ECE 375: Assignment 1

Jared Wasinger

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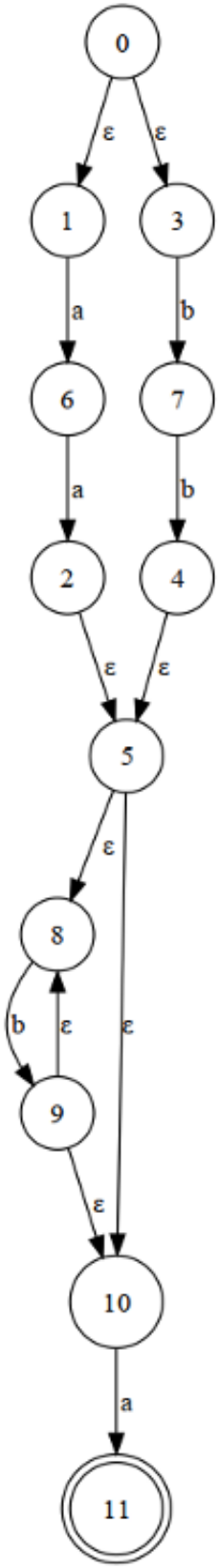
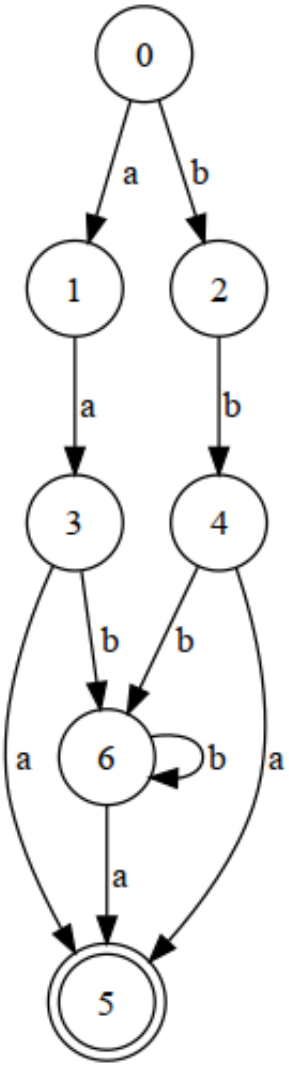
1. Write a regular expression for all strings of letters that come from the alphabet $\sigma = \{a, b\}$ that start with either **aa** or **bb**, followed by a string of 0 or more b's, and ends with a single a [10 points]

   $(aa|bb)b^*a$

2. Using Thompson's Construction, create a NFA that accepts the strings from the regular expression above. [10 points]


0
ε
ε
1
3
a
b
6
7
a
b
2
4
ε
ε
5
ε
8
b
ε
ε
9
ε
10
a
11

3. Using the Subset Construction, create a DFA from the NFA above. [10 points]



4. Try to merge states to get the smallest machine possible. When you merge states, provide a justification for why the states may be merged. [10 points]