All students should read from the beginning of Chapter 4 to §4.2 of the textbook in preparation for this assignment and the next lecture.

Distribute the following questions across the members of your group. You will share your solutions (and most importantly the *method* of your solutions) during the next lecture period. Divide up the questions so that **each** question has at least two solutions from different group members.

- 1. (a) Page 138, question 1 ('What is a sentence diagram?' you may ask...)
  - (b) We likely discussed show\_chl-nested-re-structures.pdf in lecture today, and we now know that regular languages cannot express "arbitrarily deep nesting of recursive structures", such as matching parenthesis. Show the simplist **context free grammar** you can think of that demonstrates CFG's ability to represent these languages. **Hint:** you'll need three rules, two non-terminals, one  $\lambda$  and an alphabet  $\Sigma$  with just two terminals (make them "matching", like  $\Sigma = \{ (, ) \} \text{ or } \{ [, ] \} \dots$ ).
- 2. Page 138, question 2 (Hint: look up various uses of the word "buffalo" both capitalized and not. The sentence is written without punctuation hints, feel free to add some.)
- 3. Page 138, question 4

For questions 4—6, use the following grammar:

4.	(a)	Show a left-most derivation of the source string	bghstp
	(b)	Show the resulting parse tree for the source string	bghn
5.	(a)	Show a left-most derivation of the source string	bghn
	(b)	Show a right-most derivation of the source string	bghstp
	(c)	Show the resulting parse tree for the source string	n p
6.	(a)	Show a right-most derivation of the source string	bghn
	(b)	Show the resulting parse tree for the source string	bghstp