Date:.....

Pushdown Automata

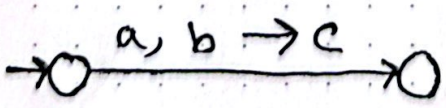
- Computational model that recognizes CFL (context-free language)

- PDA - NFA paired with stack

It is similar to NFA
- works with only important transitions.
- can have epsilon transition

- CFG has memory of at most two quantity.

- γ - stack input [different from alphabet]



a, b → c

input

current stack top that will be popped

item that will be pushed

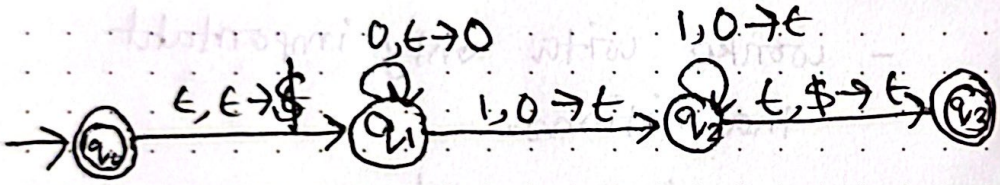
BRAC UNIVERSITY
Inspiring Excellence

Date:.....

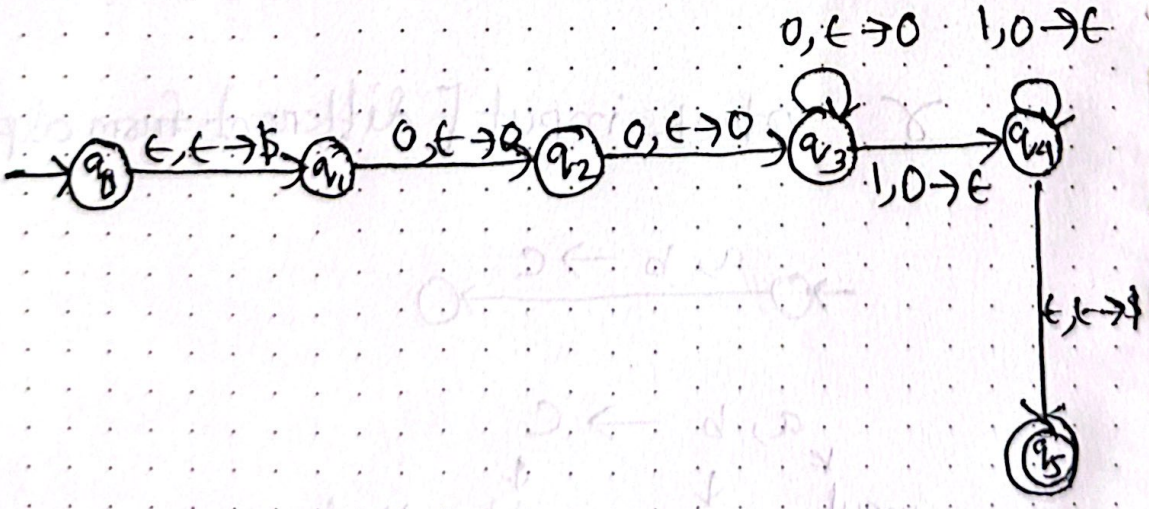
- moving from one state to another means $\epsilon, \epsilon \rightarrow \epsilon$

