Review Test Submission: Quiz 6: Probability & Naive Bayes

User	Fei Shen
Course	CS-584-Parent.17S
Test	Quiz 6: Probability & Naive Bayes
Started	3/13/17 4:09 PM
Submitted	3/13/17 5:18 PM
Due Date	3/14/17 11:59 PM
Status	Completed
Attempt Score	70 out of 70 points
Time Elapsed	1 hour, 9 minutes out of 2 hours
Results Displayed	All Answers, Submitted Answers, Correct Answers

Question 1

10 out of 10 points

Given 3 binary random variables X1, X2, X3 whose values are either T or F. Suppose

P(X1=F | X2=T) = 0.2,

P(X3=F | X1=T, X2=T) = 0.1,

P(X2=F) = 0.3,

What's the probability that all of X1, X2, X3 are T?

Selected Answer: 0.504

Correct Answer: 0.5040 ± 0.001

Question 2

20 out of 20 points

Given four binary variables X1, X2, X3, Y and the following instances, use Naive Bayes Classifier to compute the probability P(Y=1 | X1=0, X2=0, X3=0). Round your answer to 3 decimal places if necessary.

X1	X2	X3	Y
0	1	1	1
1	0	0	1
0	1	0	0
1	0	1	0

0	0	1	1

Selected Answer: 0.640
Correct Answer: 0.64
Answer range +/- 0.001 (0.639 - 0.641)

Question 3

10 out of 10 points

What's the variance of a uniform distribution U(4, 18).

Selected Answer: 16.333
Correct Answer: 16.3333 ± 0.001

Question 4

10 out of 10 points

Given k (k=5) discrete random variables: X1, X2, X3, ..., X_k, where each of them can take one of 2 possible values. There is no independence nor conditional independence between any pair of variables. How many independent parameters are needed to represent the full joint probability table P(X1, X2, X3, ..., $X_{k-2} \mid X_{k-1}, X_k$)?

Selected Answer: 28
Correct Answer: 28 ± 0

Question 5

10 out of 10 points

For two binary variables X, Y, their joint distribution is given in the following table. For example, this table tells us P(X=0, Y=0) = 1/3.

There are two values (*a* and *b*) missing in this table, but we know X and Y are independent. Please infer the value of *a*. Round your answer to 3 decimal places if necessary.

Probability	X=0	X=1
Y=0	1/3	1/6
Y=1	*a*	*b*

Selected Answer: 0.333
Correct Answer: 0.333333
Answer range +/- 0.01 (0.323333 - 0.343333)

Question 6

10 out of 10 points

Given three binary variables X, Y, Z whose values are either T or F. Suppose

P(Z=F | Y=T) = 0.2,

P(Z=T | X=T, Y=T) = 0.7,

P(X=T | Y=T) = 0.3,

what's the probability P(X=F | Y=T, Z=T) ? Please round your answer to 3 decimal places if necessary

Selected Answer: 0.738

Correct Answer: 0.7375 ± 0.001

Friday, April 28, 2017 5:39:45 PM CDT

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