
# CSE211 – Formal Languages and Automata Theory

## U3L5_Turing Machine as Copier

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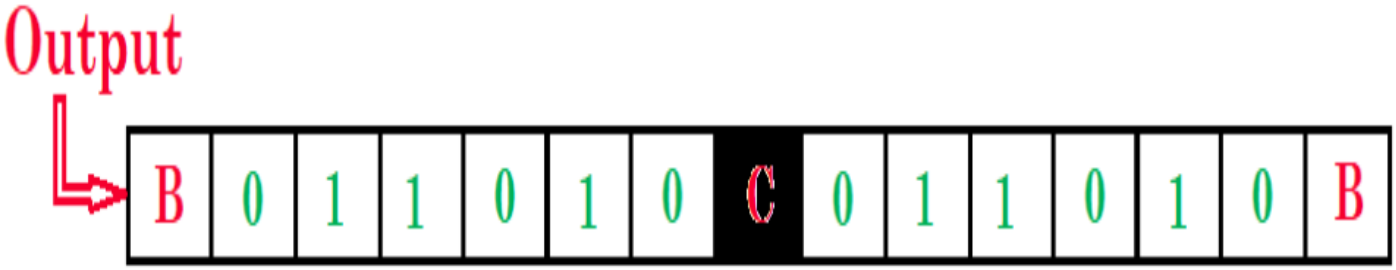
# Objectives

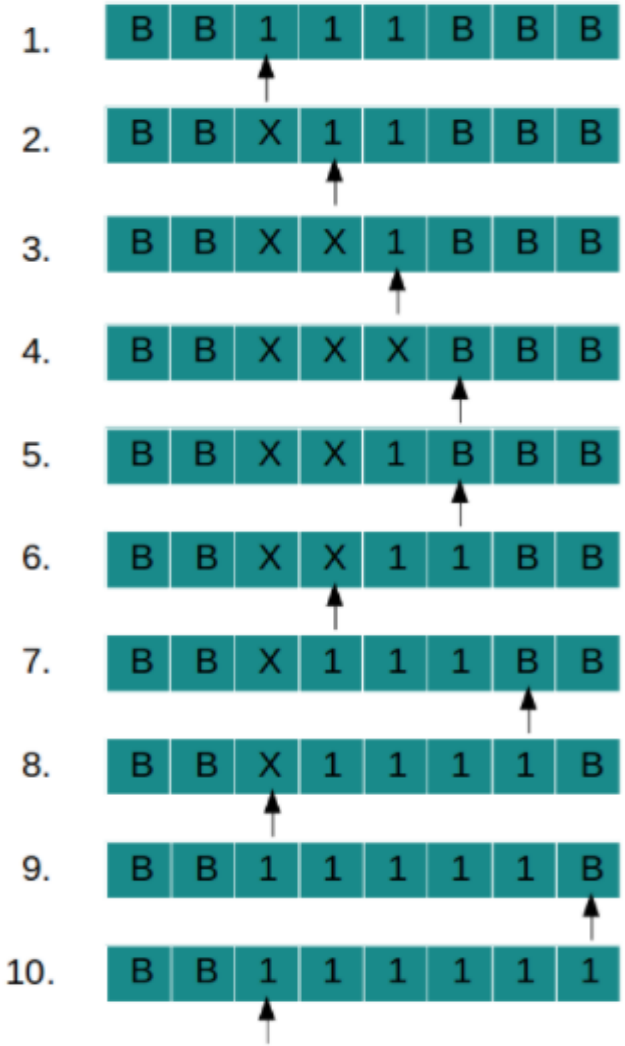
- **Problem –** Construct a Turing machine which copy data
- Example

