

Homework 2 – due Wednesday, Sept. 6

Problem 1 If $w = a_1a_2 \dots a_{n-1}a_n$, the *reverse* of w , denoted by w^R , is $w = a_na_{n-1} \dots a_2a_1$. For a language L , $L^R = \{w^R \mid w \in L\}$. A string w is called *palindrome* if it is its own reverse, i.e., if $w = w^R$. A *palindrome language* is a language that contains only palindromes.

- (a) Prove that if L is a palindrome language, then $L = L^R$.
- (b) Prove or disprove: if $L = L^R$, then L is a palindrome language.

Problem 2 Prove that if $L \subseteq \Sigma^*$ is a regular language, then L^R is also regular.

Problem 3 Problem 1.12(a,b), page 85 of Sipser.

Problem 4 Problem 1.13(a,b,f,i,l), page 86 of Sipser.

Problem 5 Problem 1.16(a), page 86 of Sipser.