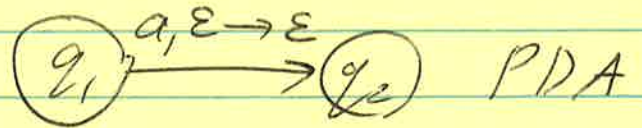
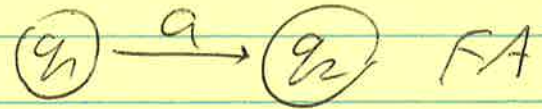
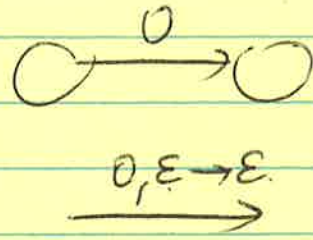
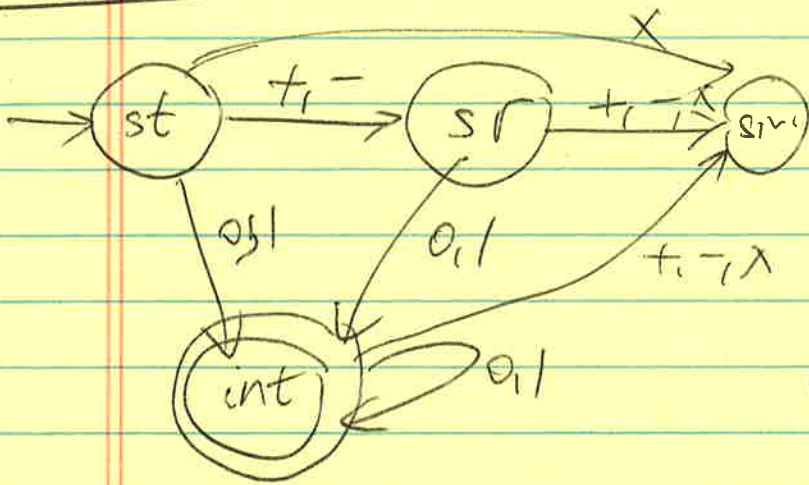


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$\forall \text{FA} \rightarrow \text{PDA}, \forall \text{FA} \rightarrow \text{CFG}$

$\text{CFG} \rightarrow \text{PDA}$



$\langle \text{integer} \rangle = + \langle \text{unsigned} \rangle$

$\langle \text{integer} \rangle = - \langle \text{unsigned} \rangle$

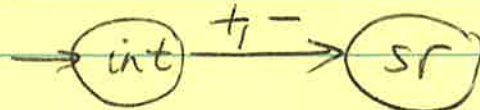
$\langle \text{integer} \rangle = \langle \text{unsigned} \rangle$

$\langle \text{unsigned} \rangle = 0 | 1 | 0 \langle \text{unsigned} \rangle | 1 \langle \text{unsigned} \rangle$

$I \rightarrow +U$

$I \rightarrow -U$

$U \rightarrow 0 | 1 | 0U | 1U$



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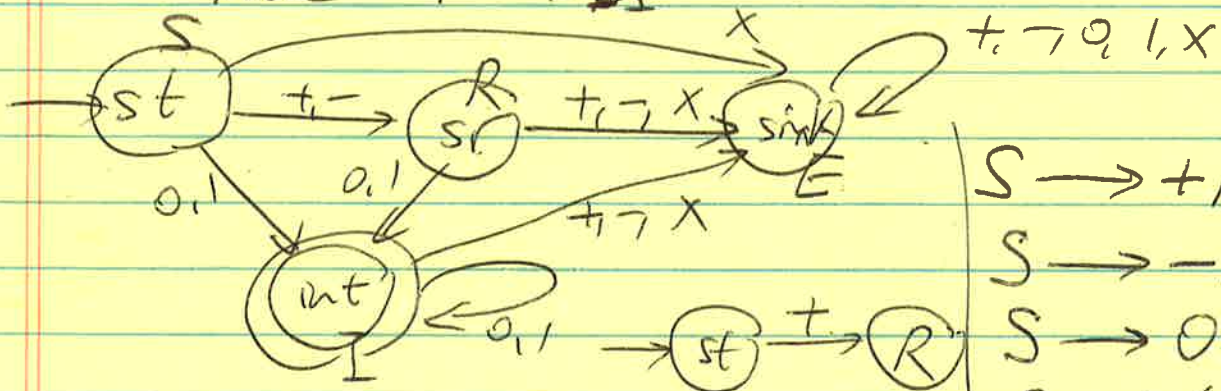
FA \rightarrow CFG

