Homework 7: Languages and Finite State Automata

Submission policy. Submit your answers online on BB **before** the class starts on **Monday**, April 6, 2020. No late submissions accepted.

1. Handwritten answers are fine but please make sure they are readable.
2. Your name should be printed at the very top of the document.

Administration. This assignment will be graded by the GTA.

Practice Questions – Do NOT submit these.

Textbook questions 7.1, 7.4, 7.5, 7.6, 7.10, 7.12, 9.3, 9.4

Questions that will be graded. Total Points 100.

Exercise 1.

1. [50 points]
Let $L = \{x | x = yz, y \in \{a\}^*, z \in \{\Lambda, b, bb\}\}$
Let $L_1 = \{x | x \in L, |x| \leq 4\}$.
List all the strings in L_1.

2. [50 points]
Define a finite state automaton (as a state transition diagram) that accepts the following language over the alphabet $\Sigma = \{0, 1\}$:
$L = \{x \mid x$ starts with 1, *or* x contains at least two 0s$\}$
If the diagram has a trap state, you must include it.
(Note: In the definition of L, the *or* is inclusive. For example, the string $100 \in L$)