{4}$ ) IF **persons=4** THEN **recommendation=acc**
- (50.00% ;  $\frac{1}{2}$ ) IF **persons=more** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{4}$ ) IF **safety=high** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{2}$ ) IF **safety=low** THEN **recommendation=acc**
- (33.33% ;  $\frac{1}{3}$ ) IF **safety=med** THEN **recommendation=acc**

We see that our best choice is to add **persons=more** to the rule making it cover 2 instance(s) with accuracy of 50.00%. Since the rule is not 100% accurate yet and we still have some attributes to extend the rule with, we continue.

### 1.1.2.2 IF **persons=more** AND ? THEN **recommendation=acc**

We are extending IF **persons=more** THEN **recommendation=acc**. We have the following options:

- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **buying-price=high** THEN **recommendation=acc**
- (100.00% ;  $\frac{1}{1}$ ) IF **persons=more** AND **buying-price=low** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{1}$ ) IF **persons=more** AND **buying-price=med** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **buying-price=vhigh** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **maintenance=high** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **maintenance=low** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **maintenance=med** THEN **recommendation=acc**
- (50.00% ;  $\frac{1}{2}$ ) IF **persons=more** AND **maintenance=vhigh** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=more** AND **safety=high** THEN **recommendation=acc**
- (0.00% ;  $\frac{0}{1}$ ) IF **persons=more** AND **safety=low** THEN **recommendation=acc**
- (100.00% ;  $\frac{1}{1}$ ) IF **persons=more** AND **safety=med** THEN **recommendation=acc**

We see that our best choice is to add **buying-price=low** to the rule making it cover 1 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
high	med	4	high	good
low	med	2	med	unacc
low	high	2	high	unacc
vhigh	vhigh	4	med	unacc
med	vhigh	more	low	unacc
high	med	4	low	unacc
low	med	4	high	good
low	low	2	high	unacc

There are no more instances with **recommendation=acc** so we are done with generating rules for this target class.

## 1.2 Rules for recommendation=*good*

We start with all our initial instances:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>med</i>	2	<i>med</i>	<i>unacc</i>
<i>low</i>	<i>high</i>	2	<i>high</i>	<i>unacc</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	4	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	4	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>more</i>	<i>low</i>	<i>unacc</i>
<i>med</i>	<i>low</i>	4	<i>med</i>	<i>acc</i>
<i>high</i>	<i>med</i>	4	<i>low</i>	<i>unacc</i>
<i>low</i>	<i>med</i>	4	<i>high</i>	<i>good</i>
<i>low</i>	<i>low</i>	2	<i>high</i>	<i>unacc</i>

### 1.2.1 Rule 1

#### 1.2.1.1 IF ? THEN recommendation=*good*

We are starting with IF  $\emptyset$  THEN **recommendation**=*good*, that is a rule with no antecedent. We can extend this rule in the following ways:

- (50.00% ;  $\frac{1}{2}$ ) IF **buying-price**=*high* THEN **recommendation**=*good*
- (20.00% ;  $\frac{1}{5}$ ) IF **buying-price**=*low* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{4}$ ) IF **buying-price**=*med* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price**=*vhigh* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance**=*high* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{2}$ ) IF **maintenance**=*low* THEN **recommendation**=*good*
- (40.00% ;  $\frac{2}{5}$ ) IF **maintenance**=*med* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{4}$ ) IF **maintenance**=*vhigh* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{3}$ ) IF **persons**=2 THEN **recommendation**=*good*
- (33.33% ;  $\frac{2}{6}$ ) IF **persons**=4 THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{3}$ ) IF **persons**=*more* THEN **recommendation**=*good*
- (50.00% ;  $\frac{2}{4}$ ) IF **safety**=*high* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{2}$ ) IF **safety**=*low* THEN **recommendation**=*good*
- (0.00% ;  $\frac{0}{6}$ ) IF **safety**=*med* THEN **recommendation**=*good*

We see that our best choice is to add **safety**=*high* to the rule making it cover 4 instance(s) with accuracy of 50.00%. Since the rule is not 100% accurate yet and we still have some attributes to extend the rule with, we continue.

