ISYS30221 Artificial Intelligence **2016/17**

Lab Sheet for NLP, Part 3/5

Task 1
The complete set of production rules and a lexicon of terminal symbols for a language are given below:
GRAMMAR:
1 S → NP VP
2 NP → DET N
3 NP → DET ADJ N
4 VP → V
5 VP → V ADV

LEXICON ENTRIES:
A (DET)
The (DET)
big (ADJ)
small (ADJ)
bark (V) (N)
barks (V) (N)
dog (N) (V)
cat (N)
dogs (N) (V)
loudly (ADV)
slowly (ADV)
fast (ADV) (ADJ) (N) (V)
fasts (N) (V)

Show in tabular form, step by step, how a top-down parser would use the above grammar and lexicon to parse the sentence: *The big dogs bark loudly.* Indicate clearly any occurrences of backtracking in your table.

Task 2
(a) Start NLTK's recursive descent parser demo app using `nltk.app.rdparser()`. Using the grammar and sentence from task 1, have this parser do the parsing.
(b) Repeat this using NLTK's chart parser, callable as `nltk.app.chartparser()`. (Hint: This demo uses a slightly different but equivalent representation of the chart, and allows the user to apply steps of different algorithms. Try applying "Bottom up strategy" repeatedly.)