

Homework 06**Guidelines for homework assignments:**

- All homework assignments should be neatly written with answers to questions presented in numerical order. Make sure that you attempt problems starting at the top of the sheet proceeding downward. Have enough empty space between one problem and the next.
- Be sure to answer all parts of each question.
- Your answers must contain detailed work and explanations for your steps. This is a MUST. 50% of credit will be deducted from your score if no detailed work is shown. To get full credit, you must show all your work.
- Your submission must be in PDF format, any other formats will not be accepted on Canvas.
- Late submission is not accepted.
- Email submission is not accepted. You must submit your homework assignments on Canvas.
- Your instructor will deduct points if your answer is hard to understand because of poor grammar or poor handwriting.

P01. Leftmost Derivation (10 points)

Find the leftmost derivation for the word “*abbabaabbbabbab*” in the grammar

$$S \rightarrow SSS \mid aXb$$

$$X \rightarrow ba \mid bba \mid abb$$

P02. Pushdown Automata (20 points)

- (12 points) Consider the following deterministic PDA, using a trace table like those in chapter 14, page 305, show what happens to the INPUT TAPE and STACK as each of the following words proceeds through the machine: “**abb**” and “**abab**”.
- (3 points) What is the language accepted by this PDA?
- (3 points) Find a CFG that generates this language.
- (2 points) Is this language regular? Explain why?

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