# Steps

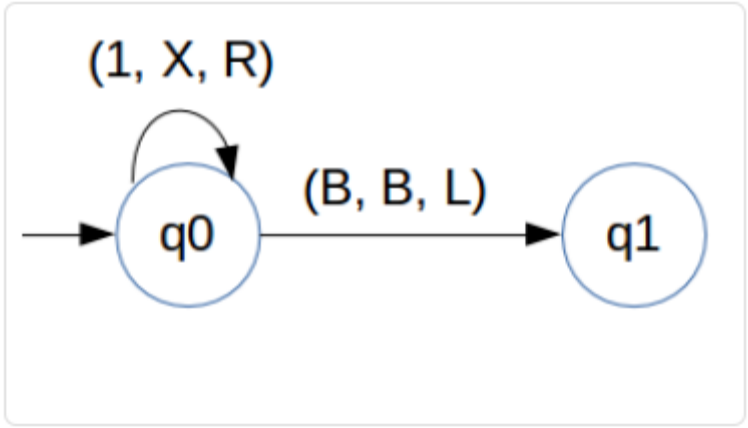
- Steps
  - Input will be given as "B B B 1 1 1 B B B"
  - First convert all '1' to 'X' : "B B B X X X B B B"
  - Then mark 'X'(rightmost) as '1' and also mark BLANK as '1' : "B B B X X 1 1 B B"
  - Repeat step 3 till all 'X' are finished
  - Point TAPE head to start of string

# TAPE movement for string "111"



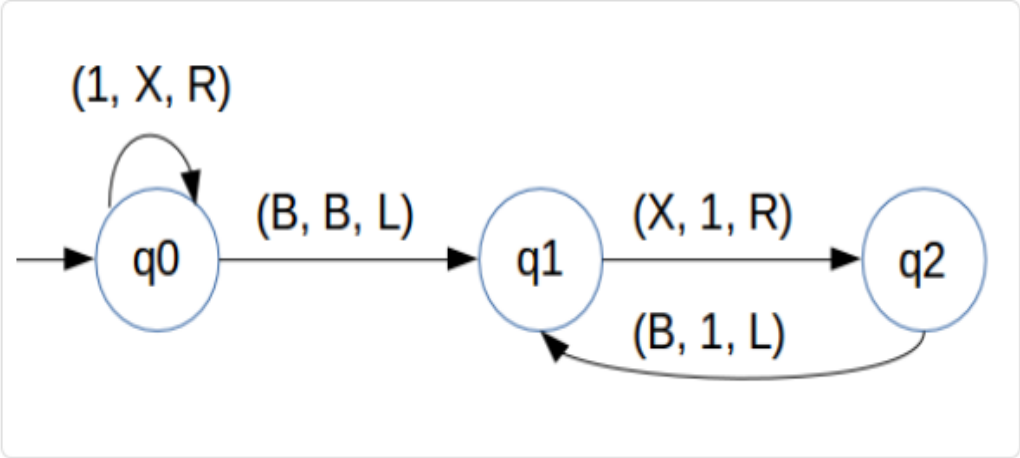
# Steps...

1. First convert all '1' to 'X'



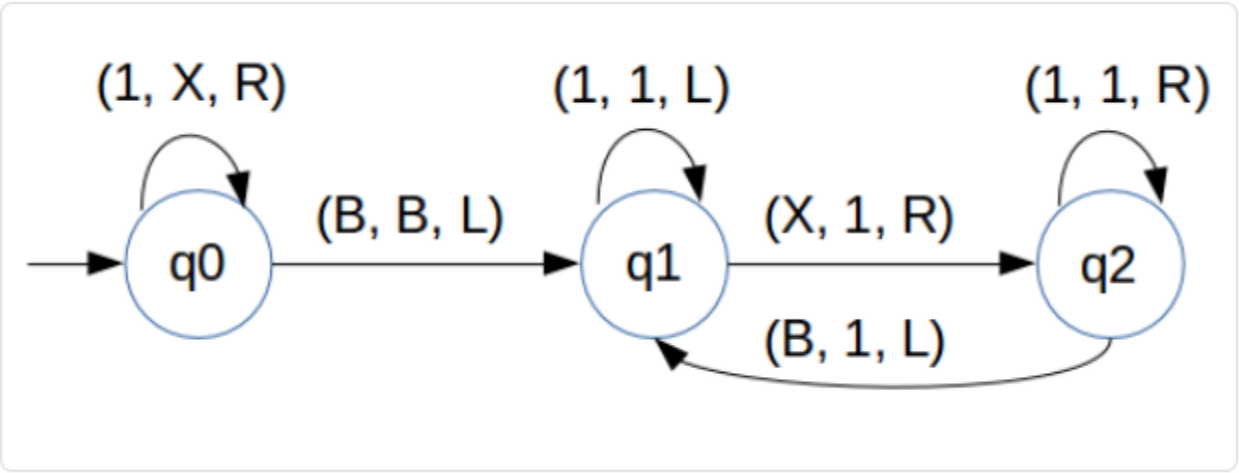
# Steps...

