**COT 4210 Quiz #1 (1/26/2012)**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1) (10 pts) Create a DFA that accepts the following language over the alphabet {a,b}: L = { w | w does NOT have consecutive appearances of the character b }. For example, aabaab, aaaa, and baaab are members of L, but bb, aaaaabb, and abababbaaaaa are not. Simply provide a clear drawing of your DFA. Make sure to clearly mark all 5 components of your DFA.

2) (10 pts) Give a regular expression for the language described in question number 1.

3) (10 pts) Prove or Disprove: If A and A $∩ $B are regular languages, then B is a regular language.

4) (20 pts) Use the Pumping Lemma to show that the language L = { $0^{2^{n}}| n \geq 0 $} is not a regular language.