

## Probleme CC seminar\_1:

1) Se da x un numar natural scris in baza 1.  
Sa se deplaseze x spre dreapta cu 4 casute.

Pentru x=5, banda arata astfel:

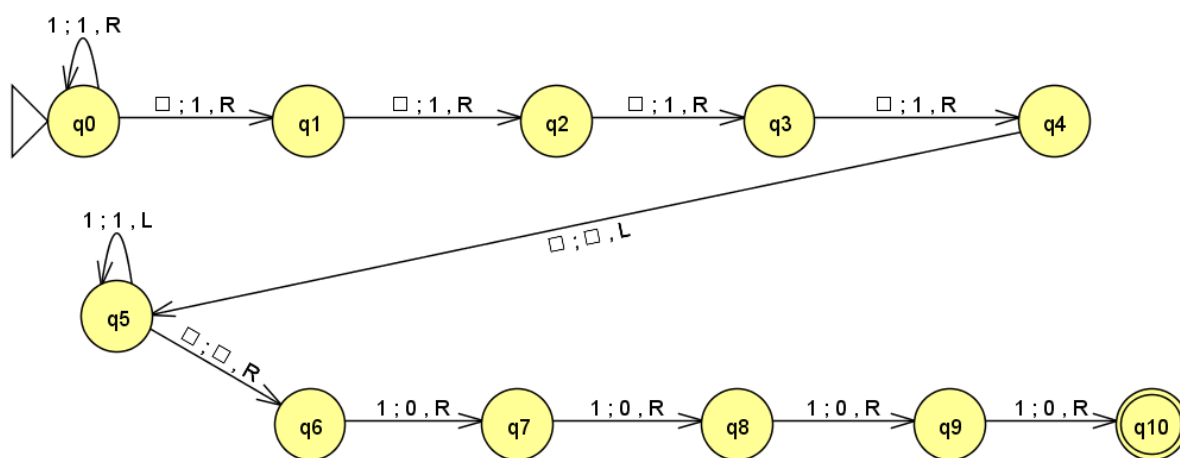
- La inceput:

...	B	B	1	1	1	1	1	1	B	B	...
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- La final:

...	B	B	0	0	0	0	1	1	1	1	1	1	B	...
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pas 1. **cat timp** citim 1, scriem 1, pas dreapta  
pas 2. **(de 4 ori)** daca citim B, scriem 1, pas dreapta  
pas 3. citim B, scriem B, pas stanga  
pas 4. **cat timp** citim 1, scriem 1, pas stanga  
pas 5. citim B, scriem B, pas dreapta  
pas 6. **(de 4 ori)** citim 1, scriem 0, pas dreapta



Obs: Pentru simplitate, la complexitati am *aproximat* lungimea benzii initiale (x+1 simboluri de 1) la valoarea x.

**Complexitate spatiu:** (numarul de celule ocupate pe banda la finalul problemei)

$$CS = x + 4 \Rightarrow O(x)$$

**Complexitate timp:** (am insumat complexitatile pt cei 6 pasi din algoritmu)

$$CT = x + 4 + 1 + (4+x) + 1 + 4 = 2x+14 \Rightarrow O(x)$$