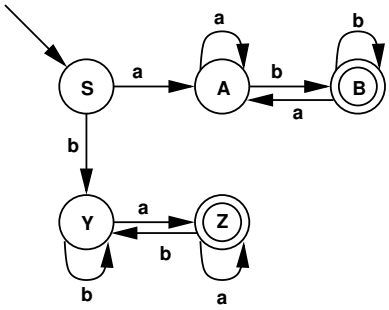
COMP 310 Homework 3

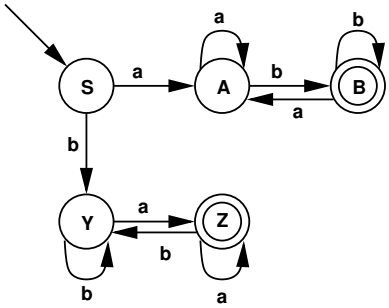
Solve the following problems, type them up, convert into a pdf file, and submit via moodle by 2355 on Monday 6/30. Clearly submissions made by the deadline are counted as on time, but additionally submissions made **before** I begin grading the item are also counted as on time. If moodle allows you to submit then I have not begun grading the item. My suggestion would be to submit something by the deadline and if you improve your answers then resubmit. Homework is not accepted after I begin to grade it. A subset of the questions will be graded. While your score will primarily be determined by whether your answers are correct, a portion of the score will be determined by the appearance of your submission and whether you followed directions. For example, submitting a word document instead of a pdf will cause you to lose some points.

Problem 1. (10 points) Create an NFA which accepts the language described by the regular expression $(a + ba + baa)^* + \lambda + (ba + b)^*(ab + a)^*$.

Problem 2. (10 points) Create a regular grammar that generates the language accepted by the DFA below.



Problem 3. (10 points) Create a regular expression that describes the same language as accepted by the DFA below.



Problem 4. (10 points) Create an NPDA which accepts $\{a^i b^j c^k : i + 2j = k + 2\}$.

Problem 5. (10 points) Create an NPDA which accepts $\{w \in \{a, b\}^* : \#a = 2 \cdot \#b + 2\}$.

Problem 6. (10 points) Create an CFG which generates $\{a^i b^j c^k : i + 2j = k + 2\}$.

Problem 7. (10 points) Create an CFG which generates $\{w \in \{a, b\}^* : \#a = 2 \cdot \#b + 2\}$.