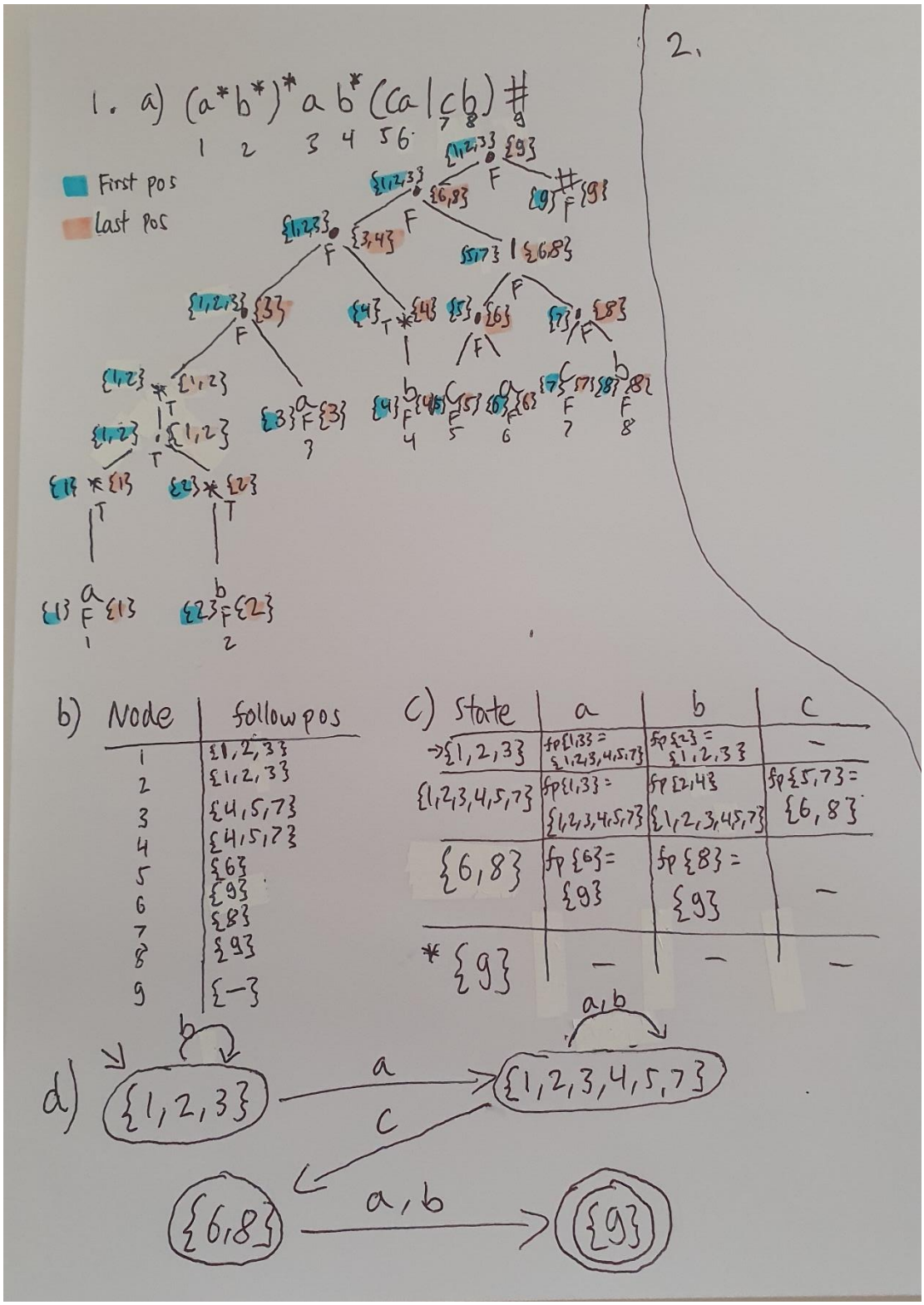
2301871196

Matthew Brian

