1. Give the state diagram of an NFA over the alphabet \{a, b\} that accepts 
\{w \mid w \text{ has either } aa \text{ or } bb \text{ as substring } \}

2. Give the state diagram of a DFA over the alphabet \{0, 1\} that accepts 
\{w \mid w \text{ has } 5m \text{ 1's for some integer } m \geq 0\}

Remember that \(m\) can be any nonnegative integer (this includes 0!). The FA must accept 
any string with exactly \((5m)\) 1's.

3. Describe \(L(M)\) where \(M\) is given by the following state diagram.

\(L(M) = \{w \mid w \text{ is a string over the alphabet } 0,1 \text{ which either contains a 0 or ends with the substring 11} \}\)

4. Define the term language over alphabet \(\Sigma\).

A language over \(\Sigma\) is defined to be any set of strings over \(\Sigma\).