



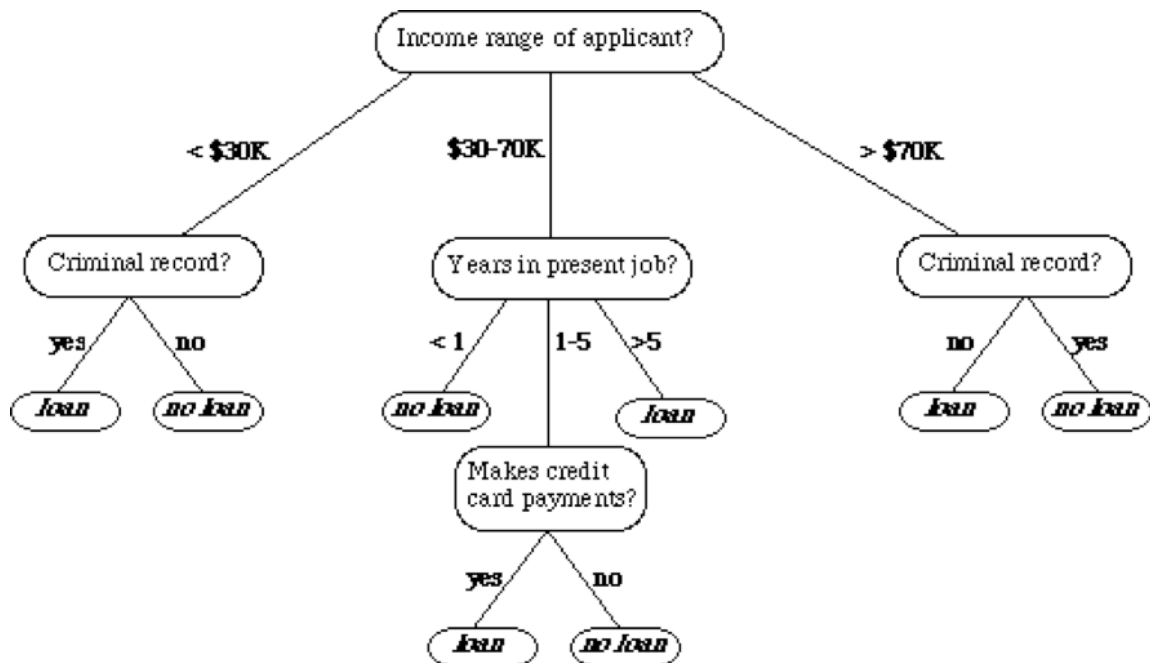
## Review Test Submission: Rule & Logic Based Classifiers

User	Fei Shen
Course	CS-584-Parent.17S
Test	Rule & Logic Based Classifiers
Started	2/18/17 3:17 PM
Submitted	2/18/17 3:44 PM
Due Date	2/18/17 11:59 PM
Status	Completed
Attempt Score	70 out of 70 points
Time Elapsed	26 minutes out of 2 hours
Results Displayed	All Answers, Submitted Answers, Correct Answers

### Question 1

10 out of 10 points

Which of the following are rules that could be derived directly from the decision tree (with no pruning)? Note there could be multiple correct choices.



Selected  
Answers:



Income = "\$30-70K" & YearsInJob = "1-5" &  
MakesCreditCardPayments=Yes → "Loan"



Income > \$70K & CriminalRecord=Yes → "No loan"

Income = "\$30-70K" & YearsInJob > 5 → "Loan"



Answers:

Income > \$70K & YearsInJob > 5 → "Loan"

Income > \$70K & YearsInJob > 5 → "Loan"



Income = "\$30-70K" & YearsInJob = "1-5" &  
MakesCreditCardPayments=Yes → "Loan"



Income > \$70K & CriminalRecord=Yes → "No loan"

Income < \$30K & CriminalRecord=Yes → "No loan"

Income = "\$30-70K" & MakesCreditCardPayments=Yes → "Loan"

Income = "\$30-70K" & YearsInJob > 5 → "Loan"



YearsInJob > 5 → "Loan"

## Question 2

10 out of 10 points

Below is a small dataset of 10 tax payers (the dataset on Pg 12 of the lecture slides). Please compute the FOIL gain for L="Refund=No" and R="Marital Status=Single --> Yes".

Note: If the result is an infinite decimal, please round it off to 3 decimal digits.

<i>Tid</i>	<i>Refund</i>	<i>Marital Status</i>	<i>Taxable Income</i>	<i>Cheat</i>
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No
4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No

10	No	Single	90K	Yes
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FOIL\_gain(L, R) = ?

Selected Answer:  0.830

Correct Answer:  0.83

Answer range +/- 0.001 (0.829 - 0.831)

### Question 3

10 out of 10 points


If  $(a < b \wedge B) \vdash c < d$ , what is B? Please use inverted resolution to compute B.

Selected Answer:   $\neg a < b \vee c < d$

Answers:  $a < b \vee c < d$

$a < b \wedge c < d$

$\neg a < b \wedge c < d$

  $\neg a < b \vee c < d$

### Question 4

40 out of 40 points

Below is a small dataset of 10 tax payers (the dataset on Pg 12 of the lecture slides). Please compute the values of the following 4 metrics for the rule "Refund=No  $\rightarrow$  Yes".

coverage = [a],

accuracy = [b],


Laplace = [c],


M-estimate = [d] (prior probability  $p$  is set to 0.2)


Note: If the result is an infinite decimal, please round it off to 3 decimal digits.


<i>Tid</i>	<i>Refund</i>	<i>Marital Status</i>	<i>Taxable Income</i>	<i>Cheat</i>
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No





4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No
10	No	Single	90K	Yes

Specified Answer for: a  0.7

Specified Answer for: b  0.429

Specified Answer for: c  0.444

Specified Answer for: d  0.378

Correct Answers for: a		
Evaluation Method	Correct Answer	Case Sensitivity
 Pattern Match	(0)?.7(00)?	
Correct Answers for: b		
Evaluation Method	Correct Answer	Case Sensitivity
 Pattern Match	(0)?.429	
Correct Answers for: c		
Evaluation Method	Correct Answer	Case Sensitivity
 Pattern Match	(0)?.444	
Correct Answers for: d		
Evaluation Method	Correct Answer	Case Sensitivity
 Pattern Match	(0)?.378	

Friday, April 28, 2017 5:40:14 PM CDT

← OK