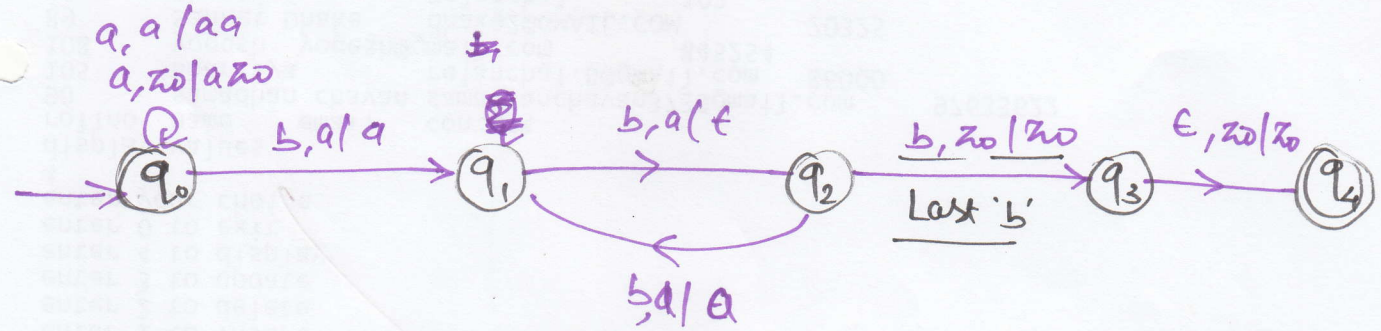
(10) $L = \{a^n b^{2n+1} \mid n \geq 1\}$

$\Rightarrow$ $a^n b^{2n} \cdot b \Rightarrow \underset{\text{Push}}{a}\ \underset{\text{Pop}}{bb}\ \underset{\text{No op}^n}{b}$

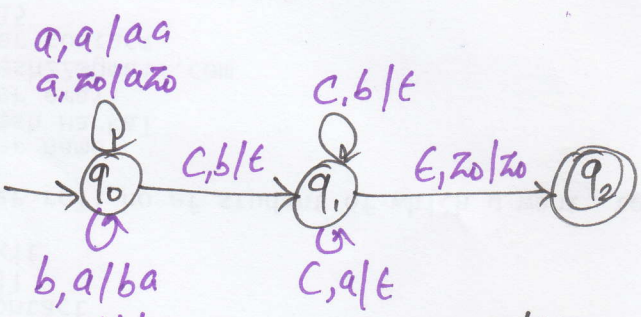
Here push single 'a' on stack & for every 2nd 'b' pop out 'a' from stack & for last single 'b' go for next state. & then accept the string.



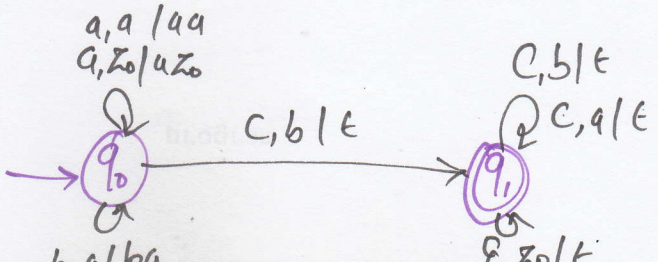
(11) $L = \{a^i b^j c^k \mid i, j, k \geq 0 \ \& \ i+j = k\}$ Dec'15 10 M

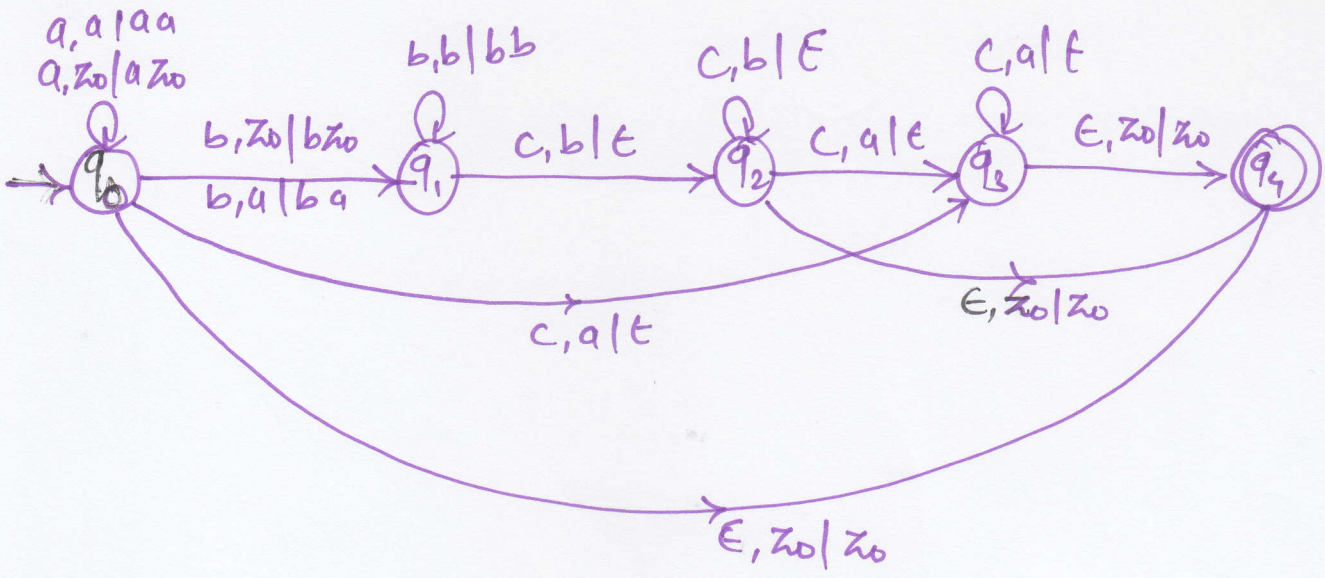
$\Rightarrow$ $L = a^i b^j c^{i+j} \Rightarrow a^i b^j c^i c^j$