1) For every state q of FA, you design a variable Q



For every transition, you add a rule $Q_1 \rightarrow aQ_2$

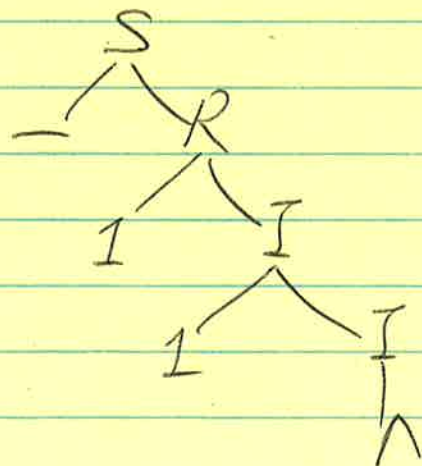
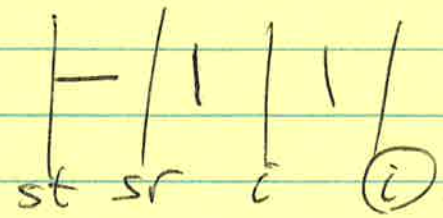
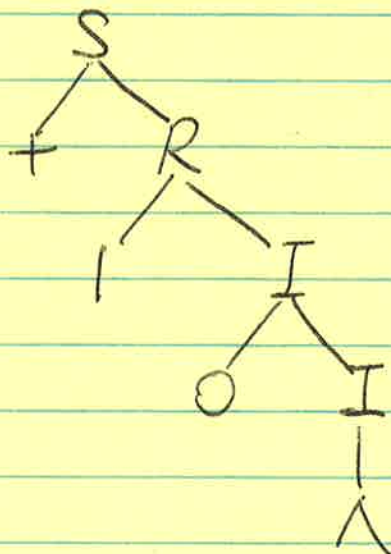
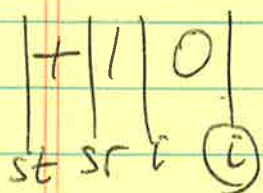
3) For every final state f , you add a rule $F \rightarrow \Lambda$



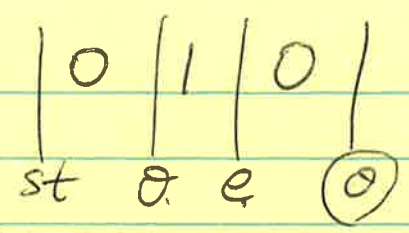
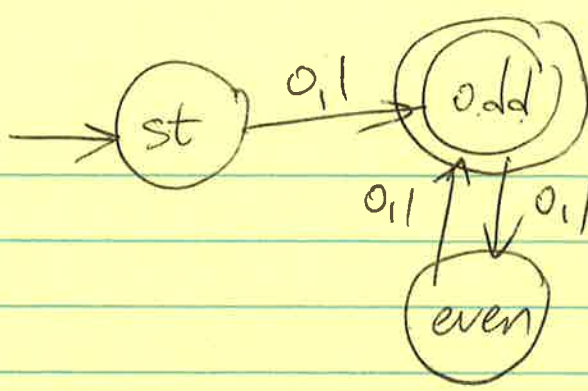
- $S \rightarrow +R$
- $S \rightarrow -R$
- $S \rightarrow 0I$
- $S \rightarrow 1I$
- $S \rightarrow xE$

- | | | |
|--------------------|--------------------|--------------------|
| $R \rightarrow +E$ | $I \rightarrow 0I$ | $E \rightarrow 0E$ |
| $R \rightarrow -E$ | $I \rightarrow 1I$ | $E \rightarrow 1E$ |
| $R \rightarrow xE$ | $I \rightarrow +E$ | $E \rightarrow +E$ |
| $R \rightarrow 0I$ | $I \rightarrow -E$ | $E \rightarrow -E$ |
| $R \rightarrow 1I$ | $I \rightarrow xE$ | $E \rightarrow xE$ |