PDA Examples

$L = \{0^n 1^n ; \quad n \geq 0\}$

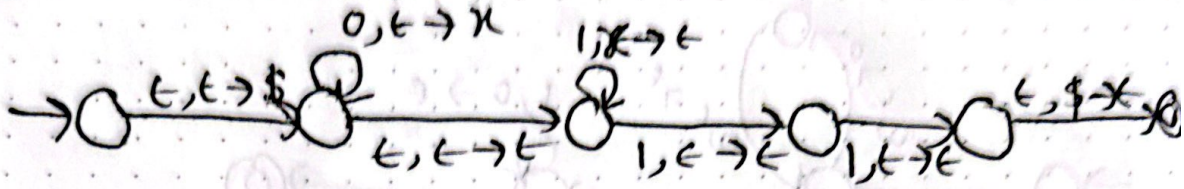


$L = \{0^n 1^n ; \quad n \geq 1\}$

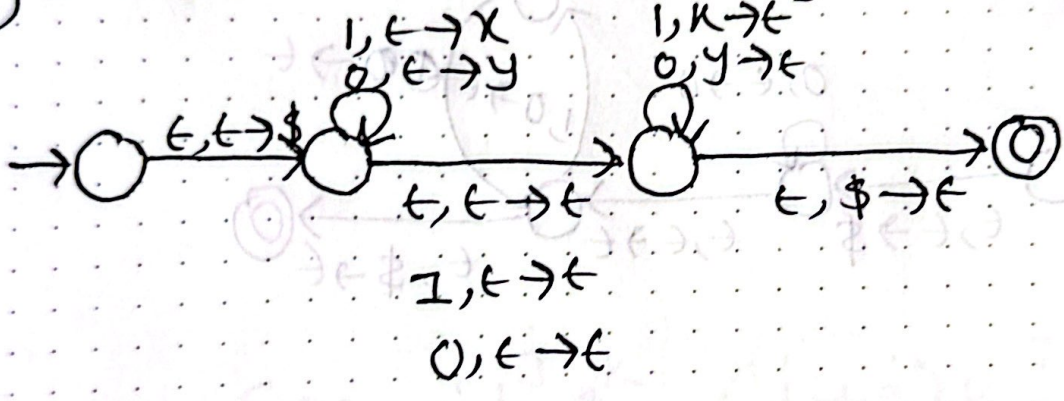


Date:.....

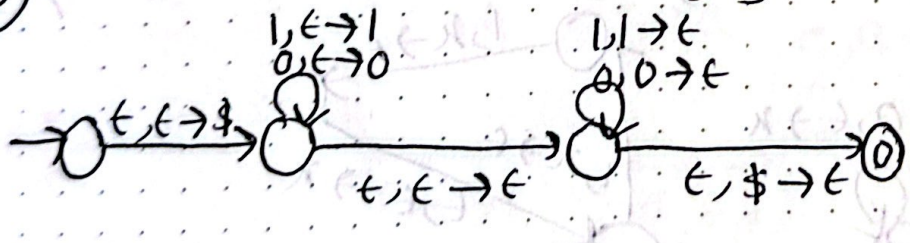
③ $L = \{ w = 0^n 1^{n+2} ;\ n \geq 0 \}$



