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

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| ☑ | ☐ | 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.