CSCE 433/627 Assignment 2 (Due Feb. 6)

1. Give a regular expression for the language $L = \{w \in \{a, b\}^* \mid w \text{ does not contain } abb\}$.
2. Given a regular language L over $\Sigma = \{a, b, c\}$, show that the language L' over $\Sigma = \{a, b\}$ obtained by changing c's into a's is regular.
3. Given a regular language R, is a language $L \subseteq R$ always regular? If yes, give a proof. If no, give an example.
4. Prove that the language $L = \{a^m b^n a^n \mid m > 0 \text{ and } n \geq 0\}$ is not regular.
5. Prove that the language $L = \{a^{m+n} b^m a^n \mid m, n \geq 0\} \cup \{a^m b^n a^{m+n} \mid m, n \geq 0\}$ is not regular.