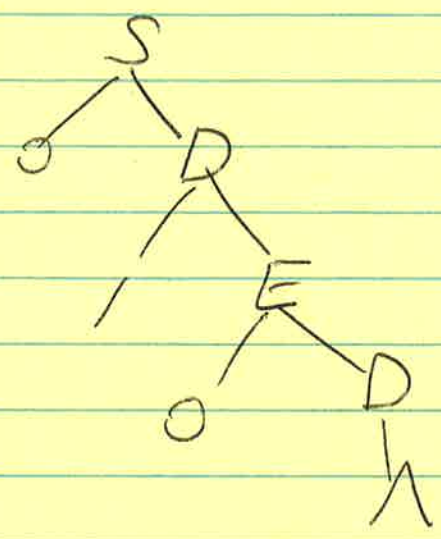
$I \rightarrow \Lambda$



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$S \rightarrow OD/ID$
 $D \rightarrow OE/IE$
 $E \rightarrow OD/ID$
 $D \rightarrow \Lambda$

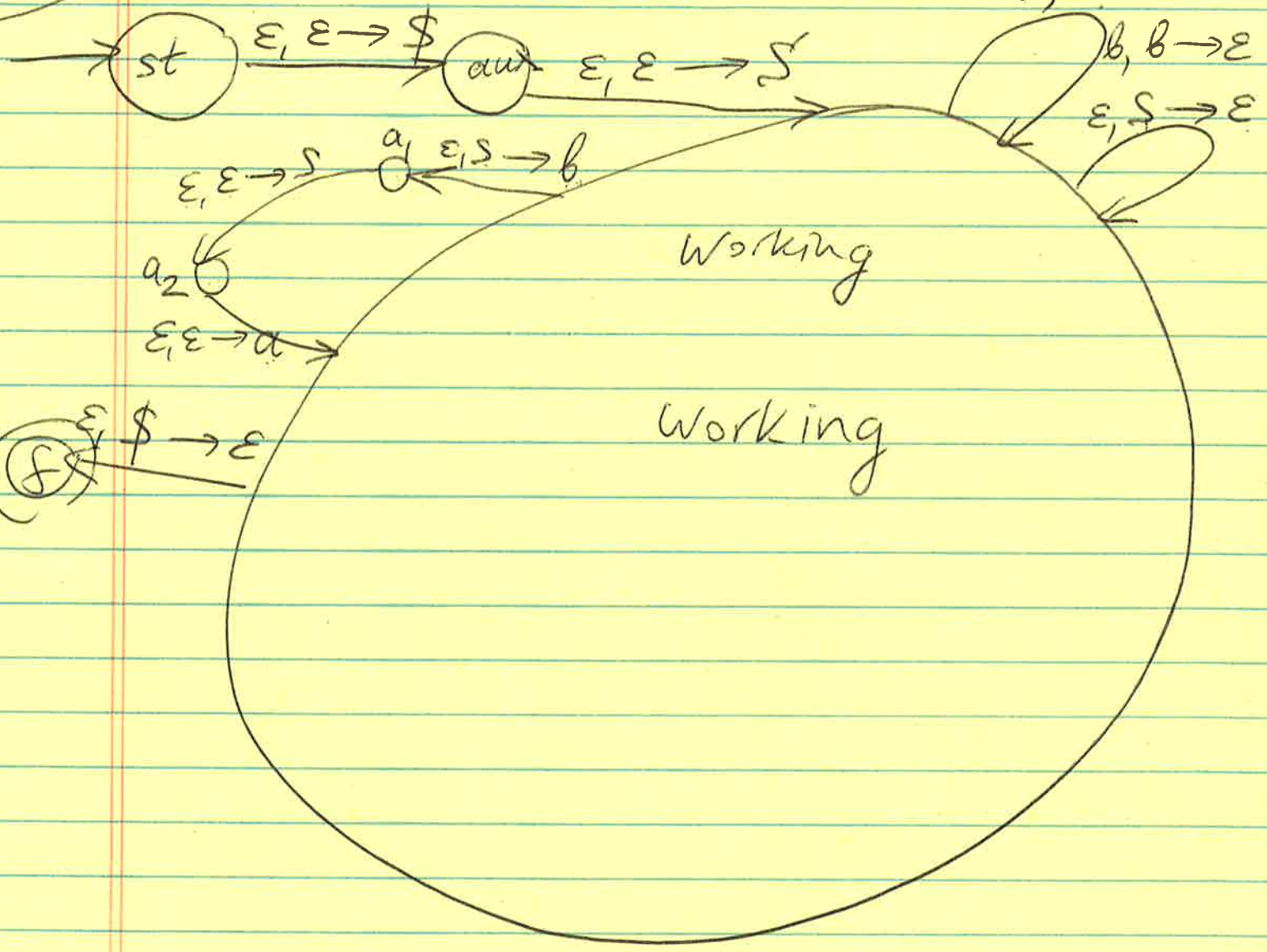
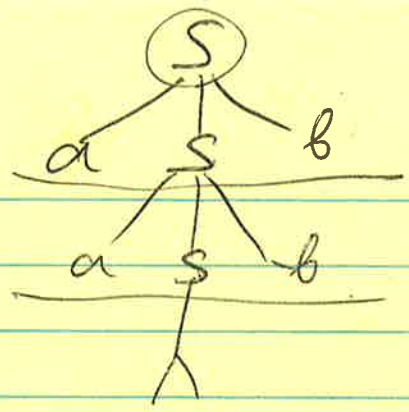