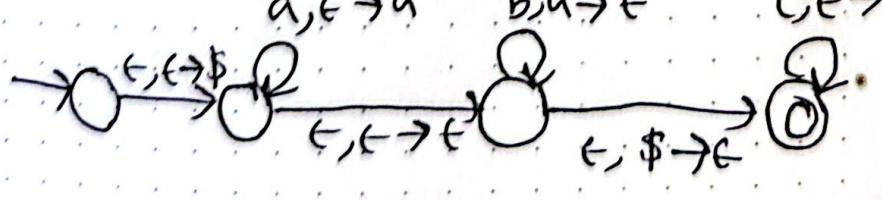
④ $L = \{ w$ is a palindrome $\}$



⑤ $L = \{ wwR ;\ w \in \{0,1\}^* \}$

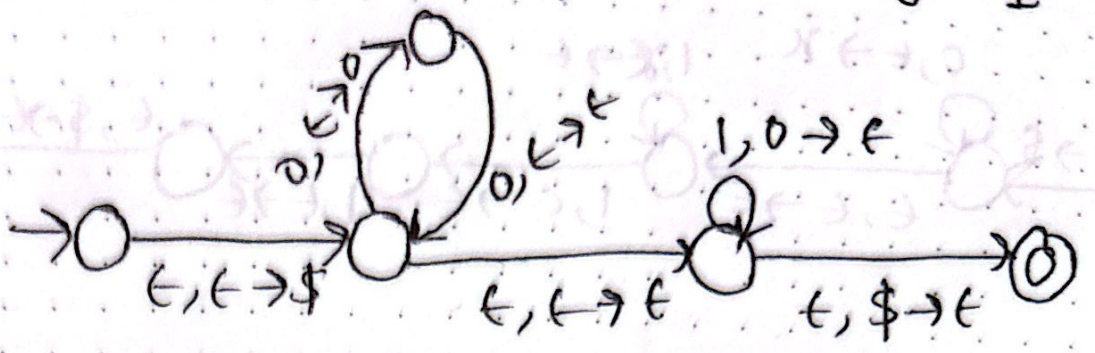


⑥ $L = \{ w = a^i b^j c^k$ where $i == j \}$

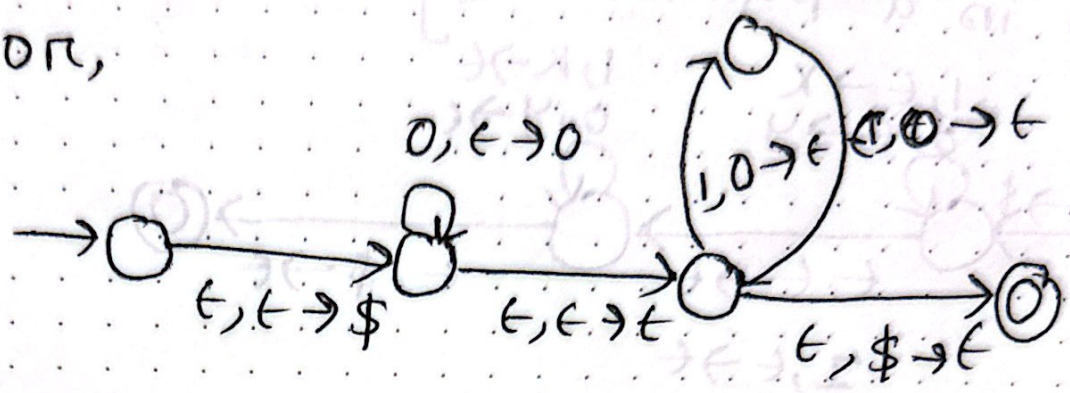


Date:.....

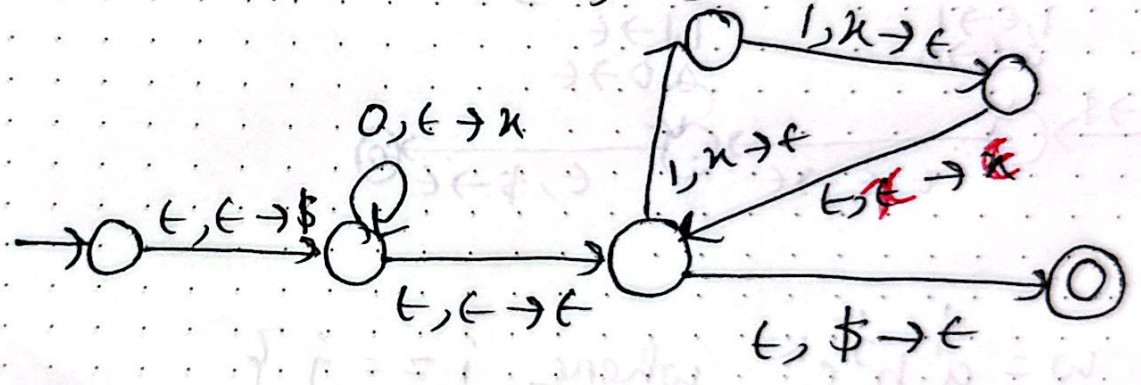
⑦ $L = \{ w \in \{0,1\}^* : w = 0^{2n} 1^n \; ; n \geq 0 \}$