(1)

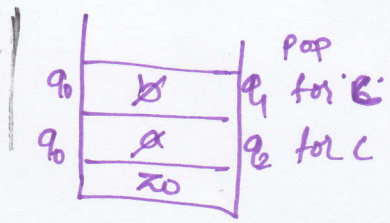


(2)





1) $w = abcc$



2) $w = ac$

$q_0 \to q_3 \to q_4$

3) $w = bc$

$q_0 \to q_1 \to q_2 \to q_4$

4) $w = \epsilon$

$q_0 \to q_4$

5) $w = aabccc$

$q_0 \to q_0 \to q_1 \to q_2 \to q_3 \to q_3 \to q_4$

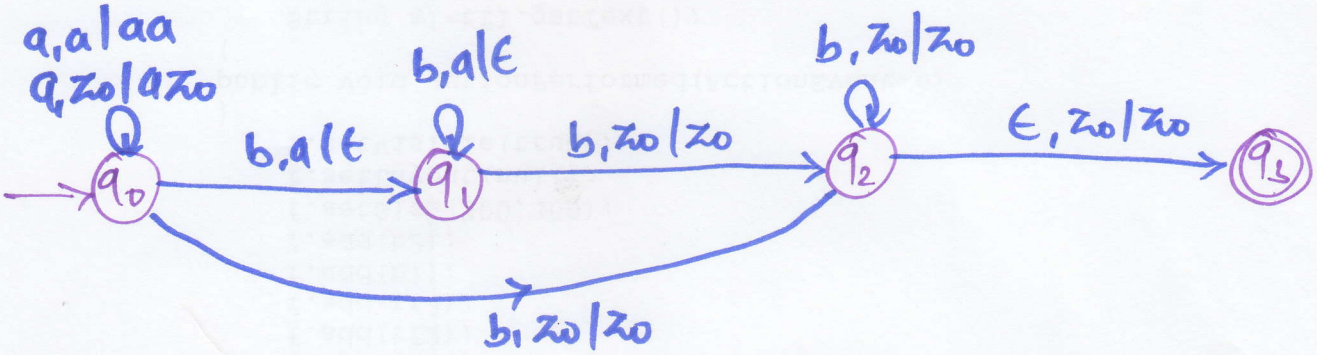
— In this for 10 M explain every step (or) transition with examples.

① $L = \{a^m b^n \mid m < n\}$

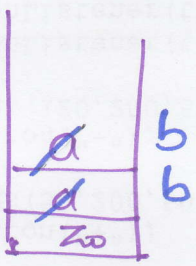
→ $0 < 1$

If 1) $m = 0 \Rightarrow b^n \mid n \geq 1 \Rightarrow b$

2) $m \neq 0 \Rightarrow$ abb, aabbb (push, pop, Nu.), aaabbbb (push, pop, No-op^n)



