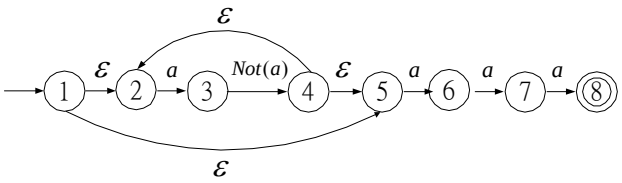
Midterm 2016 (Compiler) Name: _____ Grade:_____

1. (10%) Use one example to show that the following grammar is ambiguous.

stat → **if** cond **then** stat
| if cond **then** stat **else** stat
| other-stat

2. (10%) For the following NFA, find the corresponding DFA with the minimum number of states.

.



3. (10%) Reduce the following transition table.

		Input symbols				
	δ	+	—	·	d	ε
States	S	A	A			A
	A				B, C	E
	B				B	F
	C			D	C	
	D				D	F
	E			G	E	
	F					
	G				H	
	H				H	F

4.(10%). Is the following grammar LL(1) ? Explain why ?

S → Ab

A → a

A → B

A → ε

B → b

B → ε

5. (20%) Lab.

請用“簡短的”敍述回答以下問題（寫出重點即可，不需寫得太複雜).

(a)請問 Regular Expression 在 lex 中做判斷時，lex 是依據兩種什麼樣的規則與順序去做判斷 ？

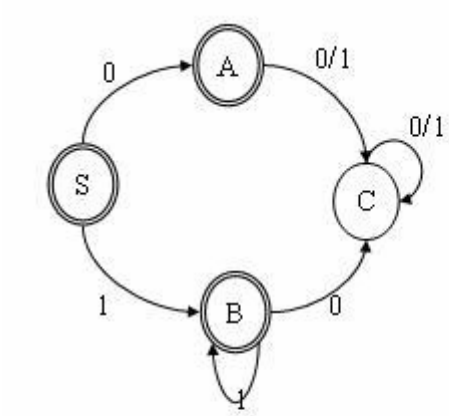
(b)在 main()中呼叫哪個 function，你的程式才會去執行辨認 token 動作？

(c)你如何處理作業說明中沒有定義的字元？

(d)在 lex 中，被 regular expression 辨認出來的 token 會存放到哪個變數中？

(e)END$，此 regular expression 代表是何種的 token？ ^BEGIN，此 regular expression 代表是何種的 token？

6. (10%) For the following FSM, write down the related production rules (for example, C->0C, C->1C).



7.(30%) For the following grammar:

<E> ::= <T> <E'>

<E'> ::= + <T> <E'> |ε

<T> ::= <F> <T'>

<T'> ::= * <F><T'> |ε

<F> ::= (<E>) | id

(a) Find First and Follow sets (for each nonterminal symbol). (10%)

(b) Create its parsing table. (10%)

(c) Shows the move made by predictive parser on input id+ id * id (based on a stack). (10%)