Due: Tuesday April 12, 2011

Please see Exercises on Pages 702–704 and 726–728. Also see, in particular, solutions to selected exercises at the end of textbook.

Question 1
Find a language (i.e., a set of strings) to describe each of the following regular expressions:
\( a + bc, \ a b^* + c, \ a^* b c^* + ac \)

Question 2
Find a regular expression to describe each of the following languages
1. \( \{aa, ab, ac\} \)
2. \( \{a, b, ab, ba, abb, baa, \ldots, ab^n, ba^n, \ldots\} \)
3. \( \{\Lambda, a, b, c, aa, bb, cc, \ldots, a^n, b^n, c^n, \ldots\} \)

Question 3
Find a regular expression for each of the following languages over \( \{a, b\} \):
1. Strings whose length is a multiple of 3.
2. Strings with an odd number of \( a \)'s.

Question 4
Design a finite automata (deterministic or non-deterministic) for each of the languages in Questions 2 and 3.

Question 5
Construct an NFA for each of the following regular expressions
1. \( (a + b)^* a \)
2. \( a^* b^* \)
3. \( a^* b c^* + ac \)
4. \( (a + a b^* c)^* \)