Introduction to Theory of Computing	**Solutions for Quiz 1**
CS 481 Fall 2004	**Monday, September 6, 2004**

Name:_____

(1) True or false? (No explanation necessary or useful).

true	*false*	
☒	☐	If $A = \emptyset$ then $AB = \emptyset$ for all languages B ... as a word in AB is a concatenation of words in A and B, but A has no words.
☐	☒	If $A = \{\varepsilon\}$ then $AB = \emptyset$ for all languages B ... instead $AB = B$ for all languages B
☐	☒	If $A = \emptyset$ then $A^0 = \emptyset$ ... as we defined $A^0 = \{\varepsilon\}$ for any language A.
☐	☒	$\emptyset = \{\varepsilon\}$
☐	☒	If $A = \{a\}^*$ and $\Sigma = \{a, b\}$ then $\Sigma^* - A = \{b\}^*$ ... for example $ab \in \Sigma^* - A$ but not in $\{b\}^*$.

(2) Design deterministic finite automata that accepts the strings in $\{0, 1\}^*$ that contain at least one 1.

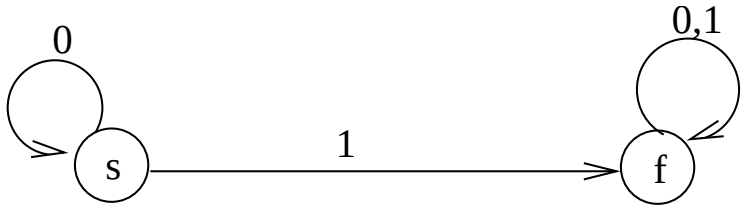

Figure 1: DFA that accepts the language above. State s is the start state and f is the only accepting state.