HW 2.

1. For each of the following regular expressions, draw an NFA-\(\lambda\) or a NFA recognizing the corresponding language.
   
   (a)  \(L_1 = (0 + 1)^*0\)
   (b)  \(L_2 = (0 + 1)^*(1 + 00)(0 + 1)^*\)
   (c)  \(L_3 = 0 + 10^* + 01*0\)

2. Draw a NFA-\(\lambda\) to recognize the language \(\{0\}^*\{01\}^*\{1\} \cup \{1\}^*\{0\}\). Convert this to a NFA and then to a DFA.

3. For the machines you drew for \(L_1\) and \(L_2\) in 1 a and 1b above, draw a NFA-\(\lambda\) accepting the following:
   
   (a)  \(L_1 \cup L_2\)
   (b)  \(L_1^*\)
   (c)  \(L_1 \circ L_2\)

4. Find a regular expression corresponding to each of the following languages over the alphabet \(\Sigma = \{0, 1\}\).
   
   (a) The language of all strings containing exactly two 0’s
   (b) The language of all strings containing at least two 0’s
   (c) The language of all strings in which the number of 0’s is even