1. Let $L = \{ \varepsilon, 01, 111 \}$ and $T = \{a, b, c\}$. Find the following:
   a. $L^1$
   b. $L^2$
   c. $L^3$
   d. $LT$
   e. $TL$

2. Give English-language descriptions and finite state automata capable of recognizing the languages generated by the following regular expressions:
   a. $(0 \mid 1)^*$
   b. $a^*b^*$
   c. $(01^*01^*)^*$
   d. $b^*(abb^*)$
   e. $(00\mid 111)^*$

3. Give a finite state automata that accepts the following languages over $\sum = \{a, b\}$:
   a. $L_1 = \{ x \mid x \text{ contains the substring } bab \}$
   b. $L_2 = \{ x \mid n_a(x) + n_b(x) \text{ is odd} \}$
   c. $L_3 = \{ x \mid n_a(x) \text{ is a multiple of } 3 \}$
   d. $L_4 = \{ x \mid x \text{ does not contain the substring } baa \}$
   e. $L_5 = \{ x \mid x \text{ is divisible by } 3 \}$

4. What languages do the following finite state automata accept? Give English-language descriptions and regular expressions.
   a. [Finite State Automaton Diagram]
   b. [Finite State Automaton Diagram]