
HW 7 – Regular Expression

CS 421 – Fall 2012

Revision 1.0

Assigned October 23, 2012

Due October 30, 2012, 11:59 pm

Extension 48 hours (20% penalty)

1 Change Log

1.0 Initial Release.

2 Turn-In Procedure

Answer the problem below, save your work as a PDF (either scanned if handwritten or converted from a program), and hand in the PDF. Your file should be named `hw7.pdf`.

3 Objectives and Background

The purpose of this HW is to test your understanding of regular expression and distinguish the differences between regular grammar and other grammar.

4 Problems

- (20 points) Decide if the following descriptions of languages are regular languages. If they are not, give a small statement and suggest why they are not regular languages. If they are, write **the regular expression of the complement** of the language.
 - $L_1 = \{0^n 1^m \mid 0 \leq n \leq m \leq 2n\}$
 - $L_2 = \{w \mid w \text{ contains at least one } 1\}$ where $\Sigma = \{0,1\}$
 - $L_3 = \{w \mid w\text{'s length is even}\}$ where $\Sigma = \{0,1\}$
 - $L_4 = \{w \mid w \text{ contains even number of } 0 \text{ or } w \text{ contains odd number of } 1\}$ where $\Sigma = \{0,1\}$
 - $L_5 = \{0^{n^2} \mid n \text{ is natural number}\}$