### 1.2.1.2 IF **safety=high** AND ? THEN **recommendation=good**

We are extending IF **safety=high** THEN **recommendation=good**. We have the following options:

- (100.00% ;  $\frac{1}{1}$ ) IF **safety=high** AND **buying-price=high** THEN **recommendation=good**
- (33.33% ;  $\frac{1}{3}$ ) IF **safety=high** AND **buying-price=low** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{0}$ ) IF **safety=high** AND **buying-price=med** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{0}$ ) IF **safety=high** AND **buying-price=vhigh** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{1}$ ) IF **safety=high** AND **maintenance=high** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{1}$ ) IF **safety=high** AND **maintenance=low** THEN **recommendation=good**
- (100.00% ;  $\frac{2}{2}$ ) IF **safety=high** AND **maintenance=med** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{0}$ ) IF **safety=high** AND **maintenance=vhigh** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{2}$ ) IF **safety=high** AND **persons=2** THEN **recommendation=good**
- (100.00% ;  $\frac{2}{2}$ ) IF **safety=high** AND **persons=4** THEN **recommendation=good**
- (0.00% ;  $\frac{0}{0}$ ) IF **safety=high** AND **persons=more** THEN **recommendation=good**

We see that our best choice is to add **maintenance=med** to the rule making it cover 2 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
low	med	2	med	unacc
low	high	2	high	unacc
low	vhigh	more	med	acc
med	vhigh	4	med	acc
vhigh	vhigh	4	med	unacc
med	med	more	med	acc
med	vhigh	more	low	unacc
med	low	4	med	acc
high	med	4	low	unacc
low	low	2	high	unacc

There are no more instances with **recommendation=good** so we are done with generating rules for this target class.

## 1.3 Rules for **recommendation=unacc**

We start with all our initial instances:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>
<i>low</i>	<i>med</i>	<i>2</i>	<i>med</i>	<i>unacc</i>
<i>low</i>	<i>high</i>	<i>2</i>	<i>high</i>	<i>unacc</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>more</i>	<i>low</i>	<i>unacc</i>
<i>med</i>	<i>low</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>high</i>	<i>med</i>	<i>4</i>	<i>low</i>	<i>unacc</i>
<i>low</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>
<i>low</i>	<i>low</i>	<i>2</i>	<i>high</i>	<i>unacc</i>

### 1.3.1 Rule 1

#### 1.3.1.1 IF ? THEN recommendation=*unacc*

We are starting with IF  $\emptyset$  THEN **recommendation**=*unacc*, that is a rule with no antecedent. We can extend this rule in the following ways:

- (50.00% ;  $\frac{1}{2}$ ) IF **buying-price**=*high* THEN **recommendation**=*unacc*
- (60.00% ;  $\frac{3}{5}$ ) IF **buying-price**=*low* THEN **recommendation**=*unacc*
- (25.00% ;  $\frac{1}{4}$ ) IF **buying-price**=*med* THEN **recommendation**=*unacc*
- (100.00% ;  $\frac{1}{1}$ ) IF **buying-price**=*vhigh* THEN **recommendation**=*unacc*
- (100.00% ;  $\frac{1}{1}$ ) IF **maintenance**=*high* THEN **recommendation**=*unacc*
- (50.00% ;  $\frac{1}{2}$ ) IF **maintenance**=*low* THEN **recommendation**=*unacc*
- (40.00% ;  $\frac{2}{5}$ ) IF **maintenance**=*med* THEN **recommendation**=*unacc*
- (50.00% ;  $\frac{2}{4}$ ) IF **maintenance**=*vhigh* THEN **recommendation**=*unacc*
- (100.00% ;  $\frac{3}{3}$ ) IF **persons**=2 THEN **recommendation**=*unacc*
- (33.33% ;  $\frac{2}{6}$ ) IF **persons**=4 THEN **recommendation**=*unacc*
- (33.33% ;  $\frac{1}{3}$ ) IF **persons**=*more* THEN **recommendation**=*unacc*
- (50.00% ;  $\frac{2}{4}$ ) IF **safety**=*high* THEN **recommendation**=*unacc*
- (100.00% ;  $\frac{2}{2}$ ) IF **safety**=*low* THEN **recommendation**=*unacc*
- (33.33% ;  $\frac{2}{6}$ ) IF **safety**=*med* THEN **recommendation**=*unacc*

We see that our best choice is to add **persons**=2 to the rule making it cover 3 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>more</i>	<i>low</i>	<i>unacc</i>
<i>med</i>	<i>low</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>high</i>	<i>med</i>	<i>4</i>	<i>low</i>	<i>unacc</i>
<i>low</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>

