

CS 21004
TUTORIAL-2
January 15th, 2016

1. Construct DFA for the following strings:
 - a) starts with 'a' and $|w| \equiv (1 \pmod{4})$
 - b) containing substring 'ab' but $|w|$ is not divisible by 2
 - c) Strings over $\{a,b\}^*$ which contain even no of a's and odd no of b's

2. Prove if the following languages are regular or not (supposing L_1 & L_2 as regular languages)
 - 1) Difference operation ($L_1 - L_2$)
 - 2) Right quotient of L_1 and L_2
 $L_1 \mid L_2 = \{x: xy \in L_1 \text{ for some } y \in L_2\}$

3. Construct NFA for
 $\{wxw^R \mid x \in (a,b)^*, w \in (a,b)^+ \text{ \& } w^R \text{ is the reverse of the string } w\}$

4. Draw the NFA for the following and convert them to their corresponding DFA
 1. Strings over $(a,b)^*$ that contain the substring 'abb'.

Home work:

1. Construct DFA for the following strings:
 - a) Number of occurrences of substring '10' is odd
 - b) Ternary Strings (base-3) whose integer equivalent is divisible by 7

2. Let L be a regular language. Prove whether the following languages are regular.:
 - a) rev_L where $rev_L = \{reverse(\alpha) \mid \alpha \in L\}$
 - b) $prefix_L$ where $prefix_L = \{ \alpha \mid \alpha\beta \in L \text{ for some } \beta \in \Sigma^* \}$
 - c) $suffix_L$ where $suffix_L = \{ \alpha \mid \beta\alpha \in L \text{ for some } \beta \in \Sigma^* \}$