

CSI 409 — Fall 2017: Homework #5

Due date: Nov 8

Answer all questions on your own. Turn in your answers at the **beginning** of class. Write your preferred e-mail address (e.g. zz6000@csc). If you are using more than one sheet of paper, make sure that you *staple* all the sheets together.

Remember that collaboration of any kind is not allowed.

1. Construct the CYK-table for the string $aabb$ using the following grammar:

$$\begin{aligned} S &\rightarrow AY \mid a \\ X &\rightarrow AY \\ Y &\rightarrow XZ \mid XB \mid b \\ Z &\rightarrow XB \mid b \\ B &\rightarrow b \\ A &\rightarrow a \end{aligned}$$

2. Design a pushdown automaton for the following language: (The alphabet is $\{a, b\}$.)

$$\{a^n b^{2n} \mid n \geq 1\}$$