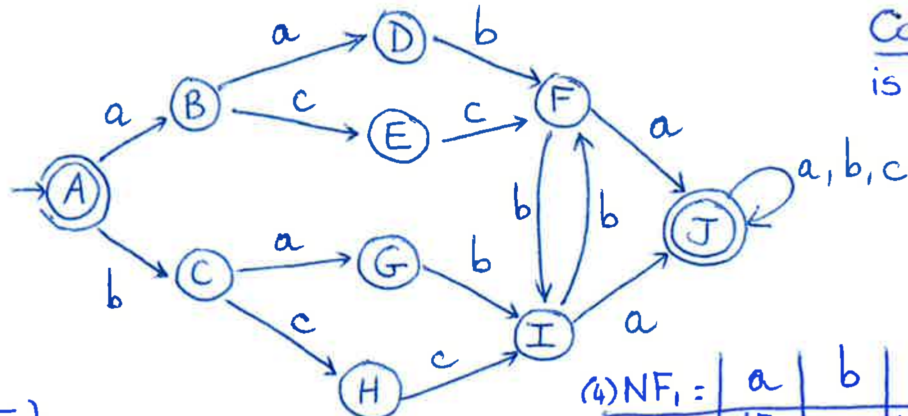
CS3350 – QUIZ 7 **October 13, 2014**
10 minutes / 10 points
NAME: ....

Question 1. [5 points] Run the DFA minimization algorithm seen in class on the following DFA. * _Important:_ *Make sure that your answer is structured in such a way that it is clear which step you took first, second, etc.*



Comment: this DFA is incomplete.

(1) Final = {A, J}
NF = {B, C, D, E, F, G, H, I}

(2) Final =

	a	b	c
A	NF	NF	X
J	F	F	F

split: $F_1 = \{A\}$, $F_2 = \{J\}$

(3) NF =

	a	b	c
B	NF	X	NF
C	NF	X	NF
D	X	NF	X
E	X	X	NF
F	F_2	NF	X
G	X	NF	X
H	X	X	NF
I	F_2	NF	X

technically "X" would be the sink if the DFA was complete = NF

split into:
$NF_1 = \{B, C, D, E, G, H\}$
$NF_2 = \{F, I\}$

and implicitly the sink too goes in NF_1 bc signature is (NF, NF, NF).

(4) NF_1 =

	a	b	c
B	NF_1	X	NF_1
C	NF_1	X	NF_1
D	X	NF_2	X
E	X	X	NF_2
G	X	NF_2	X
H	X	X	NF_2

split into:
$NF_{11} = \{B, C\}$ ← sink goes there
$NF_{12} = \{D, G\}$
$NF_{13} = \{E, H\}$

cont'd. →

Question 2. [5 points] Explain – in two sentences – how finite automata are able to recognize languages that contain infinitely many strings of infinitely large length. * _Important:_ *Make sure that your answer is legible and grammatically correct.*

(see lecture notes on Piazza)

At this point, in our container of states to consider, we have:

$NF_2 = \{F, I\}$

$NF_{11} = \{B, C\}$

$NF_{12} = \{D, G\}$

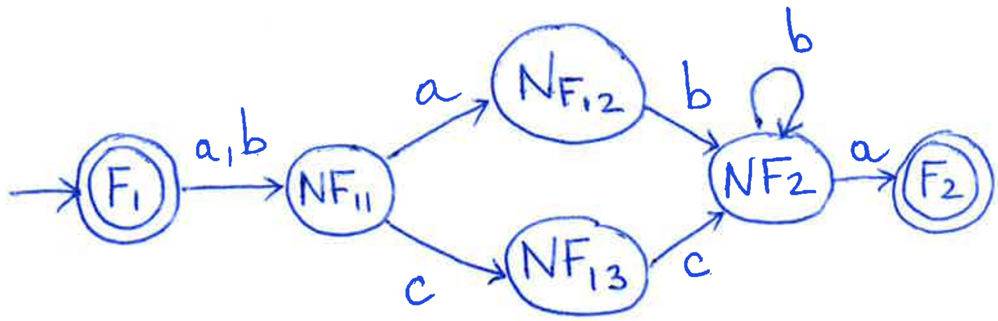
$NF_{13} = \{E, H\}$.

(5) NF_2 :

	a	b	c
F	F_2	NF_2	×
I	F_2	NF_2	×

(6) NF_{11} :

	a	b	c
B	NF_{12}	×	NF_{13}
C	NF_{12}	×	NF_{13}



(7) NF_{12} :

	a	b	c
D	×	NF_2	×
G	×	NF_2	×

(8) NF_{13} :

	a	b	c
E	×	×	NF_2
H	×	×	NF_2

(9) container is empty,

we are done.