CSC236 tutorial exercises, Week #11
best before Thursday evening

These exercises are intended to give you some practice devising deterministic finite state automata (DFAs).

1. Let $L_1 = \{x \in \{a,b\}^* \mid$ the number of as in x is even$\}$, and let $L_2 = \{z \in \{a,b\}^* \mid |z| \equiv 0 \bmod 3\}$. Build DFAs that accept L_1, L_2, and use the product procedure to build a DFA that accepts $L_1 \cap L_2$.

2. Use structural induction to prove that the DFAs you propose accept L_1 and L_2. Without any further induction, prove that your product machine accepts $L_1 \cap L_2$ by constructing a state invariant consisting of conjunctions of the state invariants of the other two machines, and then using your earlier proofs to show that this new state invariant is correct.