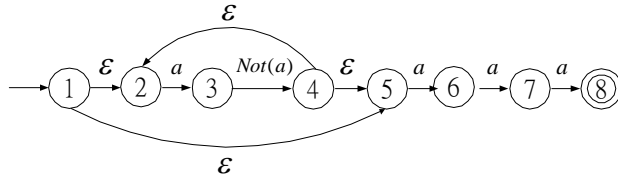


1. (10%) List 7 steps of a compiler process. Which of them are machine independent ? Which of them are machine dependent ?

2. (10%) For the following NFA, find the corresponding DFA.



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

δ	Input		
	a	b	c
1	2	5	
2	3	4	1
3	5	2	
States 4	3	2	1
5	1	4	1
6	1		1
7	3	6	3

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

$S \rightarrow Ab$

$A \rightarrow a$

$A \rightarrow B$

$A \rightarrow \epsilon$

$B \rightarrow b$

$B \rightarrow \epsilon$

5. (20%) Lab.

請用“簡短的”敘述回答以下問題（寫出重點即可，不需寫得太複雜）。

- (1) 在 main() 中呼叫哪個 function 程式才會去執行辨認 token 的動作？
- (2) 在 lex 中，被 regular expression 辨認出來的 token 會存放到哪個變數中？
- (3) 你如何處理字串中的連續兩個單引號（ ” ）？
- (4) 你如何處理規格書中沒有定義的字元(例如 #)？

(5) 你如何判斷一個字串超過 30 個字？

6. (10%) Suppose that a grammar has the following productions:

$S \rightarrow aBc$

$B \rightarrow bXb$

$B \rightarrow bX$

$X \rightarrow a$

$X \rightarrow ab$

(a) Is the string "ababc" in the language generated by the grammar ?

(b) Is the grammar ambiguous ? Justify your answer.

7.(30%) For the following grammar:

$\langle E \rangle ::= \langle T \rangle \langle E' \rangle$

$\langle E' \rangle ::= + \langle T \rangle \langle E' \rangle \mid \epsilon$

$\langle T \rangle ::= \langle F \rangle \langle T' \rangle$

$\langle T' \rangle ::= * \langle F \rangle \langle T' \rangle \mid \epsilon$

$\langle F \rangle ::= (\langle E \rangle) \mid id$

(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%)