Problem #1. Construct DFAs for the following languages:

1. The set of all binary strings beginning with 101 and ending with 010. (Note that the string 1010 should be accepted.)
2. The set of strings over \{0, 1\} which do not contain 1001 as substring.
3. The set of strings over \{a, b\} such that the fifth symbol from the right is a
4. The set of binary strings containing at least three 1s and at most three 0s.

Problem #2. Construct NFAs for the following languages:

1. The set of binary strings such that the number of 0's is a multiple of 3 or the number of 1's is a multiple of 5.
2. The set of all binary strings containing 000 or 100 as substring.
3. The set of all strings such that the 11th symbol from the right end is 0

Problem #3. Following the subset construction, construct for each of the following NFAs an equivalent DFA:

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Problem #4. Using the construction described in class, construct for each of the following regular expressions an equivalent NFA:
(1) ((ba)^*b + b*a*)^*
(2) ab(ba)^* + b*bab*```

Problem #5. Following the construction described in class, give an equivalent regular expression for each of the following NFAs: (provide all intermediate steps)