2. Reach BLANK(in right) and move one step left, and convert 'X' to '1' and move right, convert BLANK to '1'



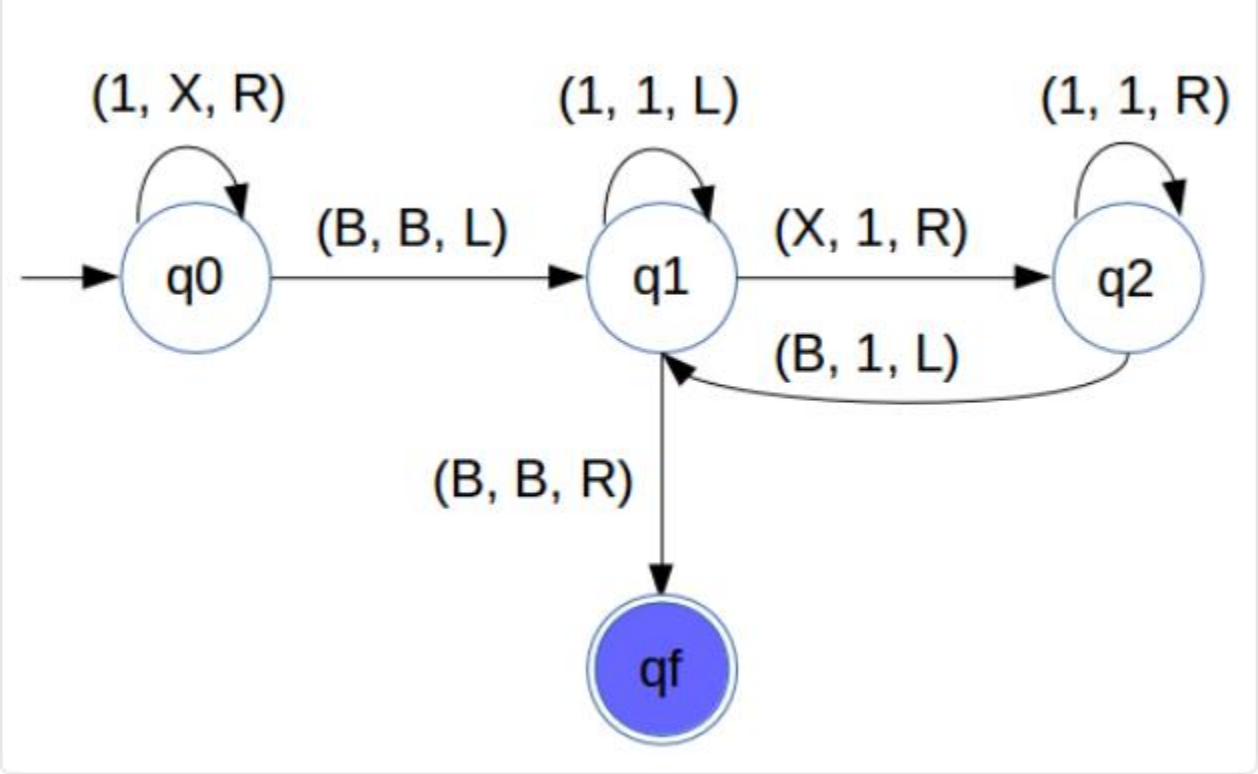
# Steps...

- 1. In step 2, while going towards BLANK(in right) we can get '1's on the way so pass them using self loop
  2. In step 2, while going towards 'X'(in left) we can get '1's on the way so pass them using self loop.

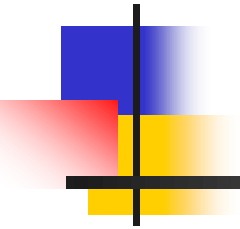


# Steps...

- **Finally when going towards 'X'(in right) if we do not get any 'X'(means all X are finished), so if we get BLANK then stop**



- **Construct Turing machine for L = {$a^n b^m a^{(n+m)}$ | n,m≥1}**
- **Turing Machine to check whether given string is Even Palindrome or not**



# Thank you.