

CS 252

TA #6

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3.1 d)

q ₁ 000000	⊔ x 0 x 0 q ₅ x ⊔	⊔ x q ₂ 0 x 0 x ⊔
⊔ q ₂ 00000	⊔ x 0 x q ₅ 0 x ⊔	⊔ x x q ₃ x 0 x ⊔
⊔ x q ₃ 0000	⊔ x 0 q ₅ x 0 x ⊔	⊔ x x x q ₃ 0 x ⊔
⊔ x 0 q ₄ 000	⊔ x q ₅ 0 x 0 x ⊔	⊔ x x x 0 q ₄ x ⊔
⊔ x 0 x q ₃ 00	⊔ q ₅ x 0 x 0 x ⊔	⊔ x x x 0 x q ₄ ⊔
⊔ x 0 x 0 q ₄ 0	q ₅ ⊔ x 0 x 0 x ⊔	⊔ x x x 0 x ⊔ q reject
⊔ x 0 x 0 x q ₃ ⊔	⊔ q ₂ x 0 x 0 x ⊔	

3.2 e)

q ₁ 10 # 10	x q ₇ 0 # x 0	x x # x q ₄ 0	x x # q ₈ x x
x q ₃ 0 # 10	q ₇ x 0 # x 0	x x # q ₆ x x	x x # x q ₈ x
x 0 q ₃ # 10	x q ₁ 0 # x 0	x x q ₆ # x x	x x # x x q ₈
x 0 # q ₅ 10	x x q ₂ # x 0	x q ₇ x # x x	x x # x x ⊔ q accept
x 0 q ₆ # x 0	x x # q ₄ x 0	x x q ₁ # x x	

3.8 b) 1. Scan the tape and mark the first 1 that has not been marked. If no 1's are found, go to stage 4. Otherwise, move the head to the front of tape.
2. Scan the tape and mark the first two 0's that have not been marked. If two unmarked 0's are not found, reject.
3. Move head to front and go back to stage 1
4. Move head to front of tape and scan. If any unmarked 0's are found, reject. Else, accept.

c) 1. Same as part b

2. Same as part b, except if two unmarked 0's are not found, accept.

3. Same as part b

4. Same as part b, but accept if any unmarked 0's are found. Else, reject

3.15 d) Given two languages L_1 and L_2 that have corresponding TM M_1 and M_2 , imagine a new machine M' :

- 1) If M_1 accepts the string, reject
- 2) If M_2 accepts the string, accept

3.16 d) Same machine M' as 3.15 d)

- 1) If M_1 rejects the string, reject. Else move to #2
- 2) If M_2 accepts the string M' recognizes and accepts the string