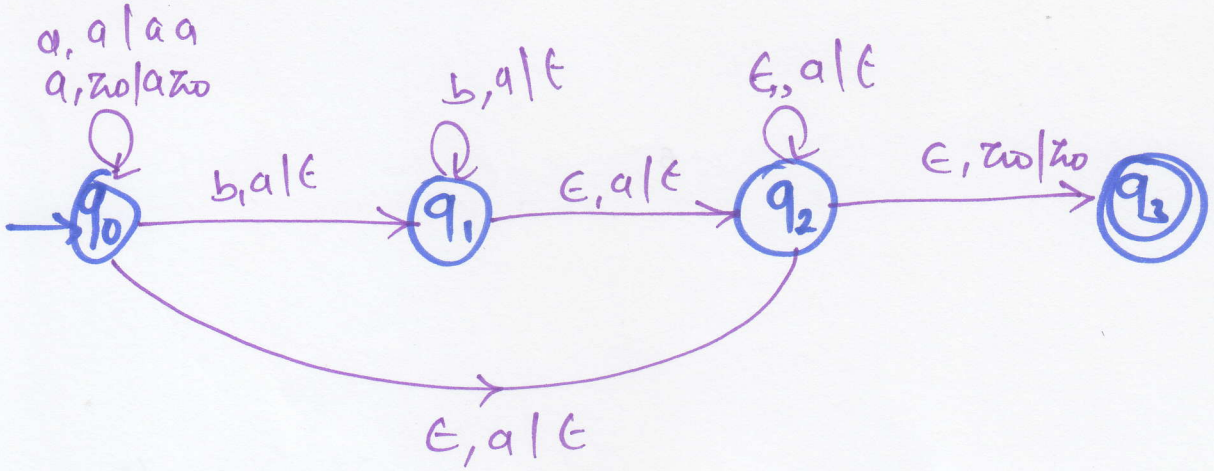
aabbbb (No-op^n)



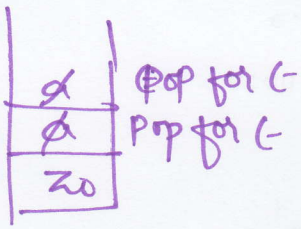
② $L = \{a^m b^n \mid m > n\}$

→ ① $n = 0 \Rightarrow a^m \mid m \geq 1 \Rightarrow a, aa, aaa \ldots$

② $n \neq 0 \Rightarrow$ aab (push, pop, pop), aaabb (pop), aaaabbb (push, pop, pop) ...

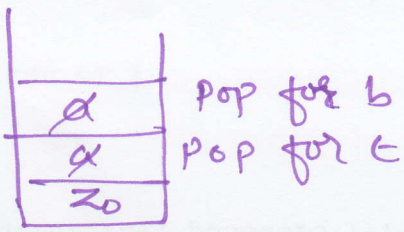


(i) $w = aa.\epsilon.b$



$q_0 \rightarrow q_2 \rightarrow q_3$

(ii) $w = aab.\epsilon$



$q_0 \rightarrow q_1 \rightarrow q_2 \rightarrow q_3$

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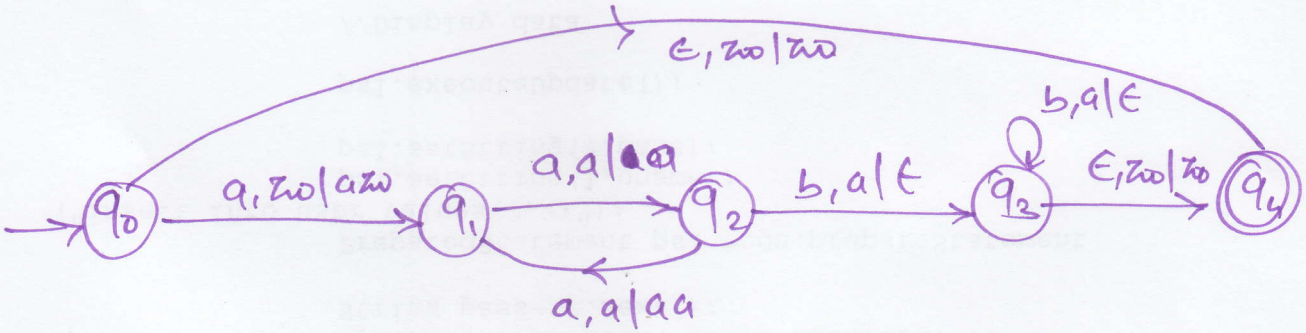
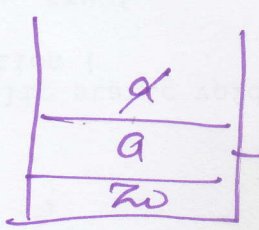
3) $L = \{ a^m b^n \mid m = 2n \} \Rightarrow L = \{ a^{2n} b^n \mid n \geq 1 \}$ May is 10M.



$L = \{ \epsilon, \underbrace{aa}_{m}\underbrace{b}_{n=1}, \overbrace{aaaa}^{m}\overbrace{bb}^{n=2} \ldots \ldots \}$

a a a a b b
Push N P N Pop

(i) $w = aaaabb$



(ii) $w = ab$

No op
a b
push pop

4) $L = \{a^m b^n \mid n = 2m\}$

→ $L = \{ \epsilon, abb, aabbbb \ldots \}$