

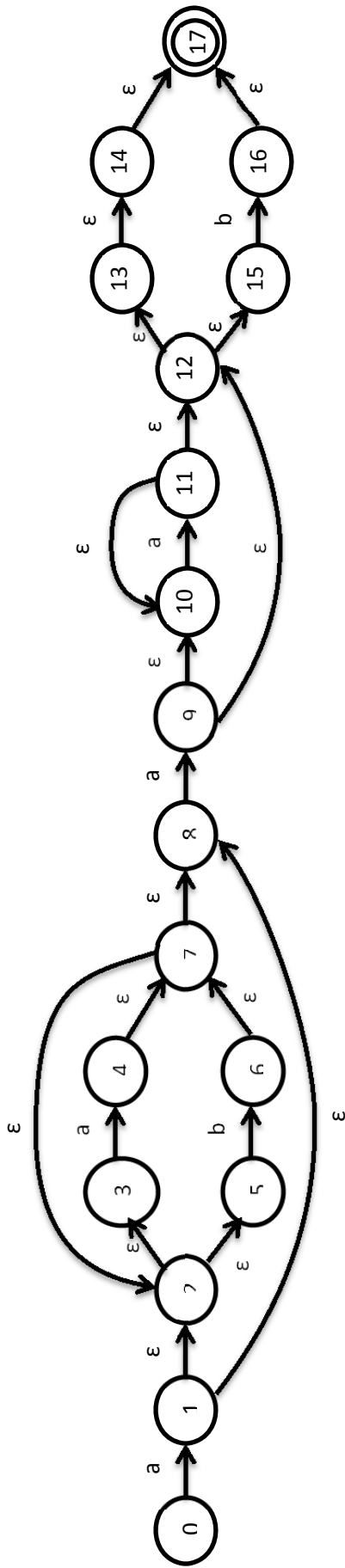
# CS 2210 – Homework 1 Solutions

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1a.)  $[01]^*000$

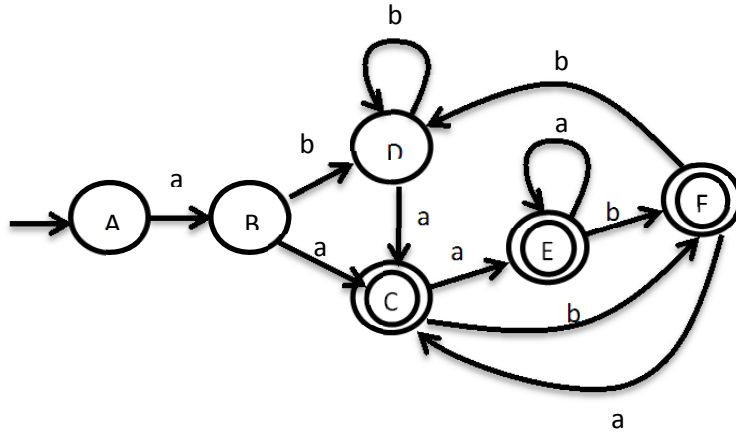
1b.)  $([+-]?([1-9][0-9]^+)|(0[0-7]^+))|(0x[0-9a-fA-F]^+)$

2.)



3.) DFA Start State =  $\epsilon$ -closure(0) = {0} = A

In state:	See an a	See a b
A = {0}	{1,2,3,5,8} = B	
B = {1,2,3,5,8}	{2,3,4,5,7,8,9,10,12,13,14,15,16,17} = C	{2,3,5,6,7,8} = D
C = {2,3,4,5,7,8,9,10,12,13,14,15,17}	{2,3,4,5,7,8,9,10,11,12,13,14,15,16,17} = E	{2,3,5,6,7,8,14,17} = F
D = {2,3,5,6,7,8}	{2,3,4,5,7,8,9,10,12,13,14,15,16,17} = C	{2,3,5,6,7,8} = D
E = {2,3,4,5,7,8,9,10,11,12,13,14,15,16,17}	{2,3,4,5,7,8,9,10,11,12,13,14,15,16,17} = E	{2,3,5,6,7,8,14,17} = F
F = {2,3,5,6,7,8,14,17}	{2,3,4,5,7,8,9,10,12,13,14,15,16,17} = C	{2,3,5,6,7,8} = D



4.) S-F = {A, B, D} F={C, E, F}

$\Pi_0 = \{A, B, D\} \{C, E, F\}$

B and D both go to D on b and C on a, but A is different:

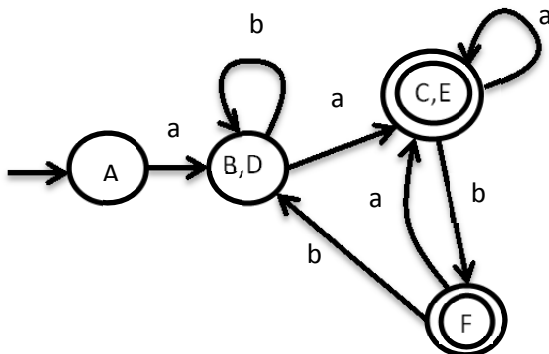
$\{A\} \{B, D\}$  a

C and E both go to E on a and F on B, but F is different:

$\{C, E\} \{F\}$

$\Pi_1 = \{A\} \{B, D\} \{C, E\} \{F\}$

Repeat. No changes in the next iteration, so that's our minimization.



5.) Both minimal DFAs are equivalent:

