CSE 200
Computability and Complexity
Calibration Homework

September 20, 2006

1. A palindrome is a sequence of symbols $x_1 ... x_n$ which is the same in reverse, $x_1 ... x_n = x_n ... x_1$. Is the set of palindromes closed under concatenation, i.e., if x is a palindrome and y is a palindrome, is $x \circ y$ a palindrome? How about self-concatenation, if x is a palindrome, is xx a palindrome?
2. How many palindromes of length n are there over an alphabet Σ of size s? How many words of length n are reverse palindromes, in that no symbol of $x_1 ... x_n$ agrees with the corresponding symbol in $x_n ... x_1$? Be sure to prove your answer.
3. Assume that L is a language closed under concatenation. Prove that $L^+ = L$. When is $L^* = L$?
4. Problem 0.12, page 27 of the textbook.
5. In your favorite programming language, write a program that takes no input and prints itself (its own code). Your program may not make system calls.