OR,



⑧ $L = \{ w \in \{0,1\}^* : w = 0^{3n} 1^{2n}, n \geq 0 \}$

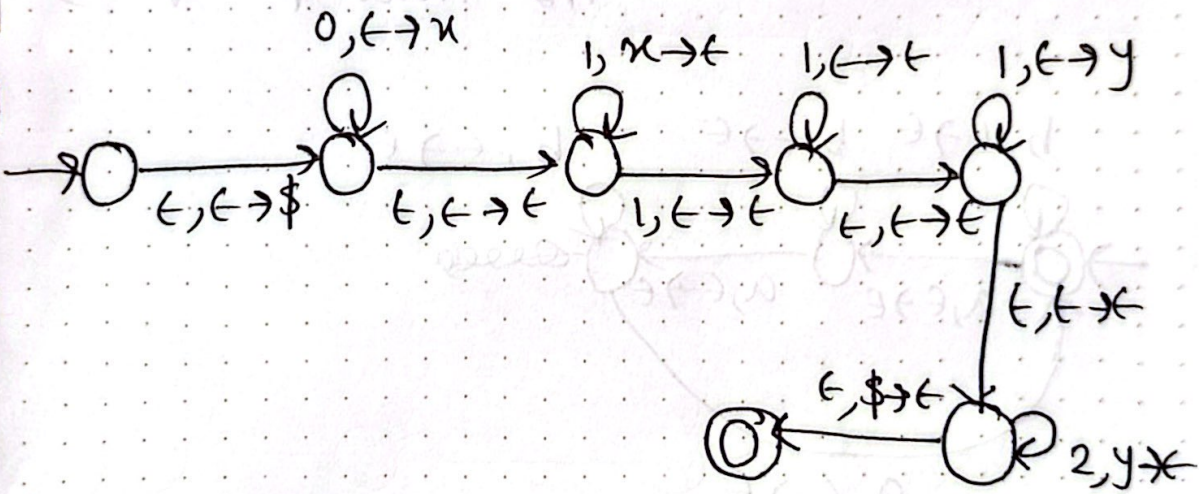


Date:.....

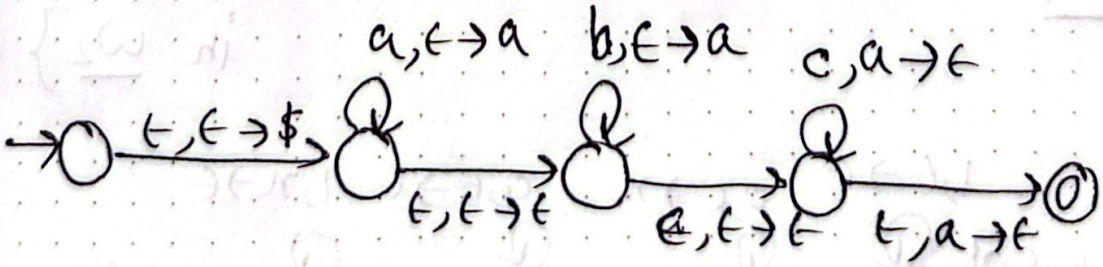
BRAC UNIVERSITY
Inspiring Excellence

(9) $L = \{ w = 0^i 1^j 2^k \quad j > i+k \; ; \; i,k \geq 0 \}$

$0^i 1^i \underline{1}^p 1^k 2^k$



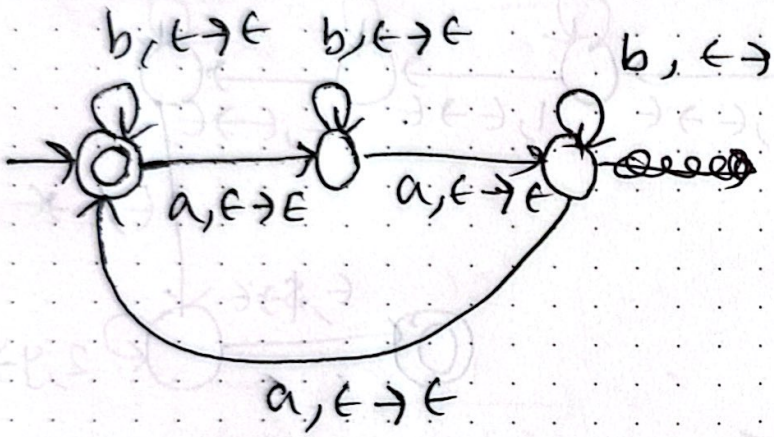
(10) $L = \{ w = a^i b^j c^k \; ; \; i+j > k \}$