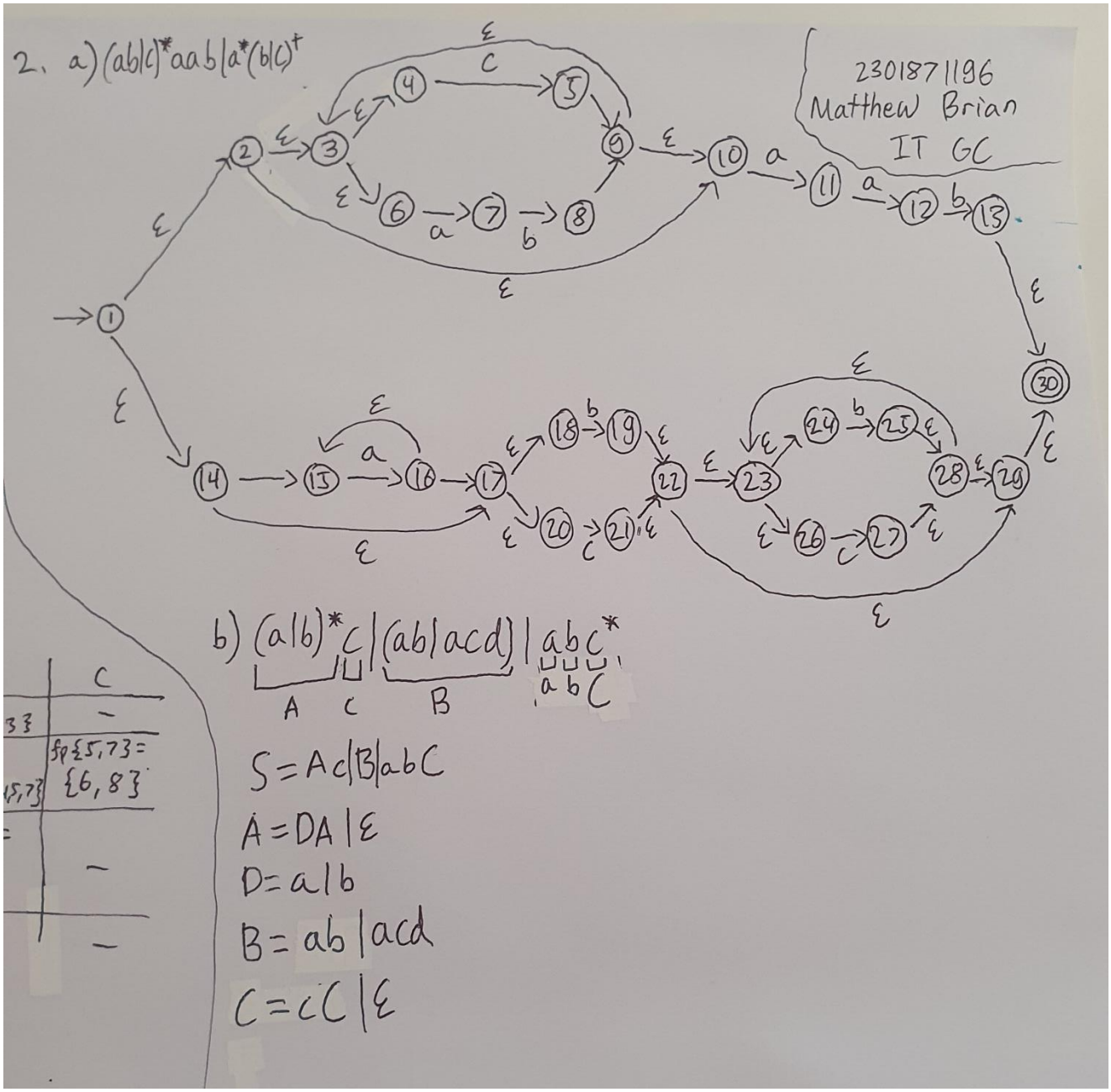
IT GC

Compilation Techniques

1.



2.


