CS703: Problem set 2

Assigned September 28, due October 12

1 Infinite strings (16=8+8 points)

1.1 \(\omega\)-regular expressions (8 points)
Exercise 4.7 on page 221 of Principles of Model checking.

1.2 Buchi automata (8 points)
Exercise 4.10 on page 222 of Principles of Model checking.

1.3 Linear temporal logic (15=5+3+7 points)

1.3.1 Problem 1 (5 points)
Exercise 5.4 on page 302 of Principles of Model checking.

1.3.2 Problem 2 (3 points)
Exercise 5.7 on page 303 of Principles of Model checking. Make sure you provide the full semantics of the operators.

1.3.3 Problem 3 (7 points)
Construct the GNBA corresponding to the formula \((\neg a)U(Xb)\) using EXACTLY the construction proposed in Theorem 5.37 on page 278 of Principles of Model checking. (Please don’t draw the GNBA and use instead a symbolic notation to provide your solution).

2 CTL

2.1 Problem 1 (12 points)
Exercise 6.14 on page 436 of Principles of Model checking. For equivalences, provide arguments based on semantics of the formulas.
3 Bisimulation (6 points)

3.1 Problem 1 (6 points)

Exercise 7.7 (Part a) on page 585 of Principles of Model checking.