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CFG \rightarrow PDA

$\{a^n b^n\}$

- ① $S \rightarrow \Lambda$
- ② $S \rightarrow aSb$



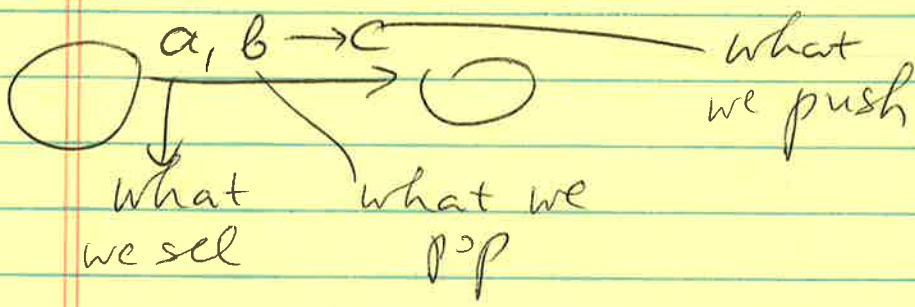
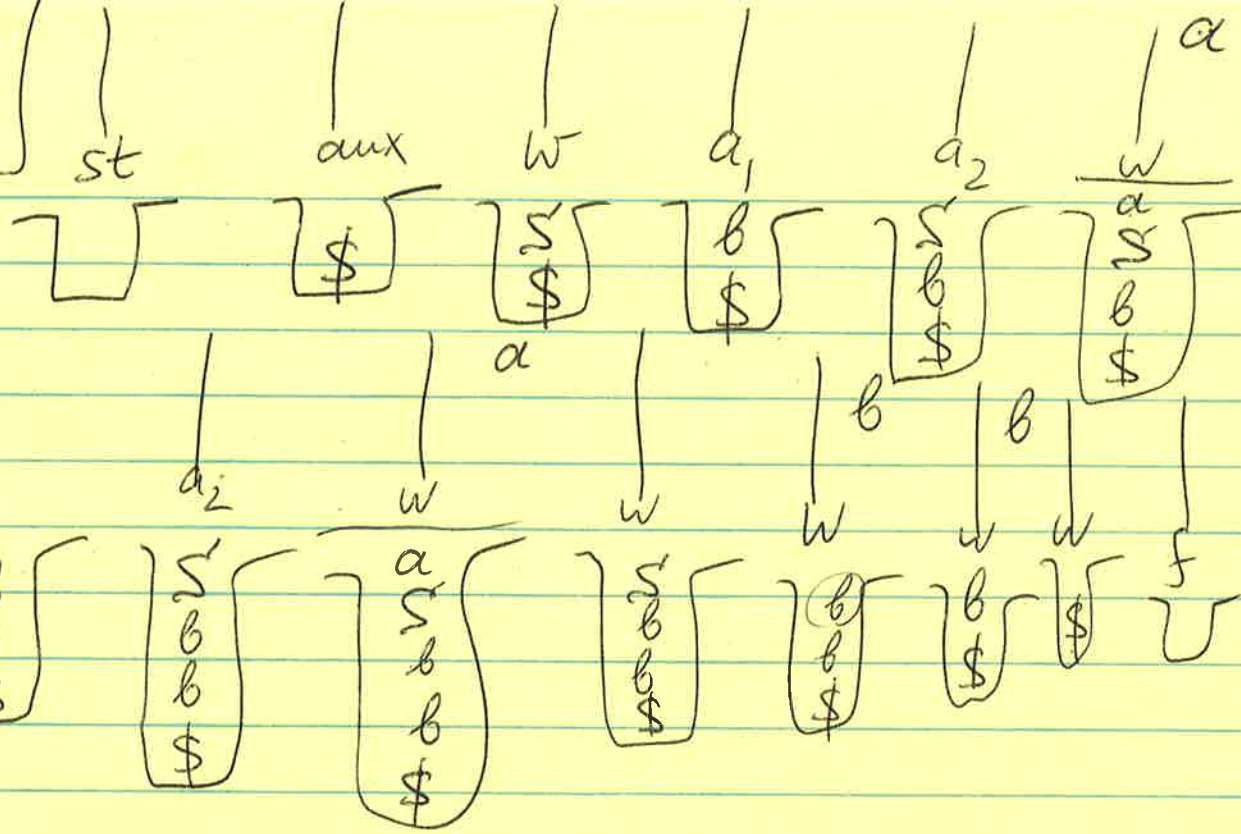
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- 1) Push \$ into the stack
- 2) Push starting variable into the stack, & go into the working state
- 3) We deal w/ working state
- 4) We pop \$, & go to final state