2. a) (ab|c)*aab|a*(b|c)+
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b) (a|b)*c|(ab|acd)|abc*
A c B
a b c
S=Ac|B|abC
A=DA|ε
D=a|b
B=ab|acd
C=cC|ε
C
fp{5,7}={6,8}

3.

3. a) $S \to SAB \mid aB$ (α = AB, β = aB) ✓ Left Recursion, ✗ Left Factoring

$S \to aBS'$

$S' \to ABS' \mid \varepsilon$

$A \to a \mid bA$ } ✗ Left Recursion, ✗ Left Factoring

$B \to aB \mid \varepsilon$ }

b) $S \to aAB \mid aS \mid Aa$ ✗ Left Recursion, ✓ Left Factoring

$S \to aS' \mid Aa$

$S' \to AB \mid S$

$A \to Sc \mid Ab \mid d$ (α = b, β = d) ✓ Left Recursion, ✗ Left Factoring

$A \to dA' \mid Sc$

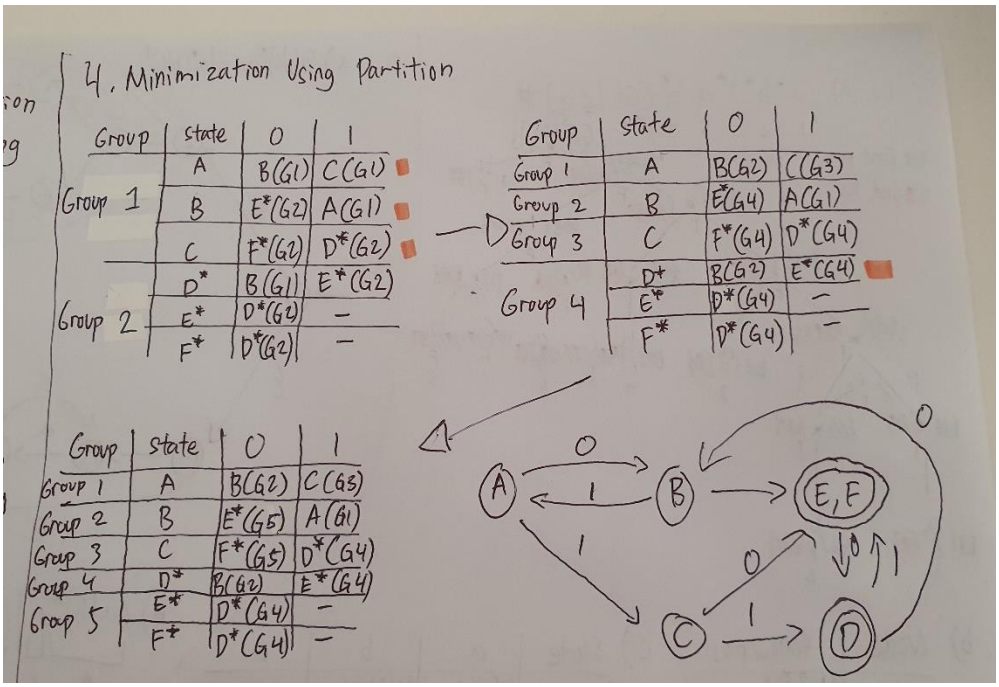
$A' \to bA' \mid \varepsilon$

