CSE 625, Fall, 2007
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CSE625 Homework 7
Due 26 Nov., 2007

1. Use the pumping lemma to show that the following languages are not CFL:
   (a) $\{ a^i b^j c^k \colon i < j < k \}$.
   (b) $\{ w \in \{a,b\}^* \colon n_a(x) = n_b(x)^2 \}$.
   (c) $\{ a^n b^{3n} c^n : n \geq 0 \}$.
   (d) $\{ a^i b^j a^i b^{i+j} : i, j \geq 0 \}$.
   (e) $\{ w \in \{a,b,c\}^* \colon n_a(x) = \max\{n_b(x), n_c(x)\} \}$.
2. In each case, show that the given language is a CFL but that its complement is not. (It follows in particular that the given language is not a DCFL.)
   (a) $\{a^i b^j c^k : i \geq j$ or $i \geq k\}$
   (b) $\{x \in \{a,b\}^* : x$ is not ww for any w$\}$