Homework 12 Due date: Wednesday, April 20, 2016 in class

The answers must be the original work of the author. While discussion with others is permitted and encouraged, the final work should be done individually. You are not allowed to work in groups. You are allowed to build on the material supplied in the class. Any other source must be specified clearly.

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1. *(10+5+5 points)* Consider the following grammar.

$$S \to aABab \,|\, aBAba$$
$$A \to a \,|\, c$$
$$B \to b \,|\, c \,|\, \lambda$$

(a) Draw the graph of the above grammar.

(b) Give the lookahead set for each rule.

(c) What is the lookahead length needed to deterministically parse strings from this grammar? Explain your answer.

2. *(20 points)* Convert 1362_{10} to binary using two different methods. Show your work *(10 points)*.

3. *(20 points)* Convert 0.3_{10} to binary. Show the result in 4 bits of precision and 16 bits of precision for the decimal part. Show your work *(10 points)*.

4. *(20 points)* Create your own example where the associative law fails due to limited precision.

5. *(20 points)* Create your own example where the distributive law fails due to limited precision.