$B \to bc \mid bd$ ✗ Left Recursion, ✓ Left Factoring

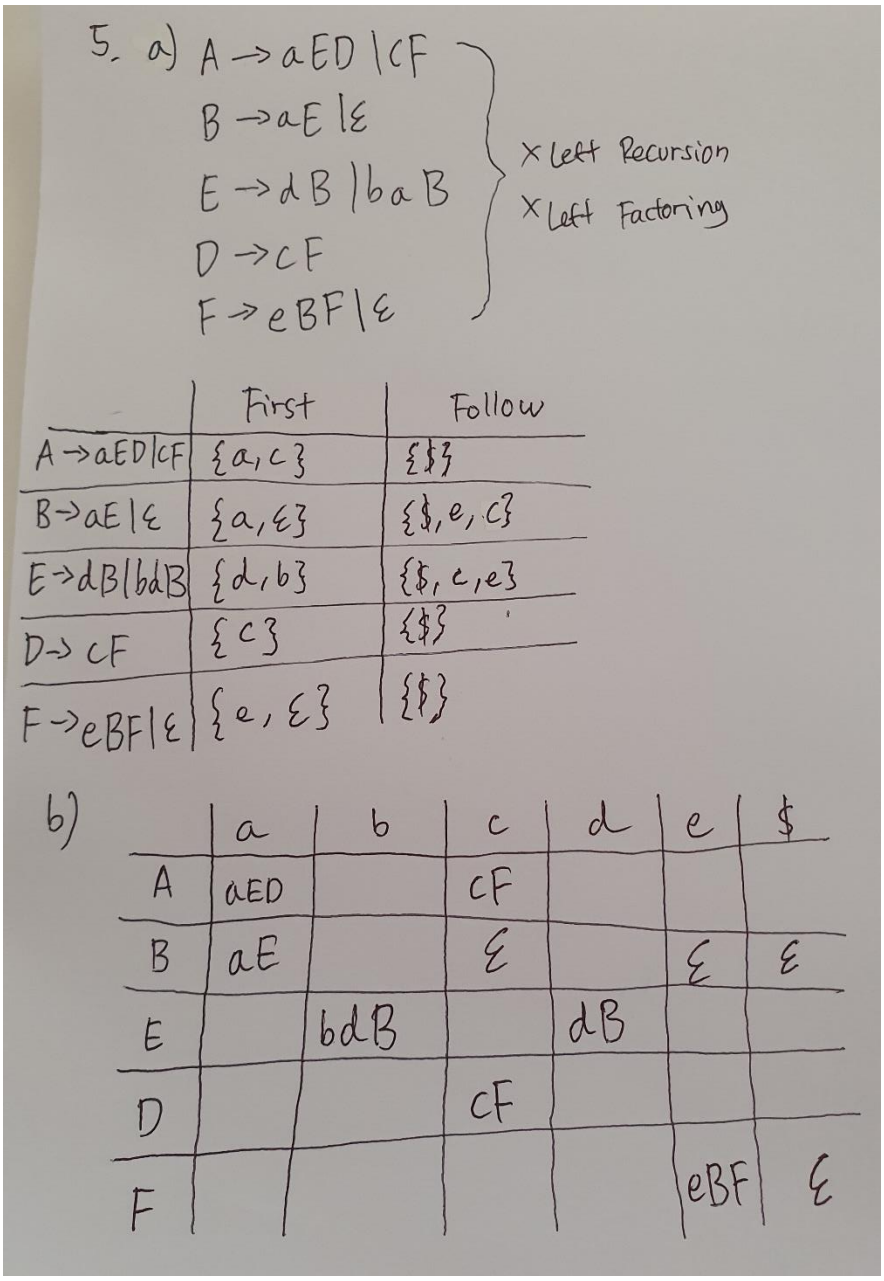
$B \to bB'$

$B' \to c \mid d$

4.



5.



5. a) $A \to aED \mid CF$
$B \to aE \mid \varepsilon$
$E \to dB \mid baB$
$D \to CF$
$F \to eBF \mid \varepsilon$

× Left Recursion
× Left Factoring

	First	Follow
A → aED | CF	{a, c}	{$}
B → aE | ε	{a, ε}	{$, e, c}
E → dB | baB	{d, b}	{$, c, e}
D → CF	{c}	{$}
F → eBF | ε	{e, ε}	{$}

b)

	a	b	c	d	e	$
A	aED		CF			
B	aE		ε		ε	ε
E		bdB		dB		
D			CF			
F					eBF	ε

c)

Stack	Input Buffer	output
A$	adacce $	A → aED
aED$	adacce $	pop a
ED$	dacce $	E → dB
dBD$	dacce $	pop d
BD$	acce $	B → aE
aED$	acce $	pop a
ED$	cce $	{INVALID}