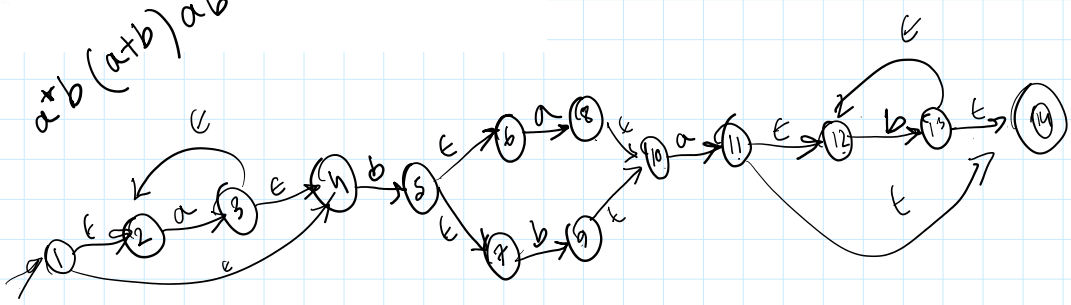
Assignment 1

Friday, June 7, 2024 5:44 PM

1. Convert the following Regular Expression to NFA. After converting the NFA, convert it into a DFA (preferably powerset construction method or any method but you must show your work)

   Regex: a*b(a|b)ab*

a*b(a+b)ab*



NFA to DFA

① Start = 1 → ε closer(1) = {1, 2, 4} → A

move(A, a) → {3} → ε closer(3) = {2, 3, 4} → B

move(A, b) → {5} → ε closer(5) = {5, 6, 7} → C

② move(B, a) → {3} → ε closer{3} → B

move(B, b) → {5} → ε closer{5} → C

③ m(C, a) → {8} → ε closer(8) → {8, 10} → D

m(C, b) → {9} → ε(9) → {9, 10} → E

④ m(D, a) → {11} → ε(11) → {11, 12, 14} → F

m(D, b) → ϕ → ε(9) → T

⑤ m(E, a) → {11} → ε(11) → F

(5) $m(E, N) \rightarrow (11) \rightarrow$

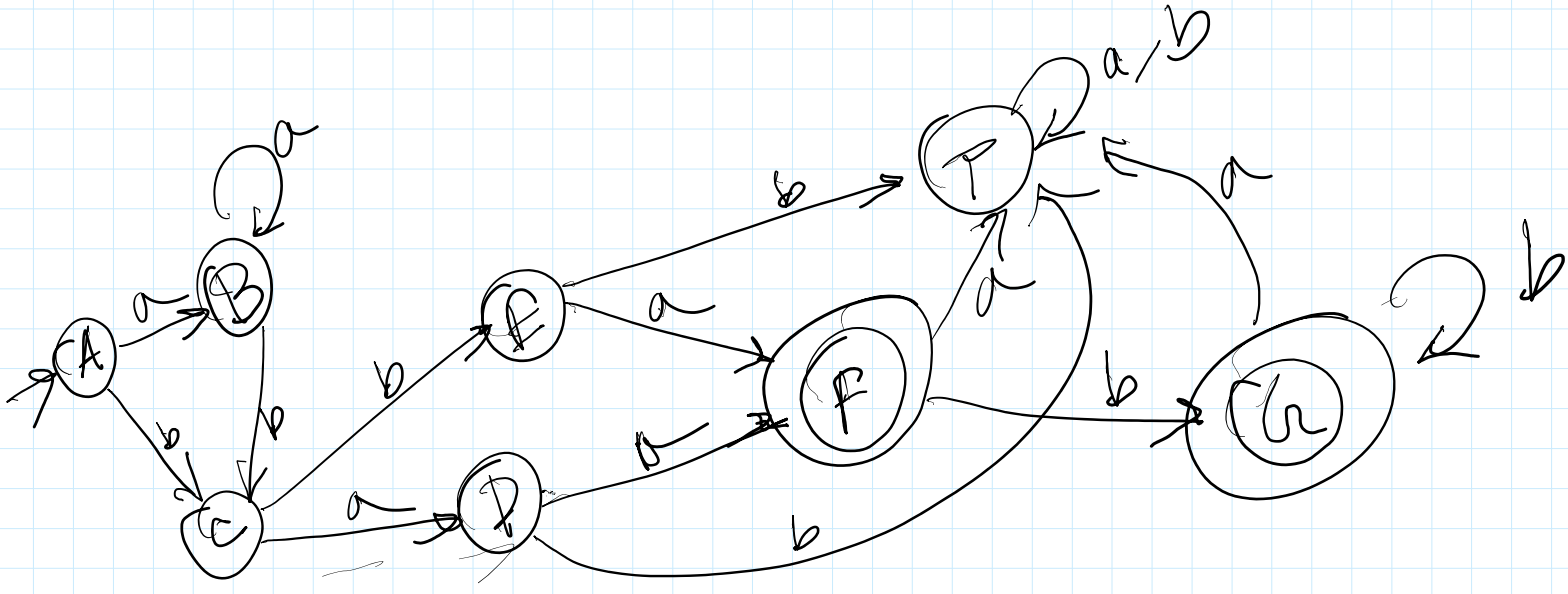
$m(E, b) \rightarrow (\phi) \rightarrow T$

(6) $m(F, a) \rightarrow \phi$

$m(F, b) \rightarrow (13) \rightarrow \{12, 14\} \rightarrow h$

(7) $m(h, a) \rightarrow \phi$

$m(h, b) \rightarrow (13) \rightarrow h$



$a \cup b \; (a \mid b) \; ab^*$