COSC 3340/6309

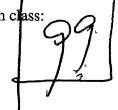
Examination 1

Tuesday, June 11, 2013, 10 - 11:45 am

Open Book and Notes

 ${f 1}$. Construct a dfa for the following nfa, using the subset construction given in class:

			a	b	С	_
→	1		3 ,	3	2	1
	2		1	2	1	1
	3	1	4	1	2,4	4 1
	4	-	2	4	/	1



2. Consider the class \mathcal{L}_A of all regular languages that contain only words of even length, over the fixed two-letter alphabet $A=\{a,b\}$.

- (a) Is \mathcal{L}_A countable?
- (b) Is the class \mathcal{M}_A countable where \mathcal{M}_A consists of all languages over A that are not in \mathcal{L}_{A} ?
- (c) Is the class $\mathcal{L}_A \cap \mathcal{M}_A$ countable?

For each question, you must give a precise argument substantiating your answer.

3. Construct an nfa for each of the following regular expressions, then find the corresponding dfa, and then reduce this dfa, always using the constructions given in class:

- $(a \cup a^2)^* (a \cup a^4)$ $((01)^* \cup (10)^*) \ 0^* (01 \cup 10)^*$ over the alphabet {a}
- over the alphabet {0,1}

4. Construct a regular expression over the alphabet {a,b} for the language accepted by the following automaton:

Points:

1:12

2:22

ERNOT LE iss

 $\frac{\partial}{\partial x} = \frac{\partial}{\partial x} = \frac{\partial}$

* le - r le

ble - r le

to le - bala

* le - r la de le - r la

La - a(ala) U b [La U (bala)] U E

La - aala U bla U bbala U E

La - La (aa u b U bba) U E

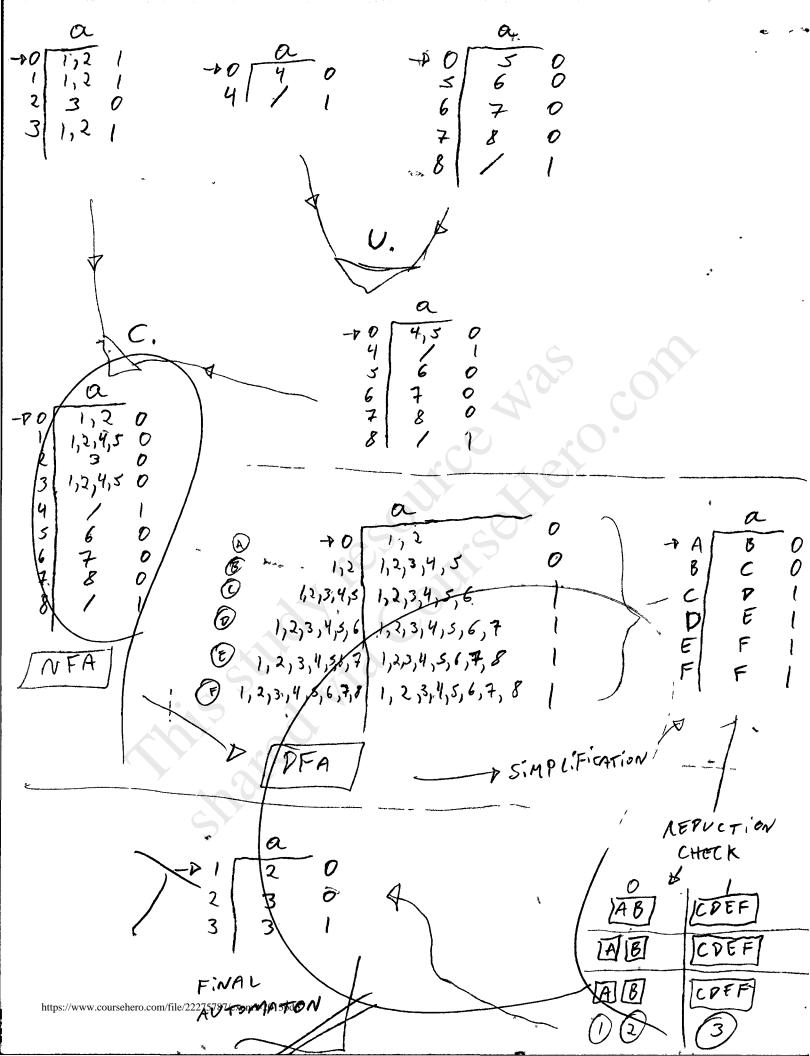
* x = 1*M

La - (aa u b U bba) * La

La - (aa u b U bba) * La

1 3 3 2 1 2 1 4 1 1,2 2,4 1,2 1,3 2,3 1,2 3,4 1,3 2,4 2,3/1,4 1,2 1,2,4 2,4 1,4 2,4 1,4 2,3 3,4 2 1,2,4/1,2,3 23,4 1,2 1,2,3 1,3,4 1,2,3 1,2,4 2, 3, 4 1, 2, 4 1, 2, 4 1, 2, 4 4,3,4/2,3,4 1,3,4 2,4 (A) (YES) SINCE LA HAS ONLY REGULAR LANGUAGES, THERE HAS TO BE AT LEAST ONE OFA THAT ACCEPTS LANGUAGES. THEREFORE, THEY ARE EACH ONE OF COUNT ABLE NO ONE KNOW WE CAN COUNT REGULAR LANGUAGES. OVER A: HOWEVER) WE CANNOT COUNT LANGUAGES THAT ARENT REGULAR, HENCE MA CAN'T COUNTABLE. PAGF

HAS THE REGULAR LANGUAGES ALL LANGUAGES THAT WE CAN ASSUME THAT LAMMA = CARDINALTY OF THE EMPTY SET IS BECAUSE COUNT IT, [TITEREFORE, LA MA A (ava²)*(ava") → (a,vazaz)*(ayvaza6a,a) STAK X -VO https://www.coursehero.com/file/22275787/exam1 # CONTINUE ON BACK



 $((o_{i}l_{2})^{*}U(l_{i}o_{y})^{*})O_{s}^{*}(o_{i}l_{z}Ul_{0}o_{y})^{*}.$ 3 1,5 * CONTINUE 4 5 PAGÉ https://www.coursehero.com/file/22275787/exant-20

