COMP 615 HW 3: Finite State Transducers and 2DFAs

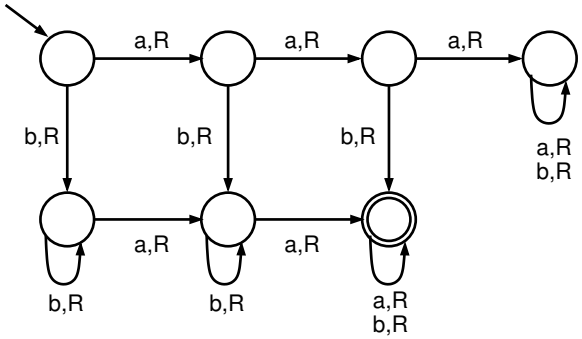
Problem 1. (10 points) Create a finite state transducer that takes a binary string as input and replaces any occurrance of ab with ba.

Problem 2. (10 points) Create a finite state transducer that takes an input of a binary string and outputs that same string with all 0's replaced with 1's.

Problem 3. (10 points) Create a finite state transducer that take an input of a binary string and outputs a binary string with a value 7 times larger.

Problem 4. (10 points) For the 2DFA below:
What strings cause the machine to fall off the string to the right in a final state?
What strings cause the machine to fall off the string to the left in a final state?

What strings cause the machine to fall off the string to the right in a non-final state?
What strings cause the machine to fall off the string to the left in a non-final state?
What strings cause the machine to run forever?



Problem 5. (10 points) For the 2DFA below:
What strings cause the machine to fall off the string to the right in a final state?
What strings cause the machine to fall off the string to the left in a final state?

What strings cause the machine to fall off the string to the right in a non-final state?
What strings cause the machine to fall off the string to the left in a non-final state?
What strings cause the machine to run forever?