### 1.3.2 Rule 2

#### 1.3.2.1 IF ? THEN **recommendation=unacc**

We are starting with IF  $\emptyset$  THEN **recommendation=unacc**, that is a rule with no antecedent. We can extend this rule in the following ways:

- (50.00% ;  $\frac{1}{2}$ ) IF **buying-price=high** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{2}$ ) IF **buying-price=low** THEN **recommendation=unacc**
- (25.00% ;  $\frac{1}{4}$ ) IF **buying-price=med** THEN **recommendation=unacc**
- (100.00% ;  $\frac{1}{1}$ ) IF **buying-price=vhigh** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{0}$ ) IF **maintenance=high** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance=low** THEN **recommendation=unacc**
- (25.00% ;  $\frac{1}{4}$ ) IF **maintenance=med** THEN **recommendation=unacc**
- (50.00% ;  $\frac{2}{4}$ ) IF **maintenance=vhigh** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=2** THEN **recommendation=unacc**
- (33.33% ;  $\frac{2}{6}$ ) IF **persons=4** THEN **recommendation=unacc**
- (33.33% ;  $\frac{1}{3}$ ) IF **persons=more** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{2}$ ) IF **safety=high** THEN **recommendation=unacc**
- (100.00% ;  $\frac{2}{2}$ ) IF **safety=low** THEN **recommendation=unacc**
- (20.00% ;  $\frac{1}{5}$ ) IF **safety=med** THEN **recommendation=unacc**

We see that our best choice is to add **safety=low** to the rule making it cover 2 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>vhigh</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>unacc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>low</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>low</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>



### 1.3.3 Rule 3

#### 1.3.3.1 IF ? THEN **recommendation=unacc**

We are starting with IF  $\emptyset$  THEN **recommendation=unacc**, that is a rule with no antecedent. We can extend this rule in the following ways:

- (0.00% ;  $\frac{0}{1}$ ) IF **buying-price=high** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{2}$ ) IF **buying-price=low** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{3}$ ) IF **buying-price=med** THEN **recommendation=unacc**
- (100.00% ;  $\frac{1}{1}$ ) IF **buying-price=vhigh** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{0}$ ) IF **maintenance=high** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{1}$ ) IF **maintenance=low** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{3}$ ) IF **maintenance=med** THEN **recommendation=unacc**
- (33.33% ;  $\frac{1}{3}$ ) IF **maintenance=vhigh** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{0}$ ) IF **persons=2** THEN **recommendation=unacc**
- (20.00% ;  $\frac{1}{5}$ ) IF **persons=4** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{2}$ ) IF **persons=more** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{2}$ ) IF **safety=high** THEN **recommendation=unacc**
- (0.00% ;  $\frac{0}{0}$ ) IF **safety=low** THEN **recommendation=unacc**
- (20.00% ;  $\frac{1}{5}$ ) IF **safety=med** THEN **recommendation=unacc**

We see that our best choice is to add **buying-price=vhigh** to the rule making it cover 1 instance(s) with accuracy of 100.00%. The rule has 100% accuracy so we can stop here and add this rule to our ruleset.

We now remove all the instances covered by our new rule. We are left with:

buying-price	maintenance	persons	safety	recommendation
<i>high</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>
<i>low</i>	<i>vhigh</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>vhigh</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>med</i>	<i>more</i>	<i>med</i>	<i>acc</i>
<i>med</i>	<i>low</i>	<i>4</i>	<i>med</i>	<i>acc</i>
<i>low</i>	<i>med</i>	<i>4</i>	<i>high</i>	<i>good</i>

There are no more instances with **recommendation=unacc** so we are done with generating rules for this target class.

## 1.4 Final Ruleset

Having generated rules for each target class, we have collected the following ruleset:

- IF **buying-price**=*med* AND **safety**=*med* THEN **recommendation**=*acc*
- IF **persons**=*more* AND **buying-price**=*low* THEN **recommendation**=*acc*
- IF **safety**=*high* AND **maintenance**=*med* THEN **recommendation**=*good*
- IF **persons**=2 THEN **recommendation**=*unacc*
- IF **safety**=*low* THEN **recommendation**=*unacc*
- IF **buying-price**=*vhigh* THEN **recommendation**=*unacc*