

CS 380 Theory of Computation  
Spring 2008  
Homework4  
Due Feb 07

1. Prove whether the following languages are regular or not. (Use Pumping lemma or show there is a DFA that will accept the language.)
  - (a)  $\{0^m 1^n 0^{m+n} \mid m \geq 1 \text{ and } n \geq 1\}$
  - (b)  $\{0^n \mid n \text{ is a prime}\}$
  - (c)  $\{x \mid x \text{ in } (0 + 1)^*, \text{ and } x = x^R\}$   $x^R$  is  $x$  written backward; for example,  $(011)^R = 110$ .
  - (d)  $\{xwx^R \mid x, w \text{ in } (0 + 1)^+\}$   $x^R$  is  $x$  written backward; for example,  $(011)^R = 110$ .
2. Page-72, Ex-3.4(d, f)
3. Page-72 Ex-3.9(prove or disprove)