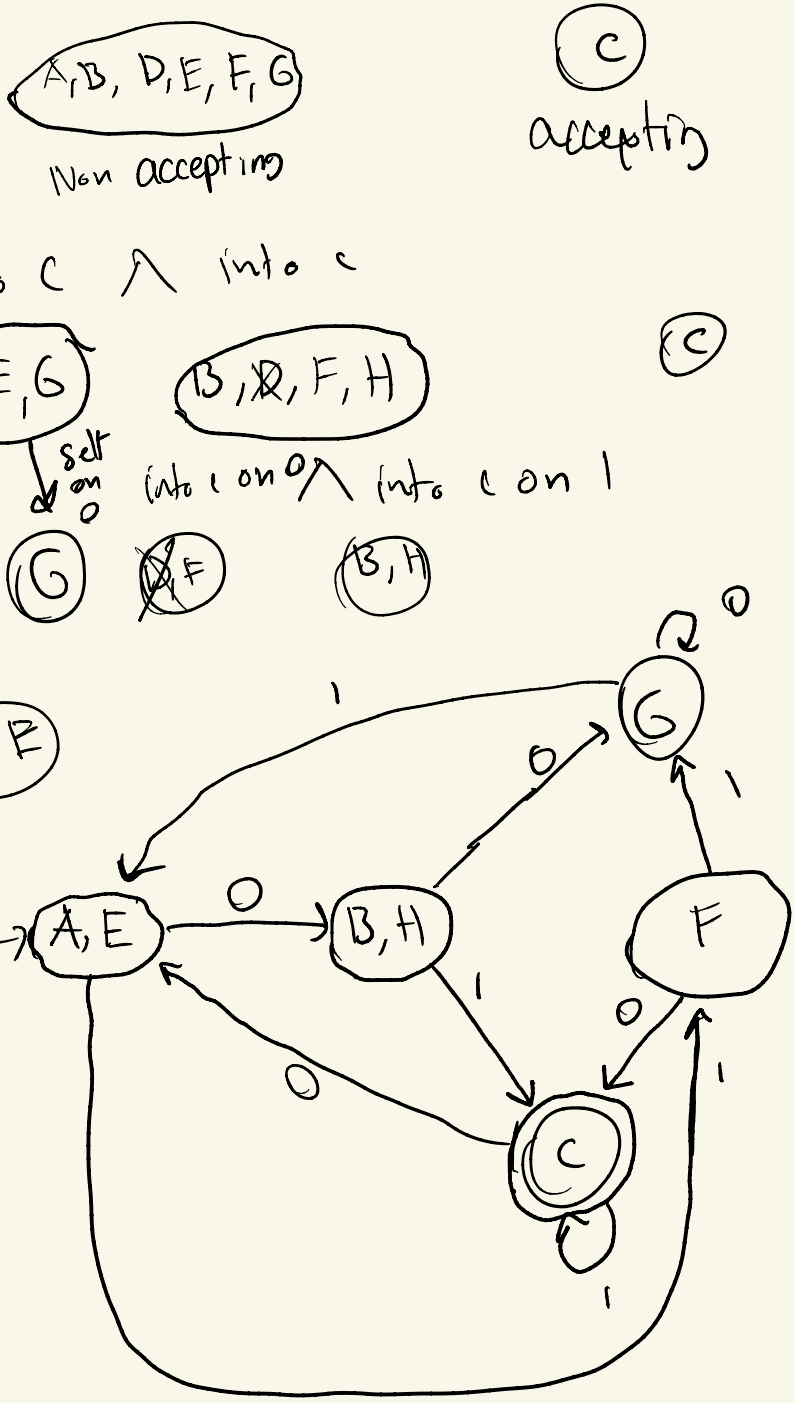
HW 9

1)


A, B, D, E, F, G
Non accepting
C
accepting
no C ∧ into C
A, E, G
B, D, F, H
C
self on 0
into C on 0 ∧ into C on 1
G
F
B, H
A, E
0
1
G
A, E
B, H
F
C

2)

	b	a	a	b	a
1	B	A, C	A, C	B	A, C
2	A, S	B	S, C	A, S	
3	∅	B	B		
4	∅	S, A			
5	A, S				

baaba will be generated as S in find row

3) Suppose $\langle G \rangle$ is a cfg in CNF

First check G produces terminal symbols, if not $L(G) = \emptyset$, and its rejected as it doesn't generate strings

Then contim $L(G)$ Finite or infinite using the pumping lemma with constant c, focusing on strings of length $c \leq \text{length} \leq 2c-1$

Run CYK for each string in this range.

If G generates any string in this range, reject G as $L(G)$ is infinite If no strings in this range continue.

Next check $L(G)$ generates exactly one string

Generate all strings length $0 \leq \text{length} \leq c-1$ for c.

Run CYK to see if any outputs generated

If exactly one string generated from CYK accept else reject

```
if isemptylang(G)          -> test L(G) empty
    reject

c = pumping lemma length(G)  -> const c from G

For length in range(c, 2*c)
    for w in generatestrings(length)  -> gen strings
                                         fro c -> 2c-1
    if cyk(G,w)               -> check if
        reject                   G generates the strings

count 0
for length in range(0,c)
    for w in generatestrings(length)  -> generate strings
                                         0 -> c-1
        if cyk(G,w)           -> test if G generates w
        count += 1
        if count > 1
            reject            -> reject if more than
                                 one string found

if count = 1                  -> accept if 1 string
    accept                       found
else
    reject
```