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Data Engineering
Exercises class 2

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Exercise 1

Given the alphabet A={a,b,c,d,e}

Construct the minimal DFA for the Regular Expression (bb|c)*(dce|ce)

Exercise 2

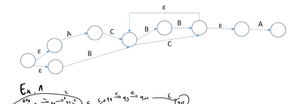
Given the alphabet A={0,1}

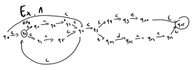
Construct a DFA for the Regular Expression (((0|10|(10)*(11|(0)|11)0|1)*

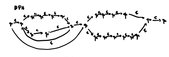
Exercise 3

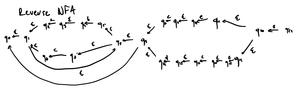
Given the alphabet A={A,B,C}

Is the following automata representing the expression ((AC|B|(BB|C)*)A ?



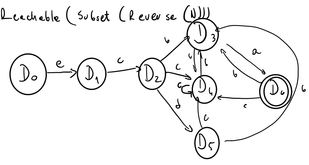




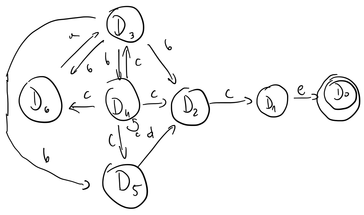


DFA	NFA	a	b	c	d	e
D0	21, 20, 13, 19	None 3	None	None	None	12,11,18,17 (D1)
D1	18,17,12,11	None	None	16,15,9,8,7,5,0 (D2)	None	None
D2	16,15,9,8,7,5,0	None	4,3 (D3)	6,1,0,8,7,5 (D4)	14,9,8,5,7,0 (D5)	None
D3	4,3	2,1,8,5,7,0 (D6)	None	None	None	None
D4	6,1,0,8,7,5	None	D3	D4	None	None
D5	14,9,8,5,7,0	None	D3	D4	None	None
D6	2,1,8,5,7,0	None	D3	D4	None	None

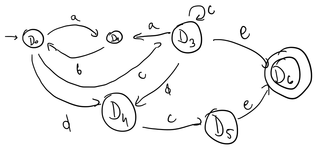
Reachable (Subset (Reverse (N)))



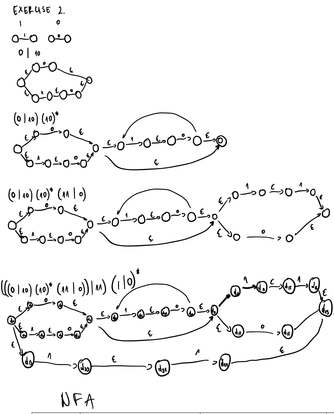
Reverse (Reachable (Subset (Reverse (N))))



SubsA (Reverse (Reachable (Subset (Reverse (N)))))

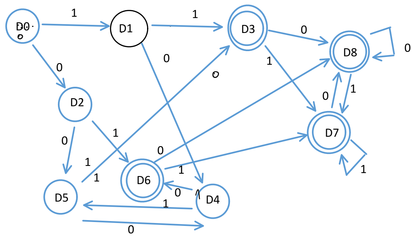


EXERCISE 1.



NFA

NFA	DFA	1	0
D0	0,1,3,19	4,5,20,21 (d1)	2,7,8,12,13,17 (d2)
D1	4,5,20,21	21,22,23,24,26, 29 (d3)	6,7,8,12,13,17 (d4)
D2	2,7,8,12,13,17	9,10,14,15 (d5)	18,22,29,23,24,26 (d6)
D3	21,22,23,24,26, 29 (f)	25,28,29,23,24,26 (d7)	27,28,29,23,24,26 (d8)
D4	6,7,8,12,13,17	9,10,14,15 (d5)	18,22,29,23,24,26 (d6)
D5	9,10,14,15	11,12,13,17 (d3)	(d4)
D6	18,22,29,23,24,26 (f)	(d7)	(d8)
D7	25,28,29,23,24,26 (f)	(d7)	(d8)
D8	27,28,29,23,24,26 (f)	(d7)	(d8)



Exercise 3

No, It is not, because of the *, it should also fit is there wasnt nothing fiting the (BB|C)*, but according to the diagram there has to be at least one (BB|C)