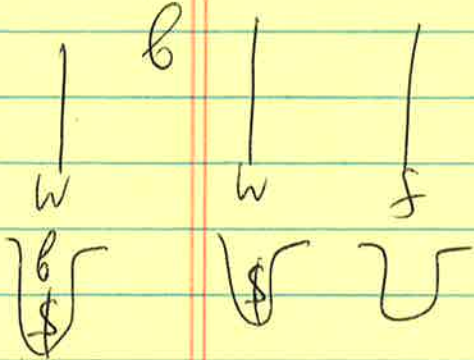
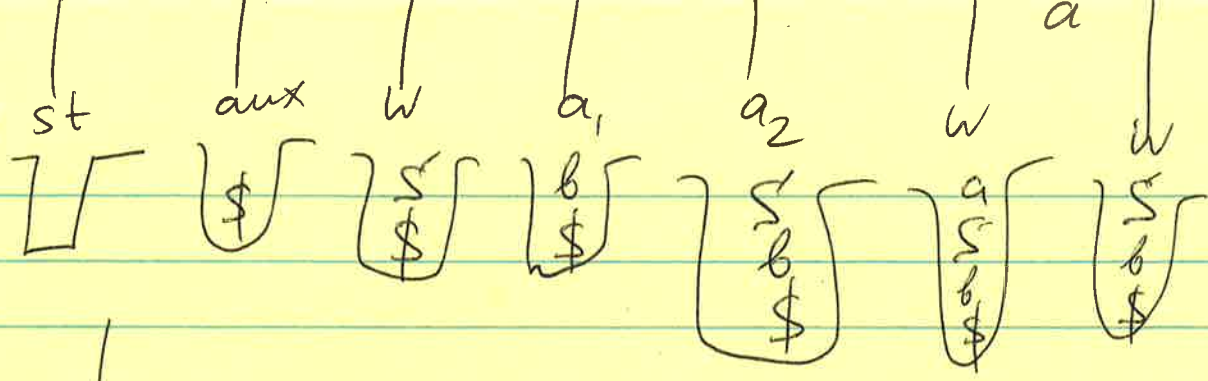
Working

- 3a) for each terminal symbol, if we see this symbol & same symbol is on stack we pop it
- 3b) every rule is interpreted as follows:
 $S \rightarrow asb$ means that if we had S on top of the stack, we replace it with asb .

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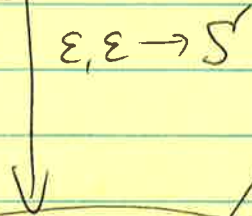
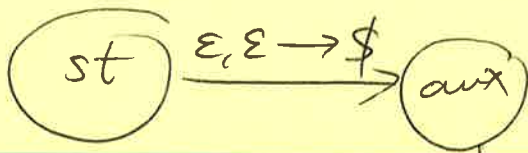


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- 1 $S \rightarrow \Lambda$
- 2 $S \rightarrow a$
- 3 $S \rightarrow b$
- 4 $S \rightarrow aSa$
- 5 $S \rightarrow bSb$

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$a, a \rightarrow \epsilon$
 $b, b \rightarrow \epsilon$

$\epsilon, S' \rightarrow \epsilon$

$\epsilon, S' \rightarrow a$

$\epsilon, S' \rightarrow b$

$\epsilon, S' \rightarrow \epsilon$

