

CSCI 5832 Fall 2013 Quiz 2

Name: \_\_\_\_\_

On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work. \_\_\_\_\_.

1. **(5 points)** What is your favorite movie?
2. **(5 points)** Give the sentence-level rule (S) that would account for the following kind of sentence:

*When did John fly to Miami?*                      S →

3. Consider the grammar on the attached page along with the following sentence.

*Kate booked Bella a flight on Monday.*

- a) **(5 points)** How many correct trees are there for this sentence?
  - b) **(5 points)** Show one correct tree for this sentence. Use the back.
4. **(5 points)** Lexicalize with heads the tree you produced for the previous question (just decorate the tree you have). Use the back.
  5. **(10 points)** Give an unlabeled dependency parse for the same tree. Use the back.
  6. **(10 points)** What role, if any, would the lexical rule probabilities play in selecting among the ambiguous parses for question 3? Assume the standard bag of rules PCFG model of statistical parsing.
  7. **(5 points) True/False:** In the CKY-based approach to statistical parsing, the algorithm does an **argmax** over the probability of all the constituents of a given type in a given cell  $[i,j]$  in the parse table.

8. (20 points) Assume that during a rule-to-rule compositional semantic analysis the following semantic representation has been produced for the VP node that immediately dominates the verb *booked* from the sentence for question three.
- (5 points) Yes/No Is this fragment compatible with the tree you selected for question 3b?
  - (10 points) Fill in the remaining semantic attachments for all the rules needed needed to produce *just this part of the representation* of this sentence. That is, just the rules used in the VP and below. You don't have to stick with the tree you gave for question 3. Just list the attachments next to the relevant rules on the next page.
  - (5 points) What problems/issues would we face in completing the remaining rules that would be needed to complete the analysis of this sentence?

$\lambda x. \exists e \text{ booking}(e) \wedge \text{booker}(e, x) \wedge \text{traveler}(e, \text{BELLA}) \wedge \text{transport}(e, \text{FLIGHT})$

## Grammar 1

### *Syntax*

1. S  $\rightarrow$  NP VP

2 NP  $\rightarrow$  PN

3 NP  $\rightarrow$  Det N

4 NP  $\rightarrow$  NP PP

5 VP  $\rightarrow$  Verb NP

6 VP  $\rightarrow$  Verb NP PP

7 VP  $\rightarrow$  Verb NP NP

8 VP  $\rightarrow$  VP PP

9 PP  $\rightarrow$  P NP

10 Verb  $\rightarrow$  *booked*

12 PN  $\rightarrow$  *Kate*

13 PN  $\rightarrow$  *Bella*

15 PN  $\rightarrow$  *Monday*

15 N  $\rightarrow$  *flight*

16 P  $\rightarrow$  *on*

17 Det  $\rightarrow$  *a*

### *Semantics*

{PN.Sem}

{KATE}

{BELLA}

{MONDAY}

{FLIGHT}