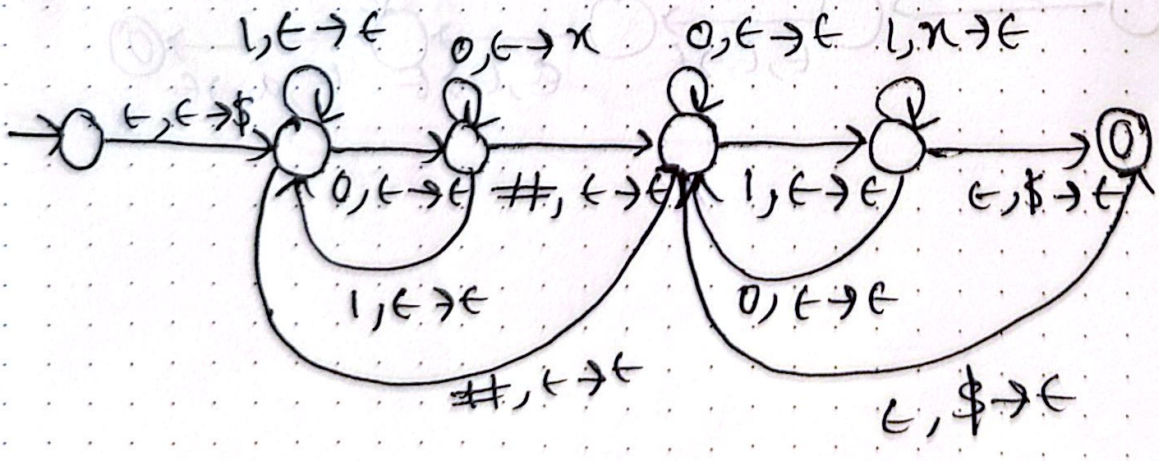
BRAC UNIVERSITY
Inspiring Excellence

Date:.....

(11) $L = \{$ the count of 'a' in w is multiple of 3$\}$



(12) $\{ w_1 \# w_2$; the number of '00' in w_1 is the same as the number of '11' in $w_2 \}$

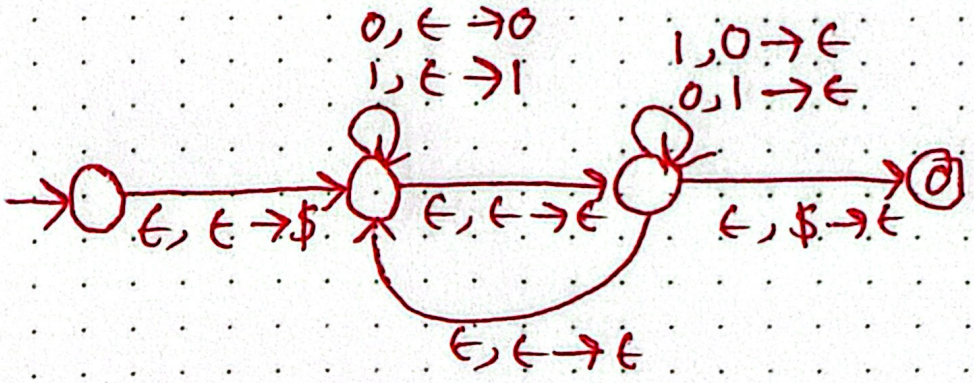


BRAC UNIVERSITY
Inspiring Excellence

Date:.....

$L = \{w \in \{0,1\}^* : \text{no of 0's \& 1's are equal in } w\}$

Hint - push all 0's & 1's in stack. [Pop 1's for 0's & 0's for 1's]



Or,