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ECS763U/ECS763P - Natural Language Processing - 2022/23 - Semester 1

Started on	Sunday, 6 November 2022, 10:48 PM
State	Finished
Completed on	Sunday, 6 November 2022, 11:12 PM
Time taken	24 mins 23 secs
Grade	**10.00** out of 10.00 (**100**%)

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Question **1**
Correct
Mark 1.00 out of 1.00
Flag question

POS-tagging is one of the most difficult NLP tasks to get a high accuracy classifier for.

Select one:
- True
- False ✔

The correct answer is 'False'.

Question **2**
Correct
Mark 1.00 out of 1.00
Flag question

HMMs estimate the underlying probability model of the data $p(x)$ while CRFs cannot.

Select one:
- True ✔
- False

The correct answer is 'True'.

Question **3**
Correct
Mark 1.00 out of 1.00
Flag question

CRFs are generally better at handling large feature sets compared to HMMs.

Select one:
- True ✔
- False

The correct answer is 'True'.

Question **4**
Correct
Mark 1.00 out of 1.00
Flag question

In a Hidden Markov Model, the class sequence model defined by a Markov Model is referred to as the _____.

Select one:
a. Emission probabilities
b. Transition probabilities ✔

The correct answer is: Transition probabilities

Question **5**
Correct
Mark 1.00 out of 1.00
Flag question

Which of these are true of Conditional Random Field (CRF) sequence classifiers?

Select one or more:
a. CRFs can be quite slow in decoding. ✔
b. CRFs use the same equation as a Maximum Entropy/Logistic Regression classifier. ✔
c. CRFs output real probability values according to a model.
d. CRFs can handle rich, overlapping features. ✔
e. CRFs use the same principle as language models.
f. CRFs can model underlying transitions of a hidden model better than HMMs.

The correct answers are: CRFs can handle rich, overlapping features., CRFs can be quite slow in decoding., CRFs use the same equation as a Maximum Entropy/Logistic Regression classifier.

Question **6**
Correct
Mark 1.00 out of 1.00
Flag question

In the below sentence showing the word/POS pair, select the appropriate Penn Treebank style POS tag in the missing position indicated by ?
Bill/NN wanted/VBD to/? go/VB home/NN.

Select one:
a. MD
b. IN
c. RB
d. TO ✔
e. JJ

The correct answer is: TO

Question **7**
Correct
Mark 1.00 out of 1.00
Flag question

Consider the below probability tables for a first order Hidden Markov Model for a Part-of-Speech tagger. The transition probabilities between the tags is shown in the top table, i.e. the $p(c_i|c_{i-1})$ values. The emission probabilities are shown in the bottom table, i.e. the $p(w_i|c_i)$ values. Give the probability that the second tag will be NN given the first tag is DT, i.e. $p(c_2 = NN|c_1 = DT)$.

c_i

c_{i-1}	NNP	MD	VB	DT	NN
$\langle s \rangle$	0.2	0	0	0.5	0.3
NNP	0.2	0.3	0.4	0.1	0
MD	0.5	0	0.5	0	0
VB	0.4	0	0	0.4	0.2
DT	0.1	0	0	0.5	0.4
NN	0	0	0.6	0	0.4

w_i

c_i	john	will	like	the	food
NNP	0.7	0.3	0	0	0
MD	0	1.0	0	0	0
VB	0	0.3	0.7	0	0
DT	0	0	0	1.0	0
NN	0.1	0.1	0	0	0.8

Answer: 0.4 ✔

The correct answer is: 0.4

Question **8**
Correct
Mark 1.00 out of 1.00
Flag question

Consider the below probability tables for a first order Hidden Markov Model for a Part-of-Speech tagger. The transition probabilities between the tags is shown in the top table, i.e. the $p(c_i|c_{i-1})$ values. The emission probabilities are shown in the bottom table, i.e. the $p(w_i|c_i)$ values. Give the probability that the first tag will be DT after the start symbol $\langle S \rangle$, i.e. $p(c_1 = DT|c_0 = \langle S \rangle)$.

c_i

c_{i-1}	NNP	MD	VB	DT	NN
$\langle s \rangle$	0.2	0	0	0.5	0.3
NNP	0.2	0.3	0.4	0.1	0
MD	0.5	0	0.5	0	0
VB	0.4	0	0	0.4	0.2
DT	0.1	0	0	0.5	0.4
NN	0	0	0.6	0	0.4

w_i

c_i	john	will	like	the	food
NNP	0.7	0.3	0	0	0
MD	0	1.0	0	0	0
VB	0	0.3	0.7	0	0
DT	0	0	0	1.0	0
NN	0.1	0.1	0	0	0.8

Answer: 0.5 ✔

The correct answer is: 0.5

Question **9**
Correct
Mark 1.00 out of 1.00
Flag question

Consider the below probability tables for a first order Hidden Markov Model for a Part-of-Speech tagger. The transition probabilities between the tags is shown in the top table, i.e. the $p(c_i|c_{i-1})$ values. The emission probabilities are shown in the bottom table, i.e. the $p(w_i|c_i)$ values. Give the probability that the first word will be "the" i.e. $p(w_1 = the)$. Give your answer to 1 DECIMAL PLACE.

c_i

c_{i-1}	NNP	MD	VB	DT	NN
$\langle s \rangle$	0.2	0	0	0.5	0.3
NNP	0.2	0.3	0.4	0.1	0
MD	0.5	0	0.5	0	0
VB	0.4	0	0	0.4	0.2
DT	0.1	0	0	0.5	0.4
NN	0	0	0.6	0	0.4

w_i

c_i	john	will	like	the	food
NNP	0.7	0.3	0	0	0
MD	0	1.0	0	0	0
VB	0	0.3	0.7	0	0
DT	0	0	0	1.0	0
NN	0.1	0.1	0	0	0.8

Answer: 0.5 ✔

The correct answer is: 0.5

Question **10**
Correct
Mark 1.00 out of 1.00
Flag question

Consider the below probability tables for a first order Hidden Markov Model for a Part-of-Speech tagger. The transition probabilities between the tags is shown in the top table, i.e. the $p(c_i|c_{i-1})$ values. The emission probabilities are shown in the bottom table, i.e. the $p(w_i|c_i)$ values. Give the probability that the first word will be "food" i.e. $p(w_1 = food)$. Give your answer to 2 DECIMAL PLACES.

c_i

c_{i-1}	NNP	MD	VB	DT	NN
$\langle s \rangle$	0.2	0	0	0.5	0.3
NNP	0.2	0.3	0.4	0.1	0
MD	0.5	0	0.5	0	0
VB	0.4	0	0	0.4	0.2
DT	0.1	0	0	0.5	0.4
NN	0	0	0.6	0	0.4

w_i

c_i	john	will	like	the	food
NNP	0.7	0.3	0	0	0
MD	0	1.0	0	0	0
VB	0	0.3	0.7	0	0
DT	0	0	0	1.0	0
NN	0.1	0.1	0	0	0.8

Answer: 0.24 ✔

The correct answer is: 0.24

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◀ Lecture live Zoom link for remote participants

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