Feedback — Parsing

Help

You submitted this quiz on **Fri 27 Apr 2012 1:54 PM PDT**. You got a score of **4.75** out of **5.00**.

Question 1

Convert the following grammar to Chomsky Normal Form (as described in the lecture video):

A → B C

B → *e*

B → C C

C → C D

C → C D D

Your Answer		Score	Explanation
○ ---------- A → B C A → C D A → C @D_D B → C C B →*e* C → C D C → C @D_D @D_D → D D ----------			
◉ ---------- A → B C A → C D A → C @A_C @A_C → D D B → C C C → C D	✔	1.00	

C → C @C_C
@C_C → D D

A → B C
A → C D
A → @A_D D
@A_D → C D

B → C C
B → *e*

C → C D
C → @C_D D
@C_D → C D

A → B C

B → C C

C → C D
C → @C_C C
@C_C → D D

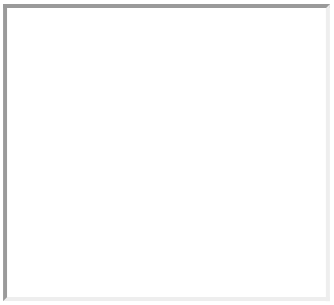
Total	1.00 / 1.00

Question 2

Given the following grammar and transition probabilities:

S → NP VP	0.9
S → VP	0.1
VP → V NP	0.5
VP → V	0.1
VP → V @VP_V	0.3
VP → V PP	0.1
@VP_V → NP NP	1.0
NP → NP NP	0.1
NP → NP PP	0.2
NP → N	0.7
PP → P NP	1.0

And given the following part of the CKY matrix:



Which of the following constituents (and with what *maximum* probability) will be in the next cell?

Your Answer		Score	Explanation
S: 0.05	✔	0.25	You may have tried to apply the S $\rightarrow$ VP unary rule to the upper left cell, but that rule applies only to that cell - the S label does not go into the upper right cell (the cell we are concerned about).
PP: 0.042	✔	0.25	PP $\rightarrow$ P NP: $1.0 \times 0.1 \times 0.42 = 0.042$.
VP: 0.04	✖	0.00	There is actually no way to get a VP in the next cell from what is given. You may have tried to apply the unary rule VP $\rightarrow$ V in the lower right cell, but that does not apply to the next cell.
@VP_V: 0.084	✔	0.25	@VP_V $\rightarrow$ NP NP: $1.0 \times 0.2 \times 0.42 = 0.084$
Total		0.75 / 1.00	

Question 3

Given the following true and guessed parses, what is the LP/LR F1 (excluding any contribution from `ROOT`)?

```
Guess:
(ROOT
  (S
    (NP (DT The))
    (VP (VBP work)
      (VP (VBN reviewed)
```

```
        (PP (IN in)
          (NP
            (NP (DT this) (NN article) (NN separates) (NN T) (NN cell) (NN develop
ment))
            (PP (IN into)
              (NP (CD four) (NNS phases)))))))
    (. .)))

Gold:
(ROOT
  (S
    (NP
      (NP (DT The) (NN work))
      (VP (VBN reviewed)
        (PP (IN in)
          (NP (DT this) (NN article)))))
    (VP (VBZ separates)
      (NP (NN T) (NN cell) (NN development))
      (PP (IN into)
        (NP (CD four) (NNS phases))))
    (. .)))
```

Your Answer		Score	Explanation
○ 0.31667			
◉ 0.3158	✔	1.00	
○ 0.6383			
○ 0.3333			
Total		1.00 / 1.00	

Question Explanation

With a labeled precision of 0.3333 and a recall of 0.3, we have a F1 of 0.3158.

Question 4

Lexicalize the following parse tree (annotate each non-terminal with the head of the phrase over which it is a constituent):

```
(S
  (PP (TO to)
    (NP (PRP him)))
```

```
  (NP (PRP she))
  (VP (VBD was)
    (NP (DT a) (JJ good) (NN friend))))
(. .))
```

Your Answer		Score	Explanation
(S-was (PP-to (TO to) (NP-him (PRP him))) (NP-she (PRP she)) (VP-was (VBD was) (NP-friend (DT a) (JJ good) (NN friend)))) (. .))	✔	1.00	
(S-to (PP-to (TO to) (NP-him (PRP him))) (NP-she (PRP she)) (VP-was (VBD was) (NP-friend (DT a) (JJ good) (NN friend)))) (. .))			
(S-she (PP-to (TO to) (NP-him (PRP him))) (NP-she (PRP she)) (VP-was (VBD was) (NP-friend (DT a) (JJ good) (NN friend)))) (. .))			
(S-was (PP-him (TO to) (NP-him (PRP him))) (NP-she (PRP she)) (VP-was (VBD was) (NP-friend (DT a) (JJ good) (NN friend)))) (. .))			
Total		1.00 / 1.00	

Question Explanation

The basic rules for head words of constituents in a parse tree are:

- The head of a noun phrase (NP) is the last noun in the phrase.

- The head of a verb phrase (VP) is the verb.
- The head of a sentence (S) is the head of the main verb phrase.
- The head of a prepositional phrase (PP) is the preposition.

Question 5

Given the following parse trees,

```
( (S (NP (NP (DT Each))
         (PP (IN of)
             (NP (NP (DT the) (NNS chapters))
                 (PP (IN of)
                     (NP (NNS Investigations))))))
     (VP (VBZ broaches)
         (NP (JJ new) (NN territory)))
     (. .)))

( (S (NP (DT Each))
     (VP (VBZ is)
         (ADJP (ADJP (JJ tentative) (CC and) (JJ incomplete))
               (, ,)
               (UCP (VP (VBG pointing))
                    (CONJP (RB but) (RB not))
                    (ADJP (RB fully) (JJ adequate)))))
     (. .)))
```

What is the MLE probability of the rule `NP^PP -> NP PP` if we were to perform parent annotation?

Your Answer		Score	Explanation
$2/3$			
$2/7$			
$1/2$	✔	1.00	Out of 2 instances of `NP` with `PP` parent, only 1 is followed by `NP PP`.
1			
Total